

FORSCHUNGEN IN EPHESOS XV/1

TAMÁS BEZECZKY

THE AMPHORAE
OF ROMAN EPHESUS

Contributors

PETER SCHERRER

ROMAN SAUER



Verlag der
Österreichischen Akademie
der Wissenschaften



OAW

TAMÁS BEZECZKY

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Peter Scherrer
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VORWORT

Die von Tamás Bevezky vorgelegte Studie über die römischen Amphoren aus Ephesos einleiten zu dürfen, ist der Unterzeichneten eine besonders große Freude. Als Grabungsleiterin, Leiterin des vom Fonds zur Förderung der wissenschaftlichen Forschung unterstützten Amphorenprojekts und als Keramikspezialistin ist es mir eine Genugtuung, dass sich die Keramikforschung nun auch in den Publikationen der Grabung Ephesos prominent niederschlägt. Erstmals in der ephesischen Grabungsgeschichte wird eine keramische Fundgattung umfassend vorgestellt und dafür Material aus verschiedenen Fundplätzen herangezogen. Der typo-chronologische Aufbau der Untersuchung basiert in erster Linie auf gut datierten Fundkomplexen aus dem Hanghaus 2 sowie der Tetragnon Agora von Ephesos. Beide Grabungsplätze lieferten umfangreiches keramisches Fundmaterial, das letztendlich eine Analyse der Amphoren vom 2. Jahrhundert v. Chr. bis in die Spätantike erlaubte. Die kontextuelle Auswertung dieser Fundkomplexe, die in Zusammenarbeit mit Bearbeitern anderer Fundkategorien sowie den Ausgräbern erfolgte, ermöglichte in vielen Fällen erst eine genaue Datierung und bildet somit das Grundgerüst dieser Arbeit.

Wie in einer Publikation von Amphoren nicht anders zu erwarten, liegt der Schwerpunkt jedoch auf deren wirtschaftsarchäologischer Interpretation. Bei der Frage nach der Herkunft einzelner Amphorentypen wurden unterstützend zur archäologischen Auswertung auch petrographische Methoden angewendet. Besonderes Augenmerk lag dabei natürlich auf einer Definition der Lokalproduktion im Umland von Ephesos, die ihrerseits wichtige Informationen über die landwirtschaftliche Produktion der Region liefern kann. Darüber hinaus ermöglicht ein genaues Studium des Amphorenspektrums auch entscheidende Rückschlüsse auf Handelsbeziehungen. Somit stellt die Bearbeitung der Amphoren einen essenziellen Beitrag zur Wirtschaftsgeschichte von Ephesos dar.

An erster Stelle ist natürlich dem Autor Tamás Bevezky zu danken, dessen Engagement und Fachwissen diese Publikation erst ermöglichten. Besonderer Dank gilt auch Roman Sauer, der für den archäometrischen Teil verantwortlich zeichnet. Dem Fonds zur Förderung der wissenschaftlichen Forschung ist für die finanzielle Absicherung des Projekts zu danken, und der Österreichischen Akademie der Wissenschaften dankt das ÖAI für die langjährige hervorragende Zusammenarbeit auf dem Gebiet der Ephesos-Forschung. Es bleibt zu hoffen, dass in baldiger Zukunft weitere Keramikstudien folgen werden.

Selçuk, September 2012

Sabine Ladstätter

VORWORT

Mit dem Abschluss der Feldforschungen zur Tetragonos Agora, die seit den späten 1980er Jahren unter Mitarbeit und späterer Leitung von Peter Scherrer durchgeführt worden waren, stand von vorne herein fest, dass für die Publikation – neben den kontextorientierten Materialvorlagen – auch wichtige Fundgattungen eine systematische Aufarbeitung erfahren sollten. Für die römischen Transportamphoren stand mit Tamás Bezczyk ein erfahrener Mitarbeiter zu Verfügung, der seit 1998 dem Team von Ephesos angehörte und im Rahmen eines von Sabine Ladstätter eingereichten FWF-Projektes im Jahre 2001 die Publikation dieser Fundgruppe übernahm. Für die hellenistischen Amphoren wurde Marc Lawall gewonnen.

Durch die vielversprechenden Erfahrungen aus abgeschlossenen Vorprojekten des Autors und die aussagekräftige Menge der Funde wurde von Anfang an festgelegt, dass die Bearbeitung auch eine materialorientierte Analyse nach petrographischen Methoden einschließen sollte. Wegen des stark fragmentierten Zustandes der Amphoren stand eine formtypologische Fragestellung im Hintergrund. Neben dem Material der Tetragonos Agora wurden auch weitere, gut stratifizierte Fundkomplexe – vor allem aus der Hanghausgrabung – in die Untersuchung einbezogen und einige gezielte Begehungen durchgeführt. Damit war die Erwartung verbunden, einen fundierten und differenzierten Überblick nicht nur zur kaiserzeitlichen Amphoren-Produktion von Ephesos zu gewinnen, sondern auch den wirtschaftsgeschichtlichen Aspekt von Importen aus dem *orbis terrarum* beleuchten zu können.

Dieses gesteckte Ziel wurde im Rahmen von zwei weiteren FWF-Projekten erweitert, die in den Jahren 2005 und 2008 vom Autor als „Selbstanträge“ eingebracht und vom FWF auch bewilligt wurden. Die Fragestellung wurde auf andere große Fundplätze im Mittelmeerraum ausgedehnt und auch ephesischer Export berücksichtigt. Dafür wurden zum einen zahlreiche Reisen notwendig, auf diesem Weg gelang aber auch die Einbindung in ein internationales Netzwerk von Fachleuten, in dem der Autor manche Anregung fand und seinerseits interessante Beiträge leisten konnte. Das gesamte Material, die Dokumentation der petrographischen Analysen und ihre Auswertung wurden in einer methodisch weiter entwickelten Datenbank aufbereitet, wodurch der Informationsaustausch mit anderen Fundorten und Produktionszentren zusätzlich vertieft werden konnte. Mit der Kampagne 2007 wurde die Materialaufnahme vor Ort abgeschlossen. Spätere Forschungsaufenthalte in der Türkei, in Griechenland, Spanien und Südfrankreich und Italien dienten den Vergleichsstudien zur ephesischen Amphoren-Produktion und ihre Verbreitung im Mittelmeerraum. Diese Ergebnisse sind unter dem Titel „Food export from Ephesus: On the basis of amphorae“ in Publikationsvorbereitung.

Mit der nun vorliegenden Publikation verbinden sich dem Unterzeichneten zwei Wünsche:

Durch die Materialauswahl und die breit gefächerte Methodik kommt der Arbeit ein hoher paradigmatischer Wert zu. Es ist zu hoffen, dass die in der Arbeit enthaltenen Erkenntnisse die weiterführenden Forschungen zur METROPOLIS ASIAE befruchten können: In der Keramik-Forschung und ihrer Methodik, in der allgemeinen Wirtschaftsgeschichte, insbesondere aber in der Reflexion zur Verbreitung und Wertigkeit von Konsumgütern und ihren großräumigen Austausch. Mit der Bearbeitung neuer Funde wird der Wissensstand zu den relevanten Fragen hoffentlich erfolgreich erweitert werden können.

Das Potenzial der erbrachten Leistungen scheint größer, als dass es in der vorliegenden Buchform ausgeschöpft wäre. Es ist daher zu wünschen, dass die Datenbank, die von Tamás Bezczyk und Péter Hornung für dieses Projekten entwickelt wurde und bisher nur wenigen Insidern als technische Struktur und als fachliche Wissensquelle bekannt ist, möglichst weiterentwickelt und vielleicht einer größeren Nutzung zur Verfügung gestellt werden kann. Mit großem Erfolg wurde sie für die Bearbeitung der Rhodischen Amphoren am „Archaeological Institut of Aegean Studies“ und die Ephorie der Dodekanes adaptiert. Im System der wissenschaftlichen Kommunikation kann ein solches Instrument sicherlich gewisse „schulbildende Kraft“ gewinnen, allerdings nur dann, wenn es öffentlich verfügbar ist.

Friedrich Krinzing

INTRODUCTION

In 1998 F. KRINZINGER, the Ephesus excavation-director and P. SCHERRER, the Tetragonos Agora excavator, invited me to study the amphorae of Ephesus. By publishing part of the Roman amphorae found at eight sites in Ephesus, I wish to contribute to present-day knowledge of amphora studies. The collection is not complete and the stores have material from other sites. However, in conjunction with the amphorae published earlier, the collection does provide an overview of the city's food trade. This book primarily contains the amphorae of the Roman period. M. LAWALL has already published the stamps of the Hellenistic amphorae of the Basilica Stoa and will soon publish the pieces found at the Tetragonos Agora. I shall refer to the Late Hellenistic amphorae of the Agora only when they were found together with Republican and Early Roman amphorae. Discussing the amphorae at the Terrace House 2, I mention a few Hellenistic amphorae briefly, for the sake of completeness.

The bulk of the available amphorae was found at two sites which had different functions in ancient times. The Tetragonos Agora was an important commercial centre during the Hellenistic and the Early Imperial periods. The excavations focused on resolving problems of architecture and chronology. The excavations lasted for more than ten years. Some of the Late Roman layers were removed during two earlier excavations (1901–1907 and 1964–1968). This makes it hard to determine the quantity of the Late Roman amphorae. The Terrace House 2 rescue excavation in 1999 was confined to certain areas and was defined by the requirements of the columns holding the new roof and not by archeological considerations. The number of amphorae discovered at the rest of the sites is significantly smaller.

Within the individual amphora types, I considered the fabric variations as well. This explains why some of the types are represented by more than one amphora in the catalogue. Usually only one amphora refers to the commercial link with a centre of production. Since there are excellent and detailed descriptions of the individual amphora types, the brief summaries this book provides should in most cases be seen as reminders of and references to the sources I have used. The amphorae in Ephesus are very fragmentary. Only the characteristic parts: rim, base and handle (RBH) were considered. The reconstruction of the bodies from the parts was not possible. More than fifty percent of the pieces are handle fragments which, unfortunately, do not always allow the identification of the type. The description of the types begins with Late Hellenistic forms produced in the eastern Mediterranean area, and continues with the Early Imperial forms. The western Mediterranean types are also discussed in a more or less chronological order. This is followed by the Middle and Late Roman amphorae. There are altogether 621 amphorae in this collection. The amphorae of the various sites are listed in the tables containing the drawings. This makes possible the investigation of the composition of the amphorae found at sites that fulfilled different functions. When I describe an amphora type, I shall refer to other amphorae belonging to the same type at all the sites. This excludes the continuous numbering within the catalogue. The index lists the amphorae according to layers and types. The amphorae from Italy are somewhat over-represented among the pieces found at the Agora. This is because the first part of my research project concentrated on the Italian amphorae and this fact is also reflected in the petrological analyses.

The numbers in the catalogue refer to the sites:

Tetragonos Agora	nos. 1–420
Terrace House 2	nos. 501–650
Magnesian Gate Survey	nos. 701–721
State Agora, Basilica Stoa	nos. 801–805
State Agora, Well	nos. 810–811
State Agora, Prytaneion	no. 820
Serapeion	no. 830
Arap-Dere Survey	nos. 851–871

The drawings have been reproduced using a scale of 1:4, with the exception of amphora No. 810, where a scale of 1:10 was used. The scale of the photos is not defined. The scale of the rubbings is 1:1. The basic information concerning the fresh breaks of all the pieces in the catalogue are in photos of 1:20 scale (5.4 x 4.3 mm area).

The petrological (thin section and heavy mineral) analyses of the amphorae was done by R. SAUER. The petrological description of the amphorae in the catalogue can be found with the individual types. The tables and diagrams can be found in the chapter on petrology.

P. SCHERRER provided the chronology of the layers of the Tetragonos Agora; S. LADSTÄTTER and A. WALDNER established the chronology of the layers at Terrace House 2; V. MITSOPOULOS LEON and C. LANG-AUINGER have provided the excavation information on the Basilica Stoa; R. MERİÇ on the Well. H. TAEUBER helped me read the Greek stamps.

The information about the amphorae is contained in a FileMaker database created by P. HORNUNG. We record the digital photos and the technical details; the box number; size and location of the section; the chronology of the excavation; as well as the 'Fundjournal' (containing the description of the ceramic and other objects) in a database. The database contains photomicrographs at 1:10 and 1:20 magnification of the fresh breaks of the fragments when deemed important. We record the petrological (thin section and heavy mineral) information and the photomicrographs of the thin sections. The database is connected to 3D software (Graphisoft ARCHICAD) that makes it possible to access the stratigraphic position of the objects using the data produced during excavation.

The book relies on the accepted chronological periods¹:

Late Hellenistic (= LH – mainly late second and first centuries B.C.)

Early Roman (= ER – c. late first century B.C. to the end of the first century A.D.)

Mid Roman (= MR – from the early second century to the end of the third century A.D.)

Late Roman (= LR – from the fourth to the seventh centuries A.D.)

The Roman amphora types of the eastern Mediterranean region are here described using the descriptive method devised by an international team, now available on the Internet. This method defines amphorae from a typological and chronological perspective, recording the economic significance when known².

To improve the ease of reading there are multiple internal references to certain topics within this book, though a number of brief repetitions were inevitable. During the process of this research, recent publications have on occasion motivated me to review my views on amphorae published previously.

My research was supported by the Austrian Archaeological Institute, the Austrian Science Fund (FWF) and the Austrian Academy of Sciences. The 2005 grant of the Austrian Science Fund allowed me to undertake indispensable examination of the comparative and reference materials as well as additional petrological analysis.

THE BOOK IS DEDICATED TO MY FAMILY

Vienna
December 2010

Tamás Bezaczký

¹ Riley 1979, 98.

² Riley 1979, 98. Grace – Savvatianou-Petropoulakou 1970; Beltran 1970; Peacock 1971; Peacock 1977; Panella – Fano 1977; Grace 1979; Keay 1984; Peacock – Williams 1986; Tchernia 1986; Empereur – Hesnard 1987; Panella 2001; Williams – Keay 2005: Roman Amphorae: http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/

The Amphoras Project, University of Toronto, www.projects.chass.utoronto.ca/cgi-bin/amphoras/well; J. R. RODRÍGUEZ (dir.), Centro para el estudio de la interdependencia provincial en la antigüedad clásica (CEIPAC) www.ceipac.gh.ub.es/; J.-Y. EMPEREUR (dir.), A. KAAAN ŞENOL, Le Centre Alexandrin d'Étude des Amphores, CNRS www.amphoralex.org.

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Fig. 1 Western part of Asia Minor.

1. HISTORICAL BACKGROUND

Ephesus is located at the mouth of the River Cayster, which flows between the Tmolos and Messogis Mountains (Fig. 2). Strabo mentions that Androklos the Athenian settled most of the people who had come with him on the local hills of Athenaeum, Hypelaeus and Mt. Coressus¹. Later, however, people moved closer to the Temple of Artemis. This situation lasted until Alexander the Great's campaigns. King Lysimachos fenced in an area with a wall in a valley between the Pion (Panayırdağ) and Preon (Bülbüldağ) hills, some distance away from the temple, and forced people to move there². He named the city Arsinoë after his wife. However, the old name of the city survived. Recent geophysical surveys have confirmed the city was built along a Hippodamus grid plane³.

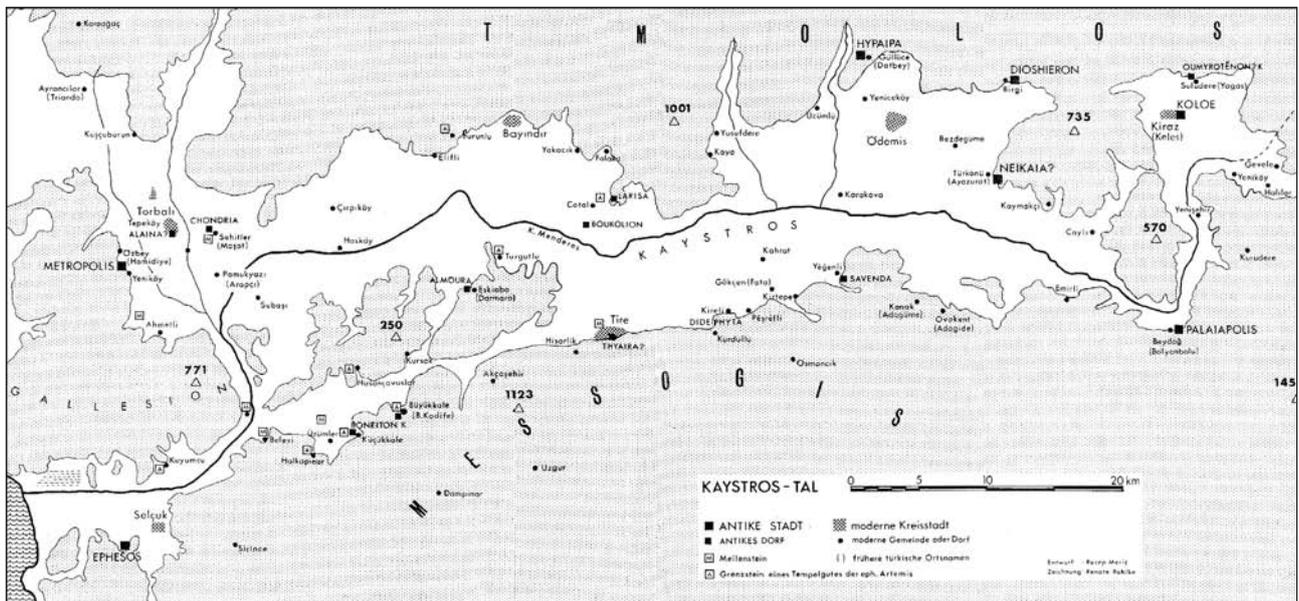


Fig. 2 Map of Ephesus and the Cayster Valley (after Meriç 1981)

The most important building of the city was the Temple of Artemis, one of the seven wonders of the ancient world. The temple was built on earlier sanctuaries. The archaic temple was built with support of Croesus, king of Lydia. The first architects were Chersiphron and Metagenes. After Herostratus set fire to the temple, in 356 B.C., a new, even more splendid temple was built by the citizens of Ephesus, who refused to accept the financial support offered by Alexander the Great⁴. Tradition has it that the famed sculptors and architects Praxiteles and Scopas also worked on the temple⁵. The cult of Artemis survived into Roman times. The temple was a place of refuge as well. The borders of the area belonging to the temple often changed and were finally

¹ Strabo XIV 1, 3, 21.

² Strabo XIV 1, 21; Pausanias 1, 9, 7 mentioned, Lysimachos founded the city next to the sea; Knibbe 2000, 18–20; Scherrer 2001, 68 note 52 with bibliography.

³ Scherrer 2001; Groh *et al.* 2006.

⁴ Strabo XIV 1, 22 ... Now Alexander, Artemidorus adds, promised the Ephesians to pay all expenses, both past and future, on condition that he should have the credit therefore on the inscription, but they were unwilling, just as they would have been far more unwilling to acquire glory by sacrilege and a spoliation of the temple. And Artemidorus praises the Ephesian who said to the king that it was inappropriate for a god to dedicate offerings to gods...

⁵ Strabo XIV 1, 23.

defined by Augustus. The reconstructed temple was first destroyed in a raid by the Goths in 262 A.D.⁶. Tradition has it that the temple “was finally destroyed” by John Chrysostom, Archbishop of Constantinople in 401⁷. The city flourished in Late Roman and Byzantine times and became an important centre of Christianity. The first Council of Ephesus was held in 431, the second in 449. More than one earthquake shook the city. The one in A.D. 23 destroyed the Tetragonos Agora but the city soon recovered. The earthquake in A.D. 262 left no trace in the layers of the Agora, but the destruction was enormous at Terrace House 2⁸. Not all the apartments were rebuilt. The modern excavations have found some of them destroyed⁹. There were two more series of earthquakes: the first in 358, 365 and 368, the second between 614, 616.

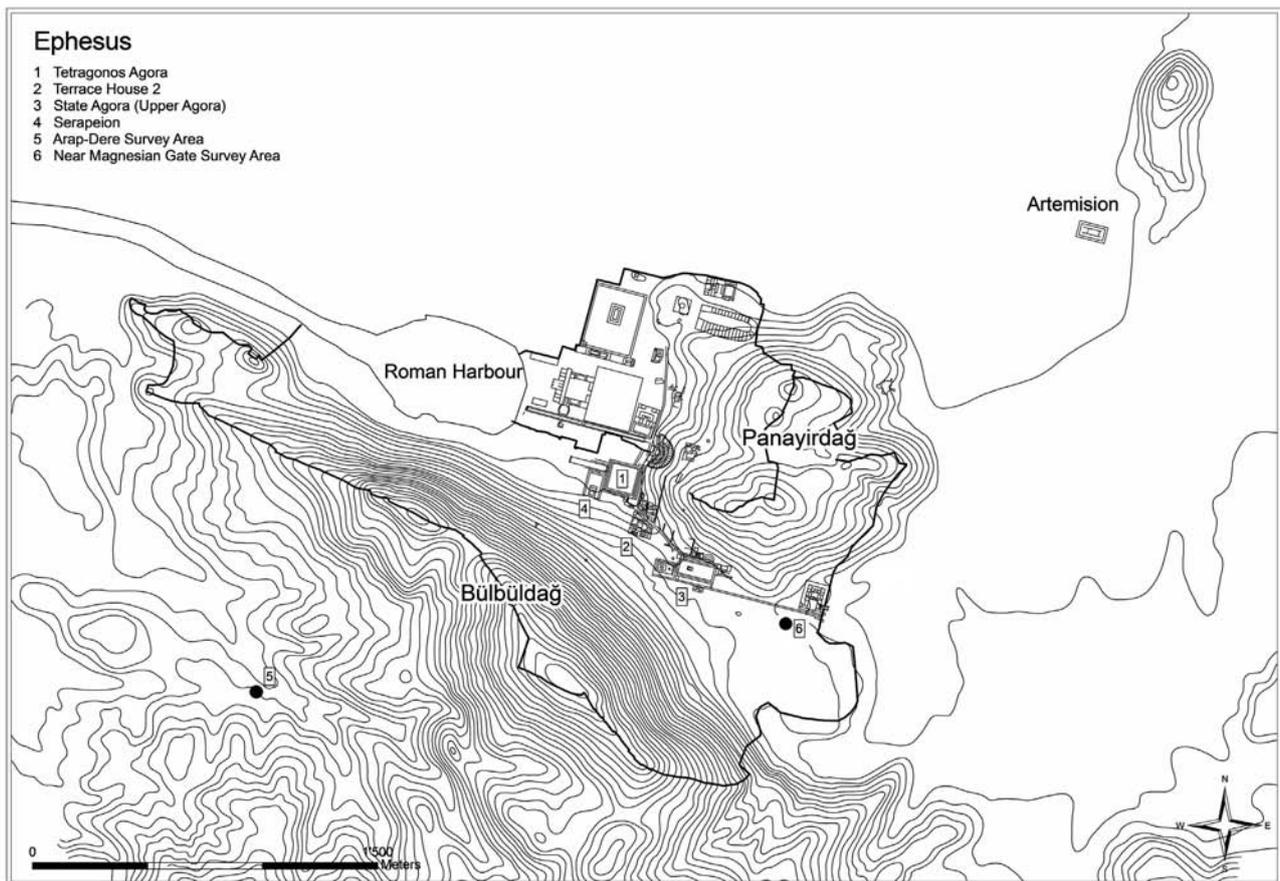


Fig. 3 Map of Ephesus and Artemis Temple (after Kurtze 2007)

Roman power in the eastern Mediterranean increased after the victory of Pydna in 168 B.C. and Delos was declared a free port in 167 B.C. in order to undermine the role of Rhodes. King Attalus III of Pergamon died in 133 B.C. and bequeathed his kingdom to Rome. The large-scale immigration of Italian merchants in the eastern Mediterranean had started even before the Delos market was opened, and Ephesus was one of the obvious targets. The political changes initiated by the Romans had an influence on the economy in the eastern Mediterranean from the middle of the second century B.C. There is no direct evidence for the arrival of Romans in Ephesus prior to their mention in inscriptions at the end of the second century B.C.¹⁰. The earliest merchants came from Latium, Campania and southern Italy. In the summer of 88 B.C., Mithridates ordered that all the Roman citizens in Asia Minor should be killed (Ephesian Vespers)¹¹.

⁶ Historia Augusta, Gallienus, 6, 2; Jordanes, Getica, 20; Foss 1979, 3.

⁷ Pülz 2008, 68.

⁸ Foss 1979, note 3, detailed bibliography; Ladstätter 2002, 26–29. 36, Taf. 77–78; Ladstätter – Pülz 2007, 394–396.

⁹ Ladstätter 2002, 26–29; Ladstätter – Pülz 2007, 396.

¹⁰ Kirbihler 2007a, 22.

¹¹ Appian Mitr. 12, 23; Eutropius 5, 5; Green 1990, 436, 561 “night of the long knives”.

Though the resulting massacre was serious, it seems that the Roman sources may have exaggerated the number of victims. It seems that the Romans (Ῥωμαῖοι) were not expelled or even intimidated and that the number of Romans in Asia actually increased, as they were interested in the potential profit to be gained by the economy and commerce of the region¹².

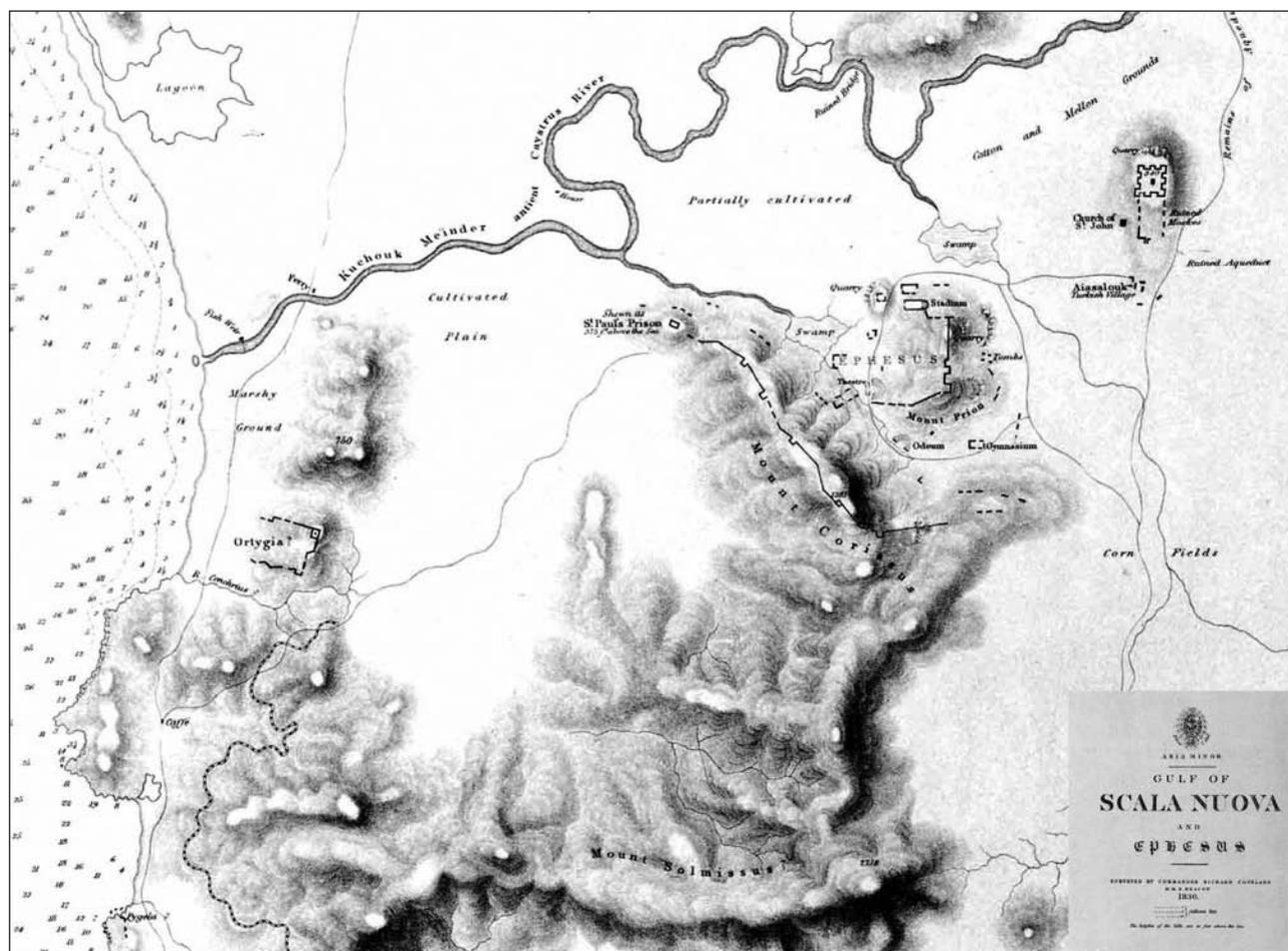


Fig. 4 Old map of Ephesus

Strabo the Greek geographer visited Ephesus in 29 B.C. and mentions that the city had shipyards and a port called Panormus. King Attalos II Philadelphos (who ruled in Pergamon around 159–138 B.C.) narrowed the entrance of the port. This was expected to regulate the way the River Cayster deposited the material it carried. However, the actual effect turned out to be the opposite. Whereas the tide used to remove the deposit from the river, the whole port now became a swamp, a process that started in the Archaic period. The recent archaeological excavations and the geological investigation provide a fairly accurate view of the changes in the bay area¹³. Although the port had its own problems, the city – due to its favourable location – managed to develop gradually. In 30/29 B.C. Augustus started to reorganize the eastern provinces and Ephesus (Fig. 3) became the capital of Asia and the largest commercial centre on this side of the Taurus mountains¹⁴.

The late literary sources mention that Ephesus could be approached easily on land and sea, and add that local and imported products were readily available for the population¹⁵. The *Expositio totius mundi et gentium*

¹² Wilson 1966, 4.

¹³ Zabehlicky 1995, detailed bibliography; Kraft *et al.* 2000; Recently I. KAYAN and his colleagues published new results, see Kraft *et al.* 2005.

¹⁴ Strabo XIV 1, 24.

¹⁵ Foss 1979, 7; *Acta conciliorum oecumenicorum* (The Acts of the Ecumenical Councils) I, I, iii, 31 and *Expositio totius mundi et gentium*, cap. 47.

describes the region as rich in various wines, olive oil, grain, good purple dye, and spelt¹⁶. A large quantity and variety of locally produced amphorae have been excavated from the port area¹⁷. These local micaceous Late Roman amphorae can be found all over the Roman world and beyond. The city was partially destroyed by the earthquake of 614 and was subsequently sacked by both Persian and Arab forces several times. It was finally occupied by the Seljuk Turks around 1300¹⁸.

Medieval and later travellers often mentioned Ephesus and the topography and history of the city has been described to some extent by a number of authors¹⁹. One of the earliest modern maps (Fig. 4) was produced in 1836 by Commander R. COPELAND of the British Navy²⁰. The Temple of Artemis is absent from his map as the English and later the Austrian excavations began only after the map was produced²¹. The Austrian excavations are still in progress.

¹⁶ *Expositio totius mundi et gentium*, cap. 47.

¹⁷ Zabehlicky 1999, 482 f.

¹⁸ Foss 1979, 121.

¹⁹ Keil 1922–1924; Alzinger 1970; Bammer 1988; Karwiese 1995; Knibbe 1998; Scherrer 2001.

²⁰ I am grateful to the Royal Geographical Society for this map.

²¹ Falkener 1862; Wood 1877; Hogarth 1908; The first Austrian excavation was proposed by O. Benndorf 1893; First excavation report Benndorf 1898.

2. DESCRIPTION OF THE SITES

The amphorae considered in this book were unearthed at the Tetragonos Agora, the Terrace House 2, the Serapeion, the State Agora (Basilica Stoa, Prytaneion and Well) and by two field surveys (Magnesian Gate and Arap-Dere). These sites are described individually.

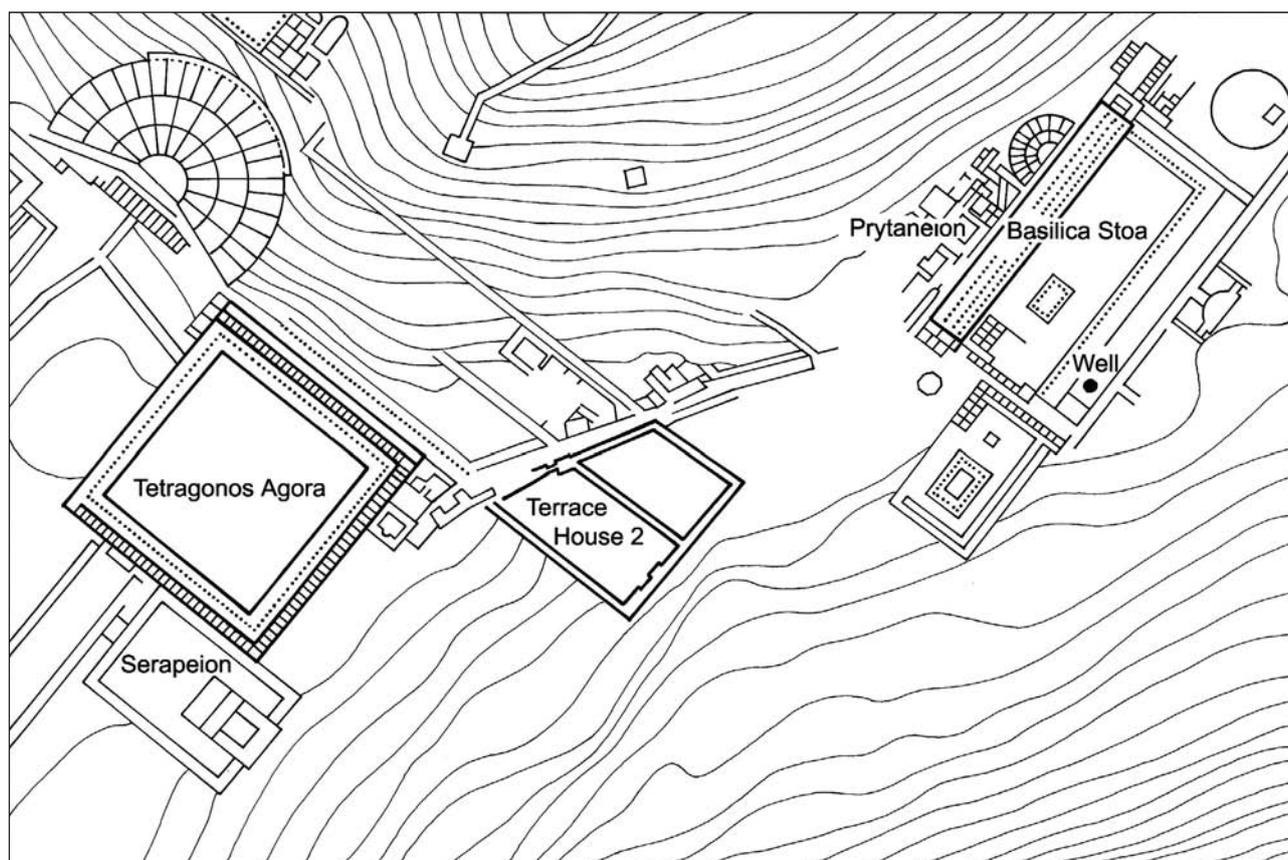


Fig 5. Map of the sites in the centre of Ephesus (after Kurtze 2007)

2.1 The Stratigraphy of the Tetragonos Agora (P. SCHERRER)

2.1.1 Introduction: methodology and research history

For nearly a millennium the commercial market in the area between the sea shore and the two mountains which carried the fortification wall of Ephesus, Preon (modern Bülbüldağ) in the south and Pion (modern Panayırdağ) in the northeast, was one of the most important locations of the city, but even earlier, from Late or Sub-Geometric times onwards, a village of the Ephesian *chora* was located here.

The Tetragonos Agora²², as the place was called in Roman Imperial times, was first excavated by W. WILBERG in 1901–1907, but besides the three gates in the north, west and south, the Late Antique floor level was reached only in parts of the eastern, southern and western Stoa and the central interior area²³. In 1964–1968 the Efes

²² IK 17/2, 4123 (Nero); IK 17/1, 3005 (Domitian).

²³ Wilberg 1923.

Müzei Selçuk cleared away most of the Byzantine debris and re-erected a series of columns, especially in the north Stoa and the south-eastern corner. Furthermore, building activities during the so-called anastylosis of the South Gate of the Agora and architectural restorations in the area of the south-eastern corner of the Agora²⁴ were only partly accompanied by archaeological investigations in 1979–1984 by S. KARWIESE and W. JOBST²⁵. From all of this archaeological work only the small finds of S. KARWIESE's excavations have been published *in extenso*²⁶. In 1977 G. LANGMANN began investigations of the so-called Archaic processional route along Mount Panayırdağ in the eastern part of the Agora courtyard and concentrated on excavations in and along the Agora west Stoa from 1982 onwards, which were co-directed by P. SCHERRER in 1987–1992 and then continued by him to 2001²⁷.

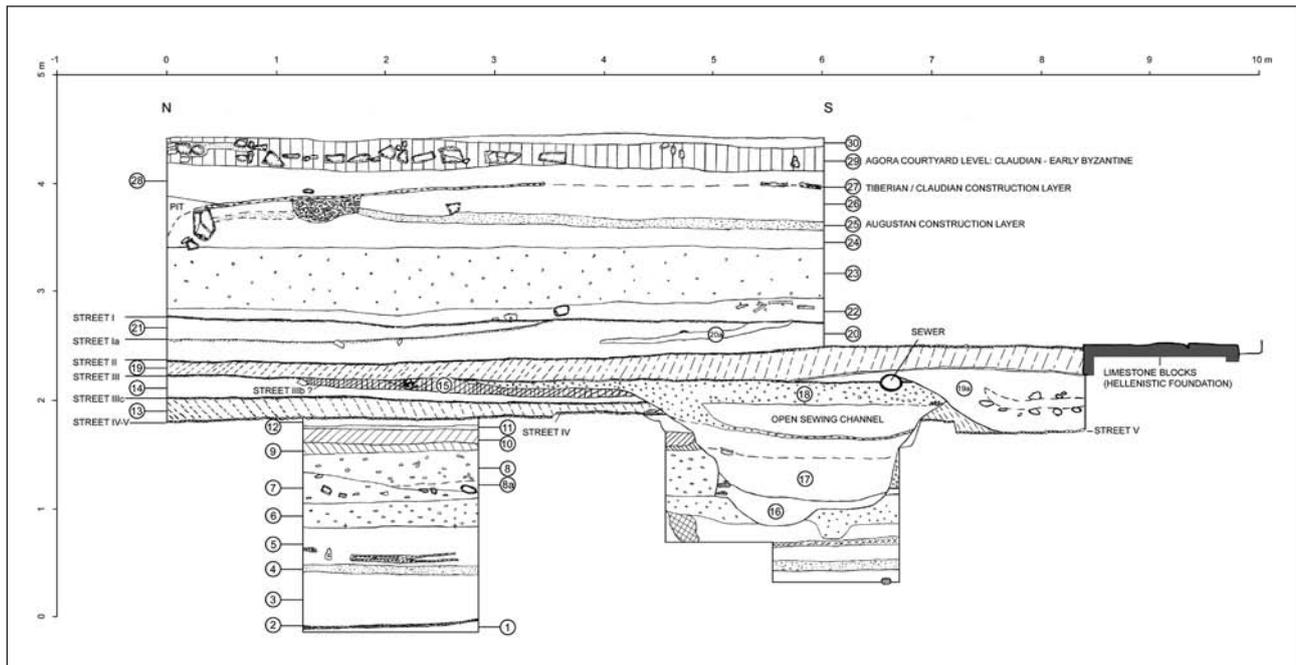


Fig. 6 Profile 1: Agora courtyard; trench 93/2; north–south profile slightly east of Hellenistic halls H–WSN and H–WSS (for exact position see Fig. 12)

The amphorae from the Agora collected in this volume nearly all come from the excavations conducted since 1987 and are well imbedded in stratigraphy and connected to the totality of finds in their context. Finds from previous excavation years are only summarily given, because the strata were not carefully observed in G. LANGMANN's excavations of 1977–1986. His excavations were mostly carried out by removing soil in layers of half a meter thick. Thus the contexts can be interpreted only in part by the aid of our later work. For these reasons, the analysis of stratigraphical data in the following pages concentrates on the excavations from 1987 onwards.

In the recent working areas, the earlier excavations had dug away nearly all of the strata above the Late Antique or Imperial floor levels, including the destruction layers, so that levels normally started at thin early Byzantine or even older layers, and were often already mixed with recent material²⁸ (Figs. 6, 7 and 9). Additionally, the walking levels in the halls and the courtyard had only marginally changed between the first and sixth centuries A.D. To keep the levels at nearly the same height, repair works in Theodosian and later times

²⁴ Hueber 1984; For the South Gate: Lang 1984.

²⁵ Karwiese 1997; Jobst 1983.

²⁶ Gassner 1997.

²⁷ For a history of research, naming of the place and its building history with an intensive discussion of the older excavation reports see now: Scherrer 2006, 1–57.

²⁸ Only in the West-Stoa-Chamber J an intact sequence of floors and destruction layers of the 5th and 6th centuries A.D. could be observed. A comprehensive study is in preparation, for now see: Scherrer, in: Karwiese 1998, 8, 9–12.

were carried out, obviously after the entire area had been thoroughly cleaned and the rubble and debris of the Imperial era had been cleared away²⁹.

On the other hand, layers of Augustan Agora construction work regularly reached heights up to 2 m (Figs. 6 and 7), as did the destruction and building layers after the earthquake which took place sometime before the building was completed – most likely in A.D. 23 (Profile 3).

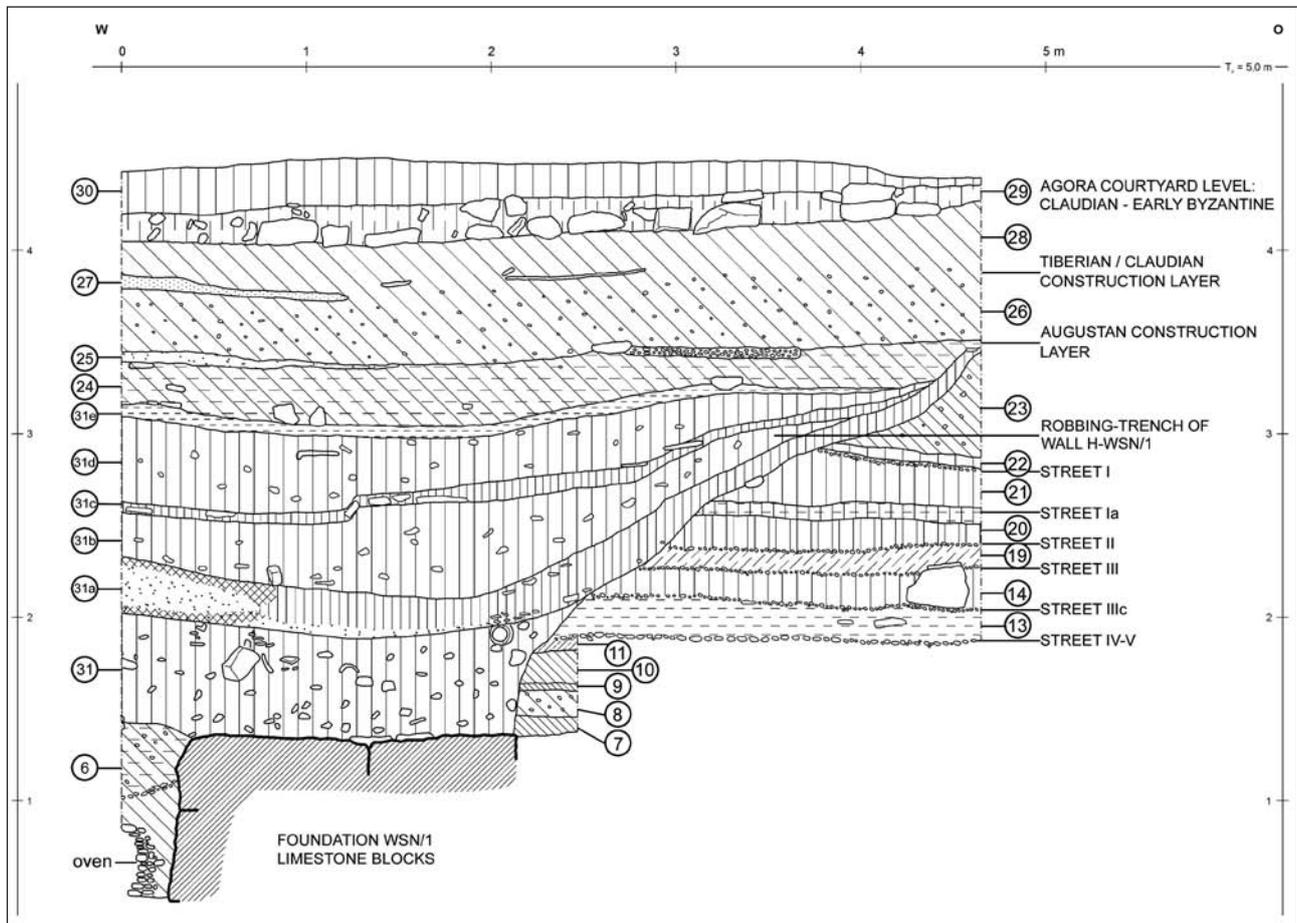


Fig. 7 Profile 2: Agora courtyard; trench 93/2; west-east profile through eastern wall of Hellenistic hall H-WSN (for exact position see Fig. 12).

By means of these Roman works, the walls of the Hellenistic Agora halls were robbed out deep into the foundations (Fig. 7) and even the floor layers were dug away in most cases. Therefore, intact usable strata of the Hellenistic and Roman Republican Agora are rare and are limited to fillings of sewer canals, construction layers and material brought there for terracing and heightening the level of halls and streets in front of and in between them (Fig. 6). Due to this circumstance, a much higher percentage of finds, including the amphorae, belong to the Augustan and Julio-Claudian period than one might expect with regard to the long lifetime of the Agora.

2.1.2 The topography and building history from Late Geometric to Hellenistic times

Besides some scattered artefacts lost by Chalcolithic or Bronze Age fishermen, the earliest remains of man in the later Agora area belong to an Archaic settlement, most probably called Smyrna, which flourished directly

²⁹ Strata and artefacts of mid first century to third century A.D. were found only in some pits in the West Stoa and the filling of West-Stoa-chamber M. This room was originally used as one possible entrance to the basement of the West Stoa till at least the late first century A.D. It could be entered from a street leading along the outer west side of the Agora on a level nearly 3 m below the Agora. The basement was filled up to Agora level, after the outer east wall of the neighbouring sacred so-called Serapeion (Temple Precinct) was built directly near the Agora west wall (see Fig. 5).

near the beach from the later eighth to the mid sixth century B.C. In an area of roughly 17×17 m directly east of the West Stoa of the Roman Agora, an excavated group of at least 6 houses of the first building phase had its floor levels between 0.90 m in the west to 0.05 m in the east (see Fig. 6, layer 2: small pebbles of floor construction of dwelling XB) below modern sea level. After a catastrophic fire in about 670 B.C., these single room dwellings of rectangular or oval shape were replaced by two houses, one originally single, the other one double-roomed, which then expanded to multi-roomed courtyard dwellings till the mid sixth century B.C.³⁰ by constant heightening of the floor levels (Fig. 6, layer no. 4 as the youngest floor level in room HA/11a). Finally by a slow but steady rising of the sea level, the area became too wet for living purposes, but in Classical times (from the middle or last third of the fifth century B.C. onwards) craftsmen established basins and wells on an evidently higher level, 0.60 to 0.90 m above modern sea level (Fig. 6: sandy horizons in the lower part of layer no. 5).

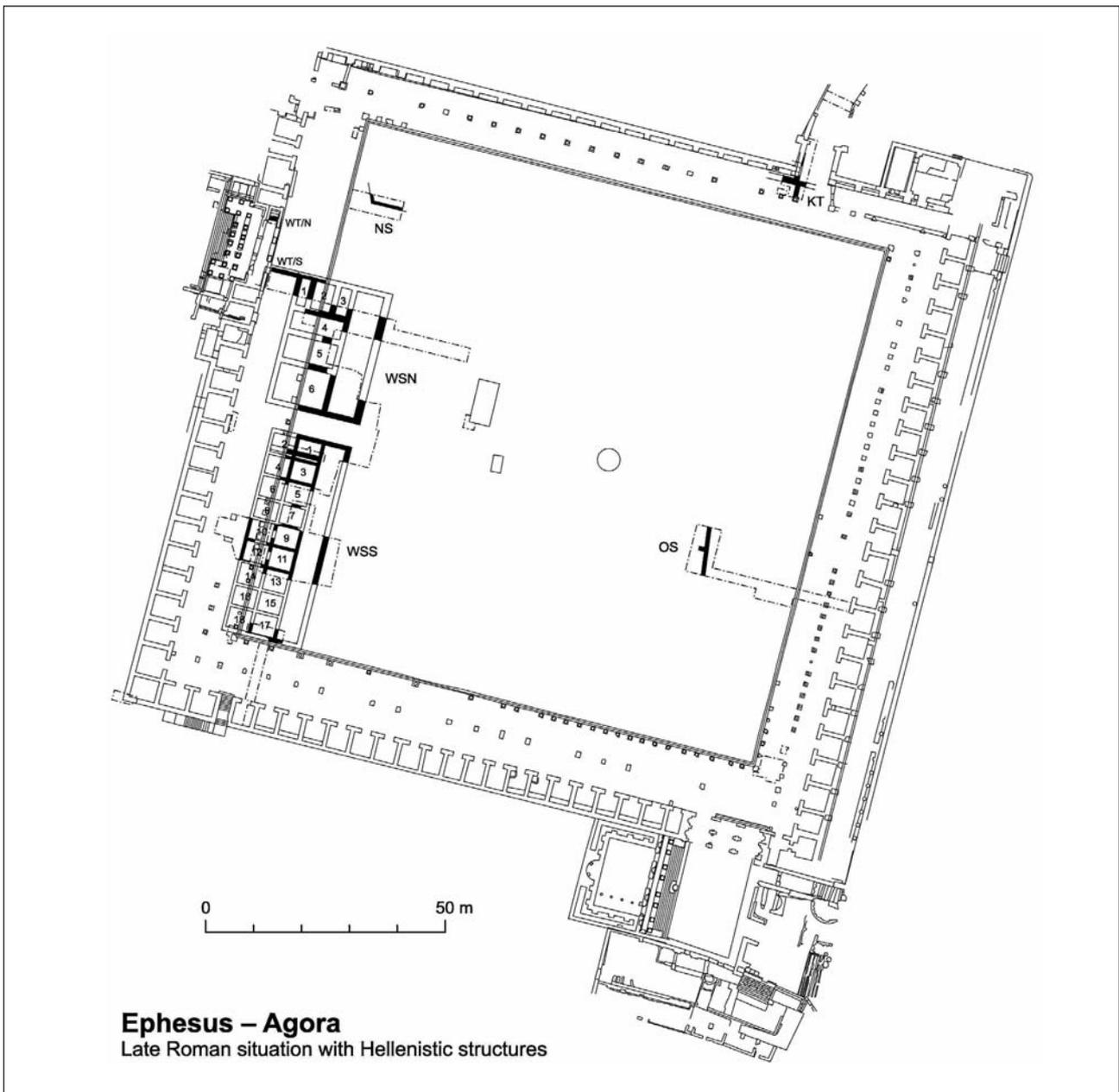


Fig. 8 Map of the Hellenistic Agora.

³⁰ For an overview see Scherrer – Trinkl 2006, 59–64 maps 6 and 19.

When King Lysimachus founded Hellenistic Arsinoeia (between 294 and 281 B.C.), as he called Ephesus, a terraced, but still slightly inclined (to the west) area of at least 95×125 m seems to have been singled out for the commercial market, but finds of this time are almost completely missing up to now. Above the rubble clay layers covering the ground walls of the devastated village of Smyrna (Fig. 6, layer no. 5, upper part) a thick strong layer (Fig. 6, no. 6) of light to greyish or dark brown clay formed the walking level of the new Agora (height at roughly 0.90 to 1.10 m above today's sea level) and at the same time isolated the market place against the ground water. This layer already covered a groundwater well, which contained some Chian and other wine amphorae and a set of dishes, including Attic black glazed ware. On the uppermost level was unearthed a terracotta figurine of Cybele. The well must have been in use only for a brief period and was ritually filled up in the years shortly after 300 B.C., probably when the last Smyrnaeans left their homes or, at the latest, when the Agora level was to be finished³¹.

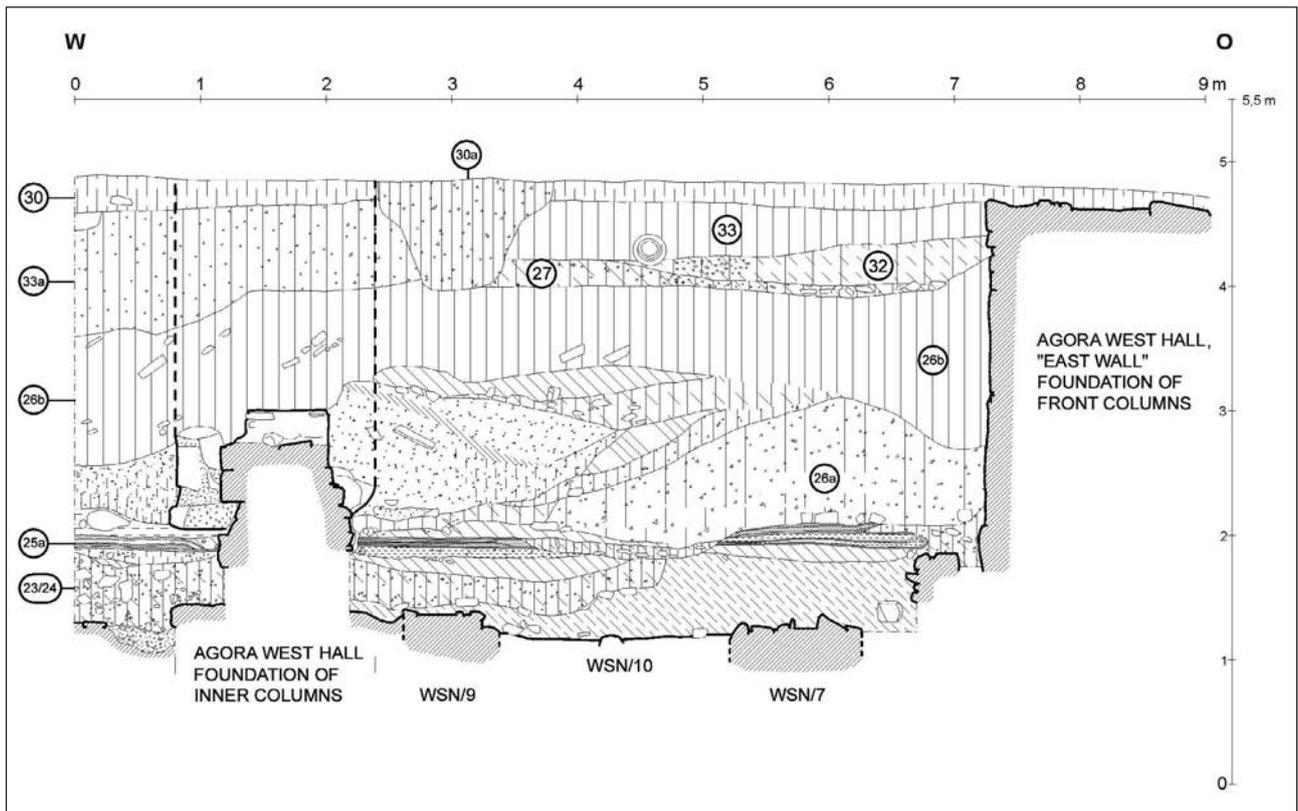


Fig. 9 Profile 3: Agora; trench 95/1; Roman West Stoa; west–east profile through eastern part of basement (for exact position see Fig. 12).

The architectural formation of the Hellenistic Agora (Fig. 8) with a market building in the south-western corner (building H–WSS) did not take place before the years around 270/260 B.C. This building, of about 43.4 m length, consisted of two rows of nine almost square rooms. Colonnades on the west (street) and east (Agora courtyard) sides may belong to the original plan or be additional features. In the later third century B.C., after a further heightening and thus levelling of the Agora walking horizon (Figs. 6 and 7) at a distance of 5 m to the north, a second stoa-like, but non-canonical market building (H–WSN) with one large and five smaller rooms and a wide colonnaded hall was erected (Figs. 7 and 9). These two buildings have largely been excavated, but Roman activities have not left us much more than the foundations. In between and along the east side, that is, in the Agora courtyard, the pebbled Street layer V and the slightly higher similar level Street IV formed the walking horizons outside the halls 1.80/1.90 m above modern sea level. Street IV was probably added as a correction soon after. In these streets an open drainage channel of about 2 m width was cut. Probably because

³¹ Forstenpointner *et al.* 1993; Soykal 1993; for the Attic drinking set see: Trinkl 2006, 188 Fig. 176; 191 Fig. 178.

the system did not work well and the water was pouring into the street and damaging it (Fig. 6: Layer no. 15, seems to be a repair after such an inundation), the sewer was filled with soil, rubble and litter with masses of pottery only a short time later (Fig. 6, nos. 16–18), most likely towards the end of the third century B.C.³². After this, a new Street layer III at a height of roughly 2.20 m above modern sea level was constructed.

The next building phase is again marked by a new Street layer II about 2.40 m above modern sea level. It may be dated to the last third of the second century B.C. and thus belongs to the period when Rome had already taken over the Pergamene kingdom as the province of Asia. This street layer forms a break in tradition and from here onwards, the import of western amphorae can be observed. Technically, Street II is contemporary with a raising of the level of the Hellenistic halls and perhaps a re-shaping of the halls' design. At least in front of the north-eastern corner of hall H–WSS a limestone foundation (Fig. 6, right side with construction pit no. 19a) was placed with its surface matching the slightly younger level of Street II.

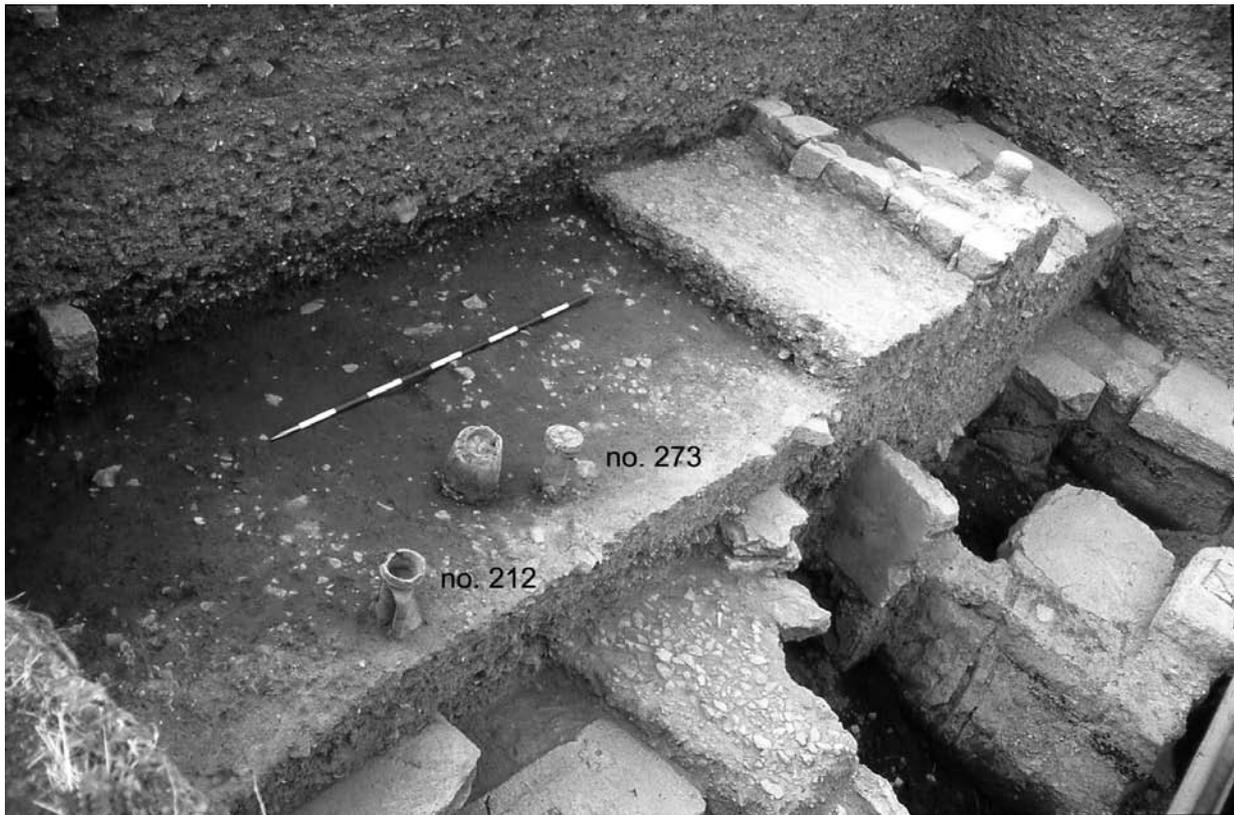


Fig. 10 Amphorae between surfaces of street III and street II

The latest Hellenistic-Republican building phase in the western part of the Ephesian Agora is marked by Street I (2.70 m above modern sea level) along the east front of the halls (Figs. 6 and 7). It belongs most likely to the decade before the middle of the first century B.C. Before Street I was constructed, it seems that the walking levels of both halls were raised again and linked together to one long building, but the extensive robbing of material and other alterations in Augustan times precludes any certainty in the analysis and interpretation of the preserved evidence. The Street layer Ia may have served as a temporary walking level during construction. It does not consist of small, firmly pressed pebbles, as do all the other street surfaces, but of rubble, clay and soil. An interesting feature of the streets in our excavation area is that before the next layer was constructed, broken (half) amphorae or other large vessels and pieces of waterpipes were placed on the old pebbled surface (Fig. 10). We surmise that these measures were taken either to improve drainage, or to quickly raise the new walking surfaces.

³² Rogl 2003b, 177 f.

2.1.3 The Augustan Agora and its re-erection in the Julio-Claudian period

The date and reasons for the construction of the new Agora remain unclear. We suggest that the presence of Roman merchants in Ephesus was responsible or at least a catalyst. The name of the new market place, Tetragonos Agora, very likely derives from Delos and as there it seems to have been used most prominently by slave traders and money-changers³³. Probably already in the mid third of the first century B.C., after the Mithridatic wars, a rebuilding of the Agora had been planned, but the works may not have gone well before the end of the civil wars and the Battle of Actium. A fragment of an honorary inscription for the consul of 36 B.C., *M. Cocceius Nerva*, whose statue was erected by the Roman merchants' club (found re-used in a late wall, somewhere in the eastern part of the Agora) may be a testimony for the start of construction³⁴.

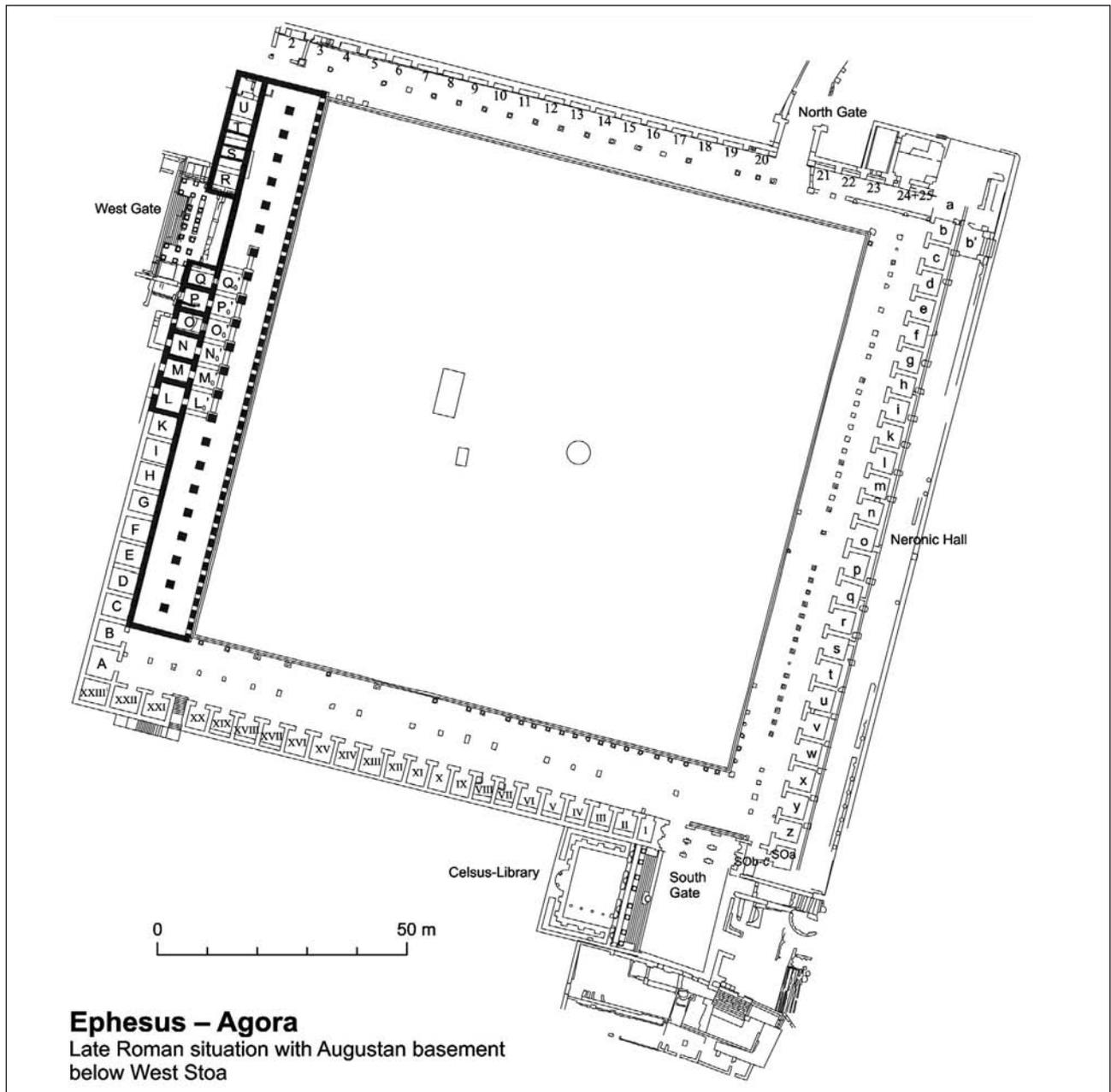


Fig. 11 Map of the Roman Agora.

³³ Scherrer 2007, 63–65; see also Trümper 2009, 24. Honorary inscriptions found in the Agora speak of those “who are dealers in the slave market” (*statarium*): IvE III 646 (around A.D. 100) and VII/1 3025 (A.D. 43). A hall of “money-changers” received its marble revetment in the time of Trajan.: IvE VII/1, 3065.

Intensive studies of the architectural remains in the whole Agora area, the extensive excavations in the West Stoa and trial excavations in other places, especially the North and West Gates and the inner south-east corner (Fig. 12), provide some secure information regarding the Augustan ground plan and architectural design. The Agora (Fig. 11) formed a square with sides of about 154 m, with double-aisled (nearly 12 m wide) and two-storey halls on all sides and a total mass of nearly 200 chambers at the rear of the colonnades. The front columns of the ground floor were of the Doric order and on the first floor, double-half-calf-pilasters had capitals of the composite or Pergamene types. There were three gates in the south-east, west and northeast with staircases in their immediate vicinity and an additional one near the south-western corner. Thus the Roman Imperial Agora was about twice as large as its Hellenistic predecessor. The east and south halls were partly built into the slope and the level of the new Agora was now determined by the natural height of the area near the South Gate. So in the western and northern areas the entire courtyard had to be brought to a height of about 4.15 m (gateway in the North Gate) above modern sea level or even more, while the walking levels in the ground-floor halls and gates were still about at least half a meter higher. From the western side, for people approaching from the harbour area, the Agora had the typical three-storey form of Hellenistic market places in western Asia. The basement of the West Stoa (floor level at about 2 m above modern sea level; see Fig. 9, no. 25a) could be entered by doors from a street passing along the Agora west front – as the Agora complex, as a whole was surrounded by streets on all four sides with additional colonnaded halls.

We have a large amount of pottery and other finds from the Augustan stratigraphy in the western half of the Agora courtyard. Here the level was raised by nearly 1 m: first by a layer of yellowish soil mixed with lots of rubble and litter, then by a much thicker layer of nearly pure cultural waste and garbage. The latter was mixed with much organic material and ashes and again with yellowish soil mixed with rubble (Figs. 6 and 7: nos. 22–24; Fig. 9: nos. 23/24). From this new level down one can observe the immense robbing trenches, when the Hellenistic halls were devastated down as far as the lowest rows of the foundation blocks. These trenches and destruction layers then were re-filled by the same material as described before, with thin layers of pressed stony soil or sand in between (Fig. 7, nos. 24 and 25a–25e). At a height of about 3.65/3.70 a light reddish layer of mortar marks the level from which the construction of the new Agora buildings were begun (Fig. 6, no. 25). All finds from these layers were surely deposited here in the last three decades of the first century B.C.³⁵, probably soon after the Battle of Actium.

How rapidly the construction work proceeded is an open question. It is probable that some parts of the Agora were always useable and construction work was done on different parts sequentially. Fact is that the South Gate – built by the Imperial freedmen Mazaïos and Mithradates – must have been finished or almost completed in 3 B.C.³⁶. When a devastating earthquake shook the city in A.D. 23³⁷ the Doric columns and other architectural elements of the halls had, at least partly, still not received their final form and surfaces.

It seems that, with the exception of a good part of the South Gate and some door thresholds of the ground-floor rooms, nearly nothing of the Agora above the foundations had survived the convulsions of the earthquake. The entire Agora, including the West and North Gates, had to be rebuilt from the floor level upwards. The 112 m long basement in the West hall was reduced to half a dozen separate small rooms to the south of the West Gate (Fig. 11, rooms Lo`–Qo`) the rest filled with unfinished broken architectural elements, soil, clay, garbage and tons of pottery (Fig. 9, no. 26a). From two sections excavated in the middle part and the south end we can estimate the total amount of Eastern-Sigillata-B at more than unbelievable one hundred thousand vessels³⁸. It is unclear if this stock of ware was stored in the Agora or brought here after the earthquake from destroyed warehouses in the harbour area to fill the basement. An additional complex of contemporary fine table ware mixed with chips of marble was found in the gaps between the column foundations of the West Gate³⁹.

In the courtyard it is not at all easy to discern the border between the Augustan and the post-earthquake layers. While a thin layer of mortar and stone chips (Figs. 6 and 7, no. 27) is surely the level for the construction

³⁴ IvE III 658.

³⁵ For small selected groups of pottery from these layers see Rogl 2003a; Rogl 2004, 208 note 5 (pottery deposits in the third quarter of the first century B.C.). For the stratigraphy: Scherrer 2006, 23.

³⁶ IvE VII/1, 3006.

³⁷ For the now known exact date of the earthquake see the discussion of Scherrer 2006, 19 note 67.

³⁸ Zabehlicky-Scheffenecker 1995; Zabehlicky-Scheffenecker 2004, 73–80.

³⁹ Zabehlicky-Scheffenecker *et al.* 1996; Rogl 2004.

of the younger phase, the yellowish soil below it (Figs. 6 and 7, no. 26) may belong to building activities some years or decades before. The material reminds one of the similar layers nos. 22 and 24. As far as we know up to now, most of the pottery and other finds from here also tend to derive from the Augustan period, but one cannot be absolutely certain; at least some undistinguishable or unrecognized pits may have brought younger material into this layer. (The box-numbers from here are classified in the list among phase-no. 4–5). The new Agora courtyard level was fixed at about 4.35 m above modern sea level with a layer of irregular shaped small to middle sized stones in a bed of white mortar. The opening of the restored Agora must have happened early in the reign of Claudius, as for the years A.D. 43/44 a series of honorary inscriptions and statues of the Emperor and of the Proconsul of Asia, *C. Sallustius Crispus Passienus*, all set up by the *Conventus Civium Romanorum* again, has come to light⁴⁰.

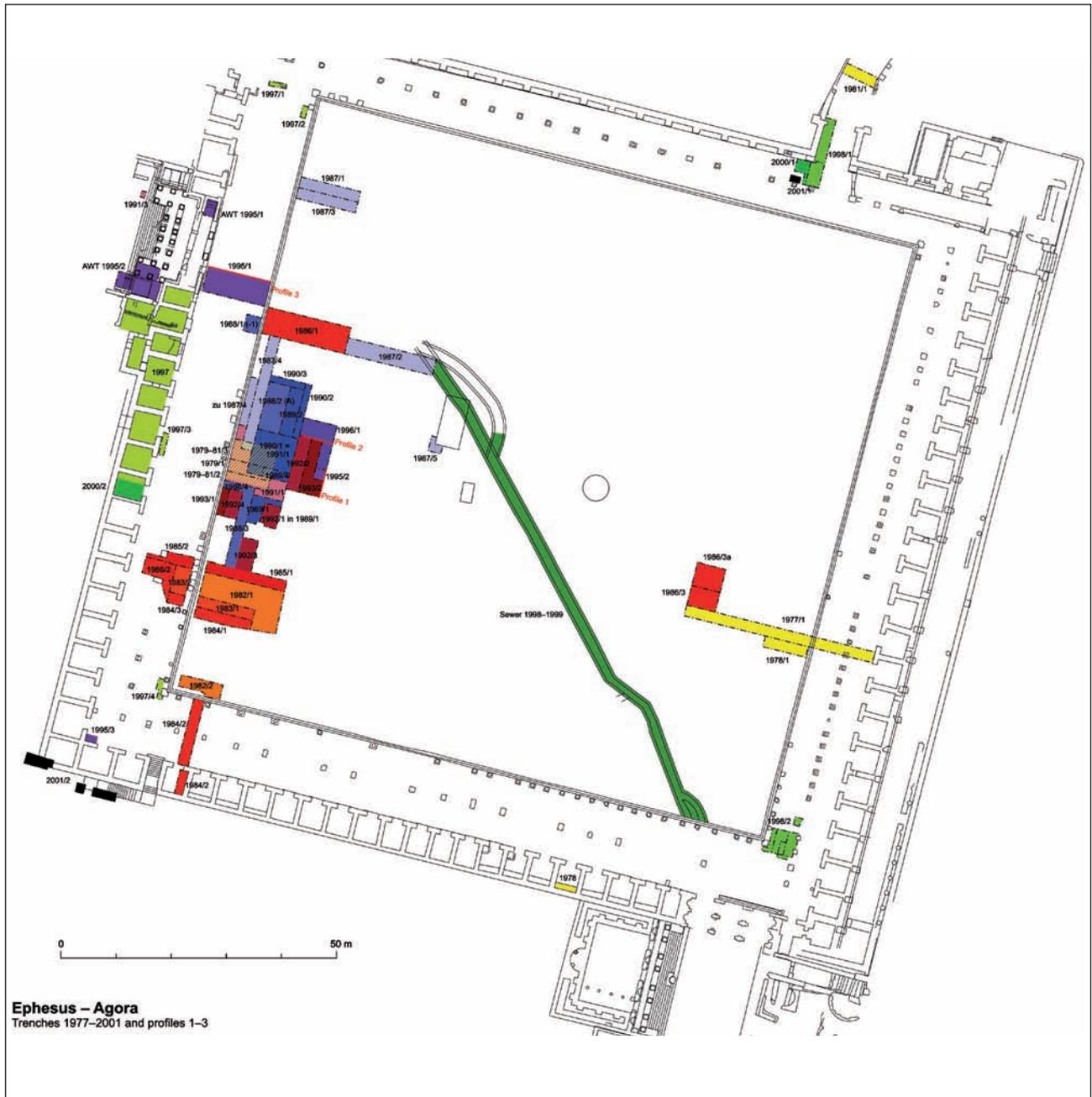


Fig. 12 Map of the excavations in the Agora from 1977 to 2001.

⁴⁰ IVE II 409; VII/1 3019. 3025.

An important source of finds from the mid first century A.D. onwards is the main sewer crossing the Agora diagonally from the South Gate to the northwestern corner. Here three layers could be discerned. Above the stone slabs forming the floor to more than half a meter in height, a brown to greenish sandy deposit settled down steadily during the first to third or fourth centuries A.D. This layer contains many coins found near the cleaning openings in the sewer's vaulted ceiling and washed out and worn small pieces of pottery. Above this, after the revitalisation of the sewer in Late Antiquity, another layer consists mostly of a fine red clay and again contains lots of coins and relatively large pieces of pottery, among these a large number of amphorae.

In other areas, the uppermost parts of our stratigraphic evidence in many cases was also from a mix of first to fourth or even sixth century A.D. building and usage layers (phases 6 to 9). As already mentioned, few stratigraphic sequences of the High or Late Imperial period can definitely be reliably and chronologically analysed. We can tell for certain that after a further earthquake of unknown date (A.D. 262 or later) the Agora was rebuilt from the upper part of the foundation upwards. This work was undertaken in the final years of the fourth century A.D. and probably lasted into the early fifth century. The shape of the ground plan was much the same as before, but the halls no longer had an upper storey. Pieces of architecture from all over Ephesus were re-used and statue bases were used to construct the new walls. At some point in the later fifth century A.D. at the earliest, but much more likely in the first half of the sixth century, the Agora was re-shaped again. The North Stoa (Fig. 11) was then totally rebuilt, with three rooms behind the colonnades only in the small section to the east of the North Gate. For the rest of its length a massive terrace wall of re-used architectural blocks with protruding pillars supported an artificial hill, on top of which today a garrison of the Turkish army and depots of the *Efes Müzesi* are located.

The end of the Agora came in the very late sixth or more likely the early seventh century A.D., when a new city wall excluded the former market place from the protected zone. It may well still have been used for some time as a garrison or a fort, but this cannot be proven. Scattered finds and rough stone walls without mortar are evidence of further irregular use till at least the ninth century A.D.

2.1.4 Description of layers in profile drawings

Description of layers in profile drawings and concordance with phase-numbers of Roman strata dealt with in this book	Date proposed and description of layers described to phases (Ph) and sub-phases (with add. small letters) with Roman amphorae	Catalogue numbers of amphorae belonging to phases and sub-phases
<p>Late Geometric, Archaic and Classical layers</p> <ol style="list-style-type: none"> 1 Natural red clay 2 Floor layer of oldest house (eight/seventh century B.C.): fine pebbles 3 Destruction layer of Early Archaic house (around 670 B.C.): rubble, dark brown clay 4 Floor layer of Archaic house (seventh/sixth century B.C.): light brown to light grey clay 5 Late Archaic and Classical layers: light to darker brown clay with horizons of pure sand and single tile-fragments (Z) in the lower part 		
<p>Hellenistic Agora layers</p> <ol style="list-style-type: none"> 6 Oldest Agora level (first half of third century B.C): greyish brown clay with small white pieces of natural lime 7 Brownish clay with stone chips from construction activity for Agora hall H-WSN (second half of third century B.C) 8a Isolation layer against ground water: dense yellow clay without pebbles 8 Isolation layer against ground water: dense yellow clay with pebbles 9 Walking horizon during construction time of hall H-WSN: grey clay 		

<p>10 Isolation layer against ground water: dense red clay</p> <p>11 Light yellow sandy clay</p> <p>12 Substructure of Streets V and IV between halls and in front of them (late third century B.C.): Sand and fine rubble</p> <p>13 Substructure of Street IIIc: Sand</p> <p>14 Substructure of Street level IIIb: yellowish soil</p> <p>15 Filling between Street levels IIIb and IIIa: yellow clay</p> <p>16 Open sewage channel, contemporary to Street layers IIIc to IIIa; sedimentation above bottom: yellow to red clay.</p> <p>17 Filling of open sewage channel, lower part (contemporary with Street III, around 200 B.C.): mixture of yellow dense clay with some pebbles and greyish soil with rubbish (rubble, organic material and lots of pottery)</p> <p>18 Filling of open sewage channel, upper part (contemporary with Street III): yellow soil with pebbles and lots of pottery with an inclusion of lighter yellow soil with pebbles</p>		
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<p>19a Ph 1 Construction pit for foundation with limestone blocks: yellow sandy soil with rubble stones and an inclusion of pure yellow sandy clay, covered by a thin layer of limestone chips</p> <p>19 Ph 1 Substructure of Street II (ca. 140–130 B.C.): soil and rubble</p> <p>20 Ph 2 Substructure of Street I and Street horizon Ia (first half of first century B.C): brownish to greyish soil and rubble with inclusions of pure limestone rubble (20a)</p> <p>21 Ph 2 Substructure of Street I above street horizon Ia (around 60 B.C.): brownish soil with rubble consisting of smaller pieces than in layer 20.</p> <p>From Augustan agora construction layers to recent times</p> <p>22 Ph 3 Yellowish soil with rubble (stones and tiles) directly above Street I</p>	<p>Ph 1 around mid to late second century B.C.: Street II</p> <p>Ph 1a mid to third quarter of second century B.C: oldest layer, between surfaces of Street III and Street IIb</p> <p>Ph 1b third quarter of second century B.C. middle layer, between surfaces of Street IIb and Street IIa</p> <p>Ph 1c from mid to late second century B.C. upper layer between surfaces of Street IIa and Street II and layers of Street II, which could not be separated, between surfaces of Street III and Street II</p> <p>Ph 2 Late second century B.C – mid first century B.C (around 60 B.C.): Street I</p> <p>Ph 2a between surfaces of Streets II and I</p> <p>Ph 2b surface of Street I</p> <p>Ph 3 Late second century B.C. / ca. 60B.C.–early Augustan period: Layers between surfaces of Streets II and I and the strata of beginning building activity of Augustan Agora</p>	<p>Ph. 1a: no. 1</p> <p>Ph. 1b: nos. 37, 48, 49, 218, 219, 246, 247, 358, 359, 360</p> <p>Ph. 1c: nos. 212, 253, 257, 273</p> <p>Ph. 2a: nos. 9, 50, 51, 52, 198, 220, 221, 254, 255, 274, 275, 276, 277</p> <p>Ph. 2b: nos. 258, 278, 279</p> <p>Ph. 3: nos. 11, 43, 77, 105, 151, 208, 210, 223, 224, 225, 226, 248, 249, 250, 280, 361</p>
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<p>23 Ph 4 Heightening layer of Agora level: mixture of soil, rubble, pebbles and ashes (in the lower part) and yellow and red clay mixed with rubble (in the upper part)</p> <p>24 Ph 4 Yellowish soil with small pieces of rubble</p> <p>25 Ph 4 Construction level: yellow sand</p> <p>31a–e Ph 4 Augustan robbing trench of walls of Hellenistic hall H–WSN; filling with different layers of soil and clay mixed with rubble, pebbles, tiles, ashes and other debris</p>	<p>Ph 4 Augustan period (and slightly after) 30/27 B.C. – 3 B.C., up to A.D. 23: Construction of Augustan Agora, probably already in use since around 4/3 B.C., but architectural features still unfinished at earthquake of A.D. 23.</p>	<p>Ph. 4: nos. 3, 4, 5, 6, 10, 12, 13, 14, 15, 17, 18, 20, 27, 33, 35, 36, 38, 39, 40, 41, 42, 45, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 71, 72, 73, 75, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 106, 107, 108, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 133, 134, 147, 150, 152, 153, 155, 156, 157, 159, 160, 161, 163, 164, 166, 167, 168, 169, 170, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 186, 187, 188, 189, 190, 191, 192, 193, 197, 199, 203, 204, 205, 209, 211, 213, 215, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 243, 244, 245, 251, 252, 256, 259, 260, 261, 262, 263, 264, 268, 269, 270, 271, 281, 282, 283, 284, 285, 286, 287, 288, 293, 294, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 321, 330, 331, 332, 333, 340, 347, 348, 349, 350, 351, 353, 354, 357, 363, 364, 365, 366, 369</p>
<p>26 Ph 4–5 Yellow soil with small pieces of rubble (before or after earthquake of A.D. 23)</p>	<p>Ph 4–5 Early Augustan – mid first cent. A.D. (30/27 B.C. – A.D. 45): Construction layers of Augustan Agora or of new construction after earthquake of A.D. 23 to Claudius</p>	<p>Ph. 4–5: nos. 44, 127, 128, 137, 200, 295, 299, 323</p>
<p>27 Ph 5 Construction level (after earthquake of A.D. 23): light pink mortar horizon</p> <p>28 Ph 5 Substructure for Agora courtyard floor: Pebbles and brown soil</p> <p>28a Ph 5 Early Imperial filling of uppermost part of Roman West Stoa basement (second quarter of first cent. A.D.)</p>	<p>Ph 5 second quarter of first cent. A.D. (23 – 45) Construction layers of remodelled Agora after earthquake of A.D. 23 to Claudius</p> <p>Ph 5a Around A.D. 23: Filling of the basement in the West Stoa with earthquake debris</p> <p>Ph 5b Lower construction layers in Agora courtyard</p> <p>Ph 5c Upper construction layers in Agora courtyard, in West and North halls below new floor levels and in foundation of West gate</p>	<p>Ph. 5a: nos. 46, 74, 91, 130, 146, 196, 326</p>
<p>33 Ph 5–7 Mixed layers of Early Imperial times to Late Antiquity (around A.D. 400 and later): brownish soil</p> <p>33a Ph 5–7 Mixed layers of Early Imperial times to Late Antiquity (around A.D. 400 and later): brownish soil with pebbles</p>	<p>Ph 6 mid first – late fourth cent. A.D.: Layers in main sewer crossing Agora, court yard and West Stoa from time of usage between Claudian remodelling of Agora and Theodosian rebuilding; also strata in Agora</p>	<p>Ph. 5b: nos. 28, 29, 30, 34, 70, 194, 195, 207, 216, 242, 289, 335</p> <p>Ph.5c: 8, 19, 26, 31, 32, 76, 92, 93, 94, 95, 96, 97, 98, 99, 100, 109, 131, 136, 162, 184, 185, 201, 202, 266, 290, 296, 322, 324, 325, 334, 336, 341, 342, 343, 344, 345, 352, 367</p> <p>Ph. 6: nos. 7, 22, 23, 25, 101, 104, 132, 135, 138, 140, 141, 142, 143, 144, 145, 297, 327, 328, 329, 337, 338, 339, 356, 376, 385, 386, 399, 406, 412, 414, 416, 417</p>

<p>29 Ph 6–9 Dark brown soil with layer of rough limestone (second quarter of first cent. A.D.), partly with thin mortar bedding above for new stone layer (fourth or even sixth cent. A.D.)</p> <p>30 Ph 11 Uppermost Byzantine Agora courtyard horizon (sixth/seventh cent. A.D.) mixed with recent layer of dusty soil, partly generated by excavation activities from 1904 onwards</p> <p>30a Ph 11 Pits and trenches of twentieth cent. A.D.</p>	<p>courtyard disturbed by setting of foundations during first to fourth cent. A.D.</p> <p>Ph 7 Late fourth to early fifth cent. A.D.: Layers of Theodosian Agora rebuilding</p> <p>Ph 8 Before mid sixth cent. A.D.: Layers and pits directly below latest marble floor in Agora courtyard</p> <p>Ph 6–9 first – early seventh cent. A.D.: Mixed layers and unclear situations During lifetime of Agora from end of Claudian construction to final abandonment</p> <p>Ph 7–9 Late fourth cent. – early seventh cent. A.D.: Uppermost destruction and usage layers in West Gate, rooms of West Stoa and fillings of sewers from Theodosian Agora rebuilding to final abandonment</p> <p>Ph 10 From early seventh cent. A.D. – recent times: Main sewer, filling after abandonment</p> <p>Ph 11 Unstratified complexes (cleaning and reopening of old trenches, collapsed trench profiles and so on)</p>	<p>Ph. 7: no. 410</p> <p>Ph. 8: no. 298</p> <p>Ph. 6–9: nos. 102, 149, 346, 362</p> <p>Ph. 7–9: nos. 21, 24, 47, 103, 139, 165, 217, 370, 371, 372, 373, 374, 375, 377, 380, 381, 382, 383, 384, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 400, 401, 402, 403, 404, 405, 407, 408, 409, 418, 419, 420</p> <p>Ph. 10: nos. 379, 411, 415</p> <p>Ph. 11: nos. 2, 16, 129, 148, 154, 158, 171, 206, 214, 222, 265, 267, 272, 291, 292, 320, 355, 368, 378, 413</p>
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2.2 So-called Serapeion Temple Precinct (P. SCHERRER)

This temple was erected on the rock of Bülbüldağ next to the Agora in the early second century A.D. A trench was already dug in the central axis of the courtyard of the so-called Serapeion by J. KEIL in the 1930s and widened in 1990. The main purpose was to find out if there was an altar, for which no traces could be found. Instead, the evidence shows that the area served for private dwellings of late Hellenistic and Augustan age.

One small piece of a mortarless wall of a house could be excavated directly to the north of the yellowish sandy clay stratum, where the *Visellius* stamp no. 830 comes from, so the sandy clay should be contemporary with the house's construction or use. The houses in this area were most probably destroyed in the earthquake of A.D. 23 and later (end of first or early second century A.D.) the courtyard plain of the Serapeion was filled over the ruined dwellings. A solid level of pound down soil and stones was finally formed at the height of 6.30 m above modern sea level (0.30 m higher than the findspot of the *Visellius* stamp no. 830). Probably this was intended to form a substructure of a then never constructed surface floor⁴¹.

Sites
Courtyard of the Serapeion

Catalogue number
830

⁴¹ Scherrer 2005.

2.3 Terrace House 2

There are two building complexes on the slopes of Bülbüldağ, near Curetes Street (the ancient name was Embolos). Terrace House 2 occupies 4000 m² behind late Hellenistic monuments (Androclos Heroon, Octagon, Alytarchs' Stoa) at the western end of the street. The workshops and taverns on the lowest terrace level opened onto Curetes Street. The Terrace House 2 had seven residential units. These richly decorated apartments (with wall paintings, marble and mosaic floors) offer an insight into the lives of the wealthy citizens of the city centre. The owner of residential unit 6 is known by name. *C. Flavius Furius Aptus* lived in the second century A.D. and as a priest of the cult of Dionysos, he belonged to the elite and, at least once, organized the Ephesian games as festival leader (alytarch)⁴². There are a number of graffiti on the walls. Some of them refer to wine, olive oil, bread and fruits⁴³. The earliest amphorae in the excavations of 1999 are from the second century B.C. The buildings were continuously in use until Late Roman times. They were damaged by earthquakes on a number of occasions in the third and fourth centuries A.D.⁴⁴.

When a protective roof was built above the Terrace House 2 in 1999, S. LADSTÄTTER excavated the area of the supporting structures. The rescue excavations included these areas:

Sites	Catalogue numbers
Stairway 1 / A3 (next to Residential unit 4) There is an old pavement more than 1 meter below the surface. The homogeneous filling between the two layers can be dated to the period of Severus ⁴⁵ .	583, 584, 585, 586, 587, 588, 591, 594, 595, 596, 598, 599, 600, 617, 622, 624, 625, 629, 630, 636, 638, 640, 641, 644
Residential unit 7, Room 32c (B6) There is a terrace wall of large, rectangular blocks of limestone and can be dated to the middle of the second century B.C. Three Early Imperial periods of construction have been documented here. There is a mosaic floor from the first century A.D. In addition, there are two lime pits ⁴⁶ .	503, 506, 510, 511, 512, 516, 517, 518, 519, 520, 521, 528, 529, 531, 536, 538, 539, 545, 556, 557, 558, 559, 560, 561, 562, 564, 566, 567, 569, 570
In the so-called „Stone cutting saw = Steinsäge“ (WT 2). There are finds and walls from the Hellenistic or even earlier periods at WT 2. ⁴⁷ There was a unique marble workshop in the northwest part of the complex. The workshop was used from the late sixth to the seventh centuries A.D. ⁴⁸ .	501, 502, 504, 505, 508, 513, 514, 522, 523, 524, 525, 527, 532, 535, 540, 541, 542, 544, 552, 565, 573, 575, 589, 597, 602, 618, 623, 633, 635, 637, 646
Unit C3 is in front of Residential unit 3 in the area of Stairway 3 ⁴⁹ . This was the western boundary of the complex. There used to be a fountain in a niche. The room was not used from the second century A.D. onwards. After extensive destruction, the area was filled up and not used again until the sixth century A.D. ⁵⁰ . The canals operated a number of water mills which changed the western façade of the Terrace House 2 ⁵¹ . The amphorae come from the filling.	509, 515, 547, 548, 549, 550, 551, 554, 555, 572, 574, 580, 590, 592, 593, 604, 605, 610, 611, 613, 615, 616, 627, 628, 631, 632, 639
There are Late Hellenistic and Roman layers behind the Octagon, in the tavern, in room 45c, B9 ⁵² .	533, 537, 543, 553, 571, 578, 579, 642, 643

⁴² Recently Rathmayr 2005, 227 note 308; Rathmayr 2009.

⁴³ Taeuber 2005.

⁴⁴ Foss 1979, 188–191; Ladstätter 2002, 23–26.

⁴⁵ Ladstätter 2000a, 372; Ladstätter 2002, 40.

⁴⁶ Ladstätter 2000a, 373.

⁴⁷ Lang-Auinger 1994, 20 f.; Ladstätter 2000a, 373.

⁴⁸ Ladstätter – Pülz 2007, 419–428; Ladstätter 2010a, 53–58.

⁴⁹ Ladstätter 2000a, 373; Ladstätter 2002, 40.

⁵⁰ Ladstätter 2000a, 373; Ladstätter – Sauer 2005, 143: Late Roman C-Ware, African Red Slip-Ware, note 3.

⁵¹ Ladstätter 2000a, 373.

⁵² Ladstätter 2000a, 373; Iro *et al.* 2009, 58–87.



Fig. 13 Map of Terrace House 2 (after Koller 2001).

2.3.1 The Terrace House 2 layers

	Layers	Catalogue Numbers
1	Hellenistic period	501, 502
1a	Late Hellenistic	543
1b	Late second to early first century B.C.	527, 532
2	First century B.C.	503, 506, 510, 511, 512, 516, 517, 518, 519, 520, 521, 528, 529, 531, 536, 538, 539, 545, 546, 556, 557, 559, 560, 561, 566, 567, 568, 569, 570
2a	Late first century B.C.	540, 541
1b-3	Late second century B.C. to the first century A.D.	535, 548, 549, 572
2a-3a	Late first century B.C. to early first century A.D.	504, 508, 513, 522, 523, 524, 525, 537, 542, 544, 565, 573
2a-3b	Late first century B.C. to mid first century A.D.	514
2a-3	Late first century B.C. to late first century A.D.	533
2a-4	Late first century B.C. to early second century A.D.	554, 592, 593
3	First century A.D.	550, 575
3a	Late first century A.D.	553, 558, 562, 564
3-7	First to fifth century A.D.	639
4	Second century A.D.	505, 597, 623
5	Third century A.D.	589
5a	Early third century A.D.	583, 584, 585, 586, 587, 588, 591, 594, 596, 598, 599, 600, 617, 622, 624, 625, 629, 630, 636, 638, 640, 641, 644, 645
5a-6a	Early third to early fourth century A.D.	552, 618
5-8	Third/fourth to sixth century A.D.	602, 635, 637, 646
6-9	Fourth to seventh century A.D.	615, 616, 627, 628, 632
7-8	Fifth/sixth century A.D.	633
10	Debris	509, 515, 555, 563, 580, 604, 606, 610, 613, 631
11	Stray find	507, 526, 530, 534, 547, 551, 571, 574, 576, 577, 578, 579, 581, 582, 590, 595, 601, 603, 605, 607, 608, 609, 611, 612, 614, 619, 620, 621, 626, 634, 642, 643, 647, 648, 649, 650

2.4 State Agora

The area of the State Agora (Upper Agora) was used from the Hellenistic period. A number of Classical and Hellenistic black and white figure vase fragments, Hellenistic amphorae, glassware and clay lamps have been found here. The Agora acquired its final shape during the reign of Augustus. The Basilica Stoa, the Prytaneum and a Well are also in this area.

2.4.1 Basilica Stoa

There was a two-storey triple-aisled building between the administrative quarter and the temple⁵³. The bilingual building inscriptions (year A.D. 11) at the Stoa mentions *C. Sextilius Pollio* and his family as the people who erected the building. "Access to the building is gained by four steps from the square. The front side had 67 columns in the ionic order. The double-spaced interior columns carried capitals decorated with widely projecting bull's heads to distribute the static load from the entablature. In spite of this, it appears that the colonnade suffered severe damage some 12 years after its erection by one of the earthquakes which are all too frequently recorded in Ephesus. The rear wall of marble orthostat blocks must have been newly erected afterwards and the number of interior columns was doubled with additional intermediate columns"⁵⁴.

⁵³ Lang-Auinger 2007, 4–8.

⁵⁴ Scherrer 2000, 80.

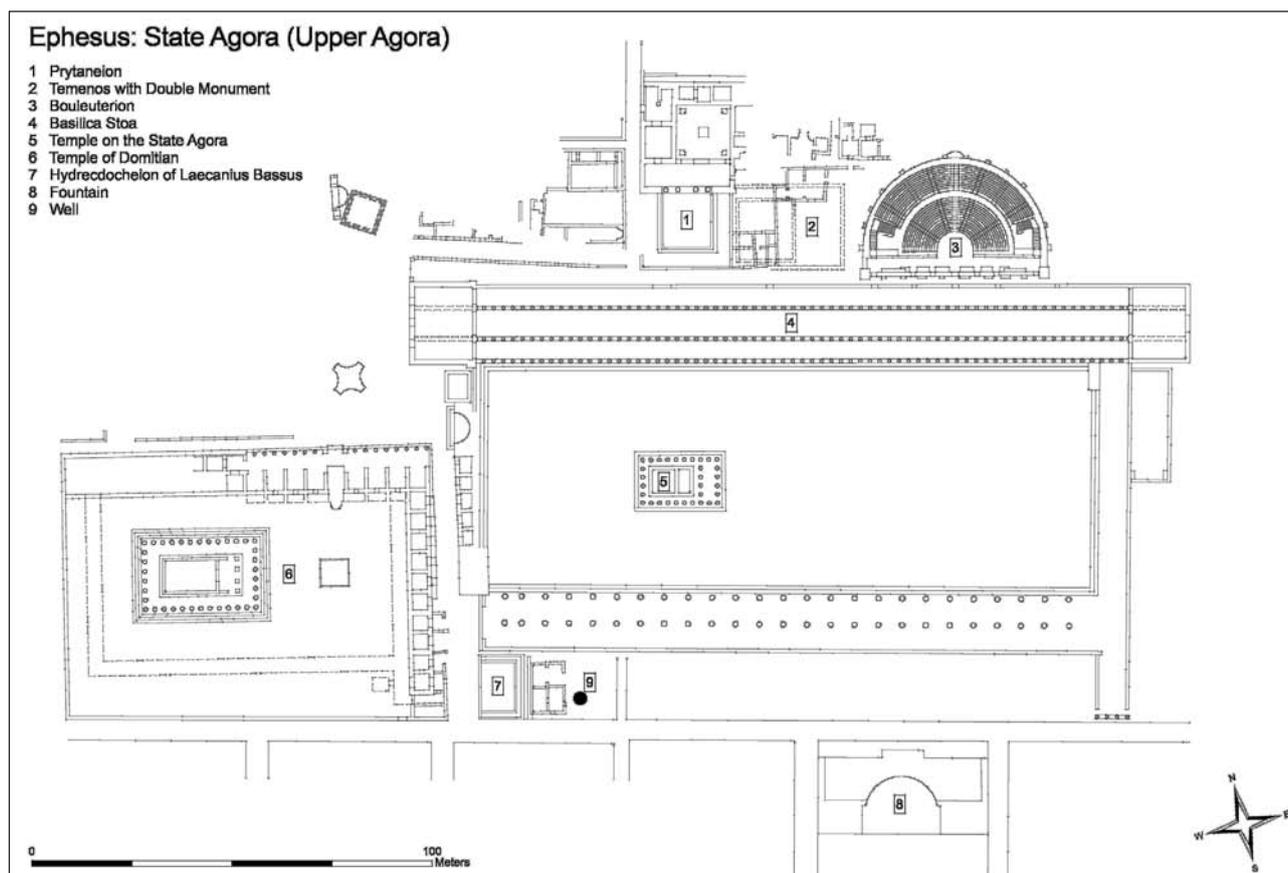


Fig. 14 Map of the State Agora (after Kurtze 2007).

A number of stamped amphorae have been found here. They can be dated from the third century B.C. to the middle of the first century A.D.⁵⁵.

Sites	Catalogue numbers
1968, trench S 4, strayfind	801
1962/1964, strayfind	802
1968, trench S 8, strayfind	803
1964, trench B 2, strayfind	804
1963, trench S 2, strayfind	805

2.4.2 Prytaneion

The Prytaneum is the administrative office of the *prytaneis* (πρύτανις) and the central civic cult building. F. MILTNER, who first excavated the area in the late 1950's, proposed a construction period in early Hellenistic times⁵⁶. However, the later examinations conducted by W. ALZINGER during the 1960's in this area made clear that the beginning of the construction was part of the programme which was initiated by Augustus after considerable changes in the administrative district of Ephesus⁵⁷. Entering from the south, there is a representative peristyle front court, followed by the inner part of the structure. The main room, which is architectonically impressive with heart-shaped columns at the inner corners, probably served as the location of public honorary banquets. The building housed the sacred flame of Hestia as well as the famous statue of Artemis. In the following centuries, it was subject of only small changes. The destruction of the building most likely occurred by an earthquake before the end of the fourth century A.D.

⁵⁵ Lawall 2007, 28–60; Bezeczky 2007.

⁵⁶ Miltner 1959, 297–300.

⁵⁷ Alzinger 1972–1975, 229–300.

After the publication of the inscriptions by D. KNIBBE⁵⁸, final excavations took place from 2007 to 2009 by M. STESKAL and were published in 2010⁵⁹. This comprises the concluding documentation of the entire architecture and the confirmation of the building phases, even if the function of some secondary room had to remain unclear. The pottery of these excavations, of which the amphorae are a large part, was analyzed and published by S. LADSTÄTTER⁶⁰. Unfortunately, this recent material could not be included in this publication.

Site	Catalogue number
L-shaped Sondage XXVI (1961) southeast corner of the southern peristyle. All the objects of the trench are earlier than the Augustan period ⁶¹ .	820

2.4.3 The Well

The objects found in the well in the southwest part of the State Agora were published by R. MERIÇ⁶². The well is next to the richly decorated fountain house (hydrekdocheion) built by the governor C. Laecanius Bassus Caecina Paetus. The well was filled starting in c. 25 B.C. and became full in the sixth century A.D. There are a few amphorae among the objects found there (Rhodian, Knidian, Cretan AC3 and AC2, Dressel 25 similis, Dressel 6A, Dressel 2–4, One handle jar (Agora F 65/66, J 46, M 281), Beltrán 2A, Dressel 24, Knossos 36, Aegean Local 1, Agora M 273, Late Roman Amphora 3, Ephesus 56).

Sites	Catalogue numbers
Filling B1 16,00–14,50 m, First quarter of the first century A.D.	810
Filling B1 17,10–16,75 m, First quarter of the first century A.D.	811

2.5 A survey near the Magnesian Gate



Fig. 15 Ephesus from Bülbüldağ. The marked part refers to the survey area.

⁵⁸ FiE IX 1,1.

⁵⁹ Steskal 2010.

⁶⁰ Since the work on the material for this publication had to be completed with the Ephesos-campaign 2007, the amphorae from the recent excavations were not accessible to me.

⁶¹ I am grateful to M. STESKAL for the data.

⁶² Meriç 2002, 86–96.

A field survey was conducted in a garden near the Magnesia Gate in 1999 and a number of amphora fragments were collected with C. İÇTEN and C. ROGL⁶³. A number of ceramic sherds had already been unearthed in this area before. U. OUTSCHAR supposed that there was a ceramic workshop here⁶⁴ “...During the construction of a watering trench in 1987–1988, they came across a heap of ceramic sherds that can be dated to the Mid Roman period. The site must have been the waste area of a workshop, since there were a number of deformed pieces and some over-fired clay. The latter may have come from the interior wall of a kiln. The heap was not investigated in detail. Most of the pieces were simple coarse ware from the second and third centuries A.D. and Peacock and Williams type 47 (that is, Kapitän 2) amphorae. The location of the site, on the outskirts of the city, near the main workshop, at the eastern gate suggests that the ceramic district may have been here...” A wide variety of vessels from the Late Hellenistic / Early Roman to the Late Roman period were found here. These objects are characteristic of a dump site outside the city gate.

Site	Catalogue numbers
Survey near the Magnesian Gate, strayfind	701–721

2.6 The Arap-Dere Survey in 2007

When U. OUTSCHAR described the local amphorae production, she relied on the observations of P. FORCHHEIMER about an aqueduct which brought water from the direction of Kuşadası⁶⁵. The site is known as Arap-Dere or Pis-Dere (Fig. 3, no 5). It is outside the city walls on Preon hill (Bülbüldağ)⁶⁶.

U. OUTSCHAR and R. SAUER collected a number of amphora fragments during the 1990s. S. LADSTÄTTER and R. SAUER also collected pieces in 2001. The fabric of the amphorae is the same as that of the samples from Ephesus. A new geological survey was started in 2001. Clay and rock samples were collected in the valleys and in the vicinity of the Rivers Cayster and Big Meander (Büyükmenderes). The evaluation and publication of these analyses are in preparation. During the last few years the area of Arap-Dere saw the rise of intensive agricultural activity. A number of new dirt roads were constructed leading to the agricultural centres. Another part of the aqueduct was discovered in a nearby valley (Fig. 16). P. FORCHHEIMER mentions that there are many ceramic pieces two hundred meters away from the aqueduct. The last field survey in 2007 uncovered some LR 3 and Ephesus 56 amphora fragments next to the aqueduct. U. OUTSCHAR mentions that hundreds of the “early versions of LR 3 amphorae” (one-handle jars, Athenian Agora F 65 to M 282) were unearthed by deep ploughing here. These amphorae were covered with quicklime⁶⁷. The quantity of the fragments, however, does suggest that the pieces come from a Late Roman villa or from a shipment of amphorae.



Fig. 16 Ruins of the aqueduct and the find spots of the amphorae.

⁶³ I am grateful for their help.

⁶⁴ Outschar 1993, 51.

⁶⁵ Forchheimer 1923, 233.

⁶⁶ I am grateful to C. KURZE. He identified the site on the basis of GPS data and a field survey.

⁶⁷ Outschar 1993, 51.

We collected 173 handles and bases and 26 body fragments. Among the rim and base fragments there are 120 (69.7 %) Ephesus 56 amphora fragments and there are 53 (30.6 %) LR 3 fragments⁶⁸.

Site
Arap-Dere Survey, Strayfind

Catalogue numbers
851–871

⁶⁸ At other sites (the Agora and the Terrace House 2), the proportion of the two types of amphorae is more or less reversed. There is a large handle and there are about ten large bases among the fragments. Their fabric is exactly the same as those of the LR 3 and Ephesus 56 amphorae.

3. EPHEBUS AND CAYSTER VALLEY FOOD AND AMPHORA PRODUCTION

The Valley of the River Cayster (Küçükmenderes = ‘Small Meander’) was famous for its agricultural products. Ancient sources claim these areas produced fruit, wine, olive oil and figs⁶⁹. The production areas in the Cayster Valley were closely connected to Ephesus. However, there are few ancient sources about agricultural production. Athenaeus mentions cabbage, and says that local parrot fish, mussels and cockles were famous⁷⁰. Archaeozoological investigations have confirmed his statements and, in addition to mussels and cockles, the remains of various sea and river fishes have been found⁷¹. The Terrace House 2 is significant from a paleobotanical point of view, as the remains of olives, grapes, figs, cucurbitaceous fruits and cereals have been recovered⁷². Both Strabo and Pliny the Elder mention Ephesian wine⁷³. Strabo said that “...the Ephesian and Metropolitan wines are good...”. Pliny was less enthusiastic: “...as for the vintage of Mesogis, it has been found to cause headache, and that of Ephesus has also proved to be unwholesome, because sea-water and boiled must are employed to season it...”. Dioscorides mentioned the *pygelites* wine from Ephesus⁷⁴. Athenaeus remarked that the mountain village of Latorea (formerly called Leto’s village) near Ephesus, produced Pramnian wine⁷⁵. Unfortunately, he does not say anything about the quality of the wine. The latter name itself alludes to the fact that this was a spicy wine. One of the inscriptions at the Temple of Artemis mentions that the Temple had estates in the Cayster Valley⁷⁶. The inscription speaks of a wine co-operative (συνεργασία), and of the way wine was sold in the city centre and in the small shops in the street between the stadium and the theatre⁷⁷. The large estates of the Temple were redefined under Augustus, Domitian and Trajan⁷⁸. Wine production continued after the advent of Christianity in the areas taken away from the pagan temples. The inscription concerning taxation in Ephesus tells us that the proportion of wine as a means of settling the taxes was higher than that of cash or olive oil⁷⁹. Philostratus, a pupil of Damianus, mentions the agricultural estates and the port of his master, a second century A.D. philosopher⁸⁰: “...In the first place, all the land that he had acquired was planted with trees, both to bear fruit and to give abundant shade. And for his estate by the sea shore he made artificial islands and moles for harbours to secure safe anchorage for cargo-boats when they put in or set sail...”. According to Philostratus, Damianus died at the age of seventy in one of his suburban villas at the beginning of the third century A.D.⁸¹. The reference to villas implies large-scale agricultural activities, and explains why Damianus needed his own port.

The ancient sources say very little about the production and trade of Ephesian olive oil. In spite of the relative lack of written evidence, oil was produced both in the Cayster Valley and in the Meander Valley⁸².

⁶⁹ Pliny NH XIV, 75; Strabo XIV 1, 15; Magie 1950, 46 note 57; Brun 2004, 92–94; Meriç 2009, 24.

⁷⁰ Athenaeus III 87c, 90d, 92d, IX 369e.

⁷¹ Forstenpointner *et al.* 2002, 286–301; Galik *et al.* 2010.

⁷² Forstenpointner *et al.* 2002, 287.

⁷³ Strabo XIV 1, 15; Pliny NH XIV, 75.

⁷⁴ The wine was probably named after the Pygelis which belonged to the town. It is also possible that the wine was produced there. Dioscorides 5, 10.

⁷⁵ Athenaeus I, 31; and I, 30. Pramnian wine ... is neither sweet nor rich, but dry, hard, and of extraordinary strength. Πράμνιος – Greek wine that was considered harsh, astringent and remarkably strong.; Pliny NH XV 6, 54”... The Pramnian wine as well, also celebrated by Homer, still retains its fame. It is grown in the territory of Smyrna, in the neighbourhood of the shrine of the Mother of the Gods...”. Raisin-wine mentioned by Dioscorides 5, 6.

⁷⁶ Engelmann 2001, 40, IV. 4. 4 and 41, IV. 4. 6; detailed Ladstätter 2008, 181 f.

⁷⁷ Knibbe 1985, 75; Engelmann 1986, 107; Ladstätter 2008, 181 f.

⁷⁸ Vitruvius 7, 8, 1; IvE VII 2, 3501–3516; Dignas 2005, 210 f. with a detailed discussion of the problem.

⁷⁹ Schulten 1906, 40–70; Ladstätter 2008, 181–183.

⁸⁰ Philostratus, The Lives of the Sophist, 606; “Damian himself attained senatorial rank, yet he married the daughter of a *clarissimus vir* and their five children either became consuls or married consuls” D’Arms 1981, 164 f.; Knibbe – Langman 1993, 56.

⁸¹ Philostratus 606.

⁸² Mitchell 2005, 85 f.

There are still olive groves in the village of Sirince near Ephesus⁸³. An inscription says that a *strategos* donated 5000 denarii for the cause of selling oil at a subsidized price⁸⁴. The written sources about oil production and trade along the coast of Asia Minor come primarily from the Late Roman period.

3.1 Villas, local production

The ruins of a Late Roman house were found south of Ephesus near Pygela (north of Kuşadası)⁸⁵. The mosaic found near the road between Ephesus and Magnesia belonged to another major villa⁸⁶. We have no information on how these buildings were connected to agricultural production and Ephesian trade. However, a number of pithoi/dolia have been discovered in Ephesus and its vicinity. They were used in both oil and wine production. Based on the inscription at the Temple of Artemis and on the petrological analyses of the amphorae, it seems quite certain that the villas which produced wine, olive oil and other foodstuffs must have been situated in the Cayster Valley and along the coast. It is currently presumed that rich families had estates in this area and played a role in the local agriculture and trade through their “freedmen and coloni.” The ownership of property changed in Late Roman times. The Imperial administration now supervised production and shipped the wine and olive oil to other provinces of the Empire⁸⁷.

In the publication mentioned above, U. OUTSCHAR claims to have seen the remains of ancient production workshops near Ephesus, in the area near the Magnesian Gate and Arap-Dere which is outside the city wall.⁸⁸ However, further investigation or excavation is needed to substantiate this.

3.2 Amphorae

The source of the various amphora types unearthed at the Agora and at the Terrace House 2 is roughly the same in Late Hellenistic, Early Roman and Late Roman times⁸⁹. The bulk of the amphorae were produced either in Ephesus or in the vicinity of the city:

The most frequent amphora types

- a – Mushroom rim type / Nikandros group
- b – Local Aegean 1 type
- c – Local Aegean 2 type
- d – One handled jar (Athenian Agora F 65–66, M 45, J 46–47)
- e – One handled jar (Athenian Agora M 125)
- f – One handled jar (Athenian Agora M 240, 255–259, M 277, M 282)
- g – Late Roman Amphora 3 (Athenian Agora M 302, 335, 373)
- h – Ephesus 56 type

The less frequent amphora types

- i – Cup shaped rim / Dressel 24–predecessor
- j – Rhodian type
- k – Kapitän 2 type

It has already been mentioned that U. OUTSCHAR first came up with the idea of local production⁹⁰. She suggested that some of the Roman amphorae (Late Roman 1, Late Roman 3 and Kapitän 2) may have been produced in

⁸³ A. BAMMER, personal discussion.

⁸⁴ IvE 3071, 7–9; Mitchell 2005, 98–103.

⁸⁵ Keil 1908, 147; Scheibelreiter-Gail 2011, 350, no. 121.

⁸⁶ Miltner 1956–1958, Beibl. 58 f.

⁸⁷ Ladstätter 2008, 181–183.

⁸⁸ Outschar 1993, 47; moulds of Megarian bowls have been found here.

⁸⁹ The excavations at Terrace Houses (1 and 2) have unearthed a number of LR 3 and Kapitän 2 amphorae. They were published with the other ceramic objects (Outschar 1996; Ladstätter 2002; Ladstätter 2003b; Ladstätter 2005; Ladstätter 2008). LR 3: Tetragonos Agora (Bezeczky 2005c). There are numerous LR 3 amphorae at the port (Zabehlicky 1996).

⁹⁰ Outschar 1993, 46–52.

and around Ephesus. The petrographical analyses detailed below have confirmed that the LR 3 amphorae were certainly produced near Ephesus. There is at present only circumstantial evidence concerning the Kapitän 2 amphorae⁹¹. The possibility that Late Roman 1 amphorae were locally produced can be excluded⁹².

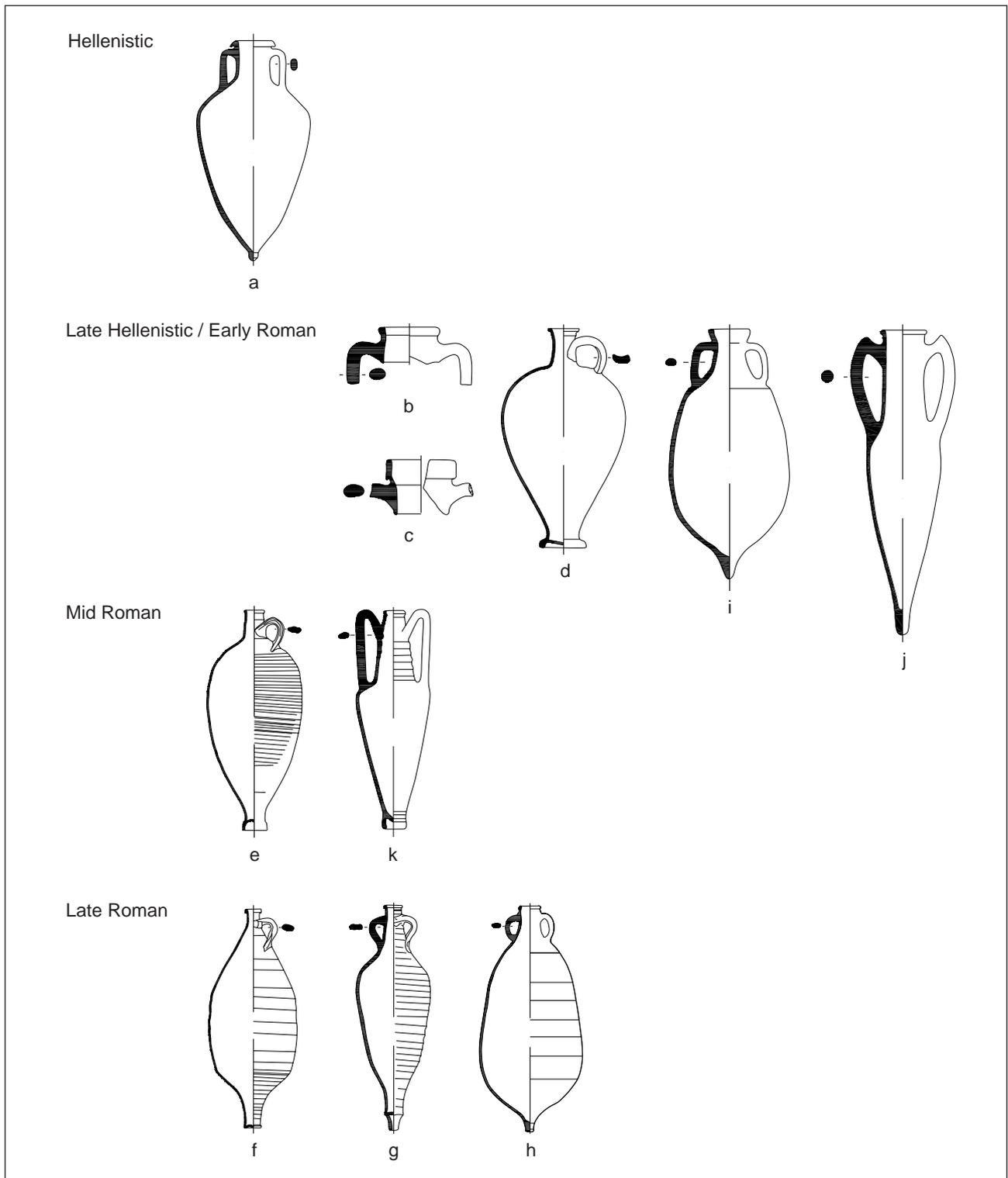


Fig. 17 Amphora types produced in the Ephesus region.

⁹¹ Bezczy 2005a, 45; Sauer 2005, 117 f.

⁹² The petrological analysis does not affirm local production, Sauer 1995.

Ephesus production, Local fabrics

To investigate the possibility of local production, some Hellenistic amphorae (Nikandros group = the Mushroom rim type) and Local Aegean 1 and Local Aegean 2 were examined. The one-handled vessels, formerly called ‘micaceous water jars’, supposedly produced in the Meander Valley, also need further investigation. We have also re-analysed material to determine whether the Late Roman 3 amphorae came from Ephesus and compared them with Ephesus 56 amphorae.

3.3 Petrological analysis

No villas or amphora workshops have yet been uncovered in the vicinity of Ephesus. Geological surveys have identified several types of clay in the Cayster Valley and in the region of Kuşadası. After comparison with petrographical analyses of the amphorae produced from Hellenistic times to the Late Roman period, three main groups of raw materials could be identified.

3.3.1 Previous research

A comprehensive geological survey was undertaken in the region during the 1990s. In addition to the samples from the local clay deposits, different types of ceramics and amphorae were also collected at Ephesus, and from various other sites off the coast of Asia Minor, such as Samos, Milet, Didima, Priene, etc⁹³. The results of this survey are documented in an unpublished manuscript and have also been used as reference material⁹⁴. Some of the data, however, has already been mentioned in other publications⁹⁵. Agora F 65, Agora J 46, Agora M 255 – 282 and LR 3 (called Peacock and Williams 45) types of the Terrace House 2 were analysed. R. SAUER distinguished Fabric A and Fabric B on the basis of these analyses. They were then compared to the material selected from the Tetragonos Agora and the Terrace House.

The ongoing research: In recent years, the Hellenistic and Late Hellenistic amphorae have also been analysed. The LR3 and Ephesus 56 amphorae, collected at Arap-Dere (2007), have been studied and analysed.

3.3.2 Fabric A (Petrology Table 1; Graph 1)

The dominance of garnet within the heavy mineral assemblages is typical for Fabric A. Subordinate to rare rutile and other TiO₂ modifications, kyanite, staurolite, hornblende, tourmaline, and rare zircon and epidote/zoisite, can be found.

The thin sections show an oxidised matrix with a temper content of about 15%. The grain size of the particles is highly variable (up to 2.5 mm). The temper grains consist mainly of mica (muscovite, phlogopite), mono- and polycrystalline quartz. Subordinate K-feldspar, heavy minerals, crystalline rock fragments and iron oxide aggregates can also be observed.

The crystalline rock fragments consist mainly of mica-schist (partly garnet bearing) and gneiss.

Comment: The utilised raw materials are decalcified or weakly calcareous, probably derived from Neogene sediments. Clay deposits of similar petrographical composition exist, for example, near Kuşadası, but also occur in the Meander Valley.

R.S.

The analysed amphorae of the Agora and the Terrace House 2 are
Agora F 65–66 type:

Ephesian fine grained Fabric: nos. 81, 91. Similar fabrics are also known from common ware and bricks produced at Ephesos

Ephesian fine to medium grained Fabric: no. 80

Ephesian coarse grained Fabric: no. 89

⁹³ This research was sponsored by U. OUTSCHAR's FWF-Project (No. 9280).

⁹⁴ Sauer 1995.

⁹⁵ Outschar 1993, 52; Bezeczky 2005c, 205; Ladstätter 2008, 180.

Agora M 240 type: Probably an Ephesian Fabric: no. 601

Rhodian type: nos. 10 and 14

Cup-shaped rim/Dressel 24–predecessor: no. 111

3.3.3 Fabric B (Petrology Table 1; Graph 1)

Fabric B typically shows high to extremely high contents of epidote/clinozoisite. Only subordinate TiO₂ modifications, zircon, hornblende, kyanite, garnet and tourmaline can be found in the heavy mineral residue.

The groundmass is oxidised. The temper content (natural temper) ranges from 20–30%.

The temper particles consist of predominant mica (muscovite, phlogopite) and quartz. Subordinate K-feldspar, heavy minerals, occasional carbonate grains and crystalline rock fragments can be observed. Some samples contain abundant carbonate particles. The crystalline rock fragments consist mainly of mica-schist (epidote/clinozoisite bearing), gneiss, quartz-epidote fragments and quartzite.

Comment: The utilised raw materials are mostly non-calcareous, silty to sandy clays. Rare calcareous weathering loams have also been used. Similar clay deposits are present among the sediments of the Little Meander Valley, and also occur around Ephesus. Recent mud bricks found at Ephesus also frequently show these epidote rich heavy mineral compositions.

R.S.

The analysed amphorae of the Agora and the Terrace House 2 are:

LR 3 type no. 381

Ephesus 56 type no. 397

Arap-Dere new research 2008: All of the samples belong to the Amphora Fabric type B. Due to the very similar mineralogical composition of the analysed samples an identical provenance of their raw materials is very likely. The samples compare well with the non-calcareous samples of Fabric B⁹⁶.

The analysed amphorae:

LR 3 type: nos. 852, 853, 856, 859, 860

Ephesus 56 type: nos. 861, 865, 869

3.3.4 Fabric C and C1 (Petrology Table 2; Graph 2)

Amphorae belonging to the Mushroom rim/Nikandros group, the Aegean Local 1 and the Aegean Local 2 types have been analysed. There are two amphora handles with the Nikandros stamp among them. One of them was found at the Agora in a Late Roman mixed layer. The other one was a sporadic find at the Byzantine Palace. Two other stamped Mushroom type amphorae (with Menophilos stamps) from the Agora were also investigated.

Higher fired group: Fabric C

Matrix: Calcareous, micaceous groundmass, optically inactive, partially recrystallised.

Temper: Very frequent sheet silicates (muscovite, oxidised sheet silicates, biotite/phlogopite), frequent monocrystalline quartz, iron-oxide concretions, carbonate grains and moulds of former carbonates, subordinate-moderate K-feldspar plus plagioclase, albite, polycrystalline quartz, rare crystalline rock fragments (quartz-feldspar aggregates, quartzite), sandstone/siltstone fragments, heavy minerals and chert.

Comment: The inactive calcareous groundmass and the high content in carbonate particles (mainly recognisable in the form of moulds) are typical. The utilised raw material is probably very similar or identical to Fabric C1 (see below). Most likely Fabric C is the higher fired variant of Fabric C1. The heavy mineral contents are often very low due to the high carbonate content (dilution) or are partially destroyed by the higher firing temperature and therefore statistically not very representative.

R.S.

⁹⁶ Sauer 1995.

The analysed amphorae of the Agora and the Terrace House 2:

Mushroom rim/Nikandros group: nos. 529, 531

Aegean Local 1: nos. 152, 153, 157, 159

Aegean Local 2: no. 168

Cup-shaped rim/Dressel 24–predecessor: nos. 120 and 124

These pieces are not included in the catalogue:

BoxNo. 1168/32, Nikandros stamp

BoxNo. 98/103, Nikandros stamp

BoxNo. 96/051–53, Menophilos stamp

Lower fired group: Fabric C1

Matrix: Calcareous, micaceous groundmass, optically active to inactive.

Temper: Very frequent carbonate grains and moulds of former carbonates, sheet silicates (muscovite, oxidised sheet silicates, biotite/phlogopite and monocrystalline quartz, iron-oxide concretions, subordinate-moderate K-feldspar plus plagioclase, albite, polycrystalline quartz, rare crystalline rock fragments (quartz-feldspar aggregates, quartzite), sandstone/siltstone fragments, heavy minerals and chert.

Comment: The calcareous groundmass and the high content in carbonate particles (but importantly the absence of microfossils) are typical. The carbonate grains are better preserved in Fabric C1 due to the lower firing temperature. Such carbonate rich clays (marls) also occur frequently in the surroundings of (around or near) Ephesus. Therefore, an Ephesian or regional production is probable.

The usage of such calcareous clays for the production of hydrias was very common at Ephesus⁹⁷.

R.S.

The analysed amphorae of the Agora:

Mushroom rim/Nikandros group: nos. 520, 526, 527

This piece is not included in the catalogue

BoxNo. AG 96/051–54, Menophilos stamp

3.3.5 The results of the petrological analysis

The Nikandros group amphorae (the Mushroom Rim type) and the Local Aegean 1 and Local Aegean 2 amphorae were made of a similar fabric. There are quite a few hydrias among the objects found in Ephesus made from this fabric. The Hellenistic amphorae can be linked with the fabric known from Kuşadası (south of Ephesus) and from the Meander Valley. Two Dressel 24–predecessor amphorae belong to this group (nos. 120 and 124).

The group designated as Fabric A includes the Agora F 65–66 amphorae and an Agora M 240 amphora. The analysis of the other amphorae showed that different types of amphorae had also been produced in the vicinity of Ephesus. Two Rhodian types (nos. 10 and 14) and a Dressel 24–predecessor (no. 111) amphorae were made here, although it seems likely that the latter form was only produced in insignificant quantities.

The LR 3 amphorae and the Ephesus 56 amphorae, produced during Late Roman times, belong to Fabric group B.

It is remarkable that the Hellenistic and Early Roman amphorae, including the one-handed jars, belong to Fabric C and A, while the Late Roman amphorae, with a few exceptions, belong to Fabric group B. The clay of the Hellenistic and Early Roman C and A Fabrics is present near Kuşadası and the Meander Valley. The clay of Fabric B can be found near Ephesus and the Cayster Valley. However, this is still a preliminary statement and needs further confirmation.

The Agora type F 65–66 amphorae require additional analysis because one of them (no. 79) was not produced in the region. The petrological analyses of the Kapitän 2 amphorae leaves a number of possibilities open. The Kapitän 2 amphorae produced in Ephesus have been found at very distant sites. Those from Pannonia

⁹⁷ Sauer 1995.

(Vindobona) belong to both Fabric groups A and B.⁹⁸ It seems likely that the buff coloured Kapitän 2 amphorae unearthed in Egypt also belong to this series⁹⁹. The other Kapitän 2 amphorae found in Ephesus were made of a fabric that has not been found in the vicinity. Their production site is yet to be discovered. They are quite frequent among the second and third century A.D. amphorae of the Terrace House 1 and Terrace House 2.

The amphorae and other ceramic material suggest large-scale production in the Ephesus region, even though no kilns have been identified so far. The production seems to have been continuous from Hellenistic times to the Byzantine period. Other regions also produced Agora F 65–66 and other one handled jars, Dressel 24–predecessor and Late Roman 3 amphorae. These other centres of production are thought to have been situated along the western shores of Asia Minor¹⁰⁰.

3.4 Epigraphy

Few producers of Ephesian amphorae are known by name. In addition to the Hellenistic Νίκανδρος, Μηνόφαντος, Μηνόφιλος, Αρχετίμος stamps, there are monograms which are hard to define¹⁰¹. From the middle of the first century B.C. the Aegean Local 1 and the Aegean Local 2 amphorae are stamped with names like Παχο (...) perhaps Πανο (...), or Προμη (...). There are three stamped handle fragments which belong to the Agora type F 65–66 amphora or to its later variant in the Basilica Stoa and at the Tetragonos Agora. One of them has an imprint of a gem with the profile of a head, the other two have initials of names Ελ(...) and Μάσ(...). Even though the names are known from inscriptions in Ephesus, these stamps do not contribute to the identification of their production site. The Kapitän 2, the Late Roman 3, and the Ephesus type 56 amphorae have no stamps at all. The Vedius Gymnasium has a Late Roman 3 amphora whose graffito refers to a spicy wine kond(itum)¹⁰². There is a Late Roman 3 amphora in Ravenna which has an ‘Aphrodisios’ (ἀφορδίσιος) graffito¹⁰³. It is presumed to be a name – perhaps that of the producer or the merchant.

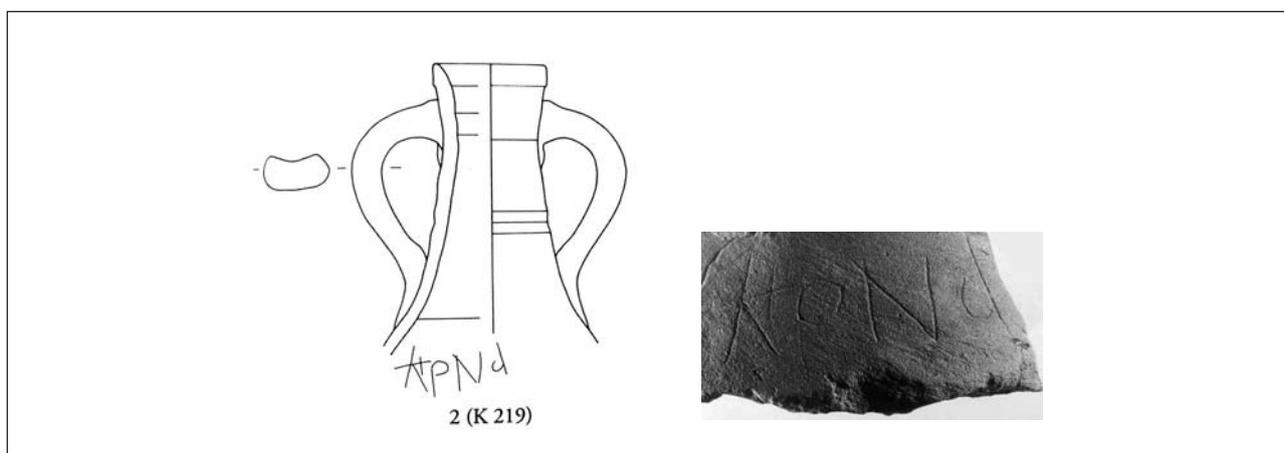


Fig. 18 Amphora graffito from the Terrace House 2 (after Ladstätter 2008).

An ostrakon recently discovered at Berenice (Egypt) and dated A.D. 30–70, refers to two Ephesian vessels. At that time this can only be the Agora F 65–66 jar.

⁹⁸ Bezczky 2005a, 45; Sauer 2005, 117 f.

⁹⁹ Majcherek 1993, 218, Type 14 fig. 1.

¹⁰⁰ Hayes 1976, 117; Williams 1982, 104; Peacock 1984, 22; Panella 1993, 663; Villa 1994, 405; Rautman 1995, 81; Arthur 1998, 165.

¹⁰¹ Lawall 2004, 177–188; Lawall 2007, 52, AH 62.

¹⁰² Ladstätter 2008, 181, K 219; Apicius I, 1. has a recipe of *conditum paradoxum* (wine of spice and surprise); in Italy: Martin 1999, 358; Robinson 1959, 107 f. (M 241) has published inscriptions (dipinti) of the one-handed jars in Athens. They suggest sweet Mytilenean wine. The M 307 amphora also has a graffito (ἄκτινο) that refers to wine (“the jar might have held wine flavoured with ἄκτινος, wild basil”).

¹⁰³ Aphrodisios is interpreted as a personal name in Fiaccadori 1983, 238 f., 23.1a-b., but paralleled to the City of Aphrodisias in Pieri 2005, 100.

Ἐσραπίων πρὸς Πισιφμόϊο καὶ Ἀνδούροισι, χαιρετῆσαι. Ἐπιτρέψαι γὰρ τῷ Καλλῷ (), υἱοῦ τοῦ Ἡρύοθου, ἀγέλας ἀγέλας τοῦ Μάχου, τοῦ τοῦ Ἀνταίου, υἱοῦ τοῦ Ἀπίωνος, 4 Λαοδικεῖα κλίσια τοῦ κρασιῦ καὶ 4 ἡμικλάδια τοῦ ἐλαίου καὶ 2 λυκία καὶ 1 Ῥωδιακὴ κλίσια τοῦ γλυκοῦ κρασιῦ (?) καὶ δύο ἐφεσια, συνολικῶς 2, καὶ 1 ... τοῦ ἀποθέματος καὶ 1 (κλίσια) τοῦ βετῆ καὶ δύο μετρηταὶ τοῦ ..., συνολικῶς 2¹⁰⁴.



Fig. 19 The Berenice ostracon (after Bagnall 2000).

There are more Ephesian amphorae among the objects found in Berenice¹⁰⁵. J. HAYES has published some Agora M 255–257, M 279–282 types from this site¹⁰⁶. There are Agora M 255–257, M 279–282 and LR 3 amphorae among the finds of the 2010 excavation. Their visual characteristics make them Ephesian amphorae¹⁰⁷.

3.5 Tradesmen, merchants

Many of the names of the Italian merchants who settled in Ephesus or conducted their economic activities through their freedmen are known from stone inscriptions and amphora stamps. Some of the names were also preserved in written literary sources. The names of the merchants in the inscriptions are: Ti. Claudius Secundus, Gallus, Agrius, Camurio, Cocceius Nerva, Collina, C. Sallustius, Crispus, Veturius Rodo, Vibius¹⁰⁸. F. KIRBIHLER has published a detailed study of the Italians in Ephesus¹⁰⁹. The stamped amphorae of two of them, C. Postumus Curtius and M. Herennius Picens, are among the pieces from the Agora. L. Agrius is mentioned

¹⁰⁴ Bagnall *et al.* 2000, 15. 20; APIS (Advanced Papyrological Information System). <http://www.columbia.edu/cu/lweb/projects/digital/apis/index.html>, no. 87, dated A.D. 30-70; I am grateful the photo credit S.E. Sidebotham and Iwona Zych.

¹⁰⁵ Wendrich *et al.* 2003, 75; “Late Roman 3 amphora, ... probably represented in the first century A.D., but more typical of the mid-4th and later.

¹⁰⁶ Hayes 1996, 172 f.

¹⁰⁷ I am grateful to R. TOMBER for permission to study the amphorae.

¹⁰⁸ IvE 646. 800. 465 = 2058. 3019. 458. 884. 3025. 74 = 659. 60 = 450.

¹⁰⁹ Kirbichler 2007, 19–35.

in an inscription dated to the first century B.C.¹¹⁰. The name Agrius is also known in other Greek regions¹¹¹, and occurs in Cicero and Varro¹¹². A certain M. Agr(ius) is mentioned in the *tituli picti* of Lamboglia 2 amphorae from northern Italy¹¹³. M. ROSTOVITZEFF says that the family of *Agrii* settled in Dalmatia¹¹⁴.

The size of the commerce involved is hard to estimate. There is, however, a piece of information that makes it possible to evaluate the supply for the highly mobile Roman troops¹¹⁵. A remark by Plutarch shows that Pompey the Great received a letter from Sulla ordering him to leave Sicily for Libya. Pompey set sail with a hundred and twenty warships and eight hundred transport ships carrying food, military equipment and money. He had six complete legions. There are few ancient written sources which refer to the commerce of the Early Imperial period. However, Petronius' Trimalchio mentions a number of important matters, which are significant even coming from a rich freedman who seems to exaggerate¹¹⁶. ...I built five ships, got a cargo of wine – which was worth its weight in gold at the time – and sent them to Rome. You may think it was a put-up job; every one was wrecked, truth and no fairy-tales. Neptune gulped down thirty million in one day. ... I built some more, bigger, better and also luckier, so that no one could say I was not a brave man. You know, a huge ship has great gallantry about her. I got another cargo of wine again, bacon, beans, perfumes, and slaves. They were the leaven of my fortune. What God wishes soon happens. I made a clear ten million in one voyage. I at once bought up all the estates which had belonged to my patron...

3.6 The distribution of Ephesian amphorae

M. LAWALL mentions the presence of amphorae belonging to the Nikandros group (the Mushroom rim type) in Corinth, Pergamon, Jerusalem, Athens, Delos, Gezer and Maresha¹¹⁷. The Local Aegean 1 and the Local Aegean 2 amphorae have only been found in Ephesus. Ephesian amphorae produced using a highly micaceous fabric were widespread in the Empire. The one-handled Agora F 65 amphora was the earliest. Its production started either immediately before or during the period of Augustus. An Agora F 65 has recently been found at the Magdalensberg¹¹⁸. Later versions of the one-handled amphora (Agora F 66, J 45/46, M 125.) have been found in southern France, Germany, Britain, Italy, Raetia and Berenice¹¹⁹. Two Kapitän 2 type amphorae produced in the Ephesus region were discovered in Vindobona and a few have been found in Egypt¹²⁰. The LR 3 and the Ephesus 56 type amphorae occur in a number of places. D. PIERI has compiled a list of the find-sites of the LR 3 amphorae¹²¹. The fabric used will indicate which of these amphorae were produced in Ephesus. Algerciras in Spain, Parentium–Poreč and the island of Brijuni in Istria can be added to the list of sites which have Ephesian LR 3 and Ephesus 56 amphorae¹²². There are also examples in India¹²³. Further investigations are needed to establish – in addition to the well-known LR 3 wine amphorae – the distribution and the relative proportion of the Ephesus 56 amphorae which may have contained olive oil. The LR 3 and the Ephesus 56 amphorae were shipped to Carthage, Marseille, Rome, Zadar, Poreč, Island of Brijuni, Bodrum and Samos.

¹¹⁰ L. Agrius CIL III 14195. 39 = Ik 16, 2058, additional *negotiator* inscriptions IvE nos. 409, 646, 658, 800, 884, 3019.

¹¹¹ Hatzfeld 1919, 119, 128.

¹¹² Cicero Pro Flacc., 31. L. Agrius; Varro RR I, 2, 1 and 3, C. Agrius.

¹¹³ Baldacci 1972, 111; Baldacci 1967-68, 16.

¹¹⁴ Rostovtzeff 1998, 639, n. 64; Lindhagen 2009, 83–108.

¹¹⁵ Plutarch, Pompei 11. We have another example from the period after Julius Caesar's assassination. Brutus (*Epistolographi graeci*, 61) sent Lucius P. Aquila to Bithynia in order to prepare a fleet of two hundred warships and fifty transport ships. In the Late Roman period see Ammianus Marcellinus XXIII: 3. 9.

¹¹⁶ Petronius, Satyricon, 76, Trimalchio came from Asia as a young slave, and became the most important supporter of his patron. He inherited a vast fortune, and thought he could add to it by trading. See D'Arms 1981, 97–120, for a detailed analysis and bibliography.

¹¹⁷ Lawall 2004, 182–186.

¹¹⁸ MB 75/NG 45, I am grateful for E. SCHINDLER-KAUDELKA.

¹¹⁹ Lemaître 2002, 220; Loeschke 1909, 292 f.; Riley 1979, 183–185; Peacock – Williams 1986, 188 f.; Panella 1986, 614.

¹²⁰ Majcherek 1993, 218; Bezczky 2005a, 43–45.

¹²¹ Pieri 2005, 193–195.

¹²² Arévalo González *et al.* 2004, 233 no. 102; V. KOVACIĆ personal discussion; Vidrih Perko – Pavletić 2000, 267.

¹²³ Tomber 2008, 166.

4. DESCRIPTION OF THE AMPHORA TYPES

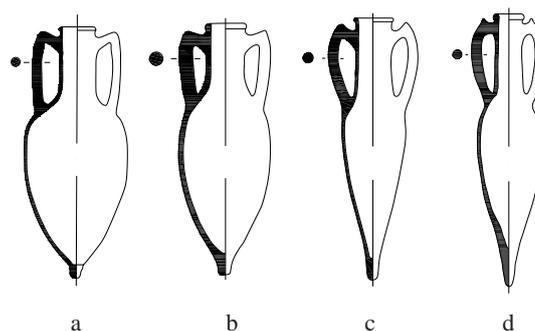
Type 1

RHODIAN

(Augst 6; Callender 7; Camulodunum 184; Ostia 65, Tardo-rodia; Peacock – Williams 9)

Rhodian amphorae are one of the most common Hellenistic amphora types. The political role of Rhodes gradually diminished during the second half of the second century B.C. after the free port of Delos opened. Rhodian amphorae also show modifications from the end of the second century¹²⁴. The jars routinely had two stamps during the Hellenistic period. V. GRACE thought the stamps were related to port taxes, which was a major source of income for the state of Rhodes¹²⁵, or to control the amphora production¹²⁶. Stamps became less frequent in the early first century B.C., and seem to have gone out of use by the Augustan period¹²⁷. The political and economic changes in the wake of the Roman conquest had an effect on Rhodes and, in general, on the whole of the eastern Mediterranean.

Form: The form of the Rhodian amphora evolved from Hellenistic prototypes¹²⁸. When the amphora form changed at the end of the second / early first century B.C., the fabric and the stamps as well as the shape became different. The body grew more slender and the handles became more curved. The amphorae of the Augustan period (b) are markedly different from the ones produced at the beginning of the century (a). After the beginning of the first century A.D., the handles are frequently horn-shaped (c–d). There is hardly any room left for the circular or rectangular stamps on the top of the handles¹²⁹. This type of amphora is common in Ephesus.



The way V. GRACE described the difference between the Hellenistic and later amphorae is relevant here: “... The relatively slim body of the Antikythera jars places them in the first century B.C. rather than at any earlier stage in Rhodian development. Again, compared with third and second century B.C. amphorae of the same series, these show a tendency toward careless manufacture, lumpiness of surface, indistinct articulation of neck and toe from body; but not to the degree shown in the Rhodian amphora of the Augustan period”¹³⁰. The shape and capacity changed at the end of the second century / beginning of the first century B.C. and also in the first century A.D.¹³¹.

Chronology: Rhodian amphorae date from the end of the fourth century B.C. to the second/third century A.D. The chronology of Rhodian amphorae was first compiled by V. GRACE, then by V. GRACE and M. SAVVATIANOU-

¹²⁴ Grace 1979, fig. 22, 62; Finkielsztein 2001, 235–237, Pl. A–C.

¹²⁵ Grace – Savvatianou-Pétropoulakou 1970, 279; Lund 1993b.

¹²⁶ Many scholars have been dealing with the issue of amphora stamping, especially V. GRACE (Grace 1934, 199; Grace 1949, 183; Grace 1956a, 118; Grace – Savvatianou-Pétropoulakou 1970, 279; Grace 1974, 90; Grace 1979, fig. 26; Most of them tend to agree that amphora stamping was part of an official need to control amphora production, see Finkielsztein 2001, 37–39.

¹²⁷ Grace – Savvatianou-Pétropoulakou 1970, 298, no. 3.

¹²⁸ Whitbread 1995, 53 f.; Empereur – Hesnard 1987, 18–20.

¹²⁹ Finkielsztein 2001, 199, 231.

¹³⁰ Grace 1965, 6, fig. 2–3; Grace 1979, fig. 62.

¹³¹ Grace 1965, 6, fig. 3; Grace 1979, fig. 62; Empereur – Hesnard 1987, Pl. 3 no. 12, 13, 14; Sciallano – Sibella 1994, Amphores Rhodiennes.

PETROPOULAKOU, and later by V. GRACE and J.-Y. EMPEREUR¹³². This chronology has recently been revised by G. FINKIELSZTEJN¹³³. He introduced new sub-periods in the V period. This is the period relevant for the Late Hellenistic vessels from Ephesus. The period begins with the destruction of Corinth and Carthage (146 B.C.), and ends with the destruction of Samaria and Scythopolis (108 B.C.). The end of G. FINKIELSZTEJN's period VI is marked by the massacre of Romans and Italians by Mithridates (88 B.C.), and the conquest of Delos (88 B.C.) and Athens (86 B.C.). In addition, G. FINKIELSZTEJN divided period VII into two parts. The two sub-periods, he claims, are separated by the Roman conquest of Rhodes (43/42 B.C.). It should be noted, however, that the archaeological finds of the first century B.C. would also permit more or different subdivisions¹³⁴. The earlier chronology was partly based on a set of stamps. However, there are fewer stamped amphorae after period VI¹³⁵. It is not precisely known when the production of Rhodian amphorae stopped (second century A.D.)¹³⁶.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 1a	Mid to third quarter of the second century B.C.	1
Ph 2a	Late second century B.C. to mid first century B.C.: between surfaces of Streets I and II	9
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	11
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	3–6, 10, 12–15, 17–18, 20, 27
Ph 5b	A.D. 23 to 45: Agora Courtyard	28–30
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	8, 19, 26, 31–32
Ph 6	Mid first to late fourth centuries A.D.	7, 22–23, 25
Ph 7–9	Late fourth to early seventh centuries A.D.	21, 24
Ph 11	Unstratified complexes	2, 16

Terrace House 2

layers	Data range	nos.
1	Hellenistic period	501–502
2	First century B.C.	503
2a–3a	Late first century B.C. to late first century. A.D.	504
4	Second century. A.D.	505

The dearth of amphorae from the end of the first century A.D. at the Ephesian Agora does not allow the dating of the Rhodian amphorae. It should also be mentioned that this type of amphora is not represented in the Severan layers of the 1999 excavation at the Terrace House 2.

Epigraphy

Inscription: Very few inscriptions on Rhodian amphorae have been published so far. In the Roman period a *titulus pictus* from Pompeii mentions *Pass(um) Rhod(ium)*¹³⁷.

Stamp: The amphorae were marked by pairs of stamps during the Hellenistic period¹³⁸. Circular, rectangular, rhomboid, square and leaf-shaped stamps were used. One of the stamps had the eponym of a person who may have been the priest of Helios in conjunction with one of the months of the Rhodian calendar. Next to this is the 'rose' or the rayed head of the sun-god Helios that were used as emblems on the coins of Rhodes. The name on the other stamp is usually regarded as referring to the *fabricant*¹³⁹. Next to him, there is often a device (or symbol) – a herm, *kerykeion*, an anchor, a bunch of grapes, stars, etc¹⁴⁰.

¹³² Grace – Savatianou-Pétropoulakou 1970, 286; Grace – Empereur 1981; Finkielsztejn 2001, 196; Lund 2002.

¹³³ Finkielsztejn 2001, 53–199; Lund 2002.

¹³⁴ Finkielsztejn 2000, 413 f.; Şenol 2003, 26–32.

¹³⁵ Grace – Savatianou-Pétropoulakou 1970, 302; Finkielsztejn 2001, 199, 231.

¹³⁶ Grace 1979, fig. 62; Peacock – Williams 1986, 103; Martin-Kilcher 1994, 348 f.; Ζεβουδακη 1978, 400 (third century A.D.).

¹³⁷ Maiuri 1933, 485 f., fig. 189: “*Pass(um) Rhod(ium) / P(ubli) Coeli Galli*”.

¹³⁸ Grace 1949, 177; Grace 1979.

¹³⁹ Grace 1979, under fig. 25: “... the stamps contain two names, one an endorsement, perhaps by a licensed manufacturer...; Finkielsztejn 2001, 230: “...head of a workshop whose name endorses the stamping by appearing on one of the [generally] two stamps of a Rhodian amphora...”

¹⁴⁰ Lund 1993b, 360 f.; Finkielsztejn 2001, 33.

Three Hellenistic stamps were found at the Terrace House 2 in 1999.



Ἀρίσταρχου – no. 501

Aristarchos fabricant, Period IIIc–d. This also co-occurs with eponyms Anesidamos II, Ainetor, and Symmachos. The amphora with the eponym Aristarchos from period I was found at the South Gate of the Agora and Basilica Stoa, Gassner 1997, 108, no. 386, pl. 87; Lawall 2007, 32 f.

Bibl.: Nilsson 1909, 160. 377 Nr. 79; Ariel 1990, 45. 122 f.; Sztetyło 1991, 59 f. no. 88 note 322; Lund 1993b, 364; Börker – Burow 1998, 44 nos. 406–408 pl. 15. 69, nos. 69–80, pl. 24; Jöhrens 1999, 66, nos. 171–174; Jöhrens 2001, 412 f., nos. 170–172; Finkielsztejn 2001, Tab. 17.



Ἐπί Κλεώνου/μου / Δάλιου – no. 502

Eponym Kleonymos II, Period IIIb, Δάλιος – Rhodian month.

Bibl.: Nilsson 1909, 242, no. 277; Rhodes: Nilsson 1909, 322, no. 817; Maiuri 1924, 249–267; Grace 1953, 123, no. 110; Sztetyło 1991, 47, no. 62; Nicolaou – Empereur 1986, 516; Jöhrens 1999, 57, nos. 145 f.; Jöhrens 2001, 394, nos. 77–80; Börker – Burow 1998, 92 f. nos. 238–239; Finkielsztejn 2001, T. 6 and 19, period 3b, c. 182 B.C.

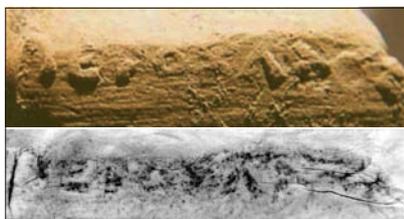


Ἐπί Ἀστυ/[μή]δευς / [Θεσ]μοφόριου – BoxNo. HH2–99/151

Astymedes II – eponym Period IV, Θεσμοφόριος – Rhodian month. The amphorae with the eponym Astymedes I from Period II was found at the Basilica Stoa, Lawall 2007, No. 28.

Bibl.: Nilsson 1909, no. 141; Grace – Savvatianou–Pétropoulakou 1970, Period V, 306; Börker – Burow 1998, no. 130; Finkielsztejn 2001, T. 7.

Three stamps were found at the Tetragonos Agora



Ἰεροκλεῦς – no. 9

Ierokles II fabricant, Period V–VI

Bibl.: Nilsson 1909, 231, no. 250; Grace – Savvatianou–Pétropoulakou 1970, 309, E 24; Grace 1962, 116, no. 8; Finkielsztejn 2001, 160, T. 23, Period VI; SGDI 3789, 13; ILind 705, 2; IG XII/1 46, 29. 300; Lawall 2004, 182.



Μητρόβιο – no. 10

The name *Metrobios* does not appear on Rhodian amphorae. The name Metrobios is of Greek origin, but it is also known in Italy on Brindisi type amphorae¹⁴¹. In addition, it can be found on Rhodes, in the area of the Peraea, and in Ephesus.

Bibl.: Rhodes see IG XII/1 46, 384; Rhodes Peraea IG XII/1 46.1; Chios, Lesbos, Paros, Samos: in Fraser – Matthews 1987, 312; Pantikapaion, Amphipolis, Demir Kapia, Istros, Olbia–Borysthenes, Perinthos–Herakleia: in Fraser – Matthews 2005, 235; Ephesus: IvE 1984, 136; slaves and freedmen: Solin 2003, 115.

¹⁴¹ Plutarch Sulla 2: “... His [Sulla] attraction to an actor called Metrobios never abated...”; Callender 1965, 83, no. 192c; CIL IX, 6079, 13; Le Roy 1984, 313 no. 34 inv.no. 59095, 1931–32; *METR(obii) BETIL(ieni) M(arci) S(ervus)* (Museum of Cairo); A METROBIVS stamp was found on a probably Brindisi amphora at the Nea Paphos excavation: Sztetyło 1976, 104, no. 392; Sztetyło 1991, 100, no. 243. She mentions this as a Spanish import? METR(...) stamp was found at the Tell Atrib excavation. It seems likely that it is also on a Brindisi amphora, Sztetyło 2000, 141, no. 217.



Μνάσων – no. 11

Mnason II – fabricant, Period VI. Reads from right to left and the omega is upside down. When Virginia Grace published the Nessana amphorae, she dated the Μνάσων stamp to the late second or early first century B.C.¹⁴². The stamp in Ephesus is different from the ones in Nessana, Rhodes, and Pergamon. The fabric and the stamps are both different. The amphora in Ephesus was found in a layer that dates to Ph 3 = period Finkielsztejn VI – VIIb. The label ‘Mnason II’ seems appropriate.

The letters have disappeared from some of the Late Hellenistic stamps, and only the rose remains. Either the stamping technique became less circumspect or the attachment of the handles changed. This can be seen in a number of Late Hellenistic stamps in Ephesus (nos. 2–6 and 8). The round stamps (nos. 2–9) offer an interesting possibility for comparison. While the rose can be seen (more or less) clearly, the letters in some of them are faint to the extent of illegibility.

Stamped amphorae of periods VI and VII have been published from Athens, the Antikythera shipwreck, Curium (Cyprus), Delos and Berenice¹⁴³. There is a handle fragment with a stamped monogram from the Augst excavation (in a layer dated to A.D. 10–30)¹⁴⁴, and there is an amphora stamp on the Claudian period Dramond D shipwreck at St. Raphaël¹⁴⁵.



Augst (after Martin-Kilcher 1994)



Dramond D shipwreck (after Joncheray 1975)

Fig. 20. Late Rhodian stamps.

Origin: A number of production sites have been mentioned on the basis of excavations in Rhodes, petrological analyses and field surveys¹⁴⁶. However, we still know very little about the production sites. Rhodes was possibly one of the important centres of production¹⁴⁷. A. MAIURI supposes that he has found the site of a Hellenistic amphora production workshop near Villanova on the north coast of Rhodes¹⁴⁸. However, no actual kiln has yet been found in this area. About twenty sites have been mentioned in the wake of J.-Y. EMPEREUR’S and M. PICON’S research. These are minor sites in the countryside and in the plains area near the coast¹⁴⁹. Another workshop has been found in the New Cemetery of Rhodes City. The kiln has been dated to the third century A.D.¹⁵⁰. The site has fragments of wasters and over-fired amphorae of the Rhodian type. They are slender vessels with horn-shaped handles. Handle fragments were later found near to the kiln¹⁵¹. These handles

¹⁴² Grace 1962, 117, nos. 9–10: “...Nilsson’s comment (1909, 103), on Μνάσων Ἀντιοχεύς and other μέτοικοι in Rhodos. The word μέτοικος appears in full on the stamps of other persons of foreign origin, it is impressed on Rhodian handles of the same period, the examples known to me are from Alexandria. Perhaps in the ligature ME we have an abbreviation of μέτοικος...”; Nilsson 1909, 254 no. 317; IG, XI, I, 199 (1356); Grace 1952, 527.

¹⁴³ Grace 1965, fig. 2–3; Mc Fadden 1946, 471–479; Grace – Savvatianou-Pétropoulakou *et al.* 1970, Period VI, under E 24, 29, 37 and 40 mentioned of some these; Grace 1952, 538, nos. 31–34; see also Finkielsztejn 2001, 162, T 14–15, Periods VI – VIIa and VIIb; Riley 1979, 123, 148 f., nos. 110–112.

¹⁴⁴ Martin-Kilcher 1994, 350, it has the letters Αντι/λο(...) Δα(...). There are similar stamps from the third century B.C. I am grateful for F. SEROGLOU’S help

¹⁴⁵ Joncheray 1975, 22; Grace – Savvatianou-Pétropoulakou 1970, 316 E 43; Empereur – Hesnard 1987, 61, fig. 14, period VII; Finkielsztejn 2000, 413 f.

¹⁴⁶ Peacock 1977a, 266–270; Peacock – Williams 1986, 102 f.; Empereur – Picon 1986, 112–116; Empereur – Picon 1989, 224 f.; Empereur – Tuna 1989; Whitbread 1995, 48; Williams 2005, Rhodian Type.

¹⁴⁷ Peacock 1977a, 269; Peacock – Williams 1986, 104; Panella 1986, 615.

¹⁴⁸ Maiuri 1924; Grace 1934, 216 f.

¹⁴⁹ Empereur – Picon 1986, 115; Whitbread 1995, 41, 54.

¹⁵⁰ Ζερβουδακη 1985, 400–402, pls. 208 f.

¹⁵¹ I am grateful to A. GIANNIKOURI’S and F. SEROGLOU’S help. There has been a collaboration since 2005 between the Archaeological Institute of Aegean Studies, Hellenic Ministry of Culture and Tourism and the Institute for the Study of Ancient Culture, Austrian Academy of Sciences.

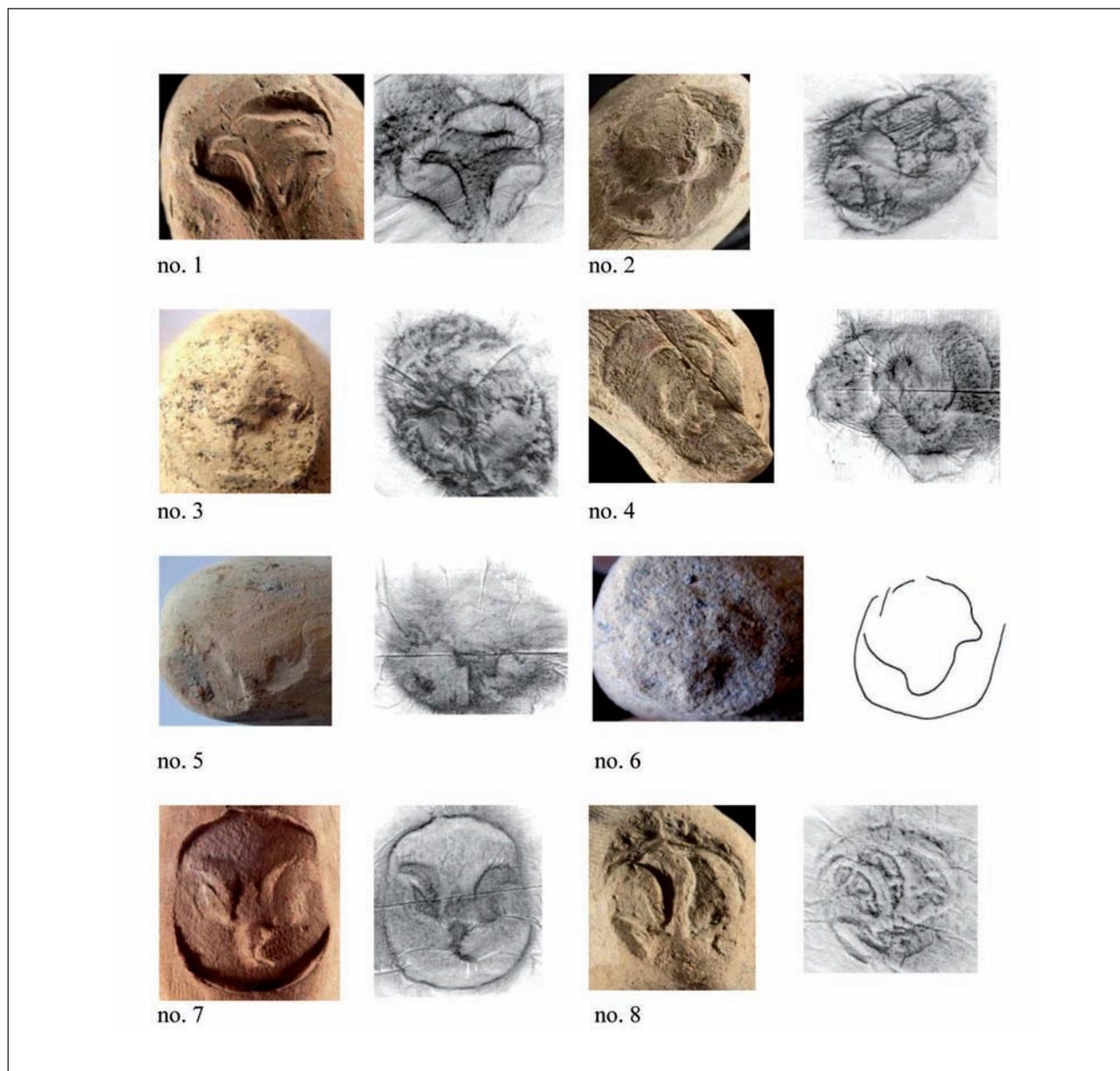


Fig. 21 Late Rhodian stamps, nos. 1, 7, and 8 have conventionalized variants of the rose.

are characteristic of the period from Augustan times to the first and second centuries A.D., and so dating the kiln solely to the third century A.D. is problematic. It is more likely to have been an Early Imperial workshop. The over-fired pieces from the later stages of the workshop can be compared with the amphora at the Athenian Agora, which was dated to the second century A.D. by V. GRACE¹⁵². Amphorae were also produced in the islands belonging to the Rhodian Peraea, and near Caria on the mainland¹⁵³. Late Rhodian amphorae have also been found in Hisarönü (near Marmaris in Datça/Reşadye Peninsula)¹⁵⁴.

¹⁵² Grace 1979, fig. 62.

¹⁵³ Fraser – Bean 1954, 139 “The islands which at various times were incorporated in the Rhodian State were Syme, Carpathos, Chalke, Telos, Nisyros and Casso”; Jones 1971, 31; Grace – Savvatianou-Pétropoulakou *et al.* 1970, 280: “...For a dynasty of Rhodian potters who eventually made also Knidian amphoras ... At the time of Rhodian occupation of neighbouring lands, when Ἀριστοκλής the Rhodian was making Knidian amphoras, potters in Kos seem to have been imitating the Rhodian amphora form, ... E 20 on handles of Rhodian shape but Koan (?) clay datable at this period... (Period VI)”; Şenol 2003, 25–32.

¹⁵⁴ Şenol *et al.* 2004, 353; Empereur – Picon 1986, 115–125; Empereur – Picon 1989, 224 f. fig. 1; Empereur – Tuna 1989.



Fig. 22 Rhodes, New Cemetery, kiln and amphorae (after Ζερβουδάκη 1978).

V. GRACE stated: “potters in Kos seem to have been imitating the Rhodian amphora form”¹⁵⁵. There are a few Rhodian type amphorae in Ephesus which were produced in Kos and the area of the Peraea. The micaceous fabric jars (nos. 10 and 14) may have been produced either in Ephesus or in the Valley of the Rivers Cayster/Meander.

I. WHITBREAD said on the basis of his study of Hellenistic amphorae: “The inclusions in each type of fabric cannot be attributed to sources (e.g. ophiolitic material for the serpentinite, olivine and orthopyroxene, and flysh for the phyllite) in specific parts of the island ... This specially applies to the fabric of Class 3, which is similar to certain Knidian and Koan examples”¹⁵⁶. The most recent petrological analyses show that the Rhodian form may also have been copied in Crete during the second, and mainly, the first century B.C.¹⁵⁷.

Contents: The content is often considered to be Rhodian wine, but other types of wine may also have been traded. Some of the amphorae contained different commodities¹⁵⁸. P. R. SEALEY mentions three possibilities: (1) sweet wine made from dried grapes, (2) figs, (3) resin; (cooked) sweet wine¹⁵⁹.

Distribution: These amphorae were present almost everywhere in the Mediterranean, the Black Sea and Red Sea regions during the Hellenistic period. The wines shipped in these amphorae were popular among the soldiers of the military camps of the Rhine, Pannonia, Britannia, Gallia and Italy¹⁶⁰.

Fabric: (analysed nos. 1, 5, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, 26, 28)

V. GRACE often remarks on the colour of the late Rhodian amphorae. The pieces found in Delos and in the Antikythera shipwreck are dark reddish brown¹⁶¹. In connection with the Nessana Μνύσσω stamp, she said:

¹⁵⁵ Grace – Savatianou-Pétropoulakou 1970, 280.

¹⁵⁶ Whitbread 1995, 63.

¹⁵⁷ Eiring *et al.* 2002, 61; perhaps Hayes 1971, 261, no. 42.

¹⁵⁸ Joncheray 1975, 27; Lund 1993b, 360; Martin-Kilcher 1994, 348 f.

¹⁵⁹ Sealey 1985, 56–58.

¹⁶⁰ Peacock 1977a, 269; Peacock – Williams 1986, 103; Laubenheimer – Marlière 2010, 46. 103. 262; Martin-Kilcher 1994, 349; Martin-Kilcher 2005, 208. 212; Marangou – Marchand 2007, 246; Desbat – Picon 1986, 642. 646–648; Bezeczky 1987, 27; Bezeczky 1998b, 233; Bagnall *et al.* 2000, 15, 20; Lemaître 2002, 221–224; Şenol – Kerem 2000, 97, no. 22; Monsieur 2001, 74, fig. 11; Panella 1986, 615; Rizzo 2003, 155, 177; Bruno 1997, 523; Auriemma – Quiri 2006, 230 f.; Ehlig 2003, 46; Tomber 2006, 164, Type 48; Laubenheimer *et al.* 2007, 339, 343.

¹⁶¹ Grace 1952, 538, nos. 32–34; Grace 1965, 14 f., fig. 2–3.

“...the fabric indicated a date at the end of the second century or early part of the first century B.C....”¹⁶². She also says that the dark red colour of an early Delos amphora is unusual when compared with the other pieces¹⁶³. I. WHITBREAD distinguishes three groups of the Hellenistic Rhodian amphorae¹⁶⁴. Most of the amphorae investigated belong to Class 1. D. PEACOCK’s petrological analysis has discovered six groups of fabric¹⁶⁵. Two of them (1 and 2) are Rhodian, the rest are probably Aegean. D. WILLIAMS has found a seventh group which is also of Aegean origin¹⁶⁶.

The Ephesus amphorae:

Visual Characteristics

1. Hard, fine fabric, white and grey inclusions, with some reddish inclusions, nos. 2–6, 8, 18, and 25
2. Hard fabric, white carbonate or white reaction rims, reddish inclusions, nos. 1, 7, 11, 16 and 22.
3. Hard to fairly hard fabric, white carbonate or white reaction rims, nos. 21, 23, 24 and 27.
4. Hard, very fine fabric, scattered grey inclusions, no. 17.
5. Hard, rough fabric, occasional pieces of white and colourless inclusions up to 1 mm across, nos. 12 and 19.
6. Hard fabric, colourless, brownish and grey inclusions up to 1 mm across, nos. 28–30.
7. Hard, very fine fabric, carbonate rich in the matrix, very rare red and brown inclusions, no. 9.
8. Hard, rough fabric, moderate reddish iron oxide, colourless – perhaps quartz – inclusions, nos. 13, 15 and 20.
9. Hard, fine fabric, frequent mica, colourless – perhaps quartz – inclusions, some white grains, nos. 10, 14, 26 and 31.

Petrology

Rhodes Island production, nos. 5, 23 and 24.

Rhodian Perea, production site unknown, nos. 1, 11–12, 16–17 and 22.

Koan production, nos. 7, 26 and 28.

Ephesus region or Meander Valley production, nos. 10 and 14.

Rhodes Island production

Sample: no. 5

Matrix: The sample shows a calcareous, optically inactive, partially recrystallised, fine-grained groundmass.

Temper: Very frequent oxidized orange serpentinite grains, frequent monocrystalline quartz and moulds of former carbonates, subordinate alkali feldspars, rare chert and carbonate grains, very rare oxidized mica, foraminifers and iron oxide concretions, traces of polycrystalline quartz, calcite bioclasts and heavy minerals.

The *heavy mineral* assemblage consists of hornblende (45%), diallage (14%), diopsidic clinopyroxene (12%), rutile (7%), chromium spinel (5%), zircon (4%), titanite (4%), epidote/zoisite (4%), garnet (3%), unidentified grains (2%) and traces of brookite/anatase.

Comment: Typical is the abundance of oxidised serpentinite fragments, abundant carbonate particles and bioclasts (partially dissolved). The composition of the temper grains and the heavy minerals is typical for areas where ophiolites, limestone and younger microfossiliferous rocks occur together. A Rhodian origin would fit.

A similar fabric for Rhodian amphorae (rich in serpentinite and carbonates) has been described by D. PEACOCK (1977: 266) and I. WHITBREAD (1995, 53–67). But there is not a 100% comparable fabric described. Due to the fact that several widely dispersed production sites are reported from Rhodes (e.g. Empereur – Picon 1986; Empereur – Tuna 1989; Empereur 1990; Whitbread 1995), it is clear that most likely more than these described Rhodian fabric types existed at Rhodes. Rhodian Fabric A.

¹⁶² Grace 1962, 117.

¹⁶³ Grace 1952, 535, no. 13.

¹⁶⁴ Whitbread 1995, 60–67.

¹⁶⁵ Peacock 1977a, 266–270, Peacock – Williams 1986, 103 f.

¹⁶⁶ Williams 1985, 162 f.

Sample: no. 23

Matrix: Fine-grained, red brown, slightly calcareous, low temper content.

Temper: Frequent: monocrystalline quartz, moulds of carbonate grains, iron oxide particles; rare: chert; traces of K-feldspar, clay clasts, siltstone, limestone grains, oxidised serpentinite fragments.

Comment: Based on thin section observation only, the fabric seems to fit to Rhodian Fabric A or A?

Sample: no. 24

Matrix: Dark reddish brown, calcareous

Temper: Very frequent iron oxide particles, frequent moulds of carbonate particles, moderate monocrystalline quartz, rare to moderate serpentinite fragments, rare K-feldspar, crystalline rock fragments, chert, heavy minerals (hornblende).

Comment: Based on thin section observation only, the fabric is a typical Rhodian Fabric A–Ah, Ah.

R.S.

Rhodian Peraea, site unknown.

Sample: no. 1

Matrix: The sample shows a reddish dark brown, optically inactive groundmass with abundant small iron oxide grains.

Temper: Very frequent iron oxide concretions, frequent monocrystalline quartz, alkali feldspar and muscovite, subordinate oxidised mica, moulds of former carbonates, very rare polycrystalline quartz, chert, crystalline rock fragments and traces of siltstone/sandstone.

The *heavy mineral* assemblage consists of garnet (56%), rutile (28%), diallage (5%), unidentified grains (5%), titanite (2%), epidote/zoisite (2%) and diopsidic clinopyroxene (2%).

Comment: Not the typical Rhodian composition. The heavy mineral composition points more to sediments sourced predominantly by a metamorphic hinterland together with carbonate material and small amounts of minerals derived from ultra basic rocks.

Sample: no. 11

Matrix: Red brown, inactive, non-calcareous

Temper: Frequent monocrystalline quartz; moderate K-feldspar, mica, muscovite, polycrystalline quartz, quartzite, moulds of former carbonate grains, iron oxide particles, rare oxidized mica, crystalline rock fragments, plagioclase, heavy minerals (epidote).

Comment: Based on thin section observation only, not a typical Rhodian fabric.

Sample: no. 12

Matrix: Red brown, non-calcareous, optically inactive

Temper: Frequent polycrystalline quartz, K-feldspar, monocrystalline quartz, moderate opaque particles; moderate-rare plagioclase, rare heavy minerals (titanite, hornblende), crystalline rock fragments, oxidised mica; very rare chert, ?volcanic plagioclase.

Note: Similar fabric to no. 148 in type 17.

Sample: no. 16

Matrix: Yellow brownish, non-calcareous, optically active.

Temper: Frequent polycrystalline quartz, K-feldspar, monocrystalline quartz, moderate opaque particles; moderate-rare plagioclase, rare heavy minerals (titanite, hornblende), crystalline rock fragments (granite), oxidised mica, very rare chert and ?volcanic plagioclase.

Comment: Similar fabric to no. 12, but lower fired.

Sample: no. 17

Matrix: Red brown, calcareous, very low temper content.

Temper: Moderate iron oxide particles, fine-grained carbonate particles, rare oxidised mica; very rare volcanic rock fragments, heavy minerals (amphibole), serpentinite fragments?

Comment: Typically low temper content. Due to the very few characteristic temper constituents no provenance information can be given.

Sample: no. 22

Matrix: Brown, inactive, non-calcareous, micaceous.

Temper: Frequent monocrystalline quartz, mica (dark mica and oxidised mica), moderate K-feldspar, polycrystalline quartz, quartzite, moulds of former carbonate grains, iron oxide particles, rare: crystalline rock fragments, altered volcanic rock fragments, plagioclase.

Comment: Based on thin section observation only, not a very typical fabric. Not similar to no. 5, but eventually could fit to other Rhodian fabrics?

R.S.

Koan production

Koan Fabric A

Sample: no. 7

Matrix: The sample shows a reddish brown, optically inactive to active, partially recrystallised, fine-grained groundmass.

Temper: Frequent monocrystalline quartz, muscovite and moulds of former carbonates, subordinate of alkali feldspars and iron oxide concretions, very rare polycrystalline quartz, plagioclase, oxidised mica, crystalline rock fragments and heavy minerals, silt and sandstone fragments.

The crystalline rock fragments consist mainly of quartzite, phyllite and volcanic rock fragments.

The *heavy mineral* assemblage consists of garnet (50%), zircon (20%), epidote/zoisite (16%), rutile (9%), brookite/anatase (2%), titanite (1%), unidentified grains (1%) and traces of hornblende and chromium spinel.

Comment: Typical is the lack of serpentinite fragments and microfossils but the occurrence of mica, metamorphic and volcanic rock particles. Also the heavy mineral composition is very different and points more to sediments sourced predominantly by a metamorphic hinterland together with slightly dispersed volcanic material. Therefore, a provenance in Rhodes Island is not very likely. A provenance in Kos (NE part) would fit better (Whitbread 1995, 84, geological map).

Koan Fabric B

Sample: no. 26

Matrix: Highly fired, optically isotropic.

Temper: Abundant temper, coarse grains, Frequent volcanic rock fragments, monocrystalline quartz, moderate crystalline rock fragments, chert, iron oxide particles, rare plagioclase, heavy minerals (hornblende), carbonate grains, volcanic plagioclase and volcanic glass (colourless).

Comment: Typically volcanic rock fragment content, together with partly well rounded carbonate grains. Fits with Koan fabric, described by Whitbread 1995, 89–91 (Fabric Class 3).

Koan Fabric B1

Sample: no. 28

Matrix: The sample shows an optically inactive, micaceous groundmass.

Temper: The temper grains are coarse-grained, partially well rounded (average 0.5 mm, max: 1.2 mm) and poor to bimodally sorted. The sample seems to be artificially tempered.

Temper composition: Frequent monocrystalline quartz, moderate quartzite, rare polycrystalline quartz and crystalline rock fragments, very rare chert, plagioclase, volcanic rock fragments and heavy minerals. Very frequent iron oxide concretions can be observed. The lithic fragments mainly consist of quartzite, oxidised sericite-chlorite quartzite (partially epidote bearing) and anchimetamorphic? siltstone to shale (phyllite). Subordinately altered acid volcanic rock fragments, epidote fels and sandstone fragments with volcanic particles can be observed.

The *heavy mineral* assemblage consists of augitic clinopyroxene (73%), hornblende (11%), diopsidic clinopyroxene (9%), zircon (3%), rutile (1%), titanite (1%), garnet (1%) and unidentified grains (1%).

Comment: Typical are the abundance of partially well rounded, coarse-grained quartzite and siltstone fragments, together with probably younger volcanic grains (fresh augite, plagioclase of volcanic origin). The heavy mineral composition is dominated by clinopyroxenes.

A provenance in Rhodes Island is possible but the fabric does not really fit with the fabrics described by I. WHITBREAD. A Koan origin could eventually fit better (possibly Fabric Class 3 of Whitbread 1995, 89 f.).

Note: Koan amphora no. 76 has a similar fabric.

R.S.

Ephesian region or Meander Valley production

Sample: no. 10

Matrix: The sample shows an optically active, strongly micaceous groundmass.

Temper: Dominant muscovite and oxidised mica, very frequent monocrystalline quartz, subordinate polycrystalline quartz, K-feldspar, crystalline rock fragments and iron oxide concretions, very rare sericitised feldspar, moulds of former carbonates, siltstone/sandstone and heavy minerals.

The *heavy mineral* assemblage consists of garnet (82%), rutile (7%), disthene (4%), zircon (3%), hornblende (2%) and traces of tourmaline, staurolite, chloritoid and chromium spinel.

The crystalline rock fragments consist mainly of sericite–quartzite and mica–schist. Typical are also calcite cemented sandstone fragments.

Comment: Typical is the abundance of partially coarse-grained mica and mica-schist. The heavy mineral composition is dominated entirely by metamorphic minerals. This points to sediments sourced predominantly by a metamorphic hinterland; possibly Ephesus or Meander Valley.

Sample: no. 14

Matrix: red brown, slightly calcareous, micaceous, optical inactive.

Temper: Very frequent muscovite, frequent carbonate particles and moulds, moderate monocrystalline quartz, opaque particles, rare K-feldspar, heavy minerals (garnet, tourmaline, titanite) and crystalline rock fragments.

Comment: A typical Ephesian fabric, calcareous.

R.S.

Catalogue

Tetragonos Agora

1. Handle fr., 96/077 (142), Trench 96/1b, Stamp: Rose, H = 6.3 cm, S = 2.7x3.4 cm, light red (10R 6/8), PLATES 1, 57
2. Rim, neck, handle fr., 95/002 (32), Trench 92/2, Stamp: Rose, D = 12 cm, V = 1.5 cm, HD = 1.2 cm, H = 10.9 cm, S = 3.2 cm, buff (7.5YR 7/4), PLATES 1, 57
3. Handle fr., 96/047 (33), Trench 96/1, Stamp: Rose, H = 8.6 cm, S = 3.7x3 cm, buff (7.5YR 7/4), PLATES 1, 57
4. Handle fr., 96/047 (216), Trench 96/1, Stamp: Rose, H = 6.9 cm, S = 2.9x3.8 cm, buff – reddish yellow (7.5YR 7/4 – 6/6), PLATES 1, 57
5. Handle fr., 90/027 (306), Trench 90/2, Stamp: Rose, H = 8.2 cm, S = 3.6x3.4 cm, reddish yellow (7.5YR 6/6), PLATES 1, 57
6. Handle fr., 89/074 (222), Trench 89/2, Stamp: Rose, H = 7 cm, S = 3.4x3 cm, reddish yellow (7.5YR 7/6 – 6/6), PLATES 1, 57
7. Handle fr., 90/008 (1331), Trench 90/3, Stamp: Rose, H = 21.8 cm, S = 3.4x3.4 cm, red (2.5YR 5/6), PLATES 1, 57
8. Handle fr., 95/010 (1668), Trench 95/2, Stamp: Rose, H = 14.6 cm, S = 3.3x3 cm, reddish yellow (5YR 6/6), PLATES 1, 57
9. Handle fr., 93/105 (2015), Trench 93/2, Stamp: Ἴεροκλεὺς, fabricant, H = 7.2 cm, S = 3.8x3.1 cm, buff (7.5YR 7/4), PLATES 1, 57
10. Handle fr., 90/032 (1197), Trench 90/4, Stamp: Μητρόβιο, H = 4.9 cm, S = 3.3x2.4 cm, red (10YR 5/8), PLATES 1, 57
11. Handle fr., 87/048 (1313), Trench 87/1, Stamp: Μνάσσο, H = 6.1 cm, S = 2.8x3.4 cm, red (2.5YR 5/8), PLATES 1, 57
12. Handle fr., 92/030 (1290), Trench 92/2, H = 6.7 cm, light red – red (2.5YR 6/6 – 5/6), PLATES 2, 57
13. Handle fr., 91/091 (1332), Trench 91/4, H = 9.2 cm, S = 2.9x2.6 cm, reddish yellow (5YR 6/6), SF: buff (7.5YR 7/4), PLATES 2, 57
14. Handle fr., 89/029 (1316), Trench 89/2, H = 16.3 cm, S = 3.1x3.4 cm, yellowish red (5YR 5/8), PLATES 2, 57
15. Handle fr., 89/028 (1242), Trench 89/2, H = 8.5 cm, light reddish brown (5YR 6/4), PLATES 2, 57
16. Rim, neck, handle fr., 92/108 (1333), Trench 92/4, D = 12.6 cm, V = 1.2 cm, HD = 1.3 cm, H = 15.7 cm, S = 2.9x2.9 cm, light red (2.5YR 6/6), PLATES 2, 58
17. Rim, neck, handle fr., 89/027 (1298), Trench 89/2, D = 12.4 cm, V = 1.2 cm, HD = 1.3 cm, H = 11 cm, S = 3.1x3 cm, red (2.5YR 5/6), PLATES 2, 58
18. Handle fr., 89/028 (1243), Trench 89/2, H = 12.9 cm, S = 3.3x3.2 cm, reddish yellow (5YR 6/6), PLATES 2, 58
19. Handle fr., 92/018 (1252), Trench 92/2, H = 23.5 cm, S = 3x3 cm, red (2.5YR 5/6), PLATES 2, 58
20. Handle fr., 89/018 (1240), Trench 89/2, H = 26.6 cm, S = 3.1 cm, reddish yellow (5YR 6/6), PLATES 2, 58
21. Handle fr., 99/046 (1300), R–sewer, H = 9.5 cm, S = 2.6x2.8 cm, reddish yellow (5YR 7/6), PLATES 3, 58

22. Handle fr., 87/019 (1293), Trench 87/2, H = 19.8 cm, S = 3.1x3 cm, red (2.5YR 5/8), PLATES 3, 58
23. Handle fr., 99/079 (1329), R-sewer, H = 12.2 cm, S = 2.4x3.2 cm, reddish yellow (5YR 6/6), PLATES 3, 58
24. Rim, neck, handle fr., 87/165 (1601), Trench 87/6, D = 12.6 cm, V = 1.5 cm, HD = 2 cm, H = 9.9 cm, S = 2.1x2.6 cm, red (2.5YR 4/6), SF: dark brown (7.5YR 4/2), PLATES 3, 58
25. Handle fr., 99/047 (1301), R-sewer, H = 7.8 cm, reddish yellow (5YR 6/6), PLATES 3, 58
26. Neck, handle fr., 95/216 (1330), Trench 95/1, H = 19.4 cm, S = 2.8x2.9 cm, reddish yellow – light reddish brown (5YR 6/6 – 6/4), PLATES 3, 58
27. Handle fr., 96/024 (34), Trench 96/1, H = 10.6 cm, S = 2.4x2.6 cm, red (2.5YR 5/6), SF: buff (5YR 8/3), PLATES 3, 58
28. Handle fr., 93/019 (1327), Trench 93/2, H = 17.6 cm, S = 3.2x3.2 cm, reddish yellow (5YR 7/8), PLATES 3, 58
29. Handle fr., 93/019 (1326), Trench 93/2, H = 6.8 cm, S = 2.9x3.1 cm, reddish yellow (5YR 7/6), PLATES 3, 58
30. Handle fr., 93/019 (1325), Trench 93/2, H = 6.6 cm, S = 3x3.2 cm, reddish yellow (5YR 7/6), PLATES 3, 59
31. Handle fr., 96/005 (1725), Trench 96/1, H = 7.7 cm, S = 3.3x3.7 cm, reddish yellow (5YR 6/8), PLATES 4, 59
32. Handle fr., 89/012 (1296), Trench 89/2, H = 6.8 cm, S = 3x3.2 cm, light reddish brown – pinkish grey (5YR 6/4 – 7.5YR 6/2), PLATES 4, 59

Terrace House 2

501. Rim, neck, handle fr., 99/119 (500), WT 2 Stone-cutting saw, Stamp: Ἀρίσταρχου – fabricant Period IIIc–d, H = 10.2 cm, S = 3.3x3.1 cm, reddish yellow (5YR 7/6), SF: pink (7.5YR 8/4), PLATES 38, 85
502. Rim, neck, handle, 99/119 (501), WT 2 Stone-cutting saw, Stamp: Ἐπί Κλεώνου/μου / Δάλιου; Κλεώνου – eponym, Δάλιου – month, H = 7.5 cm, S = 3x3 cm, reddish yellow (5YR 7/6), SF: pink (7.5YR 8/4), PLATES 38, 85
503. Handle fr., 99/712 (104), B6, Room 32c, H = 9.1 cm, S = 3.1x2.4 cm, reddish yellow (7.5YR 7/6), PLATES 38, 85
504. Base, 99/309 (220), WT 2 Stone-cutting saw, H = 8.6 cm, DF = 4.2 cm, reddish yellow (7.5YR 7/6), PLATES 38, 85
505. Base, 99/589 (179), WT 2 Stone-cutting saw, H = 14.7 cm, HF = 3.8 cm, reddish yellow (5YR 6/8), PLATES 38, 85

Magnesian Gate

705. Handle fr., MT 99/1–6, H = 6.7 cm, S = 2x2.5 cm, reddish yellow (5YR 6/6), PLATES 51, 95

The amphorae published from Ephesus:

Tetragonos Agora, South Gate: Gassner 1997, 106 Taf. 33. 37. 87 nos. 386–394, 418 f.; Terrace House 1: Lang–Auinger – Outschar 1992, 151–154; State Agora, Well: Meriç 2002, 87 Taf. 42 no. K 506; State Agora, Basilica Stoa, Hellenistic period: Lawall 2007, 31–48, Taf 5–9; AH 1–41; Lucas Grave (Lukasgrab): Liko 2001, 88 Taf. 58, no. 108 = Liko 2010, 231 no. 528; Heroon and Oktogon: Waldner 2009, 292 Fig. 11. 27.

Reference material

The amphorae of the kilns in the New Cemetery of Rhodes Town were studied. Further reference amphorae were provided by the collections in the Depots of 22nd Ephoreia of Prehistoric and Classical Antiquities in Rhodes Town. These consisted of almost complete amphorae found at various sites around the island. They can be dated based on their forms either to the period of Augustus or to the first half of the first century A.D. The stamped amphora from the Augst excavation is also used for reference¹⁶⁷. Four other amphorae from the Tetragonos Agora at Ephesus (stamps: Astos, Pausanias and Hieroteles) have also been used for comparison. They were produced in Hellenistic times at Hisarönü on the Datcha peninsula.

Rhodes New Cemetery group

From the late Hellenistic to the Early Imperial period fourteen amphora fragments and one clay (soil) sample have been investigated. In addition, two kiln floor fragments were analysed.

¹⁶⁷ I am grateful to S. MARTIN-KILCHER for this sample.

Catalogue

Rh 1 Handle, H = 18 cm, S = 3x3cm, light red (2.5YR 6/6); sf very pale brown–buff (10YR 8/3–7/3).

Rh 2 Handle, H = 7 cm, S = 3.6x3 cm, light red (2.5YR 6/6); sf very pale brown–buff (10YR 8/3–7/3)

Rh 3 Handle, H = 13.5 cm, S = 3x3 cm, reddish yellow (7.5YR 7/6) and grey (7.5YR 5/0), sf grey (5YR 5/1) irregularly fired.

Rh 4 Handle, H = 10 cm, S = 3.8x2.8 cm, very pale brown–buff (10YR 7/4).

Rh 5 Handle, H = 6.3 cm, S = 3.4x3.1 cm, pink (7.5YR 7/4).

Rh 6 Handle, H = 8.9 cm, S = 3.3x3 cm, pink (7.5YR 7/4) and brownish yellow (10YR 6/6), sf light brown (7.5YR 6/4).

Rh 7 Handle, H = 11.3 cm, S = 3.5x3 cm, pink (5YR 7/4), sf pink (7.5YR 7/4).

Rh 8 Handle, H = 8.6 cm, S = 3.6x3.1 cm, pink (5YR 7/4), sf pink (7.5YR 7/4).

Rh 9 Handle, H = 12.5 cm, S = 3.4x3.2 cm, pink (5YR 7/4), sf pink (7.5YR 7/4).

Rh 10 Base, D = 13 cm, HD = 2.8 cm, V = 1.7 cm, H = 5 cm, pink (5YR 7/4), sf pink (7.5YR 7/4).

Rh 11 Rim, D = 13 cm, HD = 2.2 cm, V = 2.15 cm, H = 4.8 cm, pink (5YR 7/4).

Rh 12 Rim, DB = 3.4 cm, H = 17.5 cm, pink (7.5YR 7/6).

Rh 13 Base, H = 16 cm, pink (7.5YR 7/4).

Rh 14 Base, H = 3 cm, pink (7.5YR 7/4), not illustrated.

Rh 15 Kiln floor fragment, not illustrated.

Rh 16 Kiln floor fragment, not illustrated.

Rh 17 Soil.

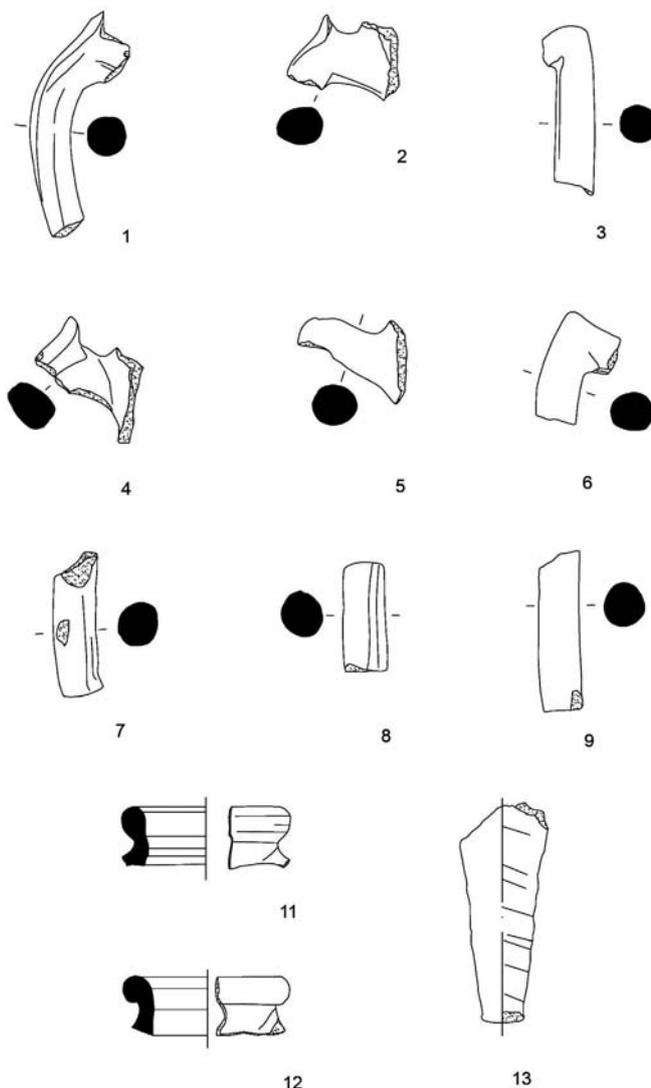


Fig. 23 Amphorae from the New Cemetery kiln.

Fabric description (R. SAUER)

Three fabric types can be distinguished (mainly based on different sample preservation and firing temperatures).

Petrographical Fabric Type A

Samples: Rh 1, Rh 2, Rh 5, Rh 8, Rh 9, Rh 10/1, Rh 11, Rh 12, Rh 13, Rh 14, Rh 17 Soil 750°C

Microscopic description

The samples show in thin section a fine grained, calcareous, optical active to inactive, partially recrystallised groundmass. The firing temperature is moderate to low.

The temper grains consist of: dominant to very frequent oxidised serpentinite, frequent moulds of former carbonates, subordinate carbonate grains, subordinate foraminifera (or moulds of foraminifera), subordinate to moderate monocrystalline quartz and K-feldspar, moderate opaque matter, rare chert (partly radiolarite), rare to very rare muscovite, calcite bioclasts and heavy minerals, very rare polycrystalline quartz and oxidised mica, very rare to traces volcanic plagioclase, traces of plagioclase, siltstone/sandstone, non-resorbed paste fragments, crystalline rock fragments in general and colourless volcanic glass.

Typical is the presence of abundant serpentinite fragments together with bioclasts (mainly foraminifera, rare shell fragments, algal grains, ostracods, sponge spicula, echinids) and carbonate grains (or moulds of carbonate grains). The pores partially contain neofomed calcite.

The heavy mineral assemblage consists of diallage (32%), hornblende (24%), clinopyroxene (21%), chromium spinel (19%), titanite (2%), zircon (traces), epidote/zoisite (1%), garnet (traces) and traces of brookite/anatase

Petrographical Fabric Type A? Kiln Material

Samples: Rh 15/1, Rh 16/2

Microscopic description

The samples show in thin section a fine grained, originally calcareous, optical inactive, partially recrystallised groundmass. The firing temperature seems to be moderate. The samples look somewhat altered (weathered, leached).

The temper grains consist of frequent moulds, former carbonates, frequent to subordinate oxidised serpentinite, moderate monocrystalline quartz and carbonate grains, rare K-feldspar, very rare oxidised mica, siltstone/sandstone and heavy minerals, very rare to traces of chert, opaque matter and sericitised feldspar, traces of polycrystalline quartz, foraminifera, calcite bioclasts and crystalline rock fragments.

The pores partially contain neofomed calcite.

The heavy mineral assemblage consists of clinopyroxene (33%), diallage (24%), hornblende (25%), chromium spinel (15%), titanite (traces), zircon (traces), rutile (traces), epidote/zoisite (1%), garnet (2%) and traces of brookite/anatase.

Petrographical Fabric Type A–Ah, Ah

Samples: A–Ah: Rh 6, Rh 7/1; Rh 17 Soil 1000°C
Ah: Rh 3/1, Rh 04,

Microscopic description

The samples show in thin section a fine grained, originally calcareous, optical inactive, partially over fired, vitrified, occasionally recrystallised groundmass. The firing temperature seems to be very high or over fired.

The temper grains consist of dominant to very frequent oxidised serpentinite, very frequent to frequent moulds of dissolved carbonates, subordinate monocrystalline quartz, moderate K-feldspar, rare opaque matter and vitrified particles, very rare polycrystalline quartz, chert and heavy minerals, very rare to traces of volcanic plagioclase, muscovite, oxidised mica, foraminifera, calcite bioclasts, siltstone/sandstone and crystalline rock fragments, traces of carbonate grains.

The heavy mineral assemblage consists of diallage (52%), clinopyroxene (23%), chromium spinel (12%) hornblende (3%), titanite (1%), zircon (traces), garnet (traces) and traces of brookite/anatase and rutile.

Comment: The utilised clay raw material was probably identical or very similar to Fabric A. But the samples are altered due to their high firing temperature.

Amphorae in the 22nd Ephorate of Prehistoric and Classical Antiquities Depots, Rhodes Town

Rhodian type

Rh.no. 4

Matrix: Non-calcareous

Temper: Frequent monocrystalline quartz, iron oxide particles, carbonate moulds?, moderate–frequent chert; rare K-feldspar; very rare heavy minerals, quartzite.

Comment: Rhodes Fabric A or A?

Rh.no. A379

Matrix: Calcareous, highly fired

Temper: Frequent orange red serpentinite, carbonate pseudomorphs; moderate monocrystalline quartz; rare quartzite, K-feldspar, chert; very rare plagioclase.

Comment: Rhodes Fabric A or A?

Rh.no. A716 (1)

Matrix: Calcareous

Temper: Very frequent carbonate pseudomorphs; moderate–frequent monocrystalline quartz; frequent red brown grains; rare K-feldspar; very rare foraminifers, polycrystalline quartz.

Comment: Rhodes Fabric A–Ah, Ah.

Rh.no. Villanova 10 RH (3)

Matrix: Slightly calcareous, iron oxide rich

Temper: Very frequent carbonate grains, frequent monocrystalline quartz, iron oxide grains, moderate polycrystalline quartz, rare K-feldspar, serpentinite grains, very rare heavy minerals (tourmaline, hornblende), quartzite, chert, phyllite and plagioclase.

Comment: Coarser grained, some sericite–quartzite, probably a different Rhodian fabric?

Rh.no. A845

Matrix: Non calcareous

Temper: Frequent iron oxide particles, moderate monocrystalline quartz, rare K-feldspar, mica and carbonate grains

Comment: Rhodes Fabric A or A?

Rh.no. A604

Matrix: Calcareous, isotropic

Temper: Very frequent carbonate pseudomorphs, frequent brown iron oxide particles, rare monocrystalline quartz, very rare K-feldspar, polycrystalline quartz and chert.

Comment: Rhodes Fabric A–Ah, Ah

Rh.no. A601

Matrix: Calcareous, recrystallised

Temper: Very frequent carbonate pseudomorphs, frequent monocrystalline quartz, red brown particles, moderate K-feldspar, moderate–rare chert, rare crystalline rock fragments, polycrystalline quartz.

Comment: Rhodes Fabric A–Ah, Ah

Rh.no. Villanova 2 RH (2)

Matrix: Calcareous, recrystallised

Temper: Very frequent carbonate pseudomorphs, moderate orange particles, rare monocrystalline quartz, K-feldspar, foraminifers? , very rare bioclasts.

Comment: Less serpentinite, no microfossils, probably a slightly different Rhodian fabric?

Rh.no. A465

Matrix: Slightly calcareous

Temper: Very frequent iron oxide particles, frequent monocrystalline quartz, moderate carbonate grains, K-feldspar, rare plagioclase, sericitised feldspar, moderate–rare polycrystalline quartz, quartzite, very rare chert, clay clasts, heavy minerals, siltstone, traces of volcanic rock fragments

Comment: Rhodes Fabric A or A?

Hellenistic Rhodian amphorae, Tetragonos Agora

Ephesus AG 93/126 Rhodian, Stamp: Astos

Matrix: Calcareous, partially recrystallised

Temper particles: Very frequent carbonate grains, moderate quartz, K-feldspar, chert, foraminifers, coarse, well rounded quartz grains, bioclasts, iron oxide concretions, rare augite, very rare plagioclase.

Comment: Distinguished by the extremely high carbonate content, presence of foraminifers and lack of serpentinite from all the Rhodian amphorae below. Probably a slightly different Rhodian fabric?

Ephesus AG 90/188 Rhodian, Stamp: Pausanias

Matrix: Calcareous, optically inactive

Temper particles: Very frequent reddish brown grains, oxidised serpentinite?, frequent carbonate pseudomorphs, moderate–frequent heavy minerals (?diallage), rare quartz, chert.

Comment: Typical are the presence of oxidised serpentinite fragments and diallage grains; Rhodes Fabric A–Ah, Ah

Ephesus AG 93/126 – 121 Rhodian, Stamp; Hieroteles

Matrix: Low carbonate content

Temper particles: Frequent iron oxide concretions, moderate quartz, rare–moderate oxidised sheet silicates, rare feldspar, carbonate pseudomorphs, volcanic rock fragments, oxidised serpentinite, diallage?

Comment: Typical is the presence of oxidised serpentinite fragments and diallage; Rhodes Fabric A or A?

Ephesus AG 93/115 – 136 Rhodian, Stamp; Hieroteles

Matrix: Non-calcareous

Temper particles: Frequent quartz, oxidised sheet silicates, reddish-brown, oxidised serpentinite, carbonate pseudomorphs, moderate-rare: chert, rare K-feldspar, crystalline rock fragments.

Comment: Typical is the presence of oxidised serpentinite fragments. Rhodes Fabric A or A?

Augst Depot

Rhodian type

Augst 60.3579; Handle fragment with stamp: Martin–Kilcher 1994, 330, fig. 135, no. 2392, Monogram stamp

Matrix: Slightly calcareous, yellowish reddish.

Temper: Frequent carbonate grains, orange particles, moderate monocrystalline quartz, K-feldspar, rare augite, heavy minerals (clinozoisite), very rare chert, polycrystalline quartz, crystalline rock fragments and calcarenite.

Comment: Rhodes Fabric A or A?

The results of the petrological analyses

The analyses show that the fabric of the amphorae at the New Cemetery is very similar. The slight differences can be explained by differences in firing temperature. There are three amphorae in Ephesus (Tetragonos Agora nos. 5, 23 and 24) which belong to this workshop, also three Hellenistic stamped amphorae (Hieroteles 93/126–121, 93/115–136; Pausanias 90/188). The Astos stamped amphora fabric is completely different. These Hellenistic amphorae were also produced in the area of (Astos, Pausanias and Hieroteles), and they also contained serpentinite. Further research is needed to identify the products of the individual workshops.

Eight amphorae in the 22nd Ephorate of Prehistoric and Classical Antiquities Depots have a similar fabric to that of the amphorae of the New Cemetery. Two others from this depot which were recovered from the sea near Villanova have different fabrics (Rh.no. Villanova 2 RH (2) Rh.no. Villanova 10 RH (3)). All the other Ephesus pieces may have been produced elsewhere on the island; in the area of Perea; or Kos.

Petrographical Fabric Type A

Comment: The samples were most likely produced from a very local clay source (calcareous and fossiliferous marine clay). The analysed soil sample also shows a similar petrographical composition (Rh17) but is more inhomogeneous and contains some coarser grained particles (serpentinite, limestone, coralline algae, volcanic rock fragments).

Samples: Rh 1, Rh 2, Rh 5, Rh 8, Rh 9, Rh 10, Rh 11, Rh 12, Rh 13, Rh 14, Rh 17 Soil 750°C.

The Tetragonos Agora, no. 5 sample is very similar.

Petrographical Fabric Type A? Kiln Material

Comment: The used clay raw material was probably very similar to Fabric A. But the samples are probably stronger weathered (e.g. leaching of the carbonate components).

Samples: Rh 15, Rh 16

Samples which are similar to Fabric Type A or A?

The samples show in thin section often typical temper grains (microfossil fragments were not identifiable). Furthermore no heavy mineral analyses were available.

Tetragonos Agora no. 23, Rh Depot 4; Rh Depot A 379; Rh Depot A 845; Rh Depot A 465; Augst Depot; Tetragonos Agora 93/126–121 Hieroteles; Tetragonos Agora 93/115–136 Hieroteles

Petrographical Fabric Type A–Ah, Ah

Comment: The utilised clay raw material was probably identical or very similar to Fabric A. But the samples are altered due to their high firing temperature.

Samples: A–Ah: Rh 6, Rh 7; Rh 17 Soil 1000° C

Ah: Rh 3, Rh 4,

Samples which are similar to Fabric type A–Ah, Ah

Tetragonos Agora no. 24; Rh Depot A716 (1); Rh Depot A 716; Rh Depot A 604; Rh Depot A 601; Tetragonos Agora 90/188 Pausianas

Probably a slightly different Rhodian fabric?

Ephesus Tetragonos Agora AG 93/126 Rhodian, Stamp: Astos

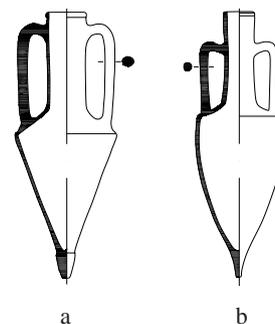
Type 2

CHIAN

(Amphore de Chios)

Chian wine was fairly popular in ancient times. However, very few Roman period Chian amphorae have been published from the western Mediterranean¹⁶⁸. On the basis of recently published stamps, it is supposed that some of the amphorae of P. Vedius Pollio were produced on Chios¹⁶⁹. A. OPAIT supposes, on the basis of Aris Tsaravopoulos's publication, that Dressel 24 similis amphorae and LR 2 amphorae of the Late Roman / Byzantine period were manufactured on the island¹⁷⁰.

Form: From Hellenistic times, this type of amphora (a) had a long cylindrical neck, initially with a rounded and later with a flat rim. The long handles are circular in section. The body has a conical shape with a solid knob. The Early Roman form (b) was more slender¹⁷¹. There are relatively few Chian amphorae among the vessels found in the Agora of Ephesus.



The amphorae found in Ephesus

Agora

layers		nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	33, 35 – 36
Ph 5b	A.D. 23 to 45: Agora Courtyard	34

Terrace House 2

layer		no.
2	First century B.C.	506

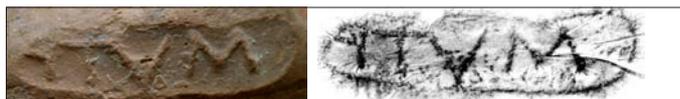
Stamp: There are stamped handle fragments at the Agora. Three of them have the name Ματρέ(ας). However, all of them were made with different dies.

¹⁶⁸ Sciallano – Sibella 1994, Diverses Amphores Grecques, Amphore de Chios; Martin-Kilcher 1994, 543.

¹⁶⁹ Finkielsztejn 2006a; Kirbihler 2007b.

¹⁷⁰ Tsaravopoulos 1986, fig. 36–37.

¹⁷¹ Grace 1979, fig. 47; Grace – Savvatianou-Pétropoulakou 1970, 359; Empereur – Hesnard 1987, 17–22.



Ματρ(...) – no. 33 (retrograde, alpha inverted)
Bibl.: Grace – Savvatianou–Pétropoulakou 1970, 362, E 229; In Samos IGR IV 994, 3; 990, 3.



Ματρέ(ας) – no. 34 (retrograde).



Ματρέ(ας) – no. 35 (retrograde).



Ἀπελλεῦ – no. 36 (alpha inverted)
Bibl.: Rhodes, ILind 1941, 151, 15; Fraser – Matthews 1987, 49.

Origin: On the basis of the sites on Chios, it has been supposed that production took place in the northwest of the island¹⁷². Three sites have been identified so far¹⁷³. They are next to the small port of Limnia, in the vicinity of Kofina and in the northern part of Chios Town.

Contents: The amphorae probably contained the famous Chian wine. Three types of Chian *ariusian* wine are known¹⁷⁴. The sweet wine was particularly popular. Some varieties were used as medicine. It was prescribed for Gaius Sentius by his doctor for indigestion¹⁷⁵. Hortensius ordered Chian wine for his immediate family members. Vast amounts of Chian wine was consumed at a banquet organised by Julius Caesar¹⁷⁶. Figs and mastic from Chios were also known in Italy¹⁷⁷. The white mastic-gum (“Chios tears”) has always been one of the best-known products of Chios.

Distribution: Chian amphorae can be found in the southeastern Mediterranean and Egypt¹⁷⁸. In Greece there are examples in Athens, they are also found in Rhodes, Cyprus and Delos¹⁷⁹. Only a few pieces have been published from the western Mediterranean and date from the Late Republican and Augustan periods. A few shipwrecks have Chian amphorae¹⁸⁰ (in Italy: near Comacchio – Valle Ponti wreck; in France: near Cannes – La Tradelière, near Toulon – Madrague de Giens wreck; in Spain: near La Manga del Mar Menor – San Ferreol wreck)¹⁸¹. A few pieces have been found recently in Saint Romain-en-Gal. The amphora also reached North Africa and the Black Sea region in small amounts¹⁸².

¹⁷² Whitbread 1995, 134–138.

¹⁷³ Whitbread 1995, 42. 138.

¹⁷⁴ Pliny NH, XIV, 73; Strabo XIV 1, 35: ...Then one comes to Ariusia, a rugged and harbourless country, about thirty stadia in extent, which produces the best of the Grecian wines...; Athenaeus I, 32 f. ... The pleasantest is the Chian, especially the variety known as *Ariusian*. There are three kinds of it; one dry, another rather sweet, the third, a mean between these two in taste, and called “self-tempered”. Now the dry has a good taste, is nourishing and more diuretic; the sweet is nourishing, satisfying, and laxative; the “self-tempered” is midway between them in useful effects. Speaking generally, Chian wine promotes digestion, is nourishing, produces good blood, is very mild, and is satisfying in its rich quality...; Dioscorides 5, 10.

¹⁷⁵ C. Sentius (preator in Macedonia 98-92 B.C.), in Pliny NH, XIV, 96.

¹⁷⁶ Pliny NH, XIV, 96–97; Tchernia 1986, 100–102.

¹⁷⁷ Varro R. R. I, 41, 6; Pliny NH, XV, 68; Athenaeus III 8; Columella X, 414; Martial VII, 25, 8; XII, 96, 9 f.; Magie 1950, 810 note 61, 62. Chian fig-trees were planted in Egypt in the third century B.C.; Cato Agr. 7. 4 and – following him – Varro R. R. I, 60 remarks that *orcis* and *posia* olives can be preserved in mastic oil; Pliny NH, XII, 72; XXIV, 121; Magie 1950, 46 note 62.

¹⁷⁸ Marangou – Marchand 2007, 243.

¹⁷⁹ Robinson 1959, F 92; Grace – Savvatianou–Pétropoulakou 1970, E 227–235; Lund 1993a, 122.

¹⁸⁰ Parker 1992, 250. 380. 433. 444.

¹⁸¹ Valle Ponti wreck: Berti 1985; Berti 1986 = Parker 1992, 443 f.; Madrague de Giens wreck: Tchernia *et al.* 1978, 46 = Parker 1992, 250; San Ferreol wreck: Parker 1992, 380; Tradelière wreck : Parker 1992, 1174; Sciallano – Sibella 1994, Diverses Amphores Grecques; Martin-Kilcher 1994, 543; Lemaître 2002, 217.

¹⁸² Riley 1979, 129 f.

Fabric (analysed no. 34)

Visual characteristics

On the basis of petrological analyses, Chian production seems to be very likely, especially in the north of the island. Two groups of fabric can be distinguished.

1. Chian Fabric A. A moderate amount of reddish brown and dark grains. White and colourless inclusions are rare, nos. 34 and 35.
2. Chian Fabric B. A moderate amount of small colourless and white grains, sparse reddish brown and dark, poorly sorted inclusions, nos. 33 and 36.

Petrology

Sample: no. 34

Matrix: Optically active, micaceous, silty groundmass.

Temper: The temper grains are fine grained (average 0.1 mm, max: 0.45 mm) and moderately sorted. The sample shows only natural temper. Very frequent monocrystalline quartz, frequent muscovite, subordinate polycrystalline quartz and heavy minerals, moderate alkali feldspars, rare crystalline rock fragments, very rare chert, moulds of former carbonates and siltstone/sandstone. Frequent are dark iron oxide concretions.

The crystalline fragments are mainly composed of quartzite, sericite quartzite and quartz-mica fragments.

The *heavy mineral* assemblage consists of zircon (57%), rutile (18%), garnet (13%), unidentified grains (8%), brookite/anatase (3%) and tourmaline (1%).

Comment: Typical are the abundance of quartzitic rock fragments and a heavy mineral composition dominated by zircon. A Chian provenance seems to be possible, especially from the northwestern part of the island (Ariusia), where Palaeozoic rocks prevail. A geological map is shown in Whitbread 1995, 137.

R.S.

Catalogue

Tetragonos Agora

33. Handle fr., 96/042 (203), Trench 96/1, Stamp: ΜΑΤΡ(...; (retr., alpha inverted), H = 8.9 cm, S = 2.8x2.8 cm, red (2.5YR 5/6); PLATES 4, 59
34. Neck, handle fr., 90/200 (1259), Trench 90/1, Stamp: ΜΑΤΡΕ((retr.), H = 13.1 cm, S = 2.9x2.8 cm, light red (2.5YR 6/6); PLATES 4, 59
35. Neck, handle fr., 92/030 (1265), Trench 92/2, Stamp: ΜΑΤΡΕ((retr.), H = 7.6 cm, S = 3.2 cm, reddish yellow (5YR 6/6); PLATES 4, 59

36. Neck, handle fr., 87/018 (1283), Trench 87/2, Stamp: ΑΠΕΛΛΕΥΣ, (alpha inverted), H = 6.5 cm, S = 2.5x2.6 cm, light red – red (10R 6/6 – 5/6); PLATES 4, 59

Terrace House 2

506. Handle, 99/645 (396), B6, Room 32c, H = 12 cm, S = 4.1x2.9 cm, reddish yellow (5YR 6/6), SF: buff (10YR 8/3); PLATES 38, 85

The amphorae published from Ephesus:

Terrace House 2: Lang-Auinger – Outschar 1994, 13, Fig. 19; Agora South Gate: Gassner 1997, 109, T. 34, no. 397; State Agora, Basilica Stoa, Hellenistic: Lawall 2007, 55 f., T 12, 71.

¹⁸³ Empereur – Picon 1986, 118 fig. 23; Empereur – Tuna 1989, 279 fig. 2; Whitbread 1995, 42. 69; Şenol *et al.* 2004.

Type 3

KNIDIAN

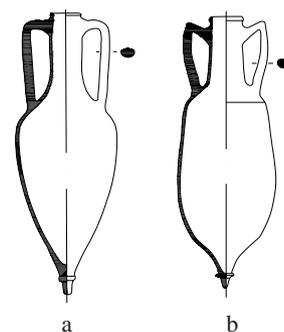
(Pompeii 38, August 50, Mau 38)

The agriculture of the long Datça peninsula thrived in ancient times. Quite a few amphora workshops have been found in the southern and central parts¹⁸³. An area of the peninsula (Hisarönü, Turgut and Callipolis) produced Rhodian amphorae in Hellenistic and Roman times¹⁸⁴. The sources state that in addition to wine, vegetables, especially onions and oil were produced for medicinal purposes¹⁸⁵. Situated at the foot of a series of hills, New Knidos had both a military and a commercial port¹⁸⁶.

Form: The shape of the amphora changed continuously during the Hellenistic period¹⁸⁷. This type has a distinctive ring around the toe marks on the base. The ring is typical of Knidian amphorae¹⁸⁸. The distinctive feature of the Hellenistic amphorae (a) is the short, curved rim. The handles, attached to the neck below the rim, rise slightly, have a curve and run vertically to the shoulder. The amphora (b) became smaller in Imperial times. The body is cylindrical¹⁸⁹. The handles have a sharp break and reach the upper part of the body in a curve. The section of the handle is oval.

This type of amphora is common in Ephesus.

Chronology: The chronology of the Knidian amphorae is very much like that of the Rhodian amphorae. This chronology was set up – following V. GRACE – by J–Y. EMPEREUR and A. HESNARD¹⁹⁰.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 1b	Third quarter of second century B.C.	37
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	43
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	38, 39, 40, 41, 42, 45
Ph 4–5	30/27 B.C. to A.D. 45	44
Ph 5a	Around A.D. 23: West Stoa	46
Ph 7–9	Late fourth to early seventh centuries A.D.	47

Terrace House 2

layers	Data range	nos.
2a–3a	Late first century B.C. to early first century A.D.	508
10	Debris	509
11	Stray find	507

The production, in smaller amounts, of Knidian amphorae was continuous during the Imperial period.

Inscription: At Pompeii (form XXXVII) a Knidian amphora has been found with the painted inscription CNIDIVM¹⁹¹. The *titulus pictus* refers to the provenance of the wine. The Knidian amphorae in Ephesus have no inscriptions.

Stamp: The Knidian amphorae were stamped on the handles in Hellenistic times. “Potter and dating official are usually named in the same stamp on Knidian jars. Whole jars retaining both handles date for us in ancient terms the annually appointed pairs of commissioners who evidently helped to administer Knidos as part of a

¹⁸⁴ The workshops of Hieroteles and other amphora producers were found near the villages of Hisarönü, Turgut and Kallipolis; Empereur – Tuna 1989; Sciallano – Sibella 1994, *Diverses Amphores Grecques*; Şenol *et al.* 2004.

¹⁸⁵ Magie 1950, 51, note 104. 105.

¹⁸⁶ Strabo XIV 2, 15.

¹⁸⁷ Grace 1979, fig. 64; Empereur – Hesnard 1987, 20 f.; Whitbread 1995, 68.

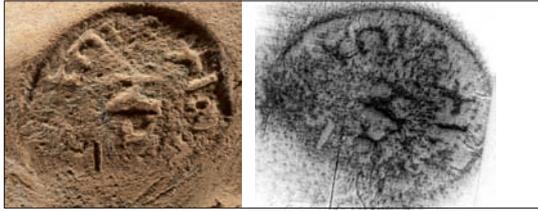
¹⁸⁸ Grace 1979, fig. 64; Panella 1986, 621 fig. 18; Martin-Kilcher 1994, 440; Augst 50; Williams 2005, Pompeii 38.

¹⁸⁹ Grace 1979, fig. 66.

¹⁹⁰ Empereur – Hesnard 1987, 20 f.

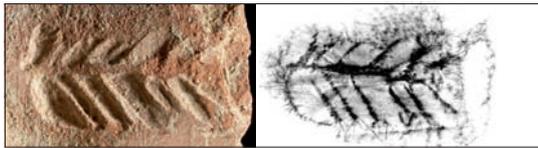
¹⁹¹ CIL IV, 5535.

Roman province in the late 2nd and early 1st centuries B.C.”¹⁹². A number of Hellenistic amphorae in Ephesus have stamps. There is only one round, not easily legible stamp at the Terrace House 2.



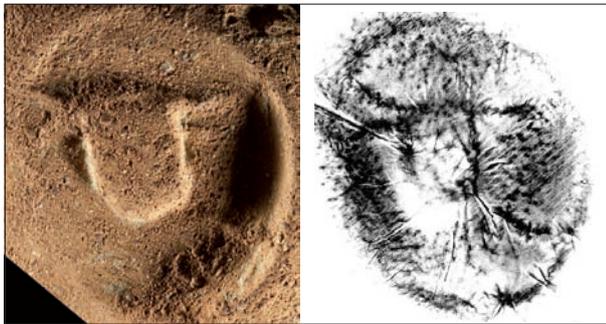
Επι Exi... and in the center No.... – no. 508

The stamps with the bull's head and the palm leaf, characteristic of the first century B.C., can be found in Ephesus as well. There are fewer stamps from the first century B.C. Late Hellenistic stamped handle fragments have been found among the ruins of the Agora.



Palm leaf – no. 40 is common (in many variations) on the late Knidian handles

Bibl.: Grace – Savvatianou-Pétropoulakou 1970, Delos E221; second quarter of first century B.C.



The bull's head – no. 43 was also common on Knidian handles in the late second/early first century B.C. Bibl.: Grace – Savvatianou-Pétropoulakou 1970, 331–343.



Bunch of grapes? – no. 47, was stamped twice. The traces of the shifted die are visible. I have not seen similar stamps.

Few Knidian amphorae are known outside the eastern Mediterranean and stamped amphorae are very rare. A typical stamp was found in a layer dated to the second half of the first century B.C. at the Magdalensberg excavations. (The right profile of a theatre mask representing a bearded man is recognizable in the stamp)¹⁹³.

Contents and origin: Knidian amphorae probably contained wine¹⁹⁴. A number of production sites are known in the Knidos region and in other parts of the Datça peninsula¹⁹⁵. A workshop has been partially unearthed near Reşadiye, near modern Datça. The terrace areas preserved traces of wine production¹⁹⁶. Today the hillside country of new Knidos has only olive groves.

Distribution: Knidian wine was popular in Hellenistic times but its consumption in the Imperial period is less documented¹⁹⁷. Amphorae of this type dated to the Roman period have been found in Italia, Narbonensis, Raetia, Germania, Dalmatia and Noricum, Pannonia, the Red Sea region and Indian Ocean region¹⁹⁸.

¹⁹² Grace 1979, under fig. 64.

¹⁹³ Bezczky 1993, 239.

¹⁹⁴ Athenaeus I, 32 “Knidian wine produces blood, is nourishing, and causes easy relaxing of the bowels; but when drunk too copiously it weaknes the stomach”; Whitbread 1995, 68.

¹⁹⁵ Empereur – Picon 1986, 116–118 fig. 23; Empereur – Tuna 1988; Empereur – Tuna 1989; Empereur *et al.* 1999; Tuna 2003.

¹⁹⁶ K. ŞENOL personal communication.

¹⁹⁷ Grace 1979, above fig. 31; Riley 1979, 128; Panella 1986, 621; Martin-Kilcher 1994, 440; Majcherek 2007, 14 f.; Williams 2005, Pompeii 38.

¹⁹⁸ Panella 1986, 621; Rizzo 2003, 155; Lemaître 2002, 221 fig. 1; Martin-Kilcher 1994, 440; Anderson-Stojanović 1992, Pl. 79 no. 668; Martin-Kilcher 1994, 440; Gassner 1989, 71 no. 25 fig. 10; Sciallano – Sibella 1994, *Diverses Amphores Grecques*; Bezczky 1993, 237–241; Bezczky 1994a, 117; Vidrih Perko 1994, 85 T/8 no. 1; Şenol – Kerem 2000, 98 no. 23; Tomber 2005, 229; Tomber 2008, 39–43, 166.

Fabric: (analysed nos. 43 and 47)

Visual characteristics

While the fabric of the amphorae is not entirely homogeneous, it is definitely less varied than that of the amphorae from Rhodes and Kos. There are two groups among the amphorae of the Agora.

1. Knidian Fabric A, Hard, slightly rough fabric. The frequency of the inclusions is common with moderate sorting. Their size varies between 0.05 and 0.5 mms. In addition to quartz with occasional limestone grains, there are reddish iron-oxide and dark grey inclusions, nos. 38, 39, 40, 41, 43, 45, 46 and 47.
2. Knidian Fabric B, Hard, slightly rough fabric. There are a few brown, some white inclusions and voids, nos. 37, 42 and 44.

Petrology

Samples: nos. 43 and 47

Matrix: Optically inactive groundmass.

Temper: The temper grains are fine to medium grained (average 0.1mm, max: 0.45 mm) and poorly sorted. The sample shows only natural temper. Dominated by monocrystalline quartz, chert, moulds of former carbonates and iron oxide concretions, moderate alkali feldspars and muscovite, rare carbonate grains, very rare polycrystalline quartz, oxidised mica, siltstone/sandstone and crystalline rock fragments, very rare plagioclase, non-reabsorbed paste fragments, and heavy minerals. The lithic fragments consist mainly of phyllite, partly? anchimetamorphic sandstone to siltstone and chert. Rare are calcareous sandstone, limestone (sparite), oxidised serpentine, and colourless volcanic ash fragments.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of chromium spinel (58%), zircon (11%), rutile (8%), hornblende (4%), diallage (4%), garnet (3%), titanite (2%), disthene (2%), epidote/zoisite (2%), diopsidic clinopyroxene (2%), unidentified grains (2%), augitic clinopyroxene (1%) and brookite/anatase (1%).

Comment: Both samples are very similar. Typical is the abundance of phyllitic rock fragments and a heavy mineral composition dominated by chromium spinel. A “Knidian” provenance is very likely, possibly from the western part of the Isthmus of Datça. It seems to be very similar to Fabric Class 1 described by Whitbread 1995, 73 f., geological map.

R.S.

Catalogue

Tetragonos Agora

37. Base fr., 95/025 (91), Trench 95/2–III, BD = 6 cm, H = 7.6 cm, yellowish red (5YR 5/6), PLATES 4, 59
38. Rim, neck, handle fr., 89/018 (1675), Trench 89/2, D = 14 cm, V = 0.9 cm, HD = 1.1 cm, H = 8.3 cm, red (2.5YR 4/8), PLATES 4, 59
39. Rim, neck, handle fr., 89/016 (1674), Trench 89/2, D = 14 cm, V = 1 cm, HD = 1 cm, H = 6.3 cm, light red (2.5YR 6/6), PLATES 4, 59
40. Neck, handle fr., 98/107 (1292), Trench 98/1, Stamp: palm leaf, H = 5.9 cm, S = 2x4 cm, red (10R 5/6), PLATES 4, 59
41. Rim, neck, handle fr., 96/047 (261), Trench 96/1, D = 11.5 cm, V = 1.2 cm, HD = 1.2 cm, H = 32.1 cm, S = 2.1x3.6 cm, reddish brown (2.5YR 5/4), SF: red (10R 5/8), PLATES 4, 59
42. Base fr., 89/015 (314), Trench 89/2, BD = 4.3 cm, H = 7.3 cm, reddish yellow (5YR 6/6), SF: light red (10R 6/8), PLATES 5, 59
43. Handle fr., 93/040 (1261), Trench 93/2, Stamp: bull's head, H = 8 cm, S = 2.7x4.5 cm, light red – red (between 2.5YR 6/6 and 5/6); PLATES 5, 59
44. Base fr., 87/008 (1147), Trench 87/2, BD = 6.5 cm, H = 8.5 cm, reddish yellow (5YR 6/6), SF: grey (10YR 6/1), PLATES 5, 59
45. Base fr., 87/009 (1151), Trench 87/2, BD = 5.2 cm, H = 9 cm, red (2.5YR 5/6), PLATES 5, 59
46. Base fr., 95/161 (156), Trench 95/1, BD = 5.1 cm, H = 7.4 cm, light red (2.5YR 6/6), PLATES 5, 60
47. Handle fr., 99/063 (1271), R-sewer, Stamp: Bunch of grapes?, H = 5.5 cm, light red – red (between 2.5YR 6/6 and 5/6); PLATES 5, 60

Terrace House 2

507. Base, 99/257 (602), AB9, Stray find, DF = 8 cm, H = 9.3 cm, reddish yellow (5YR 6/6), PLATES 38, 85
508. Handle, 99/309 (219), WT 2 Stone-cutting saw, Stamp: Επι Exiω..., H = 12.8 cm, S = 4.4x3 cm, reddish yellow (5YR 6/6), PLATES 38, 85
509. Handle, 99/570 (351), C3, Stairway 3, H = 8 cm, S = 4.1x2.1 cm, yellowish red (5YR 5/6), surface: pink (5YR 7/4), PLATES 38, 85

Magnesian Gate

701. Base fr., MT 99/1–1, H = 10.3 cm, DF = 4.9 cm, yellowish red (5YR 5/6), PLATES 51, 95
702. Base fr., MT 99/1–2, H = 7.5 cm, DF = 4.7 cm, reddish yellow – red (5YR 6/6 – 2.5YR 5/6), PLATES 51, 95

The amphorae published from Ephesus:

Tetragonos Agora South Gate: Gassner 1997, 109. 112, T 34. 37 nos. 398–399. 424; Terrace House 1: Bezczky 2003, 38. 68, T 23, K 275; Terrace House 2: Hellenistic Deposit: Ladstätter – Lang–Auinger 2001, 76 T 52 no. 71; Ladstätter 2010c, 203, A–K 76, T 71; State Agora, Well: Meriç 2002, 87 f. T 42 nos. K 507–509; State Agora, Basilica Stoa, Hellenistic: Lawall 2007, 55, T 12, AH 70; Heroon and Oktogon: Waldner 2009, 289 Fig. 7, 35.

Type 4

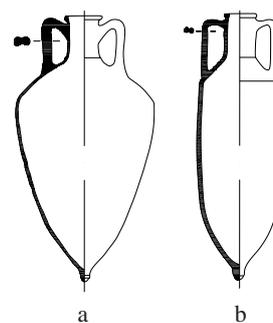
ΚΟΑΝ

(Peacock – Williams 10, Dressel 2–4 Cos)

Kos was famous for its fruit. The most important product of the island was wine, but it also produced raisins¹⁹⁹. The Hellenistic amphorae of Kos have both non-bifid and bifid handles²⁰⁰. The same names occur on some of the stamps of both type of amphorae²⁰¹. The amphorae with non-bifid handles are similar to the Mushroom rim type / Nikandros group amphorae which were produced in the vicinity of Ephesus and in the Meander valley. The two types must be distinguished. A recent report suggested that LR 1, LR 13, LR 3 (Pieri B 4) and Ephesus 56 similis types were also produced on the Island near Halasarna (modern Kardamaina)²⁰² and the region of Κώσταϊνα (Mastichari)²⁰³.

Form: The shape of the Koan type amphorae changed considerably during the Hellenistic period. The double barrelled handle jar became taller and more slender from the third century (a) to the first century B.C. A simple rounded rim and the cylindrical neck is characteristic of the late Hellenistic form. The upper part of the body is conical, the middle cylindrical, ending in a short, solid knob. The double barrelled handles formed below the rim reach the shoulder. The first century B.C. Koan form (b) became one of the characteristic amphora types of the western Mediterranean during the Roman period. This type is traditionally called the “Dressel 2–4” amphora²⁰⁴.

Chronology: The late Hellenistic form was produced from the end of the second century B.C. to the second century A.D. There are quite a few Koan amphora fragments in the Hellenistic and Early Roman layers.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 1b	Third quarter of second century B.C.	48, 49
Ph 2a	Late second century B.C. to mid first century B.C.: between surfaces of Streets I and II	50, 51, 52
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	77
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	53–69, 71–73, 75
Ph 5a	Around A.D. 23: West Stoa	74
Ph 5b	A.D. 23 to 45: Agora Courtyard	70
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	76

¹⁹⁹ Magie 1950, 51, quoting Strabo XIV 1, 18; Pliny NH, XVII, 133; Athenaeus I, 33b.

²⁰⁰ Grace – Savvatianou-Pétropoulakou 1970, 363; Empereur – Hesnard 1987, 22 f.; Καντζιά 1994, 332–342; Georgopoulos 2004, 130–132; Johnsson 2004, 135 f.; Finkielsztejn 2004, 153–163. The label “Dressel 4” seems to be less adequate in connection with the Hellenistic period Koan amphorae. It is more appropriate for the Roman versions after the middle of the first century B.C.

²⁰¹ Grace – Savvatianou-Pétropoulakou 1970, 363; Georgopoulos 2004, 130; Johnsson 2004, 137–139; Finkielsztejn 2004, 155–158.

²⁰² Diamanti 2008, 9.

²⁰³ Didioumi 2011, 74.

²⁰⁴ CIL XV, 2–4; Grace 1979, fig. 56–57; Freed 2000, 459; Williams 2005, Dressel 2–4 Cos.

Terrace House 2

layers	Data range	nos.
2	First century B.C.	510–512
2a–3a	Late first century B.C. to early first century A.D.	513
2a–3b	Late first century B.C. to mid first century A.D.	514
10	Debris	515

Epigraphy, Inscription: A few amphorae with *tituli picti* (COVM / VET) have been published from Pompeii (form XII)²⁰⁵. A similar inscription is also known from Magdalensberg²⁰⁶. The red/black *tituli picti* on Koan amphorae referred to the provenance or the quality of the wine²⁰⁷. Other Greek *tituli picti* and graffiti are often mentioned but they usually contain numbers and names²⁰⁸. The graffiti CTAXY can be seen on a Koan type (Pompeii 5–6) vessel in Magdalensberg²⁰⁹.

Stamp: During the Hellenistic period, Koan amphorae had the stamp on top of the handle. They are Koan symbols (Heracles' club and the crab) but a few names are also known²¹⁰. “The ethnic – Κώϊον or Κώϊος – appear mainly on the early stamps but also occur later, albeit rarely”²¹¹. During the Hellenistic period, there are fewer stamps on the Koan amphorae than on the Rhodian or Knidian ones²¹². It was V. GRACE who first stated that “Certain double-handled jars have Latin stamps, and these types will appear in the corpus of Roman stamped amphoras found in the eastern Mediterranean area”²¹³. S. SHERWIN WHITE mentions in her book that “... The involvement of Romans, or Italians, in the Coan wine trade is directly attested by the presence of Latin names, written in Latin, on a number of Coan amphorae handles... ”²¹⁴. Few Koan amphora stamps have been published from the western Mediterranean. During the revision of the Dressel 2–4 amphorae in Carthage, J. FREED claimed that the amphorae with P. Vedius Pollio's and P. Plotius Tucca's name were of Koan production²¹⁵. P. Vedius Pollio often visited Ephesus. His stamped amphorae have been found in Carthage and Levant. His amphorae, which have a distinctive shape, were produced on the Islands of Kos and Chios. We still know little about the growing role played by the Romans in the Greek workshops. However, a well-known scholar (grammaticus), a certain Curtius Nikias who ruled the island (as a tyrannos) for at least eight years, should be mentioned²¹⁶. The sources connect Curtius Nikias to Curtius Postumus. There are Dion, Timosionos, and Leodamas stamps in the Late Hellenistic / Roman layers in Ephesus. The names Dion and Leodamas are known from Kos. Timosionos is known from the Island of Kalymnos.



Δίον – no. 65,
Bibl.: Kos, NS 501, 6; 617; 675,3; Δίον Shelov, Sherwin-White 1978, 434



~ ΜΗΙΚΠΛΥΓ (C)

(Ti)μησίων – no. 66, Bibl.: Tenos IG XII Suppl. (138) 312 Col. II, 2. Fraser – Matthews 1987, 440

²⁰⁵ CIL IV, 5536–5539; Panella – Fano 1977, 161 Group 6; CIL IV, 5536–5541, CHOVM / VET / VO.

²⁰⁶ Piccottini 2000–2001, 374 f. fig. 5–6, COVM / AEM.

²⁰⁷ Panella 1986, 616 f. fig. 12–13.

²⁰⁸ Panella – Fano 1977, 160, Group 5.

²⁰⁹ Bezeczky 1998b, 232.

²¹⁰ Grace 1979, fig 58; Finkielsztejn 2004, 154.

²¹¹ Finkielsztejn 2004, 154.

²¹² Georgopoulos 2005, 181; Empereur – Hesnard 1987, 18.

²¹³ Grace 1962, 119 describing one of the fabric groups: “The dominant clay of the series, which we take to be native to Kos, is reddish, with more or less mica, white bits and dark bits; and the surface is greenish buff”; Grace 1956a, 170; Rauh 2003, 118, 130.

²¹⁴ Sherwin-White 1978, 252, note 184.

²¹⁵ P. Vedius Pollio stamp published: Tchernia 1969; Freed 1996, 151 note 58; Finkielsztejn 2006a, 131.

²¹⁶ Strabo XIV 2, 19; Nikias was mentioned in connection with Postumus Curtius: Cicero, Att. 7. 3. 10, 12, 26. 2; and Cicero *Ad. fam.* VII, 23 and IX. 10; Suetonius *De gram.* 14; Höghammar 1993, 31; Siani-Davis 2001, 51.



(Λ)εωδ(άμας) – no. 77,

Bibl.: Kos Paton – Hicks 1891, 10A, 3.38; Syll³ 568, 17; Sherwin White 1978, 482.

Origin: The Koan type amphorae of the Late Hellenistic / Early Roman period were made of various fabrics. The identification of the workshops on Kos is still an ongoing process. Workshops have been unearthed at Halasarna in the southern part of the island and in the town of Kos as well²¹⁷. It has been pointed out that not all the jars with a double barrelled handle were produced on the Island of Kos²¹⁸. The Koan amphorae were often copied. M. PICON and J.-Y. EMPEREUR say there were at least eight sites where Koan type amphorae were produced in the eastern Mediterranean²¹⁹. They were primarily produced near Kos, in Tarsus–Antakya / Yumurtalik, and in Egypt²²⁰. Recent research has suggested that Halicarnassos was also a production site²²¹. The copying of the form started in Italy in the middle of the first century B.C. (or even earlier), somewhat later in Gaul, Spain, and, in small amounts, in Britain, Raetia, North Africa, and on the coast of the Black Sea²²². J. HAYES mentions that both the Koan and the Rhodian amphorae were copied on the Island of Crete. The most recent petrological analyses have confirmed this statement²²³.

Contents: Koan amphorae probably contained wine. According to Athenaeus: “Wines which are more carefully treated with sea water do not cause headache; they loosen the bowels, excite the stomach, cause inflations, and assist digestion.... The wine of Kos also is very highly treated with sea water. The Rhodian, also, has, to be sure, a smaller share of the sea, but most of it is useless”²²⁴. Koan wine was also produced in Italy. According to Cato’s recipe, sea water was mixed to the hand-pressed grapes. This was further pressed three days later, and filled into dolium²²⁵.

Distribution: These amphorae can be found in the Aegean, Egypt, the Black Sea, Red Sea, the western Mediterranean: North Africa, France, Italy, Noricum, and Pannonia²²⁶.

Fabric:(analysed nos. 65, 70, 76)

Of the petrologically analysed amphorae, no. 65 was probably produced on the Island of Kos. Its fabric is remarkably similar to Fabric 4 as described by I. WHITBREAD. The other amphora (no. 76) may also have also been produced on Kos, and can be related to Whitbread’s Fabric 5.

Visual characteristics

1. Koan Fabric B1, hard, with large, colourless, red, brown, and grey grains no. 76. Compare with Rhodian amphora no. 28.
2. Koan Fabric C, hard red fabric with many small, white (most probably limestone) grains, nos. 51, 55, 58, 59, 60, 61, 62, 63, 65, 66, 68, 69, 77.
3. Koan Fabric D, hard, reddish fabric with big (0.5–0.7 mm) brown, red, white, and black grains, nos. 67, 70, 71, 74, 75.

²¹⁷ Whitbread 1995, 42, 82; S. ELPIDA pers. comm.

²¹⁸ Grace 1962, 107.

²¹⁹ Empereur – Picon 1986, 103–125 fig. 2; Empereur – Picon 1989, 225–229 fig. 2. Whitbread 1995, 82; Berg Briese 2005, 184–201.

²²⁰ Empereur – Picon 1989, 225–229.

²²¹ The wine of Halikarnassos is mentioned by Athenaeus I, 32 and 33. The shape of the amphorae coincide with that of the Late Hellenistic Koan double handled amphorae. Berg Briese 2005, 184–201. The workshop itself has not been uncovered but they found a big hole in the ground with (wasters of pottery). The fabric for coarse ware, plain ware, cooking ware and amphorae is the same. A significant amount of production can be supposed during the Hellenistic and the Early Imperial periods. Koan amphorae were also produced near Halikarnassos, even if in small amounts.

²²² Panella 2001, 194; Williams 2005, Dressel 2-4 Cos.

²²³ Eiring *et al.* 2002, 61 f. 65 and note 19 f., compare Hayes 1971, 261.

²²⁴ Athenaeus I, 32e.

²²⁵ Cato Agr. 112.

²²⁶ Marangou – Marchand 2007, 244 f.; Martin-Kilcher 2005, 208, 212; Empereur – Picon 1986, 109–112; Empereur – Picon 1989, 225–230; Hesnard 1986, 75–78; Finkielstzejn 2004, 154; Panella – Fano 1977, 161, Group 6; Lemaître 2002, 220; Monsieur 2001, 74 fig. 8–9; Wintermeyer 2004, 11, type Am 2.14–2.16; Zeest 1960, 104–107 type 52; Tomber 2005, 229; Piccottini 2000–2001, 374 f. fig. 5–6; Bezezckzy 1994a, 117 f. 122; Bezezckzy 2005a, 38; Laubenheimer *et al.* 2007, 339, 343, “Dressel 2-4 orientale”.

4. Koan Fabric E, hard reddish fabric with fine, small grains and with a few white particles, nos. 48, 50, 56, 57, 64, 73.
5. Koan Fabric F, hard buff very fine fabric with occasional brown grains, nos. 49, 52, 54.

Koan production

Koan Fabric B1

Sample: no. 76

Matrix: Shows an optically inactive, micaceous groundmass.

The temper grains are coarse grained, partially well rounded (average 0.5 mm, max: 1.2 mm) and poor to bimodally sorted. The sample seems to be artificially tempered.

Temper composition: Frequent monocrystalline quartz, subordinate alkali feldspars, rare crystalline rock fragments, very rare polycrystalline quartz, chert, plagioclase, muscovite, oxidised mica, siltstone/sandstone, quartzite and heavy minerals. Very frequent iron oxide concretions can be observed. The lithic fragments mainly consist of quartzite, oxidised sericite–chlorite quartzite (partially epidote bearing) and anchimetamorphic? siltstone to shale (phyllite). Subordinately altered acid volcanic rock fragments, epidote fels and sandstone fragments with volcanic particles can be observed.

The *heavy mineral* assemblage consists of augitic clinopyroxene (67%), diopsidic clinopyroxene (17%), epidote/zoisite (9%), hornblende (5%), garnet (1%) and traces of rutile and brookite/anatase.

Comment: Typical are the abundance of, partially well rounded, coarse grained quartzite and siltstone fragments together with probably younger volcanic grains (fresh augite, plagioclase of volcanic origin). The heavy mineral composition is dominated by clinopyroxenes.

A Koan provenance seems to be possible. Possibly comparable to “Koan” Fabric Class 5 described by Whitbread 1995, 95 and 84, geological map.

Note: similar fabric to no. 28 (Rhodian).

Koan Fabric C

Sample: no. 65

Matrix: Optically active, micaceous.

Temper: The temper grains are fine to medium grained (average 0.1mm, max: 0.45 mm) and moderately to poorly sorted.

Dominant monocrystalline quartz, frequent muscovite and moulds of former carbonates, subordinate alkali feldspars, oxidised mica, carbonate grains and iron oxide concretions, rare polycrystalline quartz and heavy minerals, very rare chert, plagioclase and crystalline rock fragments and traces of colourless and brown volcanic glass fragments. The non-carbonate lithic fragments mainly consist of phyllite, mica schist, chert and very rare volcanic fragments.

Comment: Typical are the abundance of dark mica, moulds of former carbonate fragments, traces of volcanic glass and a heavy mineral composition dominated by epidote and garnet (information only from thin section available).

A Koan provenance seems to be possible. Comparable to “Koan” Fabric Class 4, described by Whitbread 1995, 91–94. 84, geological map.

R.S.

Production site unknown

Koan Fabric D

Sample: no. 70

Matrix: Dark brownish red, inactive (highly fired, originally calcareous?).

Temper: Bimodal grain size distribution, frequent mono and polycrystalline quartz, subordinate chert (partly reddish radiolarite), alkali feldspars, iron oxide grains, rare orange particles (? oxidised serpentinite), altered (weathered), volcanic rock fragments, very rare crystalline rock fragments (quartzite), heavy minerals (hornblende, garnet), very rare oxidized mica.

Comment: Typical is the abundance of chert.

R.S.

Catalogue

Tetragonos Agora

48. Handle fr., 95/025 (168), Trench 95/2, H = 3 cm, S = 2x4.1 cm, reddish yellow (7.5 YR 6/6), PLATES 5, 60
49. Handle fr., 95/025 (168g), Trench 95/2, H = 9.8 cm, S = 2.3x4.1 cm, reddish brown (5YR 5/4), PLATES 5, 60
50. Rim, neck, handle fr., 91/022 (172), Trench 91/1, V = 1.4 cm, HD = 1.3 cm, H = 7.5 cm, S = 2x4.2 cm, reddish yellow (between 7.5YR 7/6 and 6/6), PLATES 5, 60
51. Rim, neck, handle fr., 91/022 (173), Trench 91/1, V = 1.5 cm, HD = 1.1 cm, H = 8 cm, S = 2.6x4.4 cm, red (10R 5/6), PLATES 5, 60
52. Handle fr., 91/022 (173a), Trench 91/1, H = 5 cm, S = 2.3x4.8 cm, reddish yellow (7.5YR 7/6 – 6/6), PLATES 5, 60
53. Neck, handle fr., 96/047 (235), Trench 96/1, H = 6.7 cm, S = 2.1x4.1 cm, light brown (7.5YR 6/4), SF: pink (7.5YR 8/4), PLATES 5, 60
54. Handle fr., 96/047 (236), Trench 96/1, H = 5.3 cm, pink (7.5YR 7/4), PLATES 5, 60
55. Rim, neck, bod fr., handles, 96/051 (36), Trench 96/1, D = 11 cm, V = 1.2 cm, HD = 1.2 cm, DN = 10.8 cm, HN = 14.8 cm, H = 27 cm, S = 2.3x4.5 cm, red (2.5YR 5/6), SF: buff (10YR 8/3), PLATES 6, 60
56. Rim, neck, handle fr., 96/051 (37), Trench 96/1, D = 11 cm, V = 1.5 cm, HD = 1.3 cm, H = 11.9 cm, S = 2.3x4.3 cm, light reddish brown (2.5YR 6/4 – 5/4), SF: white (10YR 8/2), PLATES 6, 60
57. Handle fr., 96/051 (45), Trench 96/1, H = 16.3 cm, S = 1.8x3.7 cm, light red (2.5YR 6/6), PLATES 6, 60
58. Handle fr., 96/051 (47), Trench 96/1, H = 5.8 cm, S = 2.2x4.2 cm, light red (2.5YR 6/6), PLATES 6, 60
59. Handle fr., 96/051(46), Trench 96/1, H = 4.6 cm, S = 1.9x4.4 cm, light red (2.5YR 6/6), SF: reddish yellow (7.5YR 8/6 – 7/6), PLATES 6, 60
60. Handle fr., 96/047 (229), Trench 96/1, H = 11.3 cm, S = 2x4 cm, red (2.5YR 5/8), SF: very pale brown (10YR 8/3), PLATES 6, 60
61. Handle fr., 96/047 (230), Trench 96/1, H = 9 cm, S = 2.2x4.7 cm, yellowish red (5YR 5/6), PLATES 6, 61
62. Handle fr., 96/056 (237), Trench 96/1, H = 3.7 cm, red (2.5YR 5/8), SF: very pale brown (10YR 8/3), PLATES 6, 61
63. Handle fr., 96/056 (238), Trench 96/1, H = 6.8 cm, S = 1.9x3.6 cm, light red (2.5YR 6/6), PLATES 6, 61
64. Rim, neck, handle fr., 90/032 (1289), Trench 90/4, D = 13.5 cm, V = 1.5 cm, HD = 0.9 cm, H = 9.8 cm, S = 2.1x4.1 cm, (between 5YR 6/4 and 6/6), SF: buff (10YR 7/4), PLATES 6, 61
65. Handle fr., 92/061 (1285), Trench 92/2, Stamp: Διον, H = 5.6 cm, S = 2.2x4.7 cm, light red – red (between 2.5YR 6/6 and 5/6), PLATES 6, 61
66. Handle fr., 89/029 (127), Trench 89/2, Stamp: (Τι)μησίον, H = 18.7 cm, S = 2.1x4 cm, red (2.5YR 6/6), PLATES 7, 61
67. Handle fr., 87/022 (1152), Trench 87/2, H = 5.7 cm, S = 4.5 x 2.3 cm, light red (2.5YR 6/6), SF: pink (5YR 8/4), PLATES 7, 61
68. Handle fr., 96/029 (244), Trench 96/1, H = 6.7 cm, S = 2.7x4.6 cm, light red (2.5YR 6/6), PLATES 7
69. Rim, neck, handle fr., 92/032 (170e), Trench 96/1, D = 13.6 cm, V = 1.9 cm, HD = 1.3 cm, H = 5.7 cm, red (2.5YR 5/6), PLATES 7, 61
70. Rim, neck, handle, body fr., base, 87/063 (1609), Trench 87/4, D = 12.5 cm, V = 1.6 cm, HD = 1.5 cm, DN = 12 cm, HN = 11.9 cm, BD = 31 cm, H = 91.6 cm, S = 2.5x4.8 cm, light red – reddish yellow (2.5YR 6/6 – 5YR 6/6), PLATES 7, 61
71. Rim, neck, handle fr., 91/108 (1211), Trench 91/4, D = 14 cm, V = 1.2 cm, HD = 0.8 cm, DN = 12.6 cm, H = 6.7 cm, S = 2.3x4.3 cm, light reddish brown (5YR 6/4), SF: pink (7.5YR 8/4), PLATES 7, 61
72. Rim, neck, handle fr., 96/045 (1853), Trench 96/1, D = 14 cm, V = 1.2 cm, HD = 1.2 cm, H = 7 cm, S = 2x4.5 cm, reddish yellow (5YR 6/6), SF: buff (10YR 7/3), PLATES 8, 61
73. Rim, neck, handle fr., 96/045 (1848), Trench 96/1, D = 14 cm, V = 1.2 cm, HD = 0.8 cm, DN = 12.6 cm, H = 9.6 cm, S = 2.3x4.3 cm, strong brown (7.5YR 5/6), SF: reddish yellow (7.5YR 7/6), PLATES 8, 61
74. Rim, neck, handle fr., 88/003 (35), Trench 88/1, D = 12.5 cm, V = 1.5 cm, HD = 1.3 cm, H = 8.3 cm, S = 2x3.7 cm, reddish yellow (5YR 6/6), PLATES 8, 61
75. Rim, neck, handle fr., 88/017 (1312), Trench 88/2, D = 12 cm, V = 1.5 cm, HD = 0.9 cm, H = 8.5 cm, S = 2.4x4.3 cm, yellowish red (5YR 5/6), PLATES 8, 61
76. Rim, neck, handle fr., 88/013 (1235), Trench 88/2, D = 12.5 cm, V = 1.4 cm, HD = 1.9 cm, H = 7.8 cm, S = 2.5x5.2 cm, reddish yellow (5YR 7/8), PLATES 8, 62
77. Rim, neck, handle fr., 99/067 (1999), Trench 87/2, Stamp: (Λ)εωδ(άμας) V = 1.5 cm, H = 5.5 cm, S = 1.9x4.4 cm, red (2.5YR 5/6), SF: light grey (2.5Y 7/2), PLATES 8, 62

Terrace House 2

510. Handle, 99/726 (295), B6, Room 32c, H = 9.5 cm, S = 3.7x1.8 cm, pink (7.5YR 7/4), SF: very pale brown (10YR 8/3), PLATES 38, 85
511. Handle, 99/729 (81), B6, Room 32c, H = 8.9 cm, S = 3.6x2.1 cm, reddish yellow (5YR 6/6), PLATES 38, 85
512. Handle, 99/712 (103), B6, Room 32c, H = 7.2 cm, S = 4.7x2.2 cm, yellowish red (5YR 5/6), PLATES 39, 85
513. Rim, neck, handle, 99/087 (315), WT 2, Stone-cutting saw, D = 12.2 cm, V = 1.5 cm, HD = 1.2 cm, H = 7.6 cm, S = 5.1x2.5 cm, reddish yellow (7.5YR 7/6), SF: white (2.5Y 8/2), PLATES 39, 85

514. Rim, neck, handle, 99/167 (148), WT 2, Stone-cutting saw, V = 1.2 cm, HD = 1.2 cm, H = 7.2 cm, S = 4x2 cm, reddish yellow (5YR 6/6), PLATES 39, 85

515. Rim, neck, handle, 99/581 (187), Stray find, D = 12 cm, V = 1.1 cm, HD = 1.2 cm, H = 7.7 cm, S = 4.6x2.2 cm, reddish yellow (7.5YR 7/6), SF: buff (10YR 8/3), PLATES 39, 85

Magnesian Gate

703. Handle frgm., MT 99/1–5, H = 11.6 cm, S = 2.6x5 cm, red (2.5YR 5/6), SF: pink (7.5YR 8/4), PLATES 51, 95

704. Handle frgm., MT 99/1–33, H = 10.7 cm, S 2.2=4.7 x cm, yellowish red (5YR 5/6), PLATES 51, 95

The amphorae published from Ephesus:

Terrace House 1: Bezezcky 2003, 38. 68, T 23, K 271–274; State Agora, Basilica Stoa: Lawall 2007, 54 f., T 11–12, AH 66–69.

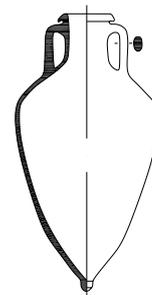
Type 5

MUSHROOM RIM TYPE / NIKANDROS GROUP

V. GASSNER has stated that some of the Hellenistic amphorae belonging to the Nikandros group (the Mushroom rim type) may have been produced in Ephesus²²⁷. M. LAWALL has also identified Ephesus as the site of production of the Mushroom type²²⁸. His conclusions are now supplemented by petrological analysis.

Form: The Mushroom rim type of amphorae seems to coincide with V. GRACE'S Nikandros group²²⁹. The description and history of the form has been published by M. LAWALL and G. CANKARDEŞ-ŞENOL.²³⁰ The shape of the rim and the base changed considerably from the third century to the middle of the first century B.C. The Local Aegean 1 and 2 type vessels can be regarded as the last phase in the evolution of the Mushroom rim type amphorae. In some cases, they have monogram-like stamps or name-stamps.

Chronology: The “monogram stamp” amphorae belong to the group dated to the period between the third century and the second century B.C. The “name stamped” amphorae belong to the period from the end of the second century to the middle of the first century B.C.²³¹.



The amphorae found in Ephesus

Terrace House 2

layers	Data range	nos.
1b	Late second to early first centuries B.C.	527, 532
1b – 3	Late second century B.C. to the first century A.D.	535
2	First century B.C.	516 – 521, 528 – 529, 531, 536, 538
2a – 3a	Late first century B.C. to early first century A.D.	522 – 525, 537
2a – 3	Late first century B.C. to late first century A.D.	533
11	Stray find	526, 530, 534

Stamp: The stamped amphorae at the Basilica Stoa have been published by M. LAWALL in the recent Ephesus volume²³².

Stamps from the Terrace House 2:

These amphorae bear the names Menophilos, Arhetimos and Menophantos. A stamped tile with the name of Menophilos was found at the Terrace House 2²³³.

²²⁷ Gassner 1997, 105–113.

²²⁸ Lawall 2004, 177–182; Lawall 2007, 48–53.

²²⁹ Grace – Savvatianou-Pétropoulakou 1970, 365–367; Fraser – Matthews 1987, 329; Fraser – Matthews 2010, 332.

²³⁰ Lawall 2004, 177–182; Lawall 2007, 48–53; Cankardeş-Şenol 2010, 125–139.

²³¹ Lawall 2004, 182.

²³² Lawall 2007, 48–53.

²³³ Terrace House 2, inv.no. 78/80.



Μηνόφιλου – no. 531

Bibl: Grace – Savvatiadou–Pétropoulakou 1970, 367, E 245; Criscuolo 1982, 120, no. 162; Sherwin-White 1978, 489; Fraser – Matthews 1987, 311; Fraser – Matthews 2010, 307; Büyükkolancı – Engelmann 1998, 79, no. 25; IvE 898 (2), 4; 906 A, 5; 945 A, 6; Solin 2003, 113–115; Lawall 2004, 183; Cankardeş–Şenol 2010, 132.

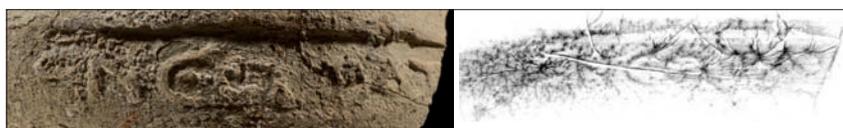


Μην[όφιλου] – no. 532



Αρχέτιμου – no. 533

Bibl: Giuliani 2004, 142, Lamp



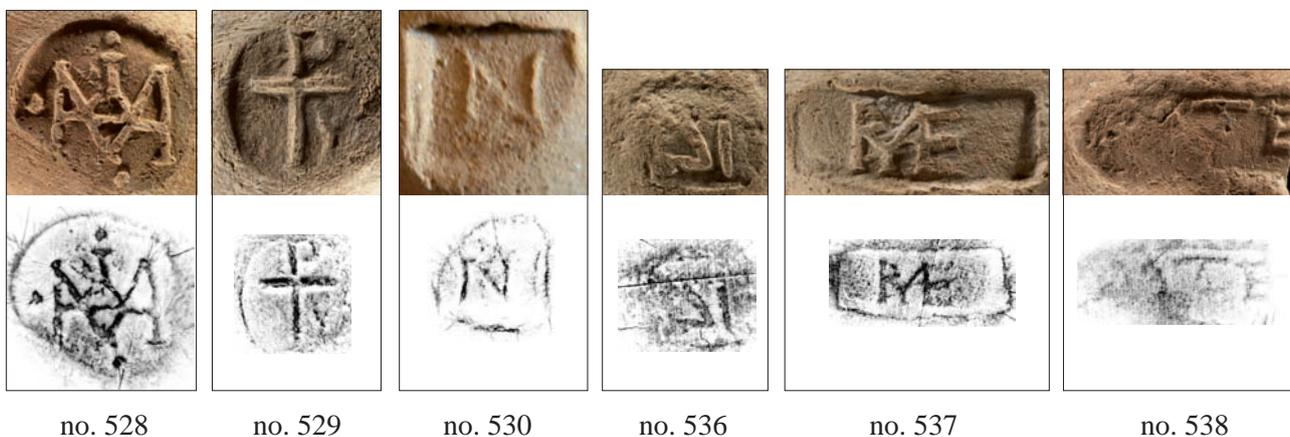
.neo..at... – no. 534



Μηνόφαντου – no. 535

Bibl.: Fraser – Matthews 1987, 311; Fraser – Matthews 2010, 306; IvE 898 A, B 5; 899, 60; Solin 2003, 113.

“Monogram stamps in the Nikandros group remain quite difficult to interpret. Even the letters represented and their proper order are difficult to establish with certainty”²³⁴.



no. 528

no. 529

no. 530

no. 536

no. 537

no. 538

Origin: According to the petrological analyses, some of the Mushroom rim type amphorae may have been produced in the vicinity of Ephesus. The analysis of the amphorae with the names Nikandros and Menophilos confirms local production. The petrological analysis of the hydria of the Agora also supports the possibility of local production.

Contents: Unknown. It may have been wine.

Distribution: The name stamps are known from Greece (Athens, Corinth, Delos), the Black Sea, western Asia Minor (Ilion, Pergamon), Egypt (Alexandria), Gezer, Maresha, Jerusalem and Giv'at Yasaf near Akko²³⁵.

²³⁴ Lawall 2007, 49.

²³⁵ Börker – Burow 1998, 116 f.; Finkielsztejn 2004, 157; Wintermeyer 2004, 109, type Am 1.6 – 1.16 and Am 1b.3–1b.8; Lawall 2004, 182–186; Marangou – Marchand 2007, 245; Cankardeş–Şenol 2010, 128.

Fabric: (analysed nos. 520, 526, 527, 529, 531; reference 1168/32, 98/103–213, 96/05–53, 96/051–54)

Visual characteristics

1. Hard fabric with fine grains. It is not completely homogeneous. It is rich in mica with frequent limestone inclusions. Their size can be 0.5 mm (nos. 516, 518–536, 538). The petrological analyses of these amphorae are consistent with the Ephesian Fabric C.
2. Hard, fine fabric, somewhat different from the previous Fabric C group (no. 517).
3. Hard, fine fabric, very fine white limestone (carbonate) grains (no. 537). It is somewhat different from Fabric C.

Petrology

Ephesus Fabric C
High fired group

Sample: no. 529

Matrix: Calcareous, micaceous, optically inactive.

Temper: Very frequent: muscovite, frequent monocrystalline quartz and moulds of carbonate grains, subordinate oxidised mica (biotite, phlogopite, oxidised sheet silicates), moderate: K-feldspars, polycrystalline quartz and carbonate grains, very rare: crystalline rock fragments, carbonate bioclasts, siltstone/sandstone fragments, traces of plagioclase.

The *heavy mineral* assemblage is dominated by garnet with subordinate zircon and rutile.

Sample: no. 531

Matrix: Calcareous, micaceous, optically inactive.

Temper: Frequent: monocrystalline quartz, moulds of carbonate grains, muscovite and oxidized mica (biotite, phlogopite, oxidised sheet silicates), subordinate polycrystalline quartz, moderate: K-feldspars, rare carbonate grains, very rare: crystalline rock fragments, siltstone/sandstone fragments and chert, traces of plagioclase.

The *heavy mineral* assemblage is dominated by garnet with subordinate zircon and rutile.

Comment: The heavy mineral content is relatively low.

Note: nos. 152, 153, 157, 159, 168 also belong to this group.

Ephesus Fabric C1

Lower fired group.

Typical are the high content in carbonate particles (but the absence of microfossils) and mica (muscovite and phlogopite).

Sample: no. 520

Matrix: Calcareous groundmass, micaceous, optically active, low firing temperature.

Temper: Very frequent: carbonate grains, muscovite and phlogopite, frequent: monocrystalline quartz, moderate: polycrystalline quartz, iron oxide-aggregates, chert, rare: fine-grained calcareous sandstone, crystalline rock fragments (polycrystalline quartz–mica fragments, sericite–quartzite).

Sample: no. 526

Matrix: Calcareous, micaceous, optically active.

Temper: Very frequent: carbonate grains, muscovite, oxidized mica (biotite, phlogopite, oxidised sheet silicates), frequent: monocrystalline quartz, subordinate K-feldspars, very rare: crystalline rock fragments, polycrystalline quartz, siltstone/sandstone grains, bioclast fragments and heavy minerals, traces of chert and plagioclase.

The rich *heavy mineral* assemblage is dominated by garnet with abundant rutile.

Sample: no. 527

Matrix: Calcareous, micaceous, optically inactive.

Temper: Very frequent: carbonate grains, frequent: muscovite, monocrystalline quartz and moulds of carbonate grains, oxidized mica (biotite, phlogopite, oxidised sheet silicates), moderate K-feldspars, very rare: crystalline rock fragments, polycrystalline quartz, siltstone/sandstone grains, traces of bioclast fragments and chert.

The *heavy mineral* assemblage is dominated by garnet with abundant zircon and rutile.

Comment: The heavy mineral content is relatively low and therefore not very representative.

R.S.

Reference material

Ephesus Fabric C
High fired group

Sample: BoxNo: 1168/32, Nikandros stamp

Matrix: Calcareous, micaceous, optically inactive.

Temper: Very frequent: monocrystalline quartz; frequent muscovite, subordinate oxidized mica (biotite, phlogopite, oxidised sheet silicates) and K-feldspars, moderate: polycrystalline quartz, rare: moulds of carbonate grains, very rare: albite, crystalline rock fragments; traces of chert.

Comment: Typical are the high firing temperature, high content in carbonate particles and mica. Statistically not representative, very low heavy mineral content (garnet and zircon, traces of rutile and epidote/clinozoisite).

Sample: BoxNo: 98/103–213, Nikandros stamp

Matrix: Calcareous groundmass, micaceous, optically inactive.

Temper: Very frequent: quartz, mica, oxidised sheet silicates, iron-oxide concretions, carbonate grains and moulds of former carbonates, frequent-moderate: K-feldspar, plagioclase, rare: crystalline rock fragments (quartz-feldspar aggregates, quartzite).

Comment: typical is the high content in carbonate particles.

Sample: Box No: 96/051–53, Menophilos stamp

Matrix: Calcareous, micaceous, optically inactive.

Temper: Very frequent: monocrystalline quartz; frequent moulds of carbonate grains, subordinate muscovite and oxidised mica (biotite, phlogopite, oxidised sheet silicates), moderate: K-feldspars and polycrystalline quartz, very rare: crystalline rock fragments, carbonate grains and siltstone/sandstone fragments, traces of albite.

Comment: Typical are the high firing temperature, high content in carbonate particles and mica. No heavy mineral analysis has been performed.

Ephesus Fabric C1
Lower fired group

Sample: BoxNo: 96/051–54, Menophilos stamp

The *heavy mineral* assemblage consists of garnet (51%), zircon (23%), rutile (22%), brookite/anatase (2%), epidote/zoisite (1.5%), tourmaline (<1%) and hornblende (<1%).

Comment: Typical are the high firing temperature, high content in carbonate particles and mica.

R.S.

Catalogue

Terrace House 2

516. Base, 99/674 (110), B6, Room 32c, H = 7 cm, DF = 5.3 cm, light brown (7.5YR 6/4), PLATES 39, 86
517. Rim, neck, 99/717 (293), B6, Room 32c, D = 12.3 cm, V = 2 cm, HD = 2.4 cm, DN = 9.5 cm, H = 7.3 cm, light red (2.5YR 6/8), SF: buff (10YR 8/3), PLATES 39, 86
518. Rim, neck, 99/705 (91), B6, Room 32c, D = 14 cm, V = 1.6 cm, HD = 2.4 cm, DN = 11.5 cm, H = 5.2 cm, reddish yellow (7.5YR 6/6), PLATES 39, 86
519. Rim, neck, handle, 99/691 (89), B6, Room 32c, D = 11.4 cm, V = 1.2 cm, HD = 2.4 cm, H = 9.3 cm, S = 3.2x2 cm, reddish yellow (7.5YR 6/6), PLATES 39, 86
520. Rim, neck, 99/706 (408), B6, Room 32c, D = 11.9 cm, V = 1.6 cm, HD = 3.3 cm, H = 5.3 cm, reddish yellow (7.5YR 7/6), PLATES 39, 86
521. Rim, neck fr., 99/693 (279), B6, Room 32c, D = 13 cm, V = 1.9 cm, HD = 3.1 cm, H = 5.5 cm, very pale brown (10YR 7/4), SF: white (2.5YR 8/2), PLATES 39, 86
522. Rim, 99/309 (218), WT 2 Stone-cutting saw, D = 11.4 cm, V = 1.1 cm, HD = 2.3 cm, H = 3.2 cm, reddish yellow (5YR 6/6), SF: pink (7.5YR 8/4), PLATES 39, 86
523. Rim, 99/054 (140), WT 2 Stone-cutting saw, D = 11.7 cm, V = 1.4 cm, HD = 2 cm, H = 3.7 cm, reddish yellow (7.5YR 7/6), PLATES 39, 86
524. Rim, 99/054 (141), WT 2 Stone-cutting saw, D = 12.7 cm, V = 1.9 cm, HD = 2.4 cm, H = 4.5 cm, reddish yellow (7.5YR 7/6), PLATES 39, 86
525. Rim, 99/054 (142), WT 2 Stone-cutting saw, D = 13.5 cm, V = 1.7 cm, HD = 2.1 cm, H = 3.2 cm, reddish yellow (7.5YR 7/6), PLATES 39, 86

526. Rim, 99/319 (54), BC1, D = 14.5 cm, V = 2.4 cm, HD = 2.1 cm, H = 3 cm, light brown (7.5YR 6/4), PLATES 39, 86
527. Rim, 99/195 (341), WT 2 Stone-cutting saw, D = 12.6 cm, V = 1.8 cm, HD = 2.3 cm, H = 5.5 cm, reddish yellow (7.5YR 7/6), PLATES 39, 86
528. Handle, 99/704 (414), B6, Room 32c, Stamp: Monogram, H = 7.2 cm, S = 3x1.8 cm, H = 15.5 cm, S = 3.4x2.5 cm, reddish yellow (5YR 6/6), SF: pink (5YR 8/4), PLATES 39, 86
529. Handle, 99/720 (76), B6, Room 32c, Stamp: Monogram²³⁶ – P T Y... stamp, perhaps P(...) $\tau\upsilon$ (...), H = 19.2 cm, S = 3.2x1.9 cm, light brown (7.5YR 6/4), PLATES 39, 86
530. Handle, 99/095 (604), WT 2 Stone-cutting saw, Stamp: N(...), H = 8.3 cm, S = 2.4x3.8 cm, reddish brown (5YR 5/4), PLATES 40, 86
531. Handle, 99/638 (409), B6, Room 32c, Stamp: Μηνόφιλου, H = 12 cm, S = 3.x2.4 cm, light brown (7.5YR 6/4), SF: buff (10YR 8/3), PLATES 40, 87
532. Handle, 99/459 (10), WT 2, Stone-cutting saw, Stamp: Μην[όφιλου], H = 7 cm, S = 3.7x2.3 cm, light yellowish brown (10YR 6/4), PLATES 40, 87
533. Handle, 99/484 (345), B9 East, 45c, Stamp: Αρχετιμου, H = 7 cm, S = 2.9x1.6 cm, reddish yellow (5YR 6/6), SF: buff (10YR 7/4), PLATES 40, 87
534. Handle, 99/336 (304), C1, Stairway 3, Stamp: .neo.ατ..., H = 7.1 cm, S = 3.3x1.8 cm, light brown (7.5YR 6/4), PLATES 40, 87
535. Handle, 99/005 (411), WT 2 Stone-cutting saw, Stamp: Μηνόφαν(...), H = 7.5 cm, S = 3.7x2 cm, buff (10YR 7/4), SF: white (10YR 8/2), PLATES 40, 87
536. Handle, 99/713 (412), B6, Room 32c, Stamp: ΔΙ, H = 5.8 cm, S = 3.5x1.8 cm, reddish yellow (5YR 7/6), SF: buff (10YR 8/3), PLATES 40, 87
537. Handle, 99/387 (9), B9 East, 45c, Stamp: PA E?, H = 5.5 cm, S = 2.8x1.8 cm, light red (2.5YR 6/6), PLATES 40, 87
538. Handle, 99/727 (413), B6, Room 32c, Stamp: .TE ..., H = 4 cm, S = 2.9x1.7 cm, reddish yellow (5YR 7/6), SF: pink (5YR 8/4), PLATES 40, 87

The amphorae published from Ephesus:

Agora South Gate: Gassner 1997, 107 T. 34–35. 37 nos. 401–402. 405–407. 409–410. 423. 425–426; Terrace House 1, Ladstätter 2003b, 25 T 4, K 38–41. 73. 79.80, T 32, K 340–345; Bezczyzky 2003, 38. 68 T 23 no. K 279–280; Terrace House 2, Ladstätter – Lang–Auinger 2001, 76 T 52, no. 67–68; Outschar 2000, 153–156, Fig. 21–24 nos. 160–167. 174. 178; Ladstätter 2005, 235. 292 T 164 no. K 267; Ladstätter 2005, 236. 300 T 168 no. K 342; Ladstätter 2010c, 203, A–K 73–74 T 70. and A–K 102–105, T 72; State Agora, Well, Meriç 2002, 88 T 42 nos. K 512–513; Basilica Stoa: Lawall 2007, 48–53 T 10–11, AH 41–64; Lucas Grave (Lukasgrab): Liko 2001, 88 f. T 58 no. 113 = Liko 2010, 231 no. 533, 241 nos. 681–682; Heroon and Oktogon: Waldner 2009, 289 Abb 7. 31–32; 292, Abb 11. 25. 28; 293, Fig. 15–16.

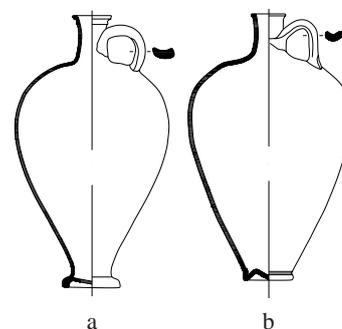
Type 6

AGORA F 65–66

(Knossos 49; Ostia 3, 368; MR amphora 3 Berenice (Benghazi); Anfora monoansata; Augst 55)

The amphorae which were earlier called “micaceous jars” are a group in themselves. They were produced from the Augustan period to Late Roman times, with the shape of the vessel undergoing many changes. In Late Roman times the distribution of the two-handle version was the most wide-spread of the series. Within the one-handle series, there is a difference between the normal size (40–60 cm) and the smaller (25–35 cm) vessels (M 275–276 and M 279–281). The earliest examples of the one-handle jars belong to F 65.

Form: The amphora is characterised by a small, double rounded rim, flat on top, a short curved neck, with a circular handle that is attached to the neck and the shoulder²³⁷. The handle is flat and curved in section. The upper part of the body is large, tapering to the base. Form F 65 has a wide, thick ring at the base (a). With form F 66 the ring is less wide and more flat (b). This type of amphora is common in Ephesus.



²³⁶ Jöhrens 1999, 261 no. 886, Lolling x 418, Athens NM Inv. Mis. EM 322, Monogram Chi, Rho, Ypsilon?

²³⁷ Robinson 1959, 17; other one-handled types: Agora G 107, M 45–46 and J 46–47, M 125–126; M 240–242 M 255–259, L 50–51; M 275–276–277, M 279–280–281–282, two-handled versions M 307, M 335, M 373; Lang 1955, 277; Panella 1986, 614; Lemaître 1997, 312 f.; Williams 2005, Agora F 65–66. The capacity of a complete F 65 amphora found at the Athenian Agora is 8.89 litres and F 66 is 10.69 litres.

Chronology: The evolution of the form can be followed from the age of Augustus to the fourth century A.D. The F 65–66 vessels of the Athenian Agora have been dated to the period between the last quarter of the first century B.C. (it is possible that they are earlier) and the first century A.D.²³⁸.

The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	78–90
Ph 5a	Around A.D. 23: West Stoa	91
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	92–100
Ph 6	Mid first to late fourth centuries A.D.	101
Ph 6 – 9	First to early seventh centuries A.D.	102

Terrace House 2

layer	Data range	nos.
1b–3	Late second century B.C. to the first century A.D.	548, 549
2	First century B.C.	545, 546
3	First century A.D.	550
11	Stray find	547

Epigraphy: *Titulus pictus* have been found in Pompeii.²³⁹

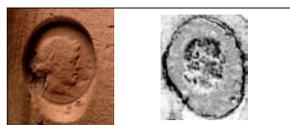
Stamp: No stamps on this form have been published so far²⁴⁰. We have three stamps on the handles in Ephesus. Two of them are at the Agora (nos. 89 and 102), and the third one is at the Basilica Stoa (no. 801).



no. 89 – Ελ(...), ? Ἐλουῖος IvE 680, 20; 683, 1. Ἐλουῖδιος (Ἐλβίδιος) IvE 972 A, 5.



no. 102 – Μάσ(...), μ and α in ligature, ? Μάσκουλος IvE VIII/2, 130



no. 801 – gem imprint showing a young head in profile, size 1.4 cm.

Origin: The fabric analysis shows that these amphorae were produced at a number of sites in Asia Minor. A significant amount were produced in Ephesus.

Contents: The vessels of the Athens Agora are generally lined with mastic resin. They probably contained wine²⁴¹.

Distribution: These amphorae occur in Germany (Haltern), Italy (Rome, Pompeii, Comacchio), Spain (Baetica), France (Lyon, Paris, Camp de Mirebau, Saint-Romain-en-Gal), Raetia (August) and Noricum (Magdalensberg), Levant (Tel Anafa), Cyprus (Paphos, Kourion), Egypt (Alexandria, Berenike)²⁴².

²³⁸ Robinson 1959, 17; Lang 1955, 277 f.; Riley 1979, 183; Martin-Kilcher 1994, 440.

²³⁹ CIL IV, 5911, *Valeri H(eliadis)*.

²⁴⁰ I have recently found a handle fragment with a CE stamp among the finds of the Athenian Agora (SS 2776). I am grateful to J. CAMP for the permission to study the amphorae.

²⁴¹ Robinson 1959, 17.

²⁴² Robinson 1959, 17; Riley 1979, 184; Loeschcke 1909, 292 f. fig. 47; CIL IV, 2 tav. II no. XXII, 5911; Panella 1973, 461 f. fig. 36; Panella 1986, 622; Rizzo 2003, 155, 170, 177; Berti 1986, 189 f.; Lusuardi Siena 1977, 223; Bonsor 1931, 138 no. 108; Lemaître 1997, 311–319; Lemaître 2002, 220; Bagnall *et al.* 2000, K 129; Berlin 1997, 166 PW 563, Pl. 70 and 94; Martin-Kilcher 1994, 440 f. nos. 5523 and 5534; E. SCHINDLER-KAUDELKA personal communication, MB 75 NG/45.



Fig. 24 Distribution of Agora F 65–66 amphorae

Fabric: (analysed nos. 79, 80, 81, 89, 91)

Visual characteristics

1. Ephesian Fabric A, hard, highly micaceous fabric, occasional fine to medium (no. 80) and coarse grained (no. 89).
2. Ephesian Fabric A, very fine, small grains, nos. 78, 81, 83, 84, 91, 101.
3. Ephesian Fabric A, with occasional large grains, nos. 95, 96, 99, 100.
4. Irregularly fired, moderately coarse grains (0.2 mm) with many black iron oxide and white grains, nos. 82, 85, 86, 87, 88, 90, 92, 93, 94, 97, 98, 102.
5. Not produced in Ephesus, a number of quartz and white grains (0,2 mm), iron oxide particles fired black no. 79.

Petrology

Ephesus Fabric A

Sample: No. 80

Matrix: The sample shows an optically active, strongly micaceous groundmass. The temper content is high, the grains are well to moderately sorted and fine to medium grained, (average 0.2 mm, max: 0.5 mm).

Temper: Dominating monocrystalline quartz and muscovite, subordinate alkali feldspars, biotite, heavy minerals and iron oxide concretions, moderate albite, rare polycrystalline quartz, moulds of former carbonates and crystalline rock fragments, very rare plagioclase and oxidised mica. The crystalline fragments mainly consist of quartz–mica fragments.

The *heavy mineral* assemblage consists of rutile (51%), garnet (21%), disthene (14%), staurolite (8%), zircon (6%) and traces of hornblende and sillimanite.

Comment: Typical are the high mica content and the metamorphic detritus.

Sample: No. 89

Matrix: Non-calcareous, micaceous, optically active

Temper: Very frequent muscovite, frequent oxidized mica (biotite, phlogopite), monocrystalline quartz, moderate K-feldspar, opaque particles, rare clay clasts, heavy minerals (garnet! amphibole, clinozoisite), carbonate grains, crystalline rock fragments; very rare plagioclase.

The *heavy mineral* assemblage is dominated by rutile and garnet and smaller amounts of kyanite, staurolite and subordinate amphibole and tourmaline.

Comment: Typical Ephesian fabric (coarse grained), similar to no. 80, but coarser grained.

Samples: nos. 81 and 91

Matrix: The samples show an optically active, micaceous groundmass. The natural temper content is very low; the few visible grains are mostly very fine grained.

Temper: The temper grains consist of frequent muscovite, subordinate monocrystalline quartz and iron oxide concretions, moderate oxidised mica, rare alkali feldspars and moulds of former carbonates, very rare polycrystalline quartz, crystalline rock fragments and heavy minerals and traces of chert, plagioclase, biotite and calcite bioclasts (dissolved ostracod shells).

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of garnet (70%), rutile (11%), tourmaline (6%), titanite (4%), zircon (3%), epidote/zoisite (3%), hornblende (2%), disthene (1%) and traces of brookite/anatase, staurolite and augitic clinopyroxene.

Comment: Typically fine-grained, with a micaceous groundmass and low temper content, with occasional ostracod shells and a heavy mineral assemblage dominated by garnet. Similar fabrics are known from common ware and bricks produced at Ephesus. Comparable garnet-rich raw materials are also available in the surroundings of Ephesus; therefore a provenance in the region of Ephesus seems to be very likely, but an origin elsewhere in the region of the Meander Valley could also be possible.

R.S.

Origin is not known

Sample: No. 79

Matrix: Optically inactive, partially recrystallised, originally probably a lime-rich groundmass.

The temper grains are fine to medium grained, (average 0.2mm, max: 0.5 mm), and poorly sorted.

Temper composition: Frequent monocrystalline quartz, oxidized mica and moulds of former carbonates, subordinate alkali feldspars, and muscovite, rare polycrystalline quartz and heavy minerals, very rare chert, plagioclase, albite, crystalline rock fragments and vitrified particles. Iron oxide concretions are frequent.

The *heavy mineral* assemblage consists of zircon (41%), rutile (31%), brookite/anatase (13%), hornblende (4%), disthene (3%), epidote/zoisite (3%), augitic clinopyroxene (2%), titanite (1%), garnet (1%), chromium spinel (1%) and traces of diopsidic clinopyroxene and unidentified grains.

Comment: The sample is highly fired and therefore many characteristic features (microfossils?) are destroyed, also the heavy mineral assemblage could be influenced. Due to this and the lack of comparisons no detailed provenance information can be given at the moment. But an Ephesian origin is not very likely.

R.S.

Catalogue

Tetragonos Agora

78. Rim, neck fr., handle, 87/025 (1160), Trench 87/2, D = 5.5 cm, V = 0.6 cm, HD = 1.2 cm, DN = 4.1 cm, H = 11.9 cm, S = 1.2x3.6 cm, reddish yellow (5YR 6/6), PLATES 8, 62

79. Neck, handle, 88/018 (1273), Trench 88/2 (A), DN = 4.6 cm, H = 10.8 cm, S = 1.2x4.2 cm, buff (10YR 7/4), PLATES 8, 62

80. Rim, neck, handle, 89/031 (290), Trench 89/2, D = 5.6 cm, V = 0.7 cm, HD = 1.4 cm, DN = 4.2 cm, H = 10.8 cm, S = 1.3x3.5 cm, grey (10YR 5/1), SF: light red (2.5YR 6/6), PLATES 8, 62

81. Rim, neck, handle, 89/031 (292), Trench 89/2, H = 13 cm, S = 1.3x3.6 cm, light red (2.5YR 6/6), PLATES 8, 62

82. Rim, neck, handle fr., 89/031 (291), Trench 89/2, D = 5.4 cm, V = 0.8 cm, HD = 1.2 cm, DN = 4.2 cm, H = 9.3 cm, weak red – reddish brown (2.5YR 4/2 – 4/4), SF: light red (2.5YR 6/6), PLATES 8, 62
83. Rim, neck, handle fr., 90/032 (337), Trench 90/4, D = 5.6 cm, V = 1.0 cm, HD = 1.3 cm, DN = 4.4 cm, H = 5.4 cm, light red (2.5YR 6/6), PLATES 8, 62
84. Base fr., 91/108 (1212), Trench 91/4, BD = 10 cm, H = 4.5 cm, light reddish brown (5YR 6/4), SF: red (10R 5/8), PLATES 8, 62
85. Rim, neck fr., 87/009 (1150), Trench 87/2, D = 5.2 cm, V = 0.7 cm, HD = 4 cm, H = 8.7 cm, reddish grey (5YR 5/2), SF: red (10R 5/8), PLATES 8, 62
86. Rim, neck, handle, 96/025 (1370), Trench 96/1, D = 5.6 cm, V = 0.75 cm, HD = 4.2 cm, H = 9.8 cm, S = 1.3x3.9 cm, red (10R 5/6), PLATES 9, 62
87. Rim, neck fr., handle, 96/025 (1617), Trench 96/1, D = 4.6 cm, V = 0.6 cm, HD = 1 cm, DN = 4 cm, H = 9.3 cm, S = 1.5x3.7 cm, red (2.5YR 5/6), SF: reddish yellow (5YR 6/6), PLATES 9, 62
88. Handle fr., 96/045 (1811), Trench 96/1, H = 8.3 cm, S = 1.5x3.5 cm, dark grey – reddish brown (5YR 4/1 – 4/4), SF: red (10R 5/6), PLATES 9, 62
89. Handle fr., 00/076 (1347), Trench 00/1, Stamp: Ελ(...), H = 7.4 cm, S = 0.7x3.3 cm, dark reddish grey (5YR 4/2), SF: red (2.5YR 5/6), PLATES 9, 62
90. Rim, neck, handle, 87/032 (1163), Trench 87/1, D = 5.6 cm, V = 0.8 cm, HD = 1.3 cm, DN = 4.4 cm, H = 10.1 cm, S = 1.3x3.3 cm, grey (5YR 5/1), SF: red (10R 5/8), PLATES 10, 62
91. Rim, neck, base fr., 88/004 (1226), Trench 88/1, D = 5.6 cm, V = 1 cm, HD = 1.3 cm, DN = 4.2 cm, BD = 10.5 cm, reddish brown (between 5YR 5/4 to 5/6), PLATES 10, 63
92. Base, 95/100 (1287), Trench 95/2 (a), BD = 7.2 cm, H = 3.4 cm, weak red (2.5YR 5/2), SF: red (2.5YR 4/6), PLATES 9, 63
93. Base fr., 89/090 (1635), Trench 89/3, BD = 9.8 cm, H = 4.2 cm, red (2.5YR 5/6), PLATES 9, 63
94. Handle fr., 89/007 (1203), Trench 89/2, H = 6.8 cm, S = 1.1x3.5 cm, light red (2.5YR 6/6), SF: buff (7.5YR 7/4), PLATES 9, 63
95. Handle fr., 89/007 (1204), Trench 89/2, H = 6 cm, S = 1.2x3.5 cm, yellowish red (5YR 5/6), PLATES 9, 63
96. Handle fr., 89/007 (1205), Trench 89/2, H = 7.1 cm, S = 1.1x3.5 cm, yellowish red (5YR 5/6), PLATES 9, 63
97. Handle fr., 89/007 (1206), Trench 89/2, H = 6.1 cm, S = 1.4x3.6 cm, reddish brown (5YR 4/4), PLATES 9, 63
98. Handle fr., 89/007 (1207), Trench 89/2, H = 3.3 cm, S = 1x2.8 cm, red (2.5YR 4/6), PLATES 9, 63
99. Handle fr., 89/007 (1208), Trench 89/2, H = 4.3 cm, S = 1.1x3 cm, brown (7.5YR 5/2), SF: red (2.5YR 5/6), PLATES 9, 63
100. Base fr., 89/007 (1209), Trench 89/2, BD = 8 cm, H = 3.4 cm, grey (5YR 5/1), SF: red (2.5YR 5/8), PLATES 9, 63
101. Rim, neck, handle fr., 90/008 (1323), Trench 90/3, D = 5.8 cm, V = 1 cm, HD = 1.7 cm, DN = 4 cm, H = 9.1 cm, red (2.5YR 5/6), PLATES 9, 63
102. Handle fr., 86/004 (2026), Trench 86/1, Stamp: Μάσ(κουλος), H = 3.9 cm, S = 3.8x1.6 cm, dark red (10R 3/6), SF: red (10R 5/4), PLATES 9, 63

Terrace House 2

545. Rim, neck, handle, 99/639 (381), B6, Room 32c, D = 6 cm, V = 0.7 cm, HD = 2 cm, H = 11 cm, S = 3.7x1.4 cm, light red (2.5YR 6/6), SF: pink (7.5YR 7/4), PLATES 41, 87
546. Base, 99/643 (384), B6, Room 32c, H = 4.6 cm, DF = 11.6 cm, red (2.5YR 5/6), SF: pink (7.5YR 7/4), PLATES 41, 88
547. Base, 99/336 (303), C1, Stairway 3, H = 5.2 cm, DF = 10.4 cm, light red (2.5YR 6/6), SF: white (10YR 8/2), PLATES 41, 88
548. Base, 99/358 (202), C3, Stairway 3, H = 8.6 cm, DF = 10 cm, light red (2.5YR 6/8), SF: pink (7.5YR 8/4), PLATES 41, 88
549. Base, 99/358 (203), C3, Stairway 3, H = 2.6 cm, DF = 7.4 cm, reddish yellow (5YR 6/6), PLATES 41, 88
550. Neck, handle, 99/190 (154), C3, Stairway 3, H = 7.2 cm, red (2.5YR 4/8), PLATES 41, 88

Basilica Stoa

801. Handle fr., 7137, Ki 25/1968, Basilica S 4/68, Stamp: Figural, head in a profile, oval 9x12.5 mm, H = 2.7 cm, S = 3.4x1.7 cm, red (10YR 5/6), PLATES 53, 96

The amphorae published from Ephesus:

Tetragonos Agora South Gate: Gassner 1997, 183 T. 61 no. 768. 773; Terrace House 1: Lang-Auinger – Outschar 1992, 151–154; Terrace House 1: Lang-Auinger – Outschar 1994, 8–13; Outschar 1996, 60–63, T. 7. 10. 16. 17, nos. 246–247. 249–250. 252–253. 256. 269–271. 280. 282. 285–289; Terrace House 2: Ladstätter – Lang-Auinger 2001, 76; Outschar 2000, 153 Fig. 21 no. 159; Ladstätter 2005, 235. 292, T 164 nos. K 269–272; State Agora, Well: Meriç 2002, 89 f., T 45 no. K 542–549; Alytarchenstoa: Ladstätter – Steskal 2009, 92 no. 1 Fig. 9, 1.

Type 7

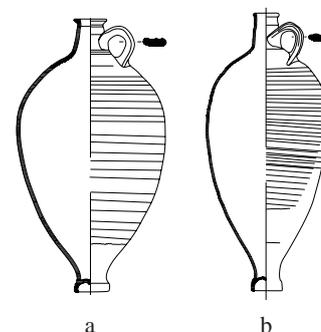
AGORA M 45 and J 46–47, M 125

(Knossos 49; Ostia 3, 368; MR amphora 3 Berenice (Benghazi); Anfora monoansata; Peacock – Williams 45A; Augst 55)

The form and fabric characteristics of the amphorae found in various sites around the Mediterranean region make a clear distinction between the pieces produced in Ephesus and in other centres of production. The distinction is primarily based on the characteristics of the base. The internal structure of the so-called hollow foot of the Ephesian amphorae is quite simple. The amphorae produced elsewhere have an internal rim and a cone in the centre (M 126). The petrological analysis of the amphorae produced elsewhere has shown, for example, particles of volcanic origin or other types of fabric which are markedly different from the ones produced in Ephesus.

Form: Both forms are the continuations of the F 65–66 type with different rims and bases. The M 45 jars are characterised by a small, everted, overhanging rim, a short neck, with an oval handle marked by a single groove. The body is ovoid and it has an open hollow foot²⁴³. The J 46–47 (a) and M 125 jars (b) are more slender, and have a wheel-ridged body²⁴⁴. The base is long with an open hollow foot. This type of amphora is common in Ephesus.

Chronology: The Agora M 45 group has been dated to the middle of the first to early second century A.D. in Athens. The M 125 amphora type has been, on the basis of a graffito, dated to the late second to early third century A.D. The Agora J 46–47 type has been dated to the period between the second century to early third century A.D.²⁴⁵.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	104
Ph 7–9	Late fourth to early seventh centuries A.D.	103

Terrace House 2

layers	Data range	nos.
2a–4	Late first century B.C. to early second century A.D.	592–593
4	Second century. A.D.	597
5a	Early third century A.D.	594, 596, 598–600
11	Stray find	595

Epigraphy, inscription: A number of graffiti have been published in Athens. In most cases, the inscriptions refer to dates²⁴⁶:

M 45 at base of the handle: PMB – the year 142 of the Actian era = A.D. 112, Lang 1955, no. 8.

M 46 at base of the handle: Νί[κης έτους] ΡΞΑ – the year 161 of the Actian era = A.D. 131, Lang 1955, no. 14.

M 125 under the handle: ρ; on the neck οε – the year 175 of the Actian era = A.D. 145, Lang 1955, no. 17.

Distribution: This type occurs mainly in the eastern Mediterranean. Greece (Athens, Corinth, Olympia, Knossos), Lybia (Benghazi–Berenike), Egypt (Berenike, Mons Claudianus), Cyprus (Paphos), Turkey (Tarsus, Zeugma), Black Sea (Tanais), Scythia (Neviodonum). There are also pieces in France (Lyon, Marseille,

²⁴³ Robinson 1959, 55 f. 88, 95 f.; Lang 1955, 282–285; Riley 1979, 183; MR amphora 3 Berenice (Benghazi); Panella 1973, 460, 631, fig. 36; Ostia III, 368; Hayes 1983, 158; Knossos 49; Peacock – Williams 1986, 188, Class 45B; Lemaître 1997, 314 f.

²⁴⁴ The capacity of a complete M 125 amphora found at the Terrace House 2 is 11.25 litres (weight: 2.3 kgs, height: 53.5 cm), in Athenian Agora M.125 is 7.67 litres.

²⁴⁵ Robinson 1959, 55 f., 95 f.

²⁴⁶ Lang 1955, 282–285; Robinson 1959, 95.

Vienne, Frejus), Italy (Aquileia, Ostia, Brescia, Pisa), Adriatic coast (Brijuni, Zadar), Raetia (Augst), Noricum (Virunum), Pannonia (Aquincum)²⁴⁷.

Contents: Wine or perhaps olive oil²⁴⁸.

Fabric:

Visual characteristics

1. Very fine fabric, small inclusions and voids, no. 600
2. Fine fabric, small white inclusions, nos. 592–594, 597
3. Irregularly fired, nos. 103, 595–596, 598–599

Catalogue

Agora M 45

Tetragonos Agora

103. Rim, neck, handle fr., 87/165 (1600), Trench 87/6, D = 5.3 cm, V = 0.8 cm, H = 8.8 cm, S = 1.2x3.1 cm, red (2.5YR 4/6), SF: dark brown (7.5YR 4/2), PLATES 9, 63

Terrace House 2

592. Rim, neck, handle, 99/293 (17), C3, Stairway 3, D = 5.3 cm, V = 0.5 cm, HD = 0.7 cm, H = 8.5 cm, S = 3.8x1.4 cm, red (2.5YR 4/6), PLATES 46, 91

593. Base, 99/293 (12), C3, Stairway 3, DF = 5 cm, H = 4.4 cm, dark reddish brown (5YR 3/4), PLATES 46, 91

Agora M 125

Tetragonos Agora

104. Base fr., 99/042 (1622), R-sewer, BD = 4.5 cm, BH = 2.1 cm, H = 8 cm, light red (2.5YR 6/6), PLATES 9, 63

Terrace House 2

594. Base, 99/462 (44), A3, Stairway 1, DF = 5.9 cm, H = 4.1 cm, dark reddish brown (5YR 3/4), PLATES 46, 91

595. Rim, neck, handle, 99/591 (115), A3, Stairway 1, D = 3.6 cm, V = 0.35 cm, HD = 0.7 cm, H = 9.2 cm, S = 2.6x1.2 cm, grey (10YR 5/1), SF: reddish brown (5YR 4/3), PLATES 46, 91

596. Base, 99/582 (188), A3, Stairway 1, DF = 4.1 cm, H = 6.7 cm, greyish brown (10YR 5/2), SF: yellowish red (5YR 5/6), PLATES 46, 91

597. Base, 99/212 (321), WT 2, Stone-cutting saw, DF = 3.9 cm, H = 7.5 cm, reddish brown (2.5YR 4/4), PLATES 46, 91

598. Base, 99/612 (369), A3, Stairway 1, DF = 4.3 cm, H = 7 cm, yellowish red (5YR 5/6), SF: reddish yellow (5YR 7/6–6/6), PLATES 46, 91

599. Base, 99/600 (66), A3, Stairway 1, DF = 4.7 cm, H = 4.3 cm, dark grey (10YR 4/4), SF: reddish brown (5YR 4/4), PLATES 46, 91

600. Base, 99/069 (120), A3, Stairway 1, DF = 3.7 cm, H = 17.7 cm, reddish yellow (5YR 6/6), PLATES 46, 91

Magnesian Gate

712. Base fr., MT 99/1–12, H = 3.4 cm, DF = 4.4 cm, red – reddish brown (2.5YR 5/6 – 5YR 5/4), PLATES 52, 95

713. Handle fr., MT 99/1–18, H = 7.7 cm, S = 1.7x3.3 cm, red (2.5YR 4/6 – 4/8), PLATES 52, 95

The amphorae published from Ephesus:

Agora M 45–46 and J 46–47 types: Tetragonos Agora South Gate: Gassner 1997, 112 T. 37 nos. 427–428; Terrace House 1: Outschar 1996, 60 T. 7 no. 255; Terrace House 2: Ladstätter 2005, 240 316 f. T 179–180; Ladstätter 2005, 240. 323 f. T. 183–184 nos. K 576–583; Ladstätter 2005, 240. 324 T. 184 nos. K 587; Ladstätter 2005, 241. 329 f. T. 187, nos. K 639–640. 642–646; State Agora, Well Meriç 2002, 89 f. T 46 nos. K 557–568; Nymphaeum Traiani: Quatember *et al.* 2008, 291, nos. 10–12 Fig. 13, 10–12.

Agora M 125 Type: Tetragonos Agora South Gate: Gassner 1997, 185 f. T 61 nos. 769–770. 774; Terrace House 2: First part of the third century A.D., Ladstätter 2005, 245. 335, T 191 no. K 702; mid third century A.D. Ladstätter 2005, 242. 331 f. T 188 nos. K 662–664; third century A.D. Ladstätter 2008, 112. 132. 133 T. 288, K 122–124; Alytarchenstoa: Ladstätter – Steskal 2009, 92 no. 12 Fig. 9. 12; Lucas Grave (Lukasgrab): Ladstätter 2010b, K 249, K 317–319; K 485.

²⁴⁷ Robinson 1959, 55 f. 95 f.; Riley 1979, 183–186; Hayes 1983, 158, Type 40, nos. 106–107; Panella 1986, 622; Kelemen 1990, 180 nos. 28–36 (M 126); Hayes 1991, 92, Type VI nos. 26–27. 29 fig. 29, no. 28 neck, with two handles – “an unusual variant”; Арсеньева – Науменко 1992, 149 fig. 29, 1; 157 fig. 38, 2; Majcherek 1993, 216 fig. 1, no. 16; Martin-Kilcher 1994, 440 f.; Hayes 1996, 172 fig. 6–18 nos. 6–9; Lemaître 1997, 314 f.; Martin 2000, 428; Vidrih Perko – Pavletić 2000, 266; Bruno 2002, 280 f.; Lemaître 2002, 220; Opař 2004a, 13; Abadie-Reynal 2004, 17 fig. 4; Auriemma – Quiri 2006, 238 f.; Majcherek 2007, 15 f.

²⁴⁸ Majcherek 2007, 15, mentioned in Rothschild-Boros 1981, 79–89.

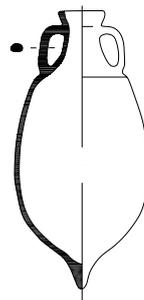
Type 8

CUP-SHAPED RIM / DRESSEL 24—PREDECESSOR
(Dressel 24; Knossos 15)

This cup-shaped rim type amphorae were produced near Erythrae in the late Hellenistic period²⁴⁹. Recent research suggests that these amphorae were also manufactured on the island of Chios as well²⁵⁰. Erythrae is situated in Asia Minor, opposite the island of Chios. Talking of the local wine, Athenaeus remarked: "...if you mix hard and fragrant wine with smooth and odourless wine, as for instance, Heracleote and Erythraean, the one supplies smoothness, the other fragrance"²⁵¹, "...and the loaf which comes white from the oven in Erythrae, where grapes grow richly, and abounds in all the luxurious daintiness of the seasons, will delight you at the feast..."²⁵².

Form: M. LAWALL has described this vessel²⁵³. In addition to being cup-shaped, the form is characterised by a curved neck, continuous with the bag-shaped body. The handle section is oval. The bottom is a short spike. With minor modifications, the Hellenistic form survived into the Early Imperial period. This form is "24" in H. DRESSEL'S typology²⁵⁴. There are a number of formal variations with similar rims. It has recently been suggested that the final phase of the evolution of the Dressel 24 form is the Late Roman 2 amphora²⁵⁵. This type of amphora is common in Ephesus.

Chronology: According to M. LAWALL'S evidence, the type is present at the excavations in Troy (the end of the second century B.C. or the beginning of the first century). Certainly before 85 B.C. when Frimbria sacked Troy²⁵⁶. In Rome, the Dressel 24 amphora has been dated to the first century A.D.²⁵⁷. The vessels from the Black Sea region are dated to the second and third centuries A.D.²⁵⁸.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 3	Late second century B.C. / ca. 60 B.C. to early Augustan period	105
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	106–108, 110–126
Ph 4–5	30/27 B.C. to A.D. 45	127–128
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	109
Ph 11	Unstratified complexes	129

Terrace House 2

layers	Data range	nos.
3a	Late first century A.D.	553
5a–6a	Early third to early fourth centuries A.D.	552
11	Stray find	551

Epigraphy: Dressel published two Greek painted inscriptions from Rome²⁵⁹. The inscription of an amphora of the third century is: ..γαλτι²⁶⁰.

²⁴⁹ Özyiğit 1990, 127 f. fig. 4–5.

²⁵⁰ Opař – Tsaravopoulos 2010, 23–28; Tsaravopoulos 1986.

²⁵¹ Athenaeus I, 32b.

²⁵² Athenaeus III, 112.

²⁵³ Lawall 2004, 185.

²⁵⁴ CIL XV, T II, 24; Manacorda 1975, 379 f.; Scotti 1994, 31 no. 39, T. Va; Bezeczky 2004, 87.

²⁵⁵ Opař 2004b, 295 f.; Opař 2007a.

²⁵⁶ Lawall 2004, 185.

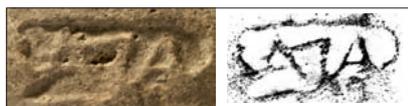
²⁵⁷ Zevi 1966, 223; Manacorda 1975, 383.

²⁵⁸ Арсенъева – Науменко 1992, Pl. 28. 30–33.

²⁵⁹ CIL XV, 4873. 4881.

²⁶⁰ Pülz 1985, 89 Form 19 Fig. 10.

Stamp: There is only one Greek stamp on this type in Ephesus.



Ἄγα (...) reverse – no. 124. The same stamp in Chalkidike Peninsula and in Tanais, *Bibl.*: ШИЕЛЮБ 1975, 151, no. 594, T. 8; Peirce 2001, 507 f., fig. 101, Pl. 76; IvE 2931, 2; IvE 2120, 1; 2205; IvE 2089;

Origin: A number of amphora fragments belonging to this type have been published from Erythrae²⁶¹. The petrological analyses suggest that these amphorae were also produced in the Meander Valley and near Ephesus. Similar amphorae may have been manufactured in other places as well.

Contents: The content of the amphorae is unknown.

Distribution: The Hellenistic amphorae can be found on the coastline of Asia Minor. The amphorae of the Roman period have been reported, in addition to Asia Minor (Ephesus and Miletus), from Egypt (Mons Claudianus) and Italy (Rome, Pompeii, Alba Pompeia and Parabiago, Brindisi)²⁶². The Dressel 24–predecessor amphorae are very frequent at Black Sea sites. The variants are widespread²⁶³.

Fabric: (analysed nos. 105, 106, 111, 113, 120, 124, 129)

Visual characteristics

There are different groups. The fabric is not entirely homogeneous, even within the individual groups.

Two groups of the workshop at Erythrae:

1. Erythrae Fabric A, fairly hard fabric, fine grains, frequent small white inclusions of limestone or white reaction rims nos. 105–109, 117, 122–123, 126
2. Erythrae Fabric B, fairly hard fabric, very fine grains, small amount of brown and white particles, large amounts of mica, microfossils and voids, nos. 113–115, 118–119, 121, 127–129, 552

Two groups from the Ephesus region workshop:

3. Fairly hard fabric, large grains and reddish–brown iron oxide inclusions, nos. 110 and 111
4. Fairly hard fabric, few white and grey inclusions no. 120

Unidentified production area

5. Large (0.1 – 0.5 mm) white, red and grey grains no. 124, 551, 553
6. Inhomogeneous fabric with large grains, nos. 116, 125

Petrology:

Erythrai Fabric A

Samples: nos. 105 and 106

Matrix: Optically inactive, partially recrystallised originally lime rich, groundmass. The natural temper content, mainly carbonate grains, is high.

Temper: Very frequent moulds of former carbonates, subordinate monocrystalline quartz and oxidised mica, moderate muscovite, rare alkali feldspars, very rare chert and traces of polycrystalline quartz, plagioclase, carbonate grains and crystalline rock fragments. Iron oxide concretions are frequent.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of zircon (25%), augitic clinopyroxene (23%), hornblende (14%), garnet (12%), rutile (7%), epidote/zoisite (8%), titanite (4%), brookite/anatase (3%), disthene (2%), chromium spinel (2%) and traces of diopsidic clinopyroxene.

Comment: Typically fine, calcareous groundmass and a high content in carbonate particles and a *heavy mineral* assemblage dominated by zircon, clinopyroxenes and hornblende. Also characteristic occurrence of chromium spinel. Comparable fabrics and raw materials are known from the Ionian region and Pergamon.

R.S.

²⁶¹ Özyiğit 1990, 127 f. fig. 4 – 5.

²⁶² Manacorda 1975, 378–383; Pülz 1985, 89 no. 59 Fig. 10; Scotti 1994, 31 no. 39, Tav. Va; Bruno 1997, 525; Rizzo 2003, 156, 170; Tomber 2006, 165; Auriemma – Quiri 2006, 234–236.

²⁶³ Арсеньева – Науменко 1992, Pl. 28. 30–33.

Erythrai Fabric B

Samples: nos. 113 and 129

Matrix: Optically inactive, partially recrystallised originally lime rich, groundmass. The fine-grained natural temper content, mainly carbonate grains is high.

Temper: Very frequent moulds of former carbonates, subordinate monocrySTALLINE quartz, moderate alkali feldspars, rare muscovite and traces of polycrystalline quartz, chert, plagioclase, biotite, oxidised mica, carbonate grains, foraminifers, calcite bioclasts, shale fragments, crystalline rock fragments, volcanic rock fragments and heavy minerals. Iron oxide concretions also occur frequently.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of hornblende (34%), zircon (27%), garnet (15%), rutile (11%), augitic clinopyroxene (4%), brookite/anatase (3%), tourmaline (2%), disthene (2%), unidentified grains (2%), traces of staurolite and epidote/zoisite.

Comment: The samples are highly fired and many characteristic features may be obscured. Typically fine calcareous groundmass, with high content in carbonate particles and a heavy mineral assemblage dominated by hornblende, zircon, garnet and rutile. Also characteristic is the occurrence of clinopyroxenes. Comparable fabrics and raw materials are known, for example, from Pergamon.

R.S.

Ephesus and Meander Valley region Fabric A

Sample: no. 111

Matrix: The sample shows an optically active to inactive, micaceous groundmass.

Temper: The temper grains consist of very frequent muscovite, subordinate monocrySTALLINE quartz, biotite and oxidized mica, moulds of former carbonates, rare alkali feldspars, very rare polycrystalline quartz, crystalline rock fragments and heavy minerals. Iron oxide concretions also occur subordinately.

The *heavy mineral* assemblage consists of garnet (55%), rutile (25%), zircon (5%), disthene (5%), epidote/zoisite (5%), hornblende (2%), brookite/anatase (1%), titanite (1%) and augitic clinopyroxene (1%).

Comment: Typically high mica content (dark and white mica). Similar fabrics and raw materials are also known from Ephesus and the Meander Valley. A local production is likely.

R.S.

Origin is not known, similar Ephesus Fabric C

Sample: no. 120

Matrix: Optically inactive to active, partially recrystallised, originally lime rich, micaceous groundmass.

The temper grains are poorly sorted.

Temper composition: Very frequent monocrySTALLINE quartz, frequent muscovite, moulds of former carbonates, and iron oxide concretions, subordinate oxidized mica and carbonate grains, rare alkali feldspars, very rare polycrystalline quartz, chert, plagioclase, biotite, calcite bioclasts, crystalline rock fragments and heavy minerals. The non-carbonate lithic fragments comprise calcareous sandstone, granite, chert, quartzite, phyllite.

The *heavy mineral* assemblage consists of zircon (50%), rutile (30%), garnet (13%), brookite/anatase (5%), titanite (1%), and traces of hornblende and unidentified grains.

Note: Similar fabric to Aegean Local 1 type no. 157.

Sample: no. 124

Matrix: Optically inactive to active, partially recrystallised, originally lime rich, micaceous groundmass.

Temper: The temper grains are poor to very poorly sorted.

Very frequent monocrySTALLINE quartz, muscovite and moulds of former carbonates, subordinate K-feldspars, oxidized mica and iron oxide concretions, moderate polycrystalline quartz, rare biotite, very rare siltstone/sandstone, crystalline rock fragments and heavy minerals and traces of chert, plagioclase, carbonate grains and calcite bioclasts. The non-carbonate lithic fragments comprise calcareous sandstone, chert, quartzite, phyllite, mica schist.

The *heavy mineral* assemblage consists of rutile (40%), zircon (37%), garnet (14%), brookite/anatase (5%), titanite (1%), disthene (1%), epidote/zoisite (1%) and unidentified grains (1%).

R.S.

Catalogue

Tetragonos Agora

105. Rim, neck, handle fr., 99/067 (1254), Trench 87/2, D = 14.5 cm, V = 1.6 cm, DN = 10.4 cm, H = 25.6 cm, S = 2.5x3.5 cm, light reddish brown (5YR 6/4), SF: buff (7.5YR 7/4), PLATES 10, 63
106. Rim, neck handle fr., 96/053 (920), Trench 96/1, D = 14.2 cm, V = 1.5 cm, DN = 10.2 cm, H = 11.7 cm, light brown (7.5YR 6/4) – light red (2.5YR 6/6), PLATES 10, 64
107. Rim, neck handle fr., 96/029 (1191), Trench 96/1, D = 14.5 cm, V = 1.9 cm, H = 11 cm, S = 2.7x4 cm, reddish yellow (5YR 6/6), SF: very pale brown (10YR 8/3), PLATES 10, 64
108. Rim fr., 96/044 (22), Trench 96/1, D = 14 cm, V = 1.5 cm, H = 6.2 cm, light red (10R 6/6), PLATES 10, 64
109. Rim fr., 92/018 (1638), Trench 92/2, D = 14 cm, V = 1.5 cm, H = 6.2 cm, light red (2.5YR 6/6), PLATES 10, 64
110. Rim, neck, handle fr., 96/047 (281), Trench 96/1, D = 16 cm, V = 1.9 cm, DN = 10.6 cm, H = 11.8 cm, pink (7.5YR 7/4) – reddish yellow (5YR 7/6), SF: pink (7.5YR 8/4), PLATES 10, 64
111. Rim fr., 96/051 (21), Trench 96/1, D = 14.6 cm, V = 1.3 cm, H = 5.7 cm, light red (2.5YR 6/6), PLATES 10, 64
112. Rim fr., 92/030 (1302), Trench 92/2, D = 14.7 cm, V = 1.6 cm, H = 4.8 cm, light red (2.5YR 6/6), PLATES 10, 64
113. Rim, neck, handle fr., 90/025 (1263), Trench 90/4, D = 14.5 cm, V = 1.5 cm, DN = 10.6 cm, H = 26.8 cm, S = 2.4x3.8 cm, light red (2.5YR 6/6), PLATES 10, 64
114. Rim, neck, handle fr., 93/032 (1260), Trench 93/2, D = 14.6 cm, V = 1.5 cm, DN = 10.6 cm, H = 23.7 cm, S = 2.3x4.1cm, reddish yellow (5YR 5/6), PLATES 10, 64
115. Rim, neck fr., 87/022 (1157), Trench 87/2, D = 14 cm, V = 1.7 cm, DN = 10.6 cm, Rim : H = 10.3 cm, light brown (7.5YR 6/4), SF: buff (7.5YR 8/4), PLATES 10, 64
116. Base fr., 87/022 (1155), Trench 87/2, H = 11.5 cm, buff (7.5YR 6/4), SF: buff (7.5YR 8/4), PLATES 11, 64
117. Rim, neck, handle fr., 87/022 (1156), Trench 87/2, D = 13.7 cm, V = 1.6 cm, DN = 10.2 cm, H = 6.6 cm, light red (2.5YR 6/8), SF: reddish yellow (5YR 7/6), PLATES 11, 64
118. Rim fr., 89/028 (1266), Trench 89/2, D = 15 cm, V = 1.5 cm, H = 7.5 cm, reddish yellow (7.5YR 6/6), SF: buff (10YR 7/4), PLATES 11, 64
119. Rim fr., 87/017 (2052), Trench 87/2, D = 16 cm, V = 1.5 cm, H = 9.9 cm, light brown (7.5YR 6/4), SF: buff (7.5YR 8/4), PLATES 11, 64
120. Rim, neck, handle fr., 89/028 (1247), Trench 89/2, D = 14.5 cm, V = 1.5 cm, DN = 10.8 cm, H = 7.7 cm, light reddish brown (2.5YR 6/4), SF: buff (7.5YR 7/4), PLATES 11, 64
121. Rim, neck, handle fr., 90/109 (1256), Trench 90/3, D = 14.5 cm, V = 1.7 cm, DN = 10.6 cm, H = 6.8 cm, light red (2.5YR 6/6), SF: buff (5YR 8/4), PLATES 11, 65
122. Rim, neck, handle fr., 91/003 (1258), Trench 91/1, D = 14.5 cm, V = 1.4 cm, DN = 11 cm, H = 6 cm, pinkish grey (5YR 6/2), SF: buff (10YR 8/3); PLATES 11, 65
123. Rim, neck, handle fr.; 87/032 (1164); Trench 87/1; D = 15 cm, V = 1.5 cm, DN = 10.4 cm, H = 6.5 cm; reddish brown (2.5YR 5/4), SF: pink=buff (5YR 7/4); PLATES 11, 65
124. Rim, neck, handle fr.; 90/027 (303); Trench 90/2; Stamp: *Αγα(...)*; D = 14 cm, V = 1.3 cm, HD = 5.1 cm, DN = 9.4 cm, H = 20.3 cm; light reddish brown (5YR 6/4) – reddish yellow (5YR 7/8); SF: pink (7.5YR 8/4), PLATES 11, 65
125. Rim, neck, handle fr.; 90/021 (298); Trench 90/2; D = 16.5 cm, V = 1.5 cm, HD = 7.2 cm, DN = 12.2 cm, H = 17.8 cm; reddish yellow (5YR 6/6); PLATES 11, 65
126. Rim, neck, handle fr.; 95/257 (1253); Trench 95/1; D = 14 cm, V = 1.6 cm, DN = 10 cm, H = 11.6 cm, S = 2.3x3.7 cm; light red (10R 6/8), SF: buff (10YR 8/3); PLATES 11, 65
127. Rim, neck, handle fr.; 96/010 (1314); Trench 96/1; D = 14 cm, V = 1.4 cm, DN = 10.4 cm, H = 7.9 cm; light reddish brown (2.5YR 6/4), SF: pale red (2.5YR 6/2); PLATES 11, 65
128. Rim fr.; 96/010 (1315); Trench 96/1; D = 14 cm, V = 1.5 cm, DN = 10 cm, H = 9.6 cm; light red (2.5YR 6/6); PLATES 11, 65
129. Rim, neck, handle fr.; 90/001 (1255); Trench 90/1; D = 14.7 cm, V = 1.7 cm, DN = 10.4 cm, H = 10.8 cm, S = 2.2x3.6 cm; light red (2.5YR 6/6), SF: buff (10YR 8/4), PLATES 11, 65

Terrace House 2

551. Rim, 99/221 (61), C3, Stairway 3, D = 11.6 cm, V = 1.3 cm, H = 6.8 cm, light reddish brown (5YR 6/4), PLATES 41, 88
552. Rim, 99/368 (214), 24, 3, WT 2 Stone-cutting saw, D = 13 cm, V = 1.5 cm, H = 4.5 cm, very pale brown (10YR 8/4), PLATES 41, 88
553. Rim, neck, handle, 99/179 (157), B9 West, 45c, D = 13.1 cm, V = 1.6 cm, H = 4.5 cm, pink (7.5YR 7/4), SF: reddish yellow (5YR 7/6), PLATES 41, 88

The amphorae published from Ephesus:

Tetragonos Agora; South Gate: Gassner 1997, 110 f. T. 34. 36 nos. 403–404. 414; Terrace House 2: Ladstätter 2005, 235. 292 T. 163 no. K 260; Ladstätter 2010c, 209, A–K 143 T. 74; State Agora, Well: Meriç 2002, 90 T. 47 no. K 572–573.

Type 9

DRESSEL 35

Form: This is a small amphora with handles resembling those of the Rhodian form. There is a simple rounded rim above the wide neck. The handles peak and run vertically to the upper part of the body. A solid knob supports the oval body²⁶⁴. There are very few amphorae of this type in Ephesus.

Chronology: Dates to the first century A.D.²⁶⁵.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 5a	Around A.D. 23: West Stoa	130
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	131
Ph 6	Mid first to late fourth centuries A.D.	132

Origin: Produced in the Aegean region²⁶⁶.

Contents: Probably wine.

Distribution: They can be found in Rome, Golfe de Fos and in Raetia (Vindonissa). In the eastern Mediterranean: Athens and Ephesus²⁶⁷.

Fabric:

Visual characteristics

Hard, fine fabric, few white and black inclusions, small white limestone or white reaction rims (no. 132), nos. 130 and 131 are over-fired.

Catalogue

Tetragonos Agora

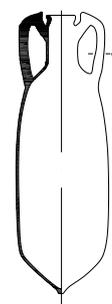
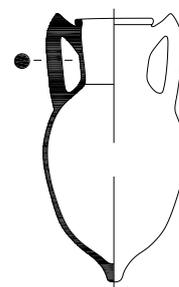
130. Handle fr., 95/161 (157c), Trench 95/1, H = 4.5 cm, S = 2.8x2.4 cm, light brownish grey (10YR 6/2), PLATES 12, 65

131. Handle fr., 95/039 (1619), Trench 95/1, H = 18 cm, S = 2.6x2.5 cm, light red (2.5YR 6/6), PLATES 12, 65

132. Handle fr., 89/068 (1299), Trench 89/3a, H = 16.6 cm, S = 2.6x2.5 cm, pale brown (between 10YR 6/3 to 7/3), PLATES 12, 65

Type 10CRETAN AC4 / AMPHORE CRÉTOISE 4
(Dressel 43; Knossos 4–5)

Form: The AC4 type is characterised by a flat rim, a conical neck, an oval body and a very small rounded basal knob. The handles are round in section. They are horn-shaped, like those of the Rhodian type amphorae and are attached to the neck below the rim²⁶⁸. There are three



²⁶⁴ Williams 2005, Dressel 35.

²⁶⁵ Ettliger – Simonett 1952, 90, Pl. 26, no. 585.

²⁶⁶ Sciallano – Sibella 1994, Dressel 35; Williams 2005, Dressel 35.

²⁶⁷ Ettliger – Simonett 1952, Pl. 26, no. 585; Athens P 21791, Lang 1976, 70 Hc 7, Pl. 39; Williams 2005, Dressel 35.

²⁶⁸ Riley 1979, 181; Hayes 1983, 145: Knossos 4–5; Amphore Crétoise 4; Empereur *et al.* 1991, 493; Sciallano – Sibella 1994, Dressel 43/Crétoise 4; Whitbread 1995, 43; Marangou-Lerat 1996, 84–86; Williams, 2005, Dressel 43.

varieties of the AC4 form²⁶⁹. Their height varies between 60 and 70 cm, the diameter of the rim is 6–8 cm and their volume is 12–13 litres, the quarter-size vessel contained about 5 litres²⁷⁰. There are very few amphorae of this type in Ephesus.

Chronology: This type can be dated from the first half of the first century to the second half of second century A.D. In Ostia this type of amphora occurs in a layer that can be dated to the middle of the second century A.D.²⁷¹.

The amphorae found in Ephesus

Agora

layers	Date range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	134, 135
Ph 6	Mid first to late fourth centuries A.D.	136

Origin: J. HAYES found some amphorae belonging to this type at the Dionysos Villa in Knossos²⁷². He thought the amphora had been locally produced. However, it is now known that AC4/Dressel 43 come from Crete, with production sites at Herakleion, Knossos, Dermatos and Tsoutsouros²⁷³. Rhodian amphorae were also copied on Crete during the first century B.C.²⁷⁴ nos. 134 and 135 amphora handles may also come from this series. Amphorae similar to the type AC4 were published from a Veneto villa²⁷⁵ and, relying on petrological analysis, A. TONIOLO proposed a local workshop²⁷⁶.

Epigraphy: These vessels contained wine, which is confirmed by the *tituli picti*. One in Pompeii reads (*vinum*) CRET(*icum*) EXC(*ellens*)²⁷⁷, while another one from Fos-sur-Mer mentions CRET(*icum vinum*)²⁷⁸. Pliny the Elder, Martial and Juvenal mention Cretan wine²⁷⁹. However, preserved fruit was also shipped in Cretan amphorae, as a *titulus pictus* from London mentions sorb apples²⁸⁰.

Distribution: The AC4 type is known in Cyprus, North Africa, the Eastern Mediterranean, Egypt, at the Danube delta, in the Western Mediterranean and the northern Provinces²⁸¹. Dressel 43 has also been found in shipwrecks at Golfe de Fos²⁸².

Fabric: (analysed no. 135)

Visual characteristics

Fine-textured hard fabric with lots of limestone. Using a microscope, white reaction rims surrounding voids which once held limestone can be seen. There are occasional quartz inclusions. The petrological analyses of D. WILLIAMS shows that the British finds of AC4 were produced in various workshops on the Island of Crete. Frequent subangular grains of quartz are common, together with flecks of mica, a little cryptocrystalline limestone and some red iron oxide. Occasionally, small pieces of igneous and metamorphic rocks are also present²⁸³.

²⁶⁹ Marangou-Lerat 1996, 84–86, fig. 69; 72, 75.

²⁷⁰ Williams 2003, 28.

²⁷¹ Panella 1986, 615, fig. 7–8; Empereur *et al* 1991, 493; Marangou-Lerat 1996, 84–86; Empereur *et al* 1991, 493; Williams 2003, 28 f.;

²⁷² Hayes 1983, 145, Type 5.

²⁷³ Marikoulaki *et al.* 1989; Marangou-Lerat 1996, 85–87.

²⁷⁴ Eiring *et al.* 2002, 61 f. 65 note 19, compare Hayes 1971, 261.

²⁷⁵ Italy, Corte Cavanella, Rovigo, Toniolo 1994, 142 f.

²⁷⁶ On the basis of the inscriptions, A. TONIOLO thinks the content of the amphorae was fish sauce.

²⁷⁷ CIL IV. 5526; Callender 1965, 16; Tchernia 1986, 244.

²⁷⁸ Liou 1987a, 91 fig. 20, F 132.

²⁷⁹ Pliny NH, XIV, 81; Martial XIII, 106; Juvenal XIV, 270; Tchernia 1986, 244; Williams 2003, 28.

²⁸⁰ Williams 2003, 30.

²⁸¹ In details Marangou-Lerat 1996, 89, map 12; Baldacci 1972, 117, fig. 26; Bezczky 1987, 73, no. 268 fig. 23; Martin-Kilcher 1994, 350; Vidrih Perko 1994, 104, Pl. 4.1; Bezczky 1997, 176 no. 18; Williams 2003, 30 f.; Rizzo 2003, 155; Ehmig 2003, 46; Williams 2005, Dressel 43; Bezczky 2005a, 39 f.; Martin-Kilcher 2005, 208. 212; Tomber 2006, 165, Type 49; Majcherek 2007, 11–13.

²⁸² Liou – Marichal 1978, 162–165; Liou 1987a, 89–93.

²⁸³ Williams 2003, 30 f.

Petrology:

Sample: no. 135

Matrix: Calcareous groundmass, optically inactive (partially recrystallised), highly fired.

Temper: Dominant moulds of carbonate grains, frequent to rare mono and polycrystalline quartz grains, opaque particles, K-feldspars, moulds of microfossils, very rare altered volcanic rock fragments and chert.

R.S.

Catalogue

Tetragonos Agora

AC4a type

133. Handle fr., 88/017 (1309), Trench 88/2 (A), H = 5.5 cm, S = 2.5x3.3 cm, buff (10YR 8/3 – 7/3), PLATES 12, 65

134. Handle fr., 91/108 (1358), Trench 91/4, H = 7 cm, S = 3x3.3 cm, white (5Y 8/2) SF: white (2.5YR 8/2), PLATES 12, 65

AC4c type

135. Rim, neck, handle fr., 87/016 (1307), Trench 87/2, D = 6.3 cm, V = 0.7 cm, HD = 1.4 cm, DN = 5.8 cm, H = 10.5 cm, S = 2x2.8 cm, pale yellow? (2.5Y 7/4), PLATES 12, 65

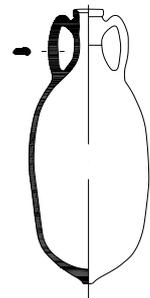
Type 11

CRETAN AC2 / AMPHORE CRÉTOISE 2

(Dressel 36; Pompeii 7 and 10; Mau 7; Schöne 8; Early Roman Amphora 1; Peacock – Williams 39)

Form: This type of amphora is characterised by a simple, flat rim, narrow neck and oval body. The base is a small knob. It has distinctive, arched double handles, which are flat in section. The handles start out below the rim, and after a sharp turn, run in a curve to the upper part of the body²⁸⁴. A. MARANGOU-LERAT distinguished variants A and B. The body of variant B is larger and more curved. The handles run vertically to the body. The handle fragment of the Ephesus amphora is flat in section. This makes it a Type A amphora. There are very few amphorae of this type in Ephesus.

Chronology: This type was primarily produced during the first and second centuries A.D.²⁸⁵. Production may have continued into the third century²⁸⁶.



The amphora found in Ephesus

Agora

layer	Data range	nos.
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	136

Epigraphy: A. MARANGOU-LERAT has published a number of *tituli picti*²⁸⁷.

Origin: This type was produced on the Island of Crete. Type A was manufactured in the workshops of Herakleion, Chersonissos–Est, Lagada, Keratokambos–Oest, and Dermatos. Type B was produced in the workshops of Kastelli de Kissamos and Nopighia–Drapania²⁸⁸.

Contents: The content was probably wine.

²⁸⁴ Peacock – Williams 1986, 73–174; Class 39; Pompeii VIII and X.

²⁸⁵ Marangou-Lerat 1996, 80 f.

²⁸⁶ Sciallano – Sibella 1994, Pompéi 7/Crétoise 2; Riley 1979, 146–146.

²⁸⁷ Marangou-Lerat 1996, 132–146.

²⁸⁸ Markoulaki *et al.* 1989, 567 f.; Empereur *et al.*, 1991, 481–523; Sciallano – Sibella 1994, Amphore Pompéi 8/Crétoise 2; Marangou-Lerat 1996, 77–80, Pl XLII.

Distribution: Outside Crete, they can be found in France (Fos), North Africa (Carthage, Benghazi–Berenike, Leptis Magna, Alexandria), Italy (Pompeii, Pyrgi, Stabies, Boscoreale, Oplontis, Herculaneum, Neapolis, Ostia), Greece (Athens, Isthmia)²⁸⁹.

Fabric:

Visual characteristics

Smooth fabric with small white limestone and occasional red inclusions and voids.

Catalogue

Tetragonos Agora

136. Handle fr., 98/031 (1606), Trench 98/1, H = 17.7 cm, S = 2.5x5.7 cm, yellow (10YR 8/6), PLATES 12, 66

The amphorae published from Ephesus:

State Agora, Well: Meriç 2002, 88 T. 42 no. K 516; Lucas Grave (Lukasgrab): Liko 2010, 241 no. 684.

Type 12

DRESSEL 5

(Sub-Koan, Knossos 19 type: A 58, A 61)

Form: This type is a variant of the Koan type amphorae. The vessel is very slender. The neck and the body are cylindrical. The bottom of the body tapers into a solid knob. The double rolled handles are horn-shaped. The top of the handles were pinched in – often with the fingerprints preserved²⁹⁰. There are very few amphorae of this type in Ephesus.

Chronology: This type was produced until the end of the first century / beginning of the second century A.D.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4–5	30/27 B.C. to A.D. 45	137
Ph 6	Mid first to late fourth centuries A.D.	138
PH 7–9	Late fourth to early seventh centuries A.D.	139

Epigraphy: These amphorae often have Greek *tituli picti* in red paint. (Rome, Lyon and Saint-Romain-en-Gal, Augst, Poetovio and Magdalensberg)²⁹¹. The Greek *tituli picti* were occasionally overwritten in black paint by the merchants or the owners²⁹².

Origin: On the basis of their fabric, John Hayes has suggested that these amphorae are of Aegean origin²⁹³. The fabric of the amphorae of the western provinces is not homogeneous, which means they were probably manufactured in different locations²⁹⁴. It has been suggested that these amphorae come from Kos or in the Aegean²⁹⁵.

²⁸⁹ Panella 1976, T. XLIII 5; Marangou-Lerat, 1996, Pl. XLIII; Martin-Kilcher 2005, 208, 212.

²⁹⁰ Hayes 1983, 149, Type 19, A 58, A 61; Panella 1986, 618, fig. 14–15.

²⁹¹ CIL XV T II. 5; Desbat *et al.* 1987, 152, L14 fig. 6; 164, SRG 4, fig. 11; Martin-Kilcher 1994, 346, P 17; Bezczky 1994a, 19–21 Fig. 3/f.

²⁹² Bezczky 1994a, 21, Fig. 3/f.

²⁹³ Hayes 1983, 149 fig. 23.

²⁹⁴ Józsa *et al.* 1994, 153 f.

²⁹⁵ Panella 1986, 618; Sciallano – Sibella 1994, Dressel 5; Williams 2005, Dressel 5.

Contents: They probably contained wine. A *titulus pictus* on an amphora in Athens (Kerameikos) says there was γλυκός, sweet wine in the vessel²⁹⁶.

Distribution: They can be found in Greece (Athens, Knossos), Italy (Rome, Porto Recanati, Pompeii, San Potito – L'Aquila), France (Lyon, Saint-Romain-en-Gal and on the Dramont D shipwreck), Raetia (Augst), Noricum (Magdalensberg) and Pannonia (Poetovio)²⁹⁷.

Fabric:

Visual characteristics

The fabric is hard, with small particles. There are two groups.

The first group was irregularly fired. They are light red (2.5YR 6/6) and grey on the inside (10YR 5/1 and 7.5YR 6/0) nos. 137 and 139.

The second group was fired regularly. It is light red (10YR 6/6). Both groups have reddish (iron ore), white (perhaps limestone), colourless and dark inclusions no. 138.

The petrological analysis of the amphorae in Noricum show volcanic (augite, andesite and basalt) inclusions²⁹⁸.

Catalogue

Tetragonos Agora

137. Handle fr., 95/302 (1608), Trench 95/2 (b), H = 6.7 cm, S = 2x4.7 cm, grey (10YR 5/1), SF: light red (2.5YR 6/6), PLATES 12, 66

138. Handle fr., 99/043 (1607), R-sewer, H = 8.9 cm, S = 2.6x4.7 cm, light red (2.5YR 6/6), SF: buff (10YR 8/4), PLATES 12, 66

139. Handle fr., 87/166(1602), Trench 87/6, H = 5.1 cm, S = 2.1x4.5 cm, grey (7.5YR 6/0), SF: light red (2.5YR 6/6), PLATES 12, 66

Magnesian Gate

706. Handle fr., MT 99/1–22, H = 7.5 cm, yellowish red (5YR 5/6), PLATES 51, 95

The amphora published from Ephesus:
Terrace House 1: Lang-Auinger – Outschar 1994, 8. 11.

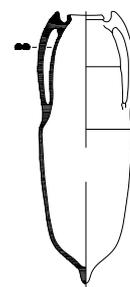
Type 13

AGORA M 54

(„Pseudo – Cos“ en cloche; Knossos 47; Nea Paphos 8)

Form: The form is characterised by a simple rounded rim. The body consists of two bell-shaped forms facing one another. The bifid handles start out below the rim and run by the upper part of the body. They reach the body where the upper and the lower parts meet. The knob is short and pointed. This type is like Agora G 198, but there are a number of differences on the upper part²⁹⁹. There are very few amphorae of this type in Ephesus. An almost complete amphora has been found at the excavation at the port of Ephesus³⁰⁰.

Chronology: This type dates to the period between the second part of the first century A.D. and the end of the second century A.D.³⁰¹.



²⁹⁶ Böttger 1992, 336 no. 47, T 98; see Bagnall *et al.* 2000, 20.

²⁹⁷ Mercado 1974, 297 f. fig. 208; Hayes 1983, 149; CIL XV/2, No. 5, 4863, 4867–4870; Panella 1986, 618 f. fig. 15; Böttger 1992, 336 nos. 46–47, T 98; Martin-Kilcher 1994, 346; Bezeczky 1994a, 19–21 Fig. 3f–g.

²⁹⁸ Józsa *et al.* 1994, 153 f. T. 12.

²⁹⁹ Robinson 1959, 89, Pl. 19; Empereur – Picon, 1989, 230–232; Hayes 1983, 158, Fig. 26, A 103; Hayes 1991, 93, Pl 25, 3; Lund 2005, Agora M 54.

³⁰⁰ H. ZABEHLICKY, personal communication.

³⁰¹ Robinson 1959, 89; Hayes 1983, 98; Hayes 1991, 93; Reynolds 2005a, 564; Lund 2005, Agora M 54.

The amphora found in Ephesus

Agora

layer	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	140

Origin: Production sites have been found in the eastern Mediterranean: in Cilicia in the vicinity of Yumurtalik and on Cyprus³⁰².

Contents: Probably wine and, perhaps, fruit³⁰³. It is also supposed that fish products were shipped in them³⁰⁴.

Distribution: They are found in Greece (Athens, Corinth, Delos), Cyprus, Lebanon (Beirut), Egypt (Alexandria, Mons Claudianus, Karanis), Turkey (Bodrum and Mersin), the western Mediterranean (Carthage, Marseilles), Gallia, Lusitania³⁰⁵.

Fabric: (analysed no. 140)

Visual characteristics

Analysed no. 140, origin Cilicia. Hard, rough fabric, few white and light grains, moderate amount of reddish, brown and black inclusions. The size of the white grains (limestone) is 2 mm, the rest are 0.05 mm.

Petrology

Sample: no. 140

Matrix: Calcareous groundmass, optically inactive (partially recrystallised).

Temper: Dominated by coarse grained probably artificially added, partially well rounded carbonate grains, rare to very rare: mono and polycrystalline quartz, heavy minerals (abundant augite, rare hornblende, epidote, olivine?), altered volcanic rock fragments, plagioclase and potassium feldspar, crystalline rock fragments (quartzite) oxidised serpentinite fragments, chert, microfossil grains.

Comment: Typical are the well rounded carbonate grains together with small amounts of altered volcanic material and oxidised serpentinite grains. A Cilician origin seems to be possible.

R.S.

Catalogue

Tetragonos Agora

140. Handle fr., 97/036 (1603), R–W–Stoa–Room M; H = 15.5 cm, S = 2.8x5 cm, reddish yellow (7.5YR 7/6); PLATES 12, 66

Magnesian Gate

707. Handle fr., MT 99/1–4, H = 12.7 cm, S = 2.4x4 cm, reddish yellow (7.5YR 6/6), PLATES 51, 95

Type 14

AGORA G 198
(Pompeii 13)

Form: This type has a wide rim and a cylindrical neck. The upper part of the body widens in a curve. The lower part of the body narrows steadily and ends in a knobbed base. The bifid handles peak sharply, and run

³⁰² Empereur – Picon, 1989, 231 f.; Sciallano – Sibella 1994, Amphore Agora M 54; Empereur 1998, 395; Lund 2005, Agora M 54.

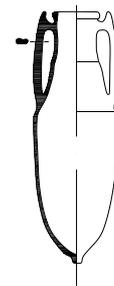
³⁰³ Empereur 1998, 395; Reynolds, 2005, 564; see LR 1 amphora.

³⁰⁴ Opař 2007b, 104, fig. 6.

³⁰⁵ Robinson 1959, 89, no. M 54; Böttger 1992, 338, f. nos. 55–60, T. 99; Warner Slane 2000, 301 note 15; Empereur – Picon 1989, 231; Reynolds 2005a, 564; Hayes 1983, 158; Hayes 1991, 93, nos. 31–32; Şenol – Kerem 2000, 92 no. 15; Lemaître 2002, 214 fig. 1; Lund 2005, Agora M 54; Alpözen *et al.* 1995; I am grateful to Mr. B. BERKAYA for the opportunity to see some complete amphorae in the storage of the Bodrum Museum.

almost vertically to the meeting point of the upper and lower parts of the body³⁰⁶. The shape is like the Agora M 54, but the upper part has a number of differences. There are very few amphorae of this type in Ephesus.

Chronology: This type is dated to the late first to second century A.D.³⁰⁷.



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	141–142

Origin: This type probably comes from the Aegean region, or perhaps Cilicia³⁰⁸.

Contents: Probably wine³⁰⁹.

Distribution: They are found in France, Germany, Italy (Pompeii), Greece (the Athenian Agora), the Adriatic region and the eastern Mediterranean³¹⁰.

Fabric:

Visual characteristics

Hard, rough fabric, moderate amount of small dark and black particles, sparse white inclusions. The small ones are 0.05 mm in size, the large ones 1 mm.

Catalogue

Tetragonos Agora

141. Handle fr., 97/028 (1604), R–W–Stoa–Room M, H = 8.5 cm, S = 2.8x4.7 cm, light reddish brown – reddish brown (5YR 6/4 – 5/4), PLATES 12, 66

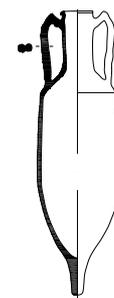
142. Handle fr., 98/161 (1605), R–W–Stoa Room M, H = 5.5 cm, S = 2.9x4.3 cm, light reddish brown (5YR 6/4), PLATES 13, 66

Type 15

KOAN STYLE WITH PINCHED HANDLE (Sub-Koan, Knossos 19 type: A 53)

Form: This type is like the amphora of Kos, but the handles, neck and base are different. The handles run to a peak and are pinched in from the sides³¹¹. The lower part of the body is cylindrical, ending in a long, pointed toe. There are very few amphorae of this type in Ephesus.

Chronology: This type can be dated to the first and second centuries A.D.³¹².



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	143–145

Terrace House 2

layer	Data range	nos.
2a–4	Late first century B.C. to early second century A.D.	554

³⁰⁶ Robinson 1959, 43, Pl. 8, G 198; Williams 2005, Pompeii 13.

³⁰⁷ Sciallano – Sibella 1994, Diverses Amphores Grecques; Panella 1986, 618; Williams 2005, Pompeii 13.

³⁰⁸ Reynolds 2005a, 564 f.

³⁰⁹ Reynolds 2005a, 564 f.; Williams 2005, Pompeii 13.

³¹⁰ Robinson 1959, 43, G 198; Lemaître 2002, 214, fig.1; Panella 1986, 618 Fig. 16; Ehmig 2003, 46 (published as Dressel 2–5, no. 674); Auriemma – Quiri 2004, 45, 47; Williams 2005, Pompeii 13.

³¹¹ Hayes 1983, 149, Type 19, A 53; Panella 1986, 618, Fig. 14–15; Williams 2005, Pseudo-Koan.

³¹² Auriemma – Quiri 2004, 48, mid second century A.D.; Parker 197, A.D. 200.

Origin and content: This type was probably produced in a number of sites in the Aegean region. The content was probably wine.

Distribution: They are found in Italy (Grado wreck, Pompeii, Porto Recanati), North Africa (Benghazi–Berenike), Greece (Athens), Crete (Knossos) and Turkey (Bodrum)³¹³.

Fabric:

Visual characteristics

Hard, rough fabric.

No. 144, many fine grains and rims of limestone voids, few dark grains.

No. 145, coated with buff slip, similar to no. 144, few white, colourless and dark particles.

No. 554, similar to no. 144, few white, colourless and dark inclusions.

Catalogue

Tetragonos Agora

143. Handle fr., 99/042 (1615), R–sewer, H = 6.5 cm, S = 2.9x3.6 cm, red (2.5YR 5/6), PLATES 13, 66

144. Handle fr., 99/068 (1616), R–sewer, H = 5.8 cm, S = 2.2x3.7 cm, red (2.5YR 5/6), PLATES 13, 66

145. Handle fr., 99/042 (1614), R–sewer, H = 7 cm, S = 2.7x4.5 cm, reddish brown (2.5YR 5/4), PLATES 13, 66

Terrace House 2

554. Handle, 99/293 (14), C3, Stairway 3, H = 7.1 cm, S = 3.5x2.2 cm, yellowish red (5YR 5/6), PLATES 41, 88

Type 16

AGORA G 199

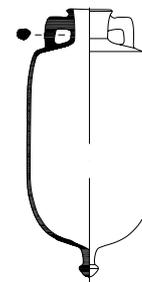
(Pinched Handle amphora; Mau 37–38; Ostia 631; Mid Roman Amphora 4; Zemer 41; Nea Paphos 3)

The earlier name for this type can be found in H. ROBINSON'S book³¹⁴. The same form has been called different names at different sites, but is often called “pinched-handle” on the basis of this distinctive feature.

Form: It has two short, angular and grooved handles, pinched in from the sides. The handles join below the rim and reach the shoulder. The length of the horizontal and vertical parts varies. It has a plain rim, short neck, wide, almost cylindrical body, and long base with a knob³¹⁵. There are very few amphorae of this type in Ephesus.

Chronology: The earliest amphorae of this type are found in Pompeii (before A.D. 79), and in Athens (the end of the first century A.D.)³¹⁶.

They occur at a number of sites in Cyprus and in the eastern Mediterranean. The form was produced until the fourth century A.D., when it was probably replaced by the Late Roman 1 type³¹⁷.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 5a	Around A.D. 23: West Stoa	146

Epigraphy, Inscription: A few amphorae with *tituli picti* (ΚΑΛΛΙ) have been published from Pompeii (form XXVII)³¹⁸.

³¹³ Mercado 1974, 297 f., 376, 384, 386; Hayes 1983, 149; Panella 1986, 618, Fig 14–15; Lopreato 1993, 273 fig. 2; Alpözen *et al.* 1995, 98; Auriemma 2000, 33, fig. 7; Auriemma – Quiri 2004, 48; Williams 2005, Pseudo–Koan.

³¹⁴ Robinson 1959, 43, G 199, Pl. 8. 106, M 239 Pl. 28.

³¹⁵ Riley 1979, 186, Mid Roman Amphora 4; Zemer 1977, 41; Hayes 1991, 91 f. type 3; Lund 2005, Agora G 199.

³¹⁶ CIL IV, 2; Riley 1979, 186; Panella 1986, 622; Lund 2005, Agora G 199.

³¹⁷ Lund 2005, Agora G 199; Reynolds 2005a, 564 “Beirut ... imports of the *Anemurium*-Rough Cilician variants are a regular feature in 2nd to late 4th century context, an indication of the separate distribution mechanisms of west Cypriot and Cilician products.”

³¹⁸ CIL IV, 6386–6388.

Origin: J. HAYES has suggested that this type comes from Cyprus. J. LUND agrees with this idea³¹⁹. However, no production workshop has been identified. Three workshops have been found in the area of Rough Cilicia (near Anemurium, Biçkici and Sydra)³²⁰.

Contents: The type often has traces of resin, suggesting it is a wine container. It is also thought to have contained olive oil and other products³²¹.

Distribution: It can be found all over the eastern Mediterranean: Athens, Benghazi (Berenice), Cyprus, Rough Cilicia, Egypt, Caesarea, Corinth and Crete. Also in Italy (Ostia, Luni, Pompeii, Brindisi) and in the Adriatic region, Gallia, Pannonia and the Black Sea region³²².

Fabric: (analysed no.146)

According to Hayes and Lund, the amphora fabric without mica was probably produced in Cyprus, while the fabric with mica was produced in one of the workshops of Rough Cilicia³²³.

Visual characteristics

Hard fabric. Few, small, white (0,05–0.5 mm) and many colourless grains, few large, red, colourless and grey inclusions (0.5–1 mm). Rich in mica.

Petrology

Sample: no. 146

Matrix: Very calcareous, abundant mica.

Temper: Very frequent muscovite, monocrystalline-quartz, limestone, frequent iron oxides, rare brown mica, feldspars, traces of shell fragments and foraminifers, siltstone fragments, crystalline rock fragments, polycrystalline quartz, chert.

R.S.

Catalogue

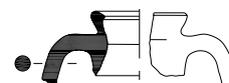
Tetragonos Agora

146. Rim, neck, handle fr., 95/180 (1328), Trench 95/1, D = 12.5 cm, V = 0.9 cm, HD = 1 cm, DN = 12 cm, H = 6.5 cm, S = 2.2x2.8 cm, light reddish brown (5YR 6/3), PLATES 13, 66

Type 17

EPHESUS 29 / BROAD CHALICE RIM AMPHORA

Form: We have only the upper part of the amphora. It has a wide, curved, everted rim which becomes narrow where the rim meets the neck. The handles – oval in section – start out from the point where the neck and the rim meet. There are very few amphorae of this type in Ephesus.



³¹⁹ Hayes 1991, 91 f.; Sciallano – Sibella 1994, Amphore Agora G 199; Lund 1999, 10 f.; Lund 2000b, 565–578; Lund 2005, Agora G 199.

³²⁰ Williams 1989, 90–95; Rauh – Slane 2000, 319–329; Lund 2005, Agora G 199; Rauh 2004, 330; Majcherek 2007, 22.

³²¹ Lund 2000b, 565; Lund 2005, Agora G 199; see LR 1 amphora in this volume.

³²² Robinson 1959, 43; Zemer 1977, type 41, 52 f.; Riley 1979, 186 f.; Panella 1986, 621 f. fig. 19; Majcherek 1990, 47 fig. 12 no. 4; Kerameikos: Böttger 1992, 340, nos. 65–66; Bezeczky 1995b, 169 fig. 8; Lund 1999, 10 fig. 10; Abadie-Reynal 1999, 263; Lund 2000b, 570; Luni II, 278, fig. 17; Lemaître 2002, 214 fig. 1; Lawall 2003, 187; Auriemma – Quiri 2004, 49; Lund 2005, Agora G 199; Auriemma – Quiri 2006, 232–235; Tomber 2006, 171, Type 60; Majcherek 2007, 21–24 fig. 5–6 and detailed bibliography;

³²³ Lund 2000b, 569–570.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	147
Ph 11	Unstratified complexes	148

Origin: Probably of Aegean origin.

Contents: Unknown.

Fabric: (analysed no. 148)

Visual characteristics

Hard, coarse fabric, dark red with many large (0.5–1 mm) colourless and a few grey inclusions.

Petrology

Sample: no. 148

Matrix: Brownish, optically inactive, and slightly micaceous

Temper: Very coarse grained, mainly mono and polycrystalline quartz and feldspars (plagioclase, albite, and K-feldspar), subordinate mica (muscovite, biotite and oxidized sheet silicates), quartz-feldspar fragments, seems to be rich in heavy minerals (mainly amphibole and titanite, subordinate epidote, and garnet), traces of carbonate grains (due to bad thin section quality only fragmentarily preserved).

Comment : Typical seems to be the abundance of amphibole, feldspars and the occurrence of quartz feldspar fragments.

Note: similar fabric to Rhodian amphora Type no. 12.

R.S.

Catalogue

Tetragonos Agora

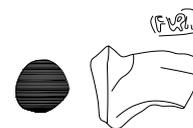
147. Rim fr., 96/029 (326), Trench 96/1, D = 18 cm, V = 2.2 cm, H = 5.7 cm, red (2.5YR 5/6), PLATES 13, 66

148. Rim, neck, handle fr., 90/010 (29), Trench 90/4, D = 18.6 cm, V = 2.5 cm, HD = 5.5 cm, H = 12.4 cm, S = 2.9x5 cm, red (2.5YR 5/8), PLATES 13, 66

Type 18

EPHESUS 373 / AMPHORA WITH FURIUS STAMP

Form: Only a stamped handle fragment is known. It is circular in section. The type cannot be defined. There is a single amphora of this type in Ephesus.

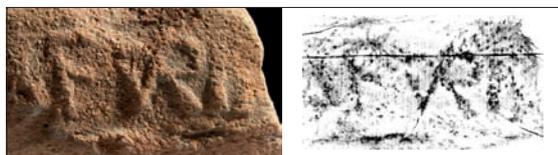


The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 6–9	First to early seventh centuries A.D.	149

Stamp:



Furi(...) – no. 149 (V–R in ligature)

The consul members of *gens Furi* are known from Tusculum (Latium) from the second and first centuries B.C.³²⁴. Cicero mentions that a certain L. Furius was the same age as himself³²⁵. Suetonius remarked that Furius Leptinus fought in one of the gladiator games organized by Caesar³²⁶.

The name Furius is known from Delos, Samothrace, Crete (Gortin), Kos, Pergamon, and Smyrna³²⁷. There was another C. Flavius Furius Aptus in Ephesus in the second century A.D.³²⁸.

Fabric:(analysed no. 149)

Visual characteristics

Hard, reddish fabric, small particles, microfossils, a number of red iron oxide particles and limestone or white reaction rims are visible.

Petrology

Sample: no. 149

Matrix: Brownish, fine grained, optically inactive groundmass.

Temper: Dominant monocrystalline quartz, frequent to rare K-feldspars (partially microcline), coarse grained augite grains, crystalline rock fragments (quartz-feldspar aggregates, quartzite), plagioclase (partially of volcanic origin), very rare altered volcanic rock fragments, moulds of carbonate grains, hornblende.

Comment: Typical is the presence of coarse grained heavy minerals (frequent augite, traces of brown hornblende) of volcanic origin together with non-volcanic crystalline fragments, as well as the absence of mica. The origin remains unclear (not an Ephesian fabric).

R.S.

Catalogue

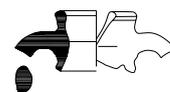
Tetragonos Agora

149. Handle fr., 85/001 (373), Trench 85/1, Stamp: FVRI...
 `Furi(...)` (V-R in Ligature), H = 4.8 cm, S = 3.1x3.2
 cm, red (2.5YR 5/6), PLATES 13, 66

Type 19

EPHESUS 1274 / CHALICE RIM AMPHORA

Form: We have only the upper part of the amphora. It resembles the Ephesus 29 type, though it is smaller. There is a single amphora of this type in Ephesus.



The amphora found in Ephesus Agora

layer	Data range	no.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	150

Fabric:

Visual characteristics

Hard, red fabric with many large (0.5–0.7 mm), colourless particles, and with occasional red iron oxide inclusions.

³²⁴ Licordari 1982, 54.

³²⁵ Cicero, Laelius, 27.

³²⁶ Suetonius, Caesar, 39.

³²⁷ Hatzfeld 1919, 392.

³²⁸ Rathmayr 2005, 227 note 308; Rathmayr 2009.

Catalogue

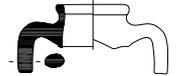
Tetragonos Agora

150. Rim, neck, handle fr., 92/030 (1274), Trench 92/2,
D = 14 cm, V = 1.8 cm, HD = 5.9 cm, H = 10.4 cm, S =
2.8x4.6 cm, red (2.5YR 5/6), SF: reddish yellow (5YR
6/6), PLATES 13, 66

Type 20

LOCAL AEGEAN 1

Form: This type of amphora has a simple, flat rim and a cylindrical neck. The handles start out horizontally from below the rim and almost immediately take a sharp turn. The handles are oval in section. The amphorae may be related to the Late Hellenistic variants of the Nikandros group³²⁹. This type of amphora is common in Ephesus.



Chronology: Late second century B.C. to early Augustan period.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	151
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	152–153, 155–157, 159–161, 163–164
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	162
Ph 7–9	Late fourth to early seventh centuries A.D.	165
Ph 11	Unstratified complexes	154, 158

Terrace House 2

layers	Data range	nos.
1a	Late Hellenistic	543
2	First century B.C.	539
2a	Late first century B.C.	540–541
2a–3a	Late first century B.C. to early first century A.D.	542, 544

Stamp: There are monogram stamps in oval and rectangular frames on the upper part of the handles.



no. 156



no. 157



no. 158

Προμη(...) – no. 156–158. They were made with the same stamp. For the name Προμηθίων at Ephesus see IvE 1473, 1.

³²⁹ Lawall 2004, 182; Bezczyk 2004, 87.



Παχο (...) – no. 159, or perhaps an Egyptian name Πάνοϋς, Arycanda TAM II 812, 1.

Origin: According to the petrological analyses, the Local Aegean 1 type of amphora may have been produced in the vicinity of Ephesus.

Contents: Unknown.

Fabric: (analysed nos. 152, 153, 157, 159 and 168)

Visual characteristics

Hard, calcareous sandy fabric, with large (0.1 – 0.5 mm) white, red and grey grains.

Note: The petrological analyses show that the Local 1 amphorae are in a similar fabric to that of the Mushroom rim/Nikandros Group and Local 2 amphorae (nos. 168, 520, 526, 527, 529, 531).

Petrology

Ephesus Fabric C
High fired group

Sample: no. 152

Matrix: Calcareous groundmass, micaceous, optically inactive.

Temper: Frequent: quartz, mica, oxidised sheet silicates, iron-oxide concretions, carbonate pseudo morphs, frequent to moderate: K-feldspar, plagioclase, rare: crystalline rock fragments (quartz-feldspar aggregates, quartzite).

The *heavy mineral* assemblage probably contains a similar composition as reference BoxNo: 96/051–54 (Type Mushroom rim/Nikandros Group) but with only few grains.

Sample: no. 153

Matrix: Calcareous, micaceous, optically inactive

Temper: Frequent: muscovite, monocrystalline quartz and moulds of carbonate grains, oxidized mica (biotite, phlogopite, oxidised sheet silicates), moderate: K-feldspars, very rare: crystalline rock fragments, polycrystalline quartz, siltstone/sandstone fragments, traces of bioclast fragments and chert.

The *heavy mineral* assemblage is dominated by garnet with subordinate zircon and rutile.

Samples: no. 157

Matrix: Optically inactive to active, partially recrystallised, originally lime rich, micaceous groundmass.

The temper grains are poor to very poorly sorted.

Temper composition: Very frequent: monocrystalline quartz, muscovite and moulds of former carbonates, subordinate alkali feldspars, oxidised mica and iron oxide concretions, moderate: polycrystalline quartz, rare: biotite, very rare: siltstone/sandstone, crystalline rock fragments and heavy minerals and traces of chert, plagioclase, carbonate grain and calcite bioclasts. The non-carbonate lithic fragments comprise calcareous sandstone, chert, quartzite, phyllite and mica schist.

The *heavy mineral* assemblage consists of rutile (40%), zircon (37%), garnet (14%), brookite/anatase (5%), titanite (1%), disphen (1%), epidote/zoisite (1%) and unidentified grains (1%).

Comment: Very similar to Cup-shaped rim type, no. 120.

Sample: no. 159

Matrix: Calcareous, recrystallised, isotropic and highly fired.

Temper: Very frequent oxidised mica; frequent-moderate monocrystalline quartz, iron oxide particles; moderate K-feldspar; rare crystalline rock fragments, polycrystalline quartz and traces of plagioclase.

The *heavy mineral* assemblage probably contains a similar composition as reference BoxNo: 96/051–54 (Type Mushroom rim/Nikandros Group).

Note: nos. 168, 529, 531 (1168/32, 98/103, 96/051–53 reference) also belong to this group.

R.S.

Catalogue

Tetragonos Agora

151. Rim, neck, handle fr., 99/067 (1673), Trench 87/2, D = 10.5 cm, V = 1.2 cm, HD = 1.9 cm, H = 7.4 cm, S = 1.9x3 cm, buff (10YR 7/4), SF: pale yellow (2.5Y 8/4), PLATES 13, 67
152. Rim, neck, handle, base fr., 96/047 (280), Trench 96/1, D = 10 cm, V = 1.2 cm, HD = 1.7 cm, DN = 9 cm, H = 20.1 cm, S = 1.8x3.6 cm, light brown (7.5YR 6/4), PLATES 13, 67
153. Rim, neck, handle fr., 96/047 (282), Trench 96/1, D = 11.5 cm, V = 1.3 cm, HD = 1.7 cm, H = 13.4 cm, S = 2x3.4 cm, light red (2.5YR 6/6), PLATES 13, 67
154. Rim, neck, handle fr., 95/002 (28), Trench 92/2, D = 11.2 cm, V = 1.2 cm, HD = 1.6 cm, H = 10.5 cm, S = 2x2.9 cm, light reddish brown (5YR 6/4), SF: pink (7.5YR 8/4), PLATES 14, 67
155. Rim, neck, handle fr., 96/051 (278), Trench 96/1, D = 12.5 cm, V = 1.2 cm, HD = 1.9 cm, H = 9.5 cm, S = 1.8x3 cm, reddish yellow (5YR 6/6), PLATES 14, 67
156. Rim, neck, handle fr., 87/033 (1372), Trench 87/1, Stamp: Προμε(...), D = 11.7 cm, V = 1.3 cm, HD = 1.6 cm, DN = 10.4 cm, H = 11.3 cm, S = 3.2x1.8 cm, light brown (7.5YR 6/4), PLATES 14, 67
157. Handle fr., 96/047 (1), Trench 96/1, Stamp: Προμε(...), H = 20.4 cm, S = 1.8x3.5 cm, light brown (7.5YR 6/4), SF: pink (7.5YR 8/4), PLATES 14, 67
158. Handle fr., 96/... (1663), Cleaning area 95–93/2, Stamp: Προμε(...), H = 6.3 cm, reddish yellow (5YR 6/6), PLATES 14, 67
159. Rim, neck, handle fr., 96/051 (55), Trench 96/1, Stamp: Παχο(...), D = 13 cm, V = 1.4 cm, HD = 1.4 cm, DN = 11.6 cm, H = 20 cm, S = 2.3x cm, light brown (7.5YR 6/4), SF: pink (7.5YR 8/4), PLATES 14, 67
160. Rim, neck, handle fr., 96/045 (1860), Trench 96/1, D = 11 cm, V = 1.2 cm, HD = 1.5 cm, H = 6.3 cm, S = 2.1x2.9 cm, light brown (7.5YR 6/4), SF: pink (7.5YR 8/4), PLATES 14, 67
161. Rim, neck, handle fr., 87/032 (1165), Trench 87/1, D = 10.7 cm, V = 1.3 cm, HD = 1.4 cm, DN = 9.7 cm, H = 12.7 cm, S = 2.1x3.3 cm, light brown (7.5YR 6/4), PLATES 14, 67
162. Rim, neck, handle fr., 95/010 (1664), Trench 95/2, D = 11 cm, V = 1.2 cm, HD = 1.7 cm, DN = 9.8 cm, H = 9.8 cm, S = 1.8x3.5 cm, pink (5YR 7/4), PLATES 14, 67
163. Rim, neck, handle fr., 87/033 (1665), Trench 87/1, D = 11.6 cm, V = 1.4 cm, HD = 1.7 cm, DN = 10 cm, H = 7.8 cm, S = 1.8x3 cm, reddish yellow (5YR 6/6), PLATES 14, 67
164. Rim, neck, handle fr., 89/015 (2003), Trench 89/2 ?, D = 10.8 cm, V = 1.3 cm, HD = 1.5 cm, H = 20.5 cm, S = 2x3.5 cm, light red (2.5YR 6/6), PLATES 14, 67
165. Rim, neck, handle fr., 99/062 (1672), R–sewer, D = 10.6 cm, V = 1.1 cm, HD = 1.6 cm, H = 8.8 cm, S = 2.4x3.7 cm, light red (2.5YR 6/6), SF: very pale brown (10YR 8/3), PLATES 14, 67

Terrace House 2

539. Rim, neck, handle, 99/696 (280), B6, Room 32c, D = 10.9 cm, V = 1 cm, H = 9.5 cm, pale yellow (5Y 7/3), PLATES 40, 87
540. Rim, neck, 99/065 (309), WT 2 Stone-cutting saw, D = 10.9 cm, V = 1.2 cm, HD = 1.9 cm, H = 8.6 cm, reddish yellow (5YR 7/6), SF: pink (7.5YR 7/4), PLATES 40, 87
541. Handle, 99/065 (308), WT 2, Stone-cutting saw, H = 15.3 cm, S = 2.7x1.6 cm, reddish yellow (5YR 6/6), SF: very pale brown (10YR 8/4), PLATES 40, 87
542. Rim, neck, 99/074 (313), WT 2, Stone-cutting saw, D = 11.3 cm, V = 1 cm, HD = 1.7 cm, H = 5.2 cm, pink (7.5YR 7/4), PLATES 40, 87
543. Rim, neck, 99/511 (113), B9 Ost 45c, D = 11.2 cm, V = 0.9 cm, HD = 1.7 cm, H = 8.3 cm, very pale brown (10YR 7/4), PLATES 40, 87
544. Rim, neck, 99/201 (320), WT 2 Stone-cutting saw, D = 10.8 cm, V = 1.2 cm, HD = 1.6 cm, H = 9.4 cm, reddish yellow (5YR 6/6), SF: very pale brown (10YR 8/4), PLATES 40, 87

Magnesian Gate

708. Handle fr. MT 99/1–32, H = 11 cm, S = 1.7x3.2 cm, reddish yellow (7.5YR 7/6 – 5YR 7/6), PLATES 51, 95
709. Base fr. MT 99/1–27, H = 6.5 cm, white yellowish brown (10YR 6/4), PLATE 51, 95

The amphorae published from Ephesus:

Lucas Grave (Lukasgrab): Liko 2001, 88 T. 58 no. 109; Terrace House 1, Hellenistic Well SR 9c: Bezeczky 2003, 38. 68, T. 23 K 276–278; Terrace House 2: Ladstätter 2005, 235. 292 T. 163–164 nos. K 263–266. 236. 300, T. 168 nos. K 341. 238. 306 T. 173 nos. K 406. 329 T. 187 nos. K 641.

Type 21

LOCAL AEGEAN 2

Form: The wide ribbon rim is attached to a cylindrical neck. The handles are attached below the rim and are oval in section. The rest of the form is unknown. This type can also be related to the Late Hellenistic pieces of the Nikandros group and the Local Aegean 1 type. There are few amphorae of this type in Ephesus.



Chronology: Early first century B.C. to early Augustan period.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	166–170
Ph 11	Unstratified complexes	171

Origin: These amphorae were either produced in the vicinity of Ephesus or in the Meander Valley.

Contents: Unknown.

Fabric: (analysed no. 168)

Visual characteristics

Hard, calcareous sandy fabric, with large (0.1 – 0.5 mm) white, red and grey inclusions.

Petrology

Ephesus Fabric C
High fired group

Sample: no. 168

Matrix: Calcareous, recrystallised, highly fired

Temper: Frequent carbonate pseudo morphs, monocrystalline quartz; moderate K-feldspar, iron oxide particles, rare crystalline rock fragments, polycrystalline quartz, clay clasts, chert, mica (partly totally altered or oxidised, traces of heavy minerals).

Note: nos. 152, 153, 157, 159, 529, 531 also belong to this group.

R.S.

Catalogue

Tetragonos Agora

- | | |
|---|--|
| <p>166. Rim, neck, handle fr., 96/047 (283), Trench 96/1, D = 13 cm, V = 1.2 cm, HD = 4.2 cm, DN = 10.2 cm, H = 13.2 cm, S = 2.4x3.6 cm, light reddish brown (5YR 6/4), PLATES 15, 68</p> | <p>169. Rim, neck, handle fr., 96/047 (288), Trench 96/1, D = 13 cm, V = 1.2 cm, HD = 2.8 cm, DN = 11 cm, H = 7.2 cm, S = 2x4.5 cm, light reddish brown (5YR 6/4), PLATES 15, 68</p> |
| <p>167. Rim, neck, handle fr., 96/047 (287), Trench 96/1, D = 11.5 cm, V = 1 cm, HD = 3.2 cm, DN = 9 cm, H = 9.2 cm, S = 2x3.3 cm, reddish yellow (5YR 6/6), PLATES 15, 68</p> | <p>170. Rim, neck, handle fr., 96/044 (23), Trench 96/1, D = 12.4 cm, V = 1.4 cm, HD = 2.6 cm, DN = 11.2 cm, H = 9.7 cm, S = cm, reddish yellow (7.5YR 7/6), SF: buff (10YR 7/3), PLATES 15, 68</p> |
| <p>168. Rim, neck fr., 96/047 (286), Trench 96/1, D = 14 cm, V = 2 cm, HD = 3.8 cm, DN = 9.6 cm, H = 13.2 cm, light reddish brown (5YR 6/4), PLATES 15, 68</p> | <p>171. Rim, neck, handle fr., 95/002 (24), Trench 92/2, D = 12.8 cm, V = 1.6 cm, HD = 3.1 cm, DN = 9.8 cm, H = 11.5 cm, S = 2x3.2 cm, reddish yellow (5YR 6/6), SF: pink (5YR 8/4), PLATES 15, 68</p> |

The amphora published from Ephesus:

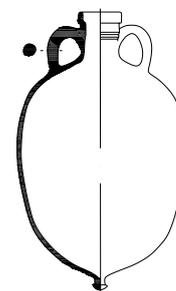
Lucas Grave (Lukasgrab): Liko 2001, 88 T. 58 no. 109.

Type 22

DRESSEL 25

Form: There are a number of variations on the Dressel 25 type. The more or less globular body has a short neck, curved rim and rounded handles. In the words of J. H. VAN DER WERFF: “The step-shaped rim resembles that of the late ‘Corinthian A’ amphorae as well as some Brindisine rim shapes.”³³⁰ One rim is very similar to those of the Brindisi amphorae (no. 178) but the fabric is not the same. There are few amphorae of this type in Ephesus.

Chronology: This type of amphora belongs to the period between the end of the first century B.C. and the first century A.D.³³¹.



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	172–183
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	184–185

An example was found in the filling (dated to the first quarter of the first century A.D.) of the well at the State Agora³³².

Epigraphy, Inscription: H. DRESSEL published a number of *tituli picti* on such amphorae in Rome³³³. Some of the Greek inscriptions in red paint refer to the capacity of the amphora.

Stamp:



Ζωίλου – no. 183, (z – reverse, v – upside down) Zoilus is obviously the name of a slave.

Bibl.: IG IV. 366, 1; Van der Werff 1986, 116 no. 62; Fraser – Matthews 1987, 195 f.; Sherwin-White 1978, 452 mentions this among the names from Kos. The same name occurs on other types of amphorae (Brindisi and Lamboglia 2): Criscuolo 1982, 133 no. 199; Desy 1989, 179, 1–3; Sztetyło 2000, 146 no. 241 does not indicate the type of amphora (dated to the second century B.C.) that has the stamp.

Origin: J. H. VAN DER WERFF suggested that the provenance of these amphorae could be southern Italy or Greece³³⁴. However, it seems more likely that the amphorae investigated were produced in Greek areas³³⁵.

Distribution: This amphora can be found in Greece (Athens), Italy (Rome, Ostia, Luni, Alba Pompeia, Aquileia, Altino, Padova, Verona, San Vittore Olona), Noricum (Magdalensberg) and in the eastern Mediterranean³³⁶.

³³⁰ Van der Werff 1986, 115 f.

³³¹ Van der Werff 1986, 115; Cipriano – Carre 1987, 485.

³³² Meriç 2002, 92, K 515, T 42.

³³³ CIL XV, 4872. 4878–4879. 4883.

³³⁴ Van der Werff 1986, 116.

³³⁵ Corinth region Whitbread 1995, 344–346; Northern coast of the Peloponnesos Sikyon and Aigio, Lawall *et al.* 2010, 396.

³³⁶ Dressel 1879, 176; CIL XV, 4816–20, 72, 78–79, 4881, 4883; Grace 1979, fig. 38; Van der Werff 1986, 116, no. 62; Cipriano – Carre 1987, 485, fig. 12; Toniolo 1991, 35; Pesavento Mattioli *et al.* 1992, 149, no. 285 T. 23; Mazzocchin – Pastore 1995, 104, fig. 18; Bruno 1997, 526, no. 43; Buchi 1973, 611, nos. 170, 172. 174 T. XI; Rizzo 2003, 170; Scotti 1994, 34, Tav. IV c-d; Bezeczky 1998a, 238 f.; Bezeczky 2005b, Dressel 25.

Fabric: (analysed nos. 172, 180, 183 and 184)

Visual characteristics

The fabric is not homogeneous and a number of fabrics can be distinguished.

1. Ionian region Fabric A. Hard fabric, containing small white inclusions of limestone, nos. 172, 173, 175, 180, 184, 185. No. 184 is irregularly fired.
2. Ionian region Fabric B, no. 183. Hard fabric, micro size (0.05 mm) white limestone and macro size (0.5 mm) iron ore inclusions. Produced, perhaps, in the Corinth region.
3. Hard, fine fabric with very small white and reddish–brown inclusions, nos. 176, 179, 181, 182.
4. Hard fabric with moderate frequency inclusions, white, brown and red particles, meso – macro size (0.05–1 mm), no. 174.
5. Hard fabric, moderate frequency inclusions, 0.05–0.5 mm size, poorly sorted, white (limestone?), brown–black iron ore, and reddish particles, no. 178.
6. Hard fabric, moderate frequency inclusions, 0.05–0.1 mm size, well sorted white (limestone?) particles, no. 177.

Petrology

Ionian region Fabric A

Samples: nos. 172, 180 and 184

Matrix: Optically inactive partially recrystallised groundmass.

Temper: Poorly to very poorly sorted, the temper grains consist of monocrystalline quartz, subordinate alkali feldspars and moulds of former carbonates, moderate muscovite and iron oxide concretions, rare chert and oxidised mica, very rare polycrystalline quartz and crystalline rock fragments and traces of carbonate grains, siltstone/sandstone, volcanic rock fragments and heavy minerals. The lithic fragments mainly consist of chert, radiolarite, quartzite, and siltstone

The *heavy mineral* assemblage (arithmetic mean of three samples) consists of garnet (32%), zircon (22%), rutile (14%), chromium spinel (14%), epidote/zoisite (8%), brookite/anatase (6%), tourmaline (1%), hornblende (1%) and traces of titanite, monazite, sillimanite, augitic clinopyroxene, diopsidic clinopyroxene and unidentified grains.

Comment: Typical is the original high content in carbonate particles and chert (partially radiolarite) and the heavy mineral assemblage dominated by garnet, zircon, rutile and chromium spinel together with epidote. Due to lack of comparisons no confident provenance information can be given at the moment. The sample no. 180 shows a similar mineralogical composition, but a significant lower natural temper content. Comparable fabrics and raw materials are also well known, for example from the Ionian region and the Adriatic Ionian coast.

R.S.

Ionian region Fabric B

Sample: no. 183

Matrix: Optically inactive, lime rich groundmass.

Temper: Very poorly sorted, frequent monocrystalline quartz, subordinate alkali feldspars, muscovite, oxidised mica, moulds of former carbonates, moderate siltstone/sandstone, rare chert, very rare polycrystalline quartz, carbonate grains and heavy minerals and traces of crystalline rock fragments. Iron oxide concretions are frequent,

The *heavy mineral* assemblage consists of garnet (36%), rutile (22%), hornblende (17%), epidote/zoisite (11%), brookite/anatase (6%), titanite (5%) and zircon (3%).

Comment: Typical are the reddish, angular siltstone clasts together with carbonate particles and chert (partially radiolarite) and the heavy mineral assemblage dominated by garnet, rutile and hornblende but no chromium spinel. The reddish siltstone clasts could have been artificially added as temper. Due to lack of comparisons no clear provenance information can be given at the moment. Comparable thin section fabrics and raw materials are known, for example, from Corinth (similar to Corinthian A fabric), the Ionian region and the Adriatic Ionian coast.

R.S.

Catalogue

Tetragonos Agora

172. Rim, neck, handle fr., 96/047+93/032 (1262+311), Trench 96/1 + 93/2, D = 14.4 cm, V = 1.6 cm, HD = 6.6 cm, DN = 11 cm, H = 14.5 cm, S = 3.6x3.4 cm, red (10R 5/6), SF: pink (5YR 7/4), PLATES 15, 68
173. Handle fr., 92/030 (1280), Trench 92/2, H = 14.2 cm, S = 4.2x3.9 cm, light red (2.5YR 6/6), SF: light brown (7.5R 6/4), PLATES 15, 68
174. Handle fr., 92/030 (1281), Trench 92/2, H = 13.6 cm, S = 3.6x3.8 cm, light red (2.5YR 6/6), SF: light brown (7.5R 6/4), PLATES 15, 68
175. Handle fr., 89/029 (1318), Trench 89/2, H = 11.5 cm, S = 4.5x4.3 cm, dark grey (10YR 4/1), SF: reddish brown (5YR 4/3), PLATES 15, 68
176. Rim, neck, handle fr., 89/029 (1319), Trench 89/2, D = 15.5 cm, V = 1.7 cm, HD = 3 cm, DN = 11 cm, H = 15 cm, light red (2.5YR 6/6), PLATES 15, 68
177. Rim, neck, handle fr., 90/021 (297), Trench 90/2, D = 13 cm, V = 1.2 cm, HD = 5 cm, DN = 10.2 cm, BH = 2 cm, H = 14.4 cm, S = 2.9x2.8 cm, red (10R 5/6), PLATES 16, 68
178. Rim, neck fr., 96/047 (309), Trench 96/1, D = 14.2 cm, V = 1.3 cm, HD = 6.3 cm, DN = 11 cm, H = 8.6 cm, light red – light brown (10R 6/8 – 7.5YR 6/4), PLATES 16, 68
179. Rim, neck, handle fr., 93/032 (1361), Trench 93/2, D = 13.6 cm, V = 1.7 cm, HD = 3.1 cm, DN = 10 cm, H = 13.6 cm, S = 3.2x3.1 cm, light red (2.5YR 6/6), SF: reddish yellow (5YR 7/6–6/6), PLATES 16, 68
180. Rim, neck, handle fr., 89/028 (1244), Trench 89/2, D = 14.5 cm, V = 1.5 cm, HD = 3.3 cm, DN = 10.8 cm, H = 12.6 cm, reddish yellow (5YR 6/6), PLATES 16, 68
181. Rim, neck, handle fr., 92/030 (1277), Trench 92/2, D = 15 cm, V = 2 cm, HD = 3.4 cm, H = 4.8 cm, light red (2.5YR 6/6), PLATES 16, 69
182. Rim, neck fr., 90/027 (295), Trench 90/2, D = 13.8 cm, V = 1.7 cm, HD = 4.2 cm, H = 6.5 cm, reddish yellow (5YR 6/6), PLATES 16, 69
183. Neck, handle fr., 87/040 (1272), Trench 87/1, Stamp: Ζωΐλου, H = 18.5 cm, S = 3.2x3.4 cm, light red (2.5YR 6/6), PLATES 16, 69
184. Rim, neck, handle fr., 88/013 (1236), Trench 88/2 (A), D = 14 cm, V = 1.4 cm, HD = 4 cm, DN = 12 cm, H = 9.6 cm, brown (7.5YR 5/2), PLATES 16, 69
185. Rim, neck, handle fr., 87/143 (1239), Trench 87/5, Horologium, D = 15 cm, V = 1.4 cm, HD = 4.5 cm, DN = 11.6 cm, H = 8.9 cm, red (2.5YR 5/6), SF: grey – dark grey (5YR 5/1–4/1), PLATES 16, 69

The amphorae published from Ephesus:

Dressel 25 similis: State Agora, Well: Meriç 2002, 88 T. 42 no. K 515.

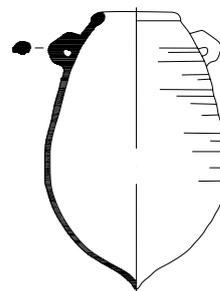
Type 23

BAGGY JAR

(Phoenician Jar)

Form: Bag-shaped body with a short, simple rim without perceptible neck. The base has a short knob. The small, rounded, twisted handles are attached to the upper part of the body. The handles are round in section. The upper part is ribbed³³⁷. There are few amphorae of this type in Ephesus.

Chronology: The amphora from Tel Anafa date from 125 B.C.³³⁸. The earliest piece at the Agora (92/040) is dated to the late second century to mid first century B.C. (Ph 2a)³³⁹.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	186 – 193
Ph 5a	Around A.D. 23: West Stoa	196
Ph 5b	A.D. 23 to 45: Agora Courtyard	194 – 195

³³⁷ Finkielsztein 2006b, 255.

³³⁸ Berlin 1997, fig. 15, PW 483; Bailey 1992, 296.

³³⁹ Rim fr., Box No. 92/040, layer 2a, late second century B.C to mid first century B.C.

Origin and contents: These jars were probably manufactured in Palestine. Their content is not known.

Distribution: Turkey (Bodrum), Lebanon (Beirut), Cyprus, Egypt, Palestine³⁴⁰.

Fabric: (analysed: nos. 192, 193 and 195)

Visual characteristics

The analyses distinguish at least four groups.

1. Palestinian Fabric A, no. 192. Hard fabric, abundant/common white, grey, brown and colourless inclusions, moderately sorted. The firing temperature must have been high as there are carbonate reactions rims.
2. Palestinian Fabric A1, no. 193. Hard fabric, moderate grey, brown and colourless inclusions, poorly sorted. This is like the previous group, but the firing temperature was lower.
3. Palestinian Fabric B no. 195. Hard fabric with smaller inclusions than the previous two groups. The fabric has grey and red grains.
4. Hard fabric, moderate grey and colourless inclusions. The fabric is red, occasionally over fired, nos. 188, 189, 190, 191, 194 and 196.

Petrology

Palestinian Fabric A

Sample: no. 192

Matrix: Optically inactive, lime rich groundmass.

Temper: Partly well rounded and moderate to bimodally sorted. The temper grains consist of frequent monocrystalline quartz and moulds of former carbonates, subordinate iron oxide concretions, moderate foraminifers, rare alkali feldspars, very rare polycrystalline quartz, muscovite, oxidised mica, carbonate grains, calcite bioclasts and heavy minerals and traces of plagioclase.

The *heavy mineral* assemblage consists of zircon (36%), epidote/zoisite (29%), rutile (13%), garnet (8%), hornblende (7%), titanite (3%), brookite/anatase (2%), tourmaline (2%) and traces of monazite, disthene, diopsidic clinopyroxene and unidentified grains.

Comment: Typical are the rounded quartz grains and the presence of foraminifers together with abundant carbonate particles. The heavy mineral assemblage is dominated by zircon and epidote/clinozoisite. Due to lack of comparisons no detailed provenance information can be given at the moment.

R.S.

Palestinian Fabric A1

Sample: no. 193

Matrix: Optically active, lime rich groundmass.

Temper: Partly very well rounded and moderate to bimodally sorted, dominant monocrystalline quartz, subordinate alkali feldspars, carbonate grains, moulds of former carbonates and heavy minerals, rare polycrystalline quartz, very rare plagioclase, muscovite, oxidised mica, calcite bioclasts and iron oxide concretions.

The *heavy mineral* assemblage consists of epidote/zoisite (47%), hornblende (28%), augitic clinopyroxene (6%), zircon (5%), titanite (4%), rutile (3%), garnet (3%), tourmaline (1%), diopsidic clinopyroxene (1%) and traces of brookite/anatase, staurolite and disthene.

Comment: Typical are the low firing temperature, the well rounded quartz grains, silty micritic limestone particles. The heavy mineral assemblage is dominated by epidote/clinozoisite and hornblende. Due to a lack of comparisons, no detailed provenance information can be given at the moment. Comparable thin section fabrics and raw materials are known, for example, from desert environments?

R.S.

³⁴⁰ Reynolds 2000, 388, fig. 1/2; Berlin 1997, fig. 15; I am grateful to B. BERKAYA for the opportunity to see some complete amphorae in the storage of the Bodrum Museum.

Palestinian Fabric B

Sample: no. 195

Temper: Partly very well rounded and moderate to bimodally sorted, very frequent carbonate grains, frequent foraminifers and iron oxide concretions, subordinate monocrystalline quartz, rare alkali feldspars, very rare chert and calcite bioclasts and traces of muscovite and non-resorbed paste fragments.

The *heavy mineral* assemblage consists of hornblende (29%), epidote/zoisite (23%), rutile (19%), zircon (10%), titanite (10%), brookite/anatase (6%) and staurolite (3%).

Comment: Typical is the low firing temperature and the abundance of foraminifers. The heavy mineral assemblage is dominated by hornblende, epidote/ clinozoisite and rutile. Due to a lack of comparisons, no detailed provenance information can be given at the moment.

R.S.

Catalogue

Tetragonos Agora

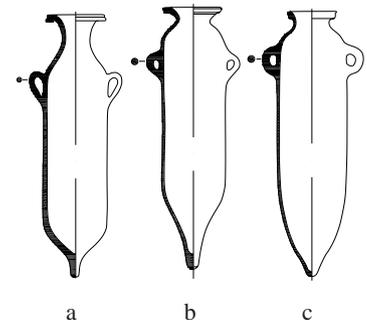
186. Rim, neck fr., 96/067 (2051), Trench 96/1, D = 12 cm, V = 1.9 cm, HD = 1.3 cm, H = 3.9 cm, buff (10YR 7/4), SF: pink (5YR 7/4), PLATES 16, 69
187. Rim, neck, handle fr., 89/016+89/018 (1213+1228), Trench 89/2, D = 13 cm, V = 1.9 cm, HD = 1.1 cm, H = 12.3 cm, reddish yellow (5YR 6/6), PLATES 16, 69
188. Handle fr., 89/016 (1214), Trench 89/2, H = 9.7 cm, S = 2.3x3.1 cm, reddish yellow (5YR 5/6), PLATES 16, 69
189. Handle fr., 89/016 (1215), Trench 89/2, H = 11.5 cm, S = 2.8x3.5 cm, reddish brown (5YR 5/4), PLATES 17, 69
190. Rim, neck fr., 96/051 (1348), Trench 96/1, D = 12.4 cm, V = 1.8 cm, HD = 1.2 cm, H = 3.1 cm, pale brown (10YR 6/3), PLATES 17, 69
191. Handle fr., 90/027 (1231), Trench 90/2, H = 10.1 cm, S = 1.7x3 cm, weak red (2.5YR 5/2), SF: red (2.5YR 5/6), PLATES 17, 69
192. Rim, neck fr., 90/029 (1218), Trench 90/1, D = 14 cm, V = 1.4 cm, HD = 1.1 cm, H = 5.3 cm, buff (10YR 7/3), PLATES 17, 69
193. Rim, neck fr., 95/347 (1217), Trench 95/3, D = 13.2 cm, V = 1.4 cm, HD = 1.1 cm, H = 9.2 cm, reddish brown (5YR 5/4), PLATES 17, 69
194. Handle fr., 90/200 (1222), Trench 90/1, H = 11.4 cm, S = 2.4x2.9 cm, brown (7.5YR 5/4), SF: white (2.5Y 8/2), PLATES 17, 69
195. Rim, neck fr., 89/138 (1229), Trench 89/1, D = 12.7 cm, V = 1.7 cm, HD = 1.1 cm, H = 4 cm, reddish yellow (5YR 6/6), PLATES 17, 69
196. Handle fr., 88/004 (1225), Trench 88/1, H = 9.9 cm, S = 1.6x3.1 cm, yellowish red (5YR 5/6), PLATES 17, 70

Type 24

AMPHORAE OF THE PUNIC TRADITION / VAN DER WERFF 1–2–3

(Dressel 18; Maña C2; Neo Punic; Oberaden 85; Peacock – Williams 32; Augst 41; Cintas 312; Ramón T–7.4, 7.5 and 7.2)

Form: Cylindrical, cigar-shaped amphorae. The flat, semicircular handles are attached to the upper part of the body. The first typological classification was made by F. BENOIT³⁴¹. J. H. VAN DER WERFF later provided another classification in which there are three typological groups³⁴². Form 1 (a) has an out-flaring rim and short neck and a cylindrical toe; Form 2 (b) is very similar to the first type but smaller and the rim flares less; Form 3 (c) has an everted rim but the outer face is near vertical and the spike is less pronounced. Recently,



³⁴¹ Benoit 1962, 327; later Maña 1974, 40 fig. 7.

³⁴² Van der Werff 1978, 178–181; Van der Werff 1986, 109–112; Peacock – Williams 1986, 151 f.; Empereur – Hesnard 1987, 38–40.

M. BONIFAY and S. R. WOLFF have compiled a survey of the available data³⁴³. There are very few amphorae of this type in Ephesus.

Chronology: These vessels were mainly produced in the second and first centuries B.C. However, some of them date to the first century A.D.³⁴⁴. Form 3 was common in Carthage in the third century B.C., elsewhere it continued into the first century B.C.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 2a	Late second century B.C to mid first century B.C.: between surfaces of Streets I and II	198
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	197, 199

Terrace House 2

layer	Data range	no.
2	First century B.C.	556

Stamp: V. GRACE, S.M. DAVIES and E. FENTRESS published some of the Punic amphorae of the Athenian Agora, Carthage and Tel'Ira³⁴⁵. The stamps are either on the upper part of the handle or on the neck.

Origin: The workshop at Kouass in Morocco produced Form 1 amphorae. This amphora type was probably also produced in Carthage³⁴⁶. A Form 1 workshop has recently been found in the Cadiz area³⁴⁷. Forms 2 and 3 were manufactured at various sites in Byzacena and Tripolitana³⁴⁸. A workshop producing these forms has also been found at Jerba³⁴⁹.

Contents: It is supposed that Form 1 contained garum, while Forms 2 and 3 contained wine³⁵⁰.

Distribution: These amphorae have been found at a number of locations across the western Mediterranean³⁵¹. In the eastern Mediterranean, they are found in Greece (Athens, Corinth, Delos), Turkey (Bodrum, Ephesus) and Levant³⁵².

Fabric: (analysed: no. 198)

Visual characteristics

The amphorae in Ephesus can be classified into two groups.

1. African Fabric A. Hard fabric, abundant limestone or white reaction rims surrounding voids which once held limestone, poorly sorted, no. 198. There is also an over fired amphora, no. 199.
2. African Fabric B. Hard fabric with very small grains and limestone or white reaction rims are visible no. 197.

Petrology

Sample: no. 198

Matrix: Optically inactive groundmass.

Temper: Partly well rounded and moderate to bimodally sorted grains.

Frequent monocrystalline quartz and moulds of former carbonates, rare K-feldspars and carbonate grains, very rare polycrystalline quartz, plagioclase, heavy minerals and iron oxide concretions.

³⁴³ Bonifay 2004, 89; Bonifay 2005, Van der Werff 1-3 types; Wolff 2004.

³⁴⁴ Van der Werff 1978, 178–181; Peacock – Williams 1986, 152; Keay 1989, 32–35, Type 9; Bonifay 2004, fig. 46.

³⁴⁵ Grace 1979, fig 41; Davies – Fentress 1984, 151 f.; Sciallano – Sibella 1994, Amphore Mañá A, C2b, C2c; Wolff 2004, 453.

³⁴⁶ Bonifay 2004, 89; Bonifay 2005, Van der Werff 1 type.

³⁴⁷ Bernal *et al.* 2003, 305f. fig. 2.

³⁴⁸ Van der Werff 1978, 178–181; Peacock 1984, 42; Martin-Kilcher 1999, 414; Bonifay 2004, 89.

³⁴⁹ Fentress 2001, 263.

³⁵⁰ Martin-Kilcher 1999, 414; Fentress 2001, 263; Bonifay 2004, 89.

³⁵¹ Van der Werff 1978, 178–181; Martin-Kilcher 1999, 414; Bonifay 2005, Van der Werff 1–3 types.

³⁵² Grace 1956b, 96 f. P XII 1–8; Grace 1979, fig. 41; Alpözen *et al.* 1995, 73; Wolff 2004, 452 f.

The *heavy mineral* assemblage consists of zircon (46%), rutile (17%), garnet (17%), epidote/zoisite (11%), titanite (5%), brookite/anatase (2%), disthene (2%) and traces of monazite, tourmaline and unidentified grains.

Comment: Typical are the well rounded quartz grains and the high carbonate particle content. The heavy mineral assemblage is dominated by zircon. Due to a lack of comparisons, no detailed provenance information can be given at the moment. The thin section fabric resembles to some extent the fabrics found among “African fabrics”.

R.S.

Catalogue

Tetragonos Agora

Van der Werff 1 type

197. Rim, neck fr., 00/065 (1346), Trench 00/1, D = 20 cm, V = 3 cm, H = 7.6 cm, red (2.5YR 5/6), PLATES 17, 70

Van der Werff 2 type

198. Rim, neck fr., 92/040 (504), Trench 92/2, D = 17.1 cm, V = 1.5 cm, H = 4.9 cm, light red – red (10R 6/8–5/8), SF: buff (10YR 8/2), PLATES 17, 70

Van der Werff 3 type

199. Rim, neck fr., 89/088 (401), Trench 89/4, D = 13.2 cm, V = 2.2 cm, H = 4.6 cm, brown (7.5YR 4/2), SF: buff (7.5YR 7/4), PLATES 17, 70

Terrace House 2

556. Handle, 99/734 (292), B6, Room 32c, H = 13.5 cm, S = 2.4x2.4 cm, red (2.5 YR 5/8), SF: pale yellow (2.5Y 8/4), PLATES 41, 70

The amphora published from Ephesus:
Tetragonos Agora South Gate: Gassner 1997, 108 T. 36 no. 412.

Type 25

EGYPTIAN AMPHORA AE 2

Form: A collar rim, a widening neck, and an ovoid body with a short, solid base. The handles from below the rim run in a curve to the upper part of the body.

Chronology: Second century to first half of the first century B.C.³⁵³. There are a few Egyptian amphorae in Ephesus found in early and late Roman layers³⁵⁴.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4–5	30/27 B.C. to A.D. 45	200
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	201–202

Origin: The pieces in Ephesus may have been produced near Lake Mariout in the Nile delta. A number of villas and workshops have been published from this area³⁵⁵.

Contents: The vicinity of Lake Mariout was famous for its wine produced from early Roman times³⁵⁶. Ancient sources also mention the excellent vinegar of the region³⁵⁷.

³⁵³ Şenol 2008, AE 2; Tomber – Williams 2000, 43; Marangou – Marchand 2007, 266 f.

³⁵⁴ Cf. LR 7 type. There is an Egloff 172 type upper part (inv.no. 81.555) and a base fragment (inv.no. 81.534) at the Terrace House 2.

³⁵⁵ Empereur – Picon 1986, 103–108 fig. 6. 9; Empereur – Picon 1998, 75–91; Pieri 2005, 132; Marangou – Marchand 2007, 266; El-Ashmawi 1998, 55–64; Şenol 2008, AE 2; Ballet – Picon 1987, 38; Brun 2004, 143–160.

³⁵⁶ Athenaeus 1, 33, The Mareotan wine, also called Alexandreotic; Brun 2004, 143–150.

³⁵⁷ Pliny NH, XIV, 117–118; Martial XIII, 122; Juvenal XIII, 85; Tchernia 1986, 21.

Distribution: These amphorae are primarily found in Egypt. Few pieces reached the eastern Mediterranean³⁵⁸.

Fabric:

Visual characteristics

Soft, Egyptian fabric of a chocolate brown colour. There are two groups.

1. Golden mica, small grains of white limestone and a few colourless and grey grains, nos. 200 and 201.
2. Silt fabric, visible traces left behind by the firing of organic materials, no. 202.

Catalogue

Tetragonos Agora

200. Base fr., 90/007 (1627), Trench 90/2, H = 10.1 cm, reddish brown (5YR 4/4), PLATES 17, 70

202. Handle fr., 96/005 (1721), Trench 96/1, H = 9.4 cm, S = 3.8x2.8 cm, brown (7.5YR 5/4), PLATES 17, 70

201. Rim, neck fr., 96/005 (1726), Trench 96/1, D = 16 cm, V = 1.8 cm, H = 6.4 cm, light yellowish brown – grey (10YR 6/4–5/1), PLATES 17, 70

Type 26

GRECO-ITALIC

(Lamboglia 4; Peacock – Williams 2; Republicaine 1)

Form: The Greco-Italic type of amphora was first surveyed by E. L. WILL and her typology has been followed by others³⁵⁹. She suggested five form variants³⁶⁰. These vessels have a triangular rim, a cylindrical neck, a pear-shaped body, and a short, solid knob. The curved handles from below the rim reach the upper part of the body. The handles are oval in section. There are very few amphorae of this type in Ephesus.

Chronology: Form Will 1A was manufactured from the mid fourth century to the beginning of the third century B.C. The last pieces of Will 1C come from the late third century B.C. The production of Will 1D (Vandermersch 6 = MGS VI) was discontinued in c. 210 B.C. Will 1E was in production till the last third of the second century B.C.³⁶¹. By consensus, this type of amphora from 140–130 B.C. is called Dressel 1A³⁶².



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	203–205
Ph 5b	A.D. 23 to 45: Agora Courtyard	207
PH 11	Unstratified complexes	206

Four Greco-Italic amphorae were found in the Hellenistic layers of the Agora³⁶³. An upper part of a Greco-Italic amphora was found at the South Gate of the Agora. There was also a handle fragment at the Terrace House 1 in a well dated to the Hellenistic period³⁶⁴.

³⁵⁸ Şenol 2008, AE 2.

³⁵⁹ Will 1982, 338–356; Tchernia 1983, 87; Tchernia 1986, 42–44, 314 f.; Peacock – Williams 1986, 84; Empereur – Hesnard 1987, 25–29; Manacorda 1986, 581–586; Vandermersch 1994, 69–92; Toniolo 2000; Olcese 2005–2006, 64 f.

³⁶⁰ Will 1982, 338–356.

³⁶¹ Lund 2000a, 80; Williams *et al.* 2005a, Greco-Italic.

³⁶² Tchernia 1983, 87; Tchernia 1986, 42–44.

³⁶³ Rim fragments: Street IVa 96/087; “Störgraben” 91/048, 93/177 and 95/116.

³⁶⁴ Gassner 1997, 111 no. 411; Bezeczky 2003, 68, K 281 T. 23.

Epigraphy and origin: There are Greek and Latin names in the stamps³⁶⁵. It has been stated on the basis of the stamps and petrological analyses that these amphorae were manufactured in Sicily, in central and southern Italy (Etruria, Latium and Campania), and on the Adriatic coast³⁶⁶. There is evidence that this type also came from southern France, Spain and perhaps North Africa³⁶⁷. C. VANDERMERSCH described the production in detail. He claims that the production of Greco-Italic type amphorae began in Sicily and Magna Graecia³⁶⁸.

Contents: Wine.

Distribution: The examples of this type can be found in Italy and the eastern Adriatic region, Gaul, Spain, France, Portugal, and Libya³⁶⁹. They are also present in the eastern Mediterranean: Greece (Athens, Delos and Corinth), Turkey, Cyprus, Levant and Egypt³⁷⁰.

Fabric: (analysed no. 204)

Visual characteristics

They were produced in volcanic regions. The fabric contains black volcanic grains.

Hard fabric, dominated by black volcanic and white limestone grains. There are a few larger (1 mm) quartz inclusions (no. 206), and voids with remains of limestone. The fabric of all the amphorae is generally similar, although each piece is slightly different from the others.

Under the stereo microscope, no. 204 is very much like the stamped L.EVMACHI amphora (no. 649), which was produced near Pompeii.

Petrology

Italian Fabric A

Sample: no. 204

Matrix: The sample shows an optically inactive, partially recrystallised lime rich groundmass. The temper content is high and the grains are partly well rounded and bimodal sorted.

Temper: Frequent moulds of former carbonates and augite, subordinate monocrystalline quartz, sanidine and iron oxide concretions, moderate muscovite, rare polycrystalline quartz, biotite, brown volcanic glass and heavy minerals, very rare chert, volcanic plagioclase, oxidized mica, carbonate grains, foraminifers, crystalline rock fragments and volcanic rock fragments.

The *heavy mineral* assemblage consists of augitic clinopyroxene (71%), diopsidic clinopyroxene (23%), garnet (3%), spinel (2%) and traces of rutile and sillimanite.

Comment: Typical are the rounded mineral grains. The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland. The sample seems to be artificially tempered by well rounded volcanic "beach sand". A provenance in the volcanic region of southern Italy seems to be very likely but a more exact definition of provenance cannot be given without more reference material.

Note: no. 322 Dressel 2–4 type amphora belongs to this group.

R.S.

³⁶⁵ Tchernia 1986, 49–51; Vandermersch 1994, 159–180; Will 1997, 122 f.; Olcese 2005–2006, 66–68; Olcese 2010, 386–401.

³⁶⁶ Riley 1979, 133; Hesnard – Lemoine 1981, 243–295; Peacock – Williams 1986, 85; Van der Werff 1986, 100; Tchernia 1986, 45–48; Empereur – Hesnard 1987, 27; Hesnard *et al.* 1989, 21–32; Arthur 1991, 73; Sciallano – Sibella 1994, Gréco-Italique; Vandermersch 1994, 69–92; Will 1997, 122 f.; Zupančič *et al.* 1998, 345–357; Toniolo 2000, 11–167; Van der Werff 2002; Williams *et al.* 2005a, Greco-Italic; Olcese 2005–2006, 61–66; Olcese – Thierrin-Michael 2009, 159–164.

³⁶⁷ Will 1982, 338–356; Tchernia 1986, 94 f.; Carreté *et al.* 1995, 80, 89; Williams *et al.* 2005a, Greco-Italic.

³⁶⁸ Vandermersch 1994, 85–87.

³⁶⁹ Lamboglia 1955, 252–260; Beltrán 1970, 348; Zemer 1977, 43; Riley 1979, 131 f.; Will 1982, 353–355; Tchernia 1986, 94–98; Peacock – Williams 1986, 85; Empereur – Hesnard 1987, 27–29; Vandermersch 1994, 123–147; Zupančič *et al.* 1998, 345–357; Williams *et al.* 2005a, Greco-Italic; Sciallano – Sibella 1994, Gréco-Italique.

³⁷⁰ Will, 1989, 298–300; Lund 2000a, 80 notes 29–33; Monsieur 2001, 75 fig. 12; Wintermeyer 2004, 109 type Am 1.17 – 1.18; Lawall 2006, 270 f.; Marangou – Marchand 2007, 248.

Catalogue

Tetragonos Agora

203. Rim, neck fr., 96/051 (10), Trench 96/1, D = 17.4 cm, V = 3.3 cm, HD = 3.4 cm, H = 4.3 cm, red (2.5YR 5/6), SF: buff (7.5YR 8/2), PLATES 18, 70

204. Rim, neck fr., 89/028 (1245), Trench 89/2, D = 17 cm, V = 3.1 cm, HD = 2.5 cm, DN = 12.3 cm, H = 4.3 cm, light reddish brown (2.5YR 6/4), PLATES 18, 70

205. Rim, neck fr., 88/017 (1311), Trench 88/2 (A), D = 16 cm, V = 3.1 cm, HD = 2.8 cm, DN = 10.8 cm, H = 6.1 cm, reddish yellow (5YR 6/6), PLATES 18, 70

206. Rim, neck fr., 95/362 (1368), Trench 84/2, D = 16 cm, V = 2.9 cm, HD = 2.8 cm, H = 4.3 cm, light red (2.5YR 6/6), PLATES 18, 70

207. Rim, neck fr., 89/138 (1249), Trench 89/1, D = 16.6 cm, V = 3 cm, HD = 2.8 cm, H = 4.9 cm, light reddish brown (5YR 6/4), PLATES 18, 70

The amphorae published from Ephesus:

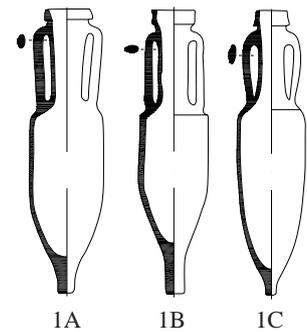
Tetragonos Agora South Gate: Gassner 1997, 107 T. 35 no. 411; Terrace House 1: Lang-Auinger – Outschar 1992, 151–154; Bezczky 2003, 38. 68 T. 23, K 281.

Type 27

DRESSEL 1

The Greco–Italic type was followed by the Dressel 1 form³⁷¹. The Dressel 1 type of amphora is one of the best-known vessels from the Republican period. It was primarily produced on the Tyrranean coast. N. Lamboglia has distinguished three groups (Dressel 1A, 1B, 1C)³⁷².

In some cases, it was not possible to decide which sub-group the individual pieces in Ephesus belonged to. There are very few amphorae of this type in Ephesus.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 1c	From mid to late second century B.C.	253
Ph 2a	Late second century B.C. to mid first century B.C.: between surfaces of Streets I and II	254–255
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	256

Fabric: (analysed nos. 253–256)

Visual characteristics

There are three fabric groups.

1. Italian Fabric B. Hard fabric, black sand with lots of black and occasional limestone grains. no. 256.
2. Italian Fabric D. Hard fabric, red, black and colourless grains, iron oxide, green augite no. 254. Very fine grains red, black, white, colourless with occasional microfossils no. 255.
3. Spanish Fabric D. Hard fabric with large, round colourless grains. Many white (0.5 mm) inclusions no. 253.

³⁷¹ Zevi 1966, 212–214; Peacock 1971, 162–165; Empereur – Hesnard 1987, 30–33; Riley 1979, 134 f.; Van der Werff 1986, 100–103; Williams *et al.* 2005a, Dressel 1.

³⁷² Lamboglia 1955, 246–248.

Petrology

Italian Fabric B

Sample: no. 256

Matrix: optically inactive, partially recrystallised lime rich groundmass. The temper content is high and the grains are partly well rounded and bimodally sorted.

Temper: sanidine and augite, subordinate moulds of former carbonates and opaque matter, rare heavy minerals, very rare carbonate grains, siltstone/sandstone and volcanic rock fragments and traces of crystalline rock fragments and brown volcanic glass.

The *heavy mineral* assemblage consists of augitic clinopyroxene (69%), diopsidic clinopyroxene (30%), spinel (1%) traces of garnet.

Note: Amphora no. 323 Dressel 2–4 belongs to this group.

R.S.

Italian Fabric D

Samples: nos 254 and 255

Matrix: Optically inactive, partially recrystallised lime rich groundmass.

The temper content is high and the grains are partly well rounded and poorly sorted.

Temper: Subordinate monocrystalline quartz, alkali feldspars, oxidized mica, moulds of former carbonates and iron oxide concretions, moderate sanidine, muscovite and heavy minerals, rare polycrystalline quartz, carbonate grains, volcanic rock fragments, augite and opaque matter, very rare volcanic plagioclase and foraminifers and traces of chert, biotite, siliceous bioclasts, siltstone/sandstone, crystalline rock fragment, brown volcanic glass and leucite.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of augitic clinopyroxene (74%), diopsidic clinopyroxene (17%), garnet (7%), zircon (1%) and traces of rutile, brookite/anatase, chromium spinel, not identified grains and melanite.

Note: no. 212 Dressel 1A type amphora belongs to this group.

R.S.

Spanish Fabric B

Sample: no. 253

Matrix: Fine grained, optically inactive, stained by iron oxide.

Temper: Dominant monocrystalline quartz and moulds of former carbonates, rare polycrystalline quartz and carbonate grains, very rare alkali feldspars, plagioclase, siltstone/sandstone, crystalline rock fragments and iron oxide concretions.

The *heavy mineral* assemblage consists of garnet (57%), augitic clinopyroxene (19%), zircon (10%), disthene (7%), titanite (2%), hornblende (2%) and not identified grains (2%).

Comment: Typical are the medium grained, well rounded, artificially added temper grains.

R.S.

Catalogue

Tetragonos Agora

253. Neck, fr., 93/050 (421), Trench 93/2, DN = 12.4 cm, H = 32.2 cm, red (2.5YR 5/6), PLATES 22, 73

255. Neck, fr., 91/022 (175), Trench 91/1, DN = 12.4 cm, H = 34.1 cm, light red – red (10R 6/8–5/8), PLATES 22, 73

254. Neck, fr., 91/022 (174), Trench 91/1, DN = 11.4 cm, H = 26.9 cm, light red (2.5YR 6/6), PLATES 22, 73

256. Rim, neck fr., 89/031 (249), Trench 89/2, D = 16.2 cm, V = 1.9 cm, HD = 6.9 cm, H = 8.8 cm, light reddish brown (5YR 6/4), PLATES 22, 74

The amphorae published from Ephesus:

Lucas Grave (Lukasgrab): Liko 2001, 88 T. 58 no. 107 = Liko 2010, 231 no. 527; Terrace House 1: Bezeczky 2003, 38 T. 23.

Type 27–1

DRESSEL 1A

(Peacock – Williams 3)

Form: The type has a short triangular rim, a cylindrical neck and cylindrical body. The long, thick handles (oval in section) from below the rim run vertically to the shoulder. The amphora is characterized by a solid spike at the base³⁷³.

Chronology: These amphorae after 140/130 B.C. are called Dressel 1A. They were produced until the middle of the first century B.C.³⁷⁴. There are very few amphorae of this type in Ephesus.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 1c	From mid to late second century B.C.	212
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	208, 210–211
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	209

Terrace House 2

layer	Data range	nos.
2	First century B.C.	557–560

Epigraphy, Inscription: There are no stamps on these amphorae in Ephesus. However, one of them has a *titulus pictus* on its neck.



no. 210 red *dipinto*: AT...?, (A – T in ligature).

Origin: The inscriptions often refer to the site of production. The most important sites were in Campania, Latium Etruria and Sicily³⁷⁵. A small-scale production also took place in Spain³⁷⁶.

Contents: The painted inscriptions usually refer to the type of the wine (*vinum Falernum* and *Caecubum*, etc.)³⁷⁷. A number of inscriptions have been published, mainly from Rome³⁷⁸.

Distribution: They can be found at many sites in the western Mediterranean. Examples have recently been found in the eastern Mediterranean as well³⁷⁹.

Fabric: (analysed nos. 209, 210 and 212)

Visual characteristics

The amphorae were produced at different sites. There are at least five groups.

³⁷³ Peacock 1971, 162–165; Peacock – Williams 1986, 86; Tchernia 1986, 316f.; Williams *et al.* 2005a, Dressel 1.

³⁷⁴ Peacock 1971, 165; Empeureur – Hesnard 1987, 29–32; Tchernia 1983, 87; Tchernia 1986, 42–44. Williams *et al.* 2005a, Dressel 1.

³⁷⁵ Pliny NH, XIV, 62–65; Peacock 1971, 164; Peacock 1977b, 262–265; Beltrán 1970, 301–305; Hesnard – Lemoine 1981, 243–295; Empeureur – Hesnard 1987, 31; Peacock – Williams 1986, 86–88; Tchernia, 1986, 45–48, Appendix 2; Will 1987, 182–201; Hesnard *et al.* 1989, 21–30; Sciallano – Sibella 1994, Amphore Dressel 1A; Williams *et al.* 2005a, Dressel 1.

³⁷⁶ Carreté *et al.* 1995, 80. 89; Williams *et al.* 2005a, Dressel 1; Bernal *et al.* 2007, 279–281.

³⁷⁷ CIL XV, 4546. 4553–4555. 4559–4560, etc.

³⁷⁸ Zevi 1966, 212–214; Panella 1980, 254–256; Tchernia 1986, 342 f.

³⁷⁹ Panella 1981, 55–80; Tchernia 1983, 87; Fitzpatrick 1985, 323–331; Fitzpatrick 2003, 11 f.; Pimenta 2003, 345–347; Stöckli 1979; Will 1979, 346–347, fig. 1c; Lund 2000a, 82; Berlin 1997, 164; Monsieur – De Paepe 2002, 160.

1. Italian Fabric D. Hard fabric with a few black volcanic and white limestone inclusions. Frequent red iron oxide and and colourless grains, no. 212.
2. Italian Fabric E. Lots of white limestone inclusions. A medium amount of black, grey and red inclusions. Medium amount of voids (sometimes quite large, 1–2 mm), no. 209.
3. Italian Fabric I. Very many small, white limestone inclusions. There are a few black inclusions. A few big (0.5–1 mm) red iron oxide grains. Few foraminifera, no. 210.
4. The other amphorae belong to two groups. The first one has lots of limestone grains, no, 211 and black volcanic inclusions nos. 557–560,
5. The no. 208 has no or very few limestone grains

Petrology

Italian Fabric D

Sample: no. 212

Matrix: Optically inactive, partially recrystallised lime rich groundmass.

The temper content is high and the grains are partly well rounded and poorly sorted.

Temper: Subordinate monocrystalline quartz, alkali feldspars, oxidized mica, moulds of former carbonates and iron oxide concretions, moderate sanidine, muscovite and heavy minerals, rare polycrystalline quartz, carbonate grains, volcanic rock fragments, augite and opaque matter, very rare volcanic plagioclase and foraminifers and traces of chert, biotite, siliceous bioclasts, siltstone/sandstone, crystalline rock fragment, brown volcanic glass and leucite.

The *heavy mineral* assemblage consists of augitic clinopyroxene (74%), diopsidic clinopyroxene (17%), garnet (7%), zircon (1%) and traces of rutile, brookite/anatase, chromium spinel, not identified grains and melanite.

Note: Amphorae nos. 254 and 255 (Dressel 1) also belong to this group.

R.S.

Italian Fabric E

Sample: no. 209

Matrix: Optically inactive, partially recrystallised lime rich groundmass. The temper content is high and the grains are partly well rounded and poorly sorted.

Temper: Frequent moulds of former carbonates, subordinate sanidine, moderate mono- and polycrystalline quartz, rare alkali feldspars, carbonate grains, augite, opaque matter and iron oxide concretions, very rare volcanic plagioclase, muscovite, biotite, and heavy minerals and traces of chert, oxidized mica, foraminifers, siltstone/sandstone, crystalline rock fragments and volcanic rock fragments.

The *heavy mineral* assemblage consists of augitic clinopyroxene (70%), diopsidic clinopyroxene (26%), spinel (3%), garnet (1%) and traces of rutile, hornblende and not identified grains.

Comment: Typical are the frequent augite and carbonate particles. The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland. A provenance in the volcanic region of southern Italy seems to be very likely.

Note: Amphora no. 222 (Dressel 1C) also belongs to this group.

R.S.

Italian Fabric I

Sample: no. 210

Matrix: Optically inactive, partially recrystallised lime rich groundmass.

Temper: The temper content is high and the grains are partly well rounded and poorly sorted.

Very frequent monocrystalline quartz and carbonate grains, frequent alkali feldspars and iron oxide concretions, subordinate oxidized mica, muscovite and moulds of former carbonates, rare polycrystalline quartz, siliceous bioclasts and heavy minerals, very rare chert, plagioclase, siltstone/sandstone, crystalline rock fragments, quartzite and volcanic rock fragments and traces of foraminifers and calcite bioclasts.

The *heavy mineral* assemblage consists of augitic clinopyroxene (57%), diopsidic clinopyroxene (20%), garnet (15%), rutile (3%), titanite (3%) and traces of zircon, brookite/anatase, chromium spinel and diallage.

Comment: Typical are the rounded mineral grains. The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland. The sample seems to be artificially tempered by well rounded volcanic “beach sand”.

A provenance in southern Italy seems to be very likely.

R.S.

Catalogue

Tetragonos Agora

208. Rim, neck fr., 90/135 (157), Trench 90/1, D = 19.6 cm, V = 2.5 cm, HD = 4.6 cm, H = 6.4 cm, red (2.5YR 5/6), PLATES 18, 70
209. Rim, neck fr., 96/051 (11), Trench 96/1, D = 21.5 cm, V = 3.1 cm, HD = 3.9 cm, H = 7.8 cm, red (10R 5/6), PLATES 18, 70
210. Rim, neck, handle fr., 90/127 (1184), Trench 90/3, Inscr: titulus pictus with red ink: AT...T, A-T in ligature, D = 17 cm, V = 3 cm, HD = 4.2 cm, DN = 11.8 cm, H = 12.5 cm, S = 2.6x4.5 cm, light red (2.5YR 6/8), SF: buff (7.5YR 8/4), PLATES 18, 70
211. Rim, neck fr., 93/030 (415), Trench 93/2, D = 19.5 cm, V = 3.2 cm, HD = 3.8 cm, H = 6.4 cm, red (2.5YR 5/6-5/8), PLATES 18, 71
212. Rim, neck, handles, 93/050 (12) Trench 93/2, light red (2.5YR 6/6), D = 18.4 cm, V = 3 cm, HD = 5.4 cm, DN = 12 cm, HN = 29.9 cm, H = 42 cm, S = 3.5x4.4 cm, PLATES 18, 71

Terrace House 2

557. Rim, 99/667 (107), B6, Room 32c, D = 17 cm, V = 3.2 cm, HD = 3.5 cm, H = 5.4 cm, red (2.5YR 5/8), PLATES 42, 88
558. Rim, 99/644 (388), B6, Room 32c, D = 18.7 cm, V = 3 cm, HD = 4.9 cm, H = 9.8 cm, reddish brown (2.5YR 5/4), SF: reddish yellow (5YR 7/6), PLATES 42, 88
559. Handle, 99/650 (401), B6, Room 32c, H = 8.5 cm, S = 5.6x3.2 cm, yellowish red (5YR 5/6), SF: pink (5YR 7/4), PLATES 42, 88
560. Handle, 99/634 (301), B6, Room 32c, H = 12.7 cm, S = 4.6x2.8 cm, red (10R 5/8), PLATES 42, 88

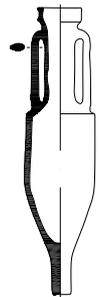
Type 27–2

DRESSEL 1B

(Peacock – Williams 4)

Form: These amphorae are huge and robust. The type has an almost vertical collar-rim. There are long and thick handles, oval in section. The long, solid knob is usually flat. There are few amphorae of this type in Ephesus.

Chronology: The type was produced between the last quarter of the second until the last decade of the first century B.C.³⁸⁰.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	213, 215
Ph 5b	A.D. 23 to 45: Agora Courtyard	216
Ph 7–9	Late fourth to early seventh centuries A.D.	217
Ph 11	Unstratified complexes	214

Stamp: The stamps are on the rim, or, infrequently, on the neck. In Ephesus there is only one stamp. It is on the rim, in a rectangular frame.

³⁸⁰ Peacock 1971, 165; Peacock 1977b, 265–267; Peacock – Williams 1986, 90; Hesnard *et al.* 1989, 21–34; Williams *et al.* 2005a, Dressel 1.



GAA or CAA – no. 216 *tria nomina* perhaps C(...) A(...) A(...) or G(...) A(...) A(...). This stamp has not yet been identified elsewhere.

Origin: They were mainly produced in Campania, Latium and Etruria³⁸¹.

Contents: The *tituli picti* refer to wine. Spondylus shells, resin and nuts have been found in some of the Dressel 1B amphorae³⁸².

Distribution: This form occurs at a number of sites in the western Mediterranean³⁸³. Few amphorae have been published from the eastern Mediterranean³⁸⁴.

Fabric: (analysed no. 216)

Visual characteristics

Hard, fairly rough fabric containing black, dark and white ill-sorted inclusions. They were produced from different fabrics. There are three major groups.

1. Italian Fabric F. Hard Fabric, there are very many tiny white (0.05–0.1mm) limestone particles in the matrix. Occasionally there are bigger grains (0.5mm) of limestone. There is also a moderate amount of medium-size (0.1–0.2mm) white, red and grey particles. The bigger (0.5–1mm) dark brown and black inclusions are rare, no. 216.
2. Hard, typically black sand fabric; abundant in black volcanic and dark red particles, with occasional bigger, colourless inclusions. There are many very small limestone particles in the matrix. There are occasional limestone grains, no. 217.
3. An inhomogenous group: no. 213 hard fabric, moderate amount of white grains of limestone. There are fewer red, black and grey particles, just like the colourless and white inclusions. No. 214 hard, frequent white grains of limestone and microfossils. Moderate amount of colourless, opal, white and grey particles. Their size is small (0.05–0.5 mm) with a few bigger ones (0.5–1 mm). No. 215, hard, with frequent white grains of limestone. Few colourless, grey particles of large size (0.5–1mm).

Petrology

Italian Fabric F

Sample: no. 216

Matrix: granular, optically inactive, calcareous, abundant, light coloured spots (due to decomposed carbonates particles), slightly recrystallised

Temper: Frequent, moulds of former carbonates and iron oxide concretions, subordinate monocrystalline quartz and alkali feldspars, rare polycrystalline quartz and chert, very rare sanidine, plagioclase, muscovite, biotite, volcanic rock fragments, heavy minerals and vitrified particles and traces of crystalline rock fragments.

The *heavy mineral* assemblage is composed of augitic clinopyroxene (74%), diopsidic clinopyroxene (18%), titanite (3%), spinel (2%), zircon (1%), garnet (1%) and traces of brookite/anatase, disthene and unidentified grains.

Comment: The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland.

R.S.

³⁸¹ Peacock 1971, 164; Panella 1981, 66 f.; Hesnard – Lemoine 1981, 251–264; Peacock – Williams 1986, 69–71; Hesnard *et al.* 1989, 21–35; Arthur 1991, 73; Sciallano – Sibella 1994, Amphore Dressel 1B; Williams *et al.* 2005a, Dressel 1.

³⁸² Williams *et al.* 2005a, Dressel 1.

³⁸³ Panella 1981, 55–80; Tchernia 1983, 91; Stöckli 1979; Fitzpatrick 1985, 323–331; Fitzpatrick 2003, 11 f.; Martin-Kilcher 2005, 208. 212; Ehmig 2003, 46; Williams *et al.* 2005a, Dressel 1; Laubenheimer – Marlière 2010, 27.

³⁸⁴ Will 1989, 299 f., 307; Lund 2000a, 83; Monsieur 2001, 75 fig. 13–14; Monsieur – De Paepe 2002, 161.

Catalogue

Tetragonos Agora

213. Rim, neck, handle fr., 91/004 (1169), Trench 91/1, D = 21 cm, V = 3.6 cm, HD = 5.6 cm, H = 13.6 cm, light red (2.5YR 6/8), PLATES 18, 71
214. Rim, neck, handle fr., 95/002 (13), Trench 92/2, D = 19.6 cm, V = 2.5 cm, HD = 5.5 cm, H = 23.7 cm, light red-red (2.5YR 6/6 – 5/6), PLATES 18, 71
215. Rim, neck, handle fr., 87/032 (1162), Trench 87/1, D = 18 cm, V = 3.6 cm, HD = 5.2 cm, H = 13.1 cm, light red (2.5YR 6/6–5/6), PLATES 19, 71
216. Rim, neck, handle fr., 90/103 (999), Trench 90/1, Stamp: ..CAA or ..GAA, D = 18 cm, V = 2.9 cm, HD = 5.6 cm, H = 25.5 cm, light red (2.5YR 6/6), PLATES 19, 71
217. Rim, neck fr., 99/062 (1670), R-sewer, D = 14 cm, V = 2.3 cm, HD = 3.4 cm, H = 4.8 cm, red (2.5YR 5/6), PLATES 19, 71

The amphorae published from Ephesus:

Terrace House 1: Outschar 1996, 63 T. 7 no. 284; Terrace House 2: Ladstätter 2005, 317 nos. K 513, not illustrated.

Type 27–3

DRESSEL 1C

(Peacock – Williams 5)

Form: It has a high, curved rim. Ribbed handles (oval in section) are attached to the long neck. The long, slightly tapering body has a short spike. There are few amphorae of this type in Ephesus.

Chronology: These amphorae were manufactured from the end of the second century to the second quarter of the first century B.C.³⁸⁵. The Dressel 1C amphorae of the Ephesian Agora belong to the earliest Roman finds.



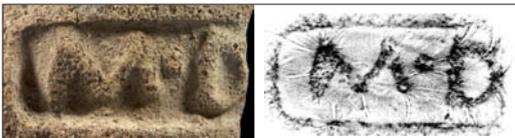
The amphorae found in Ephesus
Agora

layers	Data range	nos.
Ph 1b	Third quarter of second century B.C.	218–219, 246–247
Ph 2a	Late second century B.C. to mid first century B.C.: between surfaces of Streets I and II	220–221
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	223–226, 248–250
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	227–241, 243–245, 251–252
Ph 5b	A.D. 23 to 45: Agora Courtyard	242
Ph 11	Unstratified complexes	222

Terrace House 2

layers	Data range	nos.
2	First century B.C.	561
3a	Late first century A.D.	562

Stamp: The stamps are often on the rim, occasionally on the handles. Letters, abbreviations, or symbols are used.



M.D(...) – no. 222

The incomplete M.D(...) stamp on the basis of the stamps published as: M D HER (H–R in ligature), M.D LIO, M.D.S, M.DASIO. Bibl: CIL II, Suppl. 6254.15; CIL X, 8051.11; CIL XV, 3440; Calender 1965, nos. 1054, 1055, 1056; Desy 1989, no. 216.

³⁸⁵ Peacock – Williams 1986, 92; Williams *et al.* 2005a, Dressel 1.

Origin: The production sites were in Campania, Etruria, and Spain³⁸⁶. The amphorae in Ephesus came from the area of Vesuvius and other regions of Campania. Some of the amphorae came from Gibraltar (Algeciras)³⁸⁷. The exact location of the sites is still being investigated³⁸⁸.

Contents: These amphorae contained wine, although there is evidence that they carried other commodities as well³⁸⁹. There may be two exceptions: the amphorae from Cosa and Algeciras carried fish sauce³⁹⁰.

Distribution: These amphorae are primarily found in the western Mediterranean³⁹¹. However, amphorae belonging to this type were also found in the eastern Mediterranean³⁹².

Fabric: (analysed nos. 219, 223, 230, 240, 222, 228, 246)

Their fabric usually has volcanic black sand, suggesting a Campanian origin³⁹³. Some of the amphorae may have come from Spain.

Visual characteristics

1. Italian Fabric C. Black sand fabric with varying amounts of limestone:

Black, red, white inclusions, a few limestone or white reaction rims are visible nos. 218–221, 223, 226 230, 240, and 244. A few bigger grains of limestone, moderate amount of small, black, red, green augite and colourless inclusions, nos. 224, 236, 242. Many red, black, colourless particles, few grains of limestone, nos. 225, 227, 232, 233, 234, 237 and 561. Black, red, white and colourless grains, small grains of limestone in the matrix, occasionally large clay pellet inclusions, no. 245. Tiny grains of limestone in the matrix, many black, red and colourless inclusions, no. 238. Many black, red, green augite and colourless particles, occasionally limestone and quartz, nos. 239, 241.

2. Italian Fabric E. Hard fabric, frequent colourless, white inclusions, no. 222.

3. Italian Fabric G. Hard fabric, red, black, white and colourless inclusions, nos. 228, 243.

4. Other Italian fabrics

Hard fabric, large (1–2 mm) iron oxide, clay pellet in the matrix, fine grains of limestone, frequent (0.05–0.5 mm) grains, no. 229.

Hard fabric, frequent black, red, grey, green, augite grains, sparse amount of limestone, large iron oxide, and black inclusions, nos. 231, 235.

Hard fabric, moderate white, sparse iron oxide particles and voids, no. 562.

5. Spanish fabric A

Hard fabric, abundant rounded white and colourless grains. A few limestone or white reaction rims are visible. Occasional iron oxide grains (0.5 mm), nos. 246, 247, 248, 249, 250, 251 and 252.

Petrology

Italian Fabric C

Samples: 219, 223, 230, 240

Matrix: fine grained, optically inactive, rare fine grained decolouration spots (probably decomposed carbonates)

Temper: Subordinate volcanic rock fragments and augite, moderate molds of former carbonates, rare sanidine, volcanic plagioclase, heavy minerals and opaque matter, very rare biotite and leucite and traces of mono- and polycrystalline quartz, chert, alkali feldspars, carbonate grains, brown volcanic glass and iron oxide concretions.

³⁸⁶ Charlin *et al.* 1978, 24; Panella 1981, 67; Tchernia 1986, 48; Peacock – Williams 1986, 91 f; Will 1987, 201–203; Empereur – Hesnard 1987, 31; Sciallano – Sibella 1994, Amphore Dressel 1C; Carreté *et al.* 1995, 84; Étienne – Mayet 2000, 74–79; Étienne – Mayet 2002, 113–118. 160–171 nos. 20–21. 35. 46. 54; Williams *et al.* 2005a, Dressel 1; Sciallano – Sibella 1994, Amphore Dressel 1C;

³⁸⁷ Domergue 1973, 112–115; Étienne – Mayet 2000, 74–79; Étienne – Mayet 2002, 113–118; Lagóstena – Bernal 2004, in Cadiz, 48–88.

³⁸⁸ D. BERNAL, personal communication.

³⁸⁹ Charlin *et al.* 1978, 23 f.; Peacock – Williams 1986, 92; Will 1987, 202; Williams *et al.* 2005a, Dressel 1.

³⁹⁰ Will 1979, 346 f. note 26; Will 1987, 202.

³⁹¹ Panella 1981, 50–80; Peacock – Williams 1986, 92; Fitzpatrick 1985, 323–331; Will 1987, 201–204; Fitzpatrick 2003, 13; Ehmig 2003, 46.

³⁹² Lund 2000a, 83, Greece: Athens, Delos, Tenos; Cyprus: Nea Paphos; Egypt: Alexandria.

³⁹³ Peacock – Williams 1986, 87 f. 92.

The *heavy mineral* assemblage (arithmetic mean of four samples) consists of augitic clinopyroxene (65%), diopsidic clinopyroxene (32%), spinel (2%) and traces of rutile, brookite/anatase, titanite, garnet, epidote/zoisite, and not identified grains.

Comment: Typical are the leucite rich volcanic rock fragments. The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland. A provenance in the volcanic region of southern Italy seems to be very likely but a more exact definition of provenance cannot be given without more reference material.

R.S.

Italian Fabric E

Sample: no. 222

Matrix: Optically inactive, partially recrystallised lime-rich groundmass. The temper content is high and the grains are partly well rounded and poorly sorted.

Temper: Frequent moulds of former carbonates, subordinate sanidine, moderate mono- and polycrystalline quartz, rare alkali feldspars, carbonate grains, augite, opaque matter and iron oxide concretions, very rare volcanic plagioclase, muscovite, biotite, and heavy minerals and traces of chert, oxidized mica, foraminifers, siltstone/sandstone, crystalline rock fragments and volcanic rock fragments.

The *heavy mineral* assemblage consists of augitic clinopyroxene (70%), diopsidic clinopyroxene (26%), spinel (3%), garnet (1%) and traces of rutile, hornblende and unidentified grains.

Comment: Typical are the frequent augite and carbonate particles. The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland. A provenance in the volcanic region of southern Italy seems to be very likely.

Note: Amphora no. 209 Dressel 1A also belongs to this group.

R.S.

Italian Fabric G

Sample: no. 228

Matrix: granular (fine mica plus very fine grained carbonate particles), calcareous, optically active (very low firing temperature)

Temper: Very frequent carbonate grains, frequent sanidine, subordinate volcanic plagioclase, muscovite, volcanic rock fragments and iron oxide concretions, rare monocrystalline quartz and augite, very rare biotite, foraminifers, calcite bioclasts and heavy minerals.

The *heavy mineral* assemblage consists of augitic clinopyroxene (74%), diopsidic clinopyroxene (25%), traces of garnet and melanite

Comment: The heavy mineral composition clearly points to sediments sourced predominantly by a volcanic hinterland. A provenance in the volcanic region of southern Italy seems to be very likely.

R.S.

Spanish fabric A

Sample: no. 246

Matrix: Dark-brownish, inactive groundmass.

Temper: Content is approx: 24 %, the temper grains are bimodally sorted, (maximum grain size: 0.8 mm).

The temper grains consist of frequent monocrystalline quartz, subordinate muscovite and moulds of former carbonates, moderate alkali feldspars and iron oxide concretions, rare polycrystalline quartz, chert, biotite, foraminifers, siltstone/sandstone, crystalline rock fragments and heavy minerals and traces of calcite bioclasts.

Typical is the presence of most likely artificially added, partially well rounded quartz grains (grain size approx. 0.2–0.6 mm). Some grains show quartz cement overgrowths. The few crystalline rock fragments are mainly quartzite.

The *heavy mineral* assemblage consists of zircon (32%), disthene (16%), rutile (8%), sillimanite (7%), unidentified grains (7%), brookite/anatase (5%), staurolite (5%), andalusite (4%), titanite (3%), garnet (3%), hornblende (3%), chromium spinel (2%), spinel (2%), epidote/zoisite (1%), monazite (1%) and diopsidic clinopyroxene (1%).

R.S.

Catalogue

Tetragonos Agora

218. Rim fr., 95/025 (509), Trench 95/2–III, D = 15.6 cm, V = 2 cm, HD = 5.8 cm, H = 6.5 cm, black (5YR 2.5/1), SF: buff (5Y 8/4), PLATES 19, 71
219. Handle fr., 95/025 (508), Trench 95/2–III, H = 16 cm, S = 3.4x5.7 cm, red (10R 5/6), PLATES 19, 71
220. Rim, neck fr., 91/022 (1183), Trench 91/1, D = 16 cm, V = 2.6 cm, H = 5.2 cm, red (2.5YR 5/6), PLATES 19, 71
221. Handle fr., 93/048 (501), Trench 93/2, H = 21.8 cm, S = 2.8x5.2 cm, reddish brown (2.5YR 5/4), SF: buff (10YR 8/3), PLATES 19, 71
222. Handle fr., 92/035 (185), Trench 87/4, Stamp: M.D(...), H = 7.5 cm, S = 2.7x4.7 cm, red (10R 5/6), PLATES 19, 71
223. Rim, neck, handle fr., 93/069 (430), Trench 93/2, D = 15.2 cm, V = 2.8 cm, HD = 6.6 cm, DN = 11 cm, H = 23 cm, red (10R 5/6), PLATES 19, 71
224. Rim, neck, handle fr., 90/127 (1173), Trench 90/3, D = 14.8 cm, V = 3.1 cm, HD = 6.8 cm, DN = 11 cm, H = 13 cm, red (2.5YR 5/6), SF: buff (10YR 8/2), PLATES 19, 71
225. Rim, neck, handle fr., 90/127 (1175), Trench 90/3, D = 15.8 cm, V = 2.9 cm, HD = 6.5 cm, DN = 11.5 cm, H = 11.1 cm, red (2.5YR 5/6), SF: buff (10YR 8/2), PLATES 19, 71
226. Handle fr., 87/028 (1179), Trench 87/2, H = 17.6 cm, S = 3.4x5.9 cm, red (10R 5/6), PLATES 20, 72
227. Handle fr., 96/029 (243), Trench 96/1, H = 7 cm, S = 3.1x6.6 cm, red (2.5YR 5/6–5/8), PLATES 20, 72
228. Rim, neck, handle fr., 89/017 (1181), Trench 89/1, D = 15 cm, V = 1.6 cm, HD = 8 cm, DN = 11 cm, H = 18.1 cm, light brown (7.5YR 6/4), SF: buff (10YR 7/4), PLATES 20, 72
229. Base fr., 89/017 (1187), Trench 89/1, BD = 6.7 cm, H = 16.7 cm, light reddish brown (2.5YR 6/4), PLATES 20, 72
230. Rim, neck–, handle fr., 89/017 (14), Trench 89/1, D = 15 cm, V = 2.9 cm, HD = 7.3 cm, DN = 11 cm, H = 15 cm, red (10R 5/6), PLATES 20, 72
231. Neck, handle fr., 89/078 (405), Trench 89/4, DN = 11.7 cm, H = 8 cm, reddish yellow (5YR 6/6), PLATES 20
232. Base fr., 89/078 (402), Trench 89/4, BD = 5 cm, H = 16.1 cm, red (2.5YR 5/6), PLATES 20, 72
233. Rim fr., 92/042 (407), Trench 92/2, D = 15.3 cm, V = 3.3 cm, HD = 6.7 cm, H = 6.7 cm, red (2.5YR 4/6), PLATES 20, 72
234. Handle fr., 89/082 (404), Trench 89/4, H = 7.6 cm, red (2.5YR 5/6), PLATES 20, 72
235. Neck, handle fr., 96/051 (240), Trench 96/1, DN = 12.2 cm, H = 10.3 cm, light red (2.5YR 6/6), PLATES 20, 72
236. Rim, neck fr., 92/050 (409), Trench 92/2, D = 15.2 cm, V = 2.3 cm, HD = 6.2 cm, DN = 11 cm, H = 9.2 cm, red (2.5YR 5/6), PLATES 20, 72
237. Neck, handle fr., 92/050 (410), Trench 92/2, H = 7.4 cm, S = 2.7x5.7 cm, red (2.5YR 5/6), PLATES 20, 72
238. Handle fr., 92/042 (408), Trench 92/2, H = 6 cm, red (2.5YR 5/6), PLATES 21, 72
239. Rim, neck fr., 91/001 (1182), Trench 91/1, D = 16 cm, V = 3.1 cm, HD = 6.5 cm, H = 7.2 cm, red (10R 5/6), PLATES 21, 72
240. Rim, neck, handle fr., 90/011 (1172–800), Trench 90/3, D = 14.8 cm, V = 2.6 cm, HD = 6.8 cm, DN = 10 cm, H = 28.7 cm, red (10R 5/6), SF: buff (10YR 8/2), PLATES 21, 72
241. Neck, handle fr., 90/092 (1178), Trench 90/1, H = 18.7 cm, S = 3.2x5.6 cm, reddish brown (2.5YR 5/4), PLATES 21, 73
242. Rim, neck fr., 93/023 (413), Trench 93/2, D = 15 cm, V = 2.5 cm, H = 6.5 cm, red (2.5YR 5/6), PLATES 21, 73
243. Handle fr., 93/030 (416), Trench 93/2, H = 10.3 cm, S = 3.6x5.3 cm, brown (7.5YR 5/4), coated, white (10YR 8/2), PLATES 21, 73
244. Handle fr., 93/030 (418), Trench 93/2, H = 16.3 cm, S = 2.8x5.5 cm, reddish brown (5YR 4/3), SF: very dark grey (5YR 3/1), PLATES 21, 73
245. Rim, neck fr., 93/065 (427), Trench 93/2, D = 16.1 cm, V = 2.3 cm, HD = 6.5 cm, DN = 12.2 cm, H = 7.5 cm, red (2.5YR 5/6), PLATES 21, 73
246. Rim, neck fr., 92/041 (506), Trench 92/2–IIb, D = 16 cm, V = 2.6 cm, HD = 7.3 cm, H = 10.5 cm, red (2.5YR 5/6), SF: buff (10YR 8/3), PLATES 21, 73
247. Handle fr., 96/068 (505), Trench 96/1, H = 13.7 cm, S = 2.6x4.6 cm, light red (2.5YR 6/6), PLATES 21, 73
248. Handle fr., 93/069 (431), Trench 93/2, H = 8.5 cm, S = 2.9x6.9 cm, red (2.5YR 5/8), PLATES 21, 73
249. Rim, neck, handle fr., 90/127 (1174), Trench 90/3, D = 15.6 cm, V = 2.7 cm, HD = 7.2 cm, DN = 11.2 cm, H = 20.2 cm, red (10R 5/8), SF: buff (10YR 8/2), PLATES 21, 73
250. Rim, neck fr., 90/127 (1185), Trench 90/3, D = 17.4 cm, V = 3 cm, HD = 6.3 cm, H = 8.8 cm, red (10R 5/8), PLATES 22, 73
251. Rim, neck fr., 96/029 (242), Trench 96/1, D = 15 cm, V = 2.5 cm, HD = 5 cm, H = 7 cm, red (2.5YR 5/6), PLATES 22, 73
252. Handle fr., 93/027 (414), Trench 93/2, H = 27.6 cm, S = 3.3x5.9 cm, reddish yellow (5YR 6/6), PLATES 22, 73

Terrace House 2

561. Handle, 99/639 (380), B6, Room 32c, H = 7 cm, S = 5.5x3.1 cm, reddish brown (2.5YR 5/4), SF: coated, white (10YR 8/2), PLATES 43, 89

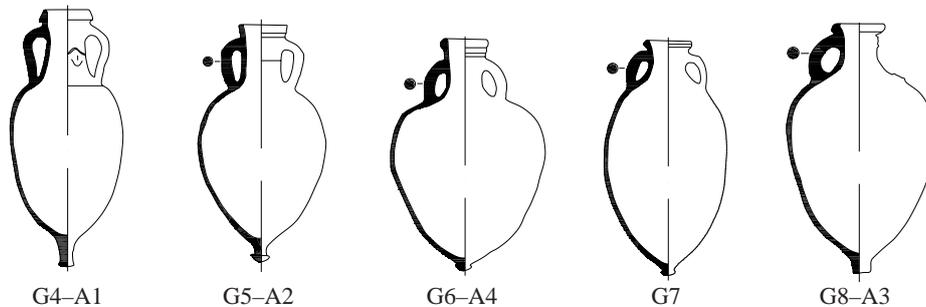
562. Body, handle, 99/644 (389), B6, Room 32c, DB = 32 cm, H = 12.5 cm, reddish yellow (5YR 6/6), SF: pink (5YR 7/4), PLATES 43, 89

The amphorae published from Ephesus:
Terrace House 1: Lang–Auinger – Outschar 1994, 9. 11.

Type 28

BRINDISIAN AND OTHER ADRIATIC OVOID AMPHORAE
(Ostia 66, Peacock – Williams 1)

Form: The ovoid amphorae of the Adriatic coast were shipped to a number of places. The excavations and the stamps have revealed the amphorae were produced near Brindisi. The finds of different workshops (Giancola, “La Rosa”, Apani) have been published³⁹⁴.



The Apani workshop was first published in a comprehensive typological survey³⁹⁵. D. MANACORDA has published similar forms from the Giancola workshop³⁹⁶. The forms of the two workshops are quite similar but there are differences in size. The amphorae of the Giancola workshop are more slender.

There are Giancola 5 – Apani 2, Giancola 6 – Apani 4, Giancola 8 – Apani 3, Giancola 7 type amphorae in Ephesus. It should be noted that the Giancola 4 – Apani 1 amphorae are typologically the same as the Lamboglia 2 amphorae³⁹⁷. The production site of the other Adriatic ovoid amphorae is unknown. The petrological analyses suggest that the amphorae of “marine clay” were produced in the middle of the Adriatic region.

There are few amphorae of this type in Ephesus.

Chronology: The production of amphorae in Brindisi started in the late second century, reaching its peak in the first half of the first century B.C., and continued until the Late Augustan period.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 1c	From mid to late second century B.C.	257
Ph 2b	Late second century. B.C to mid first century. B.C.: surface of Street I	258
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	259–260, 262–264, 268–271
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	266
Ph 11	Unstratified complexes	265, 267, 272

³⁹⁴ CIL IX 6079; Will 1962, 649 f.; see Cipriano – Carre 1989; Desy 1989; Empeur – Hesnard 1987; Manacorda 1988, 1990, 1994, 1998, 2001; Palazzo 1988, 1989, 1990, 1992, 1993, 1994, 1996; Palazzo – Silvestrini 2001; Sciara 1970.

³⁹⁵ Palazzo 1988, 107–117; Palazzo 1989, 550–553; Palazzo 1996, 47–53.

³⁹⁶ Manacorda 1990, 389, note 48; Manacorda 2001, 231 f.

³⁹⁷ Manacorda 1998.

Terrace House 2

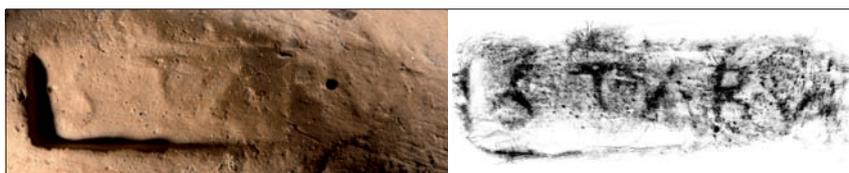
layer	Data range	no.
10	Debris	563

Stamp:



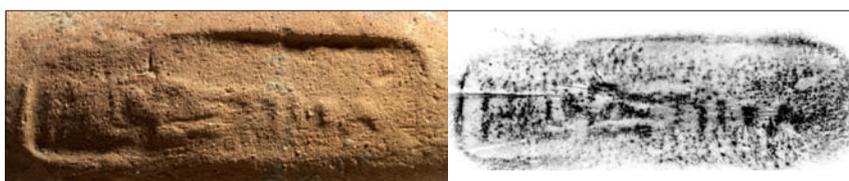
Viselli – no. 830

Bibl: Manacorda 1990, 382; Desy 1989, 170; Palazzo 1994, 220–222 T. V no. 2; Sztetyłło 2000, no. 235–238, Cipriano 2003, 237, fig. 1.



Stabu(a) – no. 265

Bibl: Manacorda 2001, 235, fig. 4; Palazzo 1994, 219, no. 15; Stabua was a slave of Visellius.



Demetrius? – no. 269, illegible? The slave Demetrius occurs at Giancola. (inv.no. B1203)³⁹⁸.



[P]hilipvs Betil(ieni) – no. 266

Bibl: Palazzo 1993, 232 f. Pl. 106, no. 5; Panella – Morizio forthcoming, no. 1148; The workshop owned by *M. Betilienus* manufactured these amphorae, Philip(p)us was his slave.



Menopilus – no. 267

Bibl: Palazzo 1990, 146, f. no. 7; Sciarra 1970, 150, no. 26; Desy 1989, 85, 170 and 176, nos. 558–564, 958; CIL IX. 6079.41; different workshops of “La Rosa”, Apani and Giancola.

Origin: On the basis of the stamps, the amphorae are primarily the products of the workshops near Brindisi (Giancola, Apani, “La Rosa”). However, the petrological analyses suggest that there are also ovoid amphorae present from unidentified workshops in central Italy.

The Visellius workshop

Several amphora stamps with Visellius’s name have been identified on the vessels from the Giancola workshop³⁹⁹. This and another pottery workshop (Marmorelle) belonged to the Visellii *gens* in the third quarter of the first century B.C.⁴⁰⁰. The amphorae manufactured in this workshop were used for transporting wine and

³⁹⁸ I am grateful to D. MANACORDA for calling my attention to this possible reading.

³⁹⁹ Manacorda 1990, 382; Manacorda 1994, 4–7.

⁴⁰⁰ Manacorda 2001, 229–240 fig.3; Manacorda 1990, 387; RE I X A 1 (1961) s. v. Visellius 353 (Gundel); Wiseman 1971, 275 No. 501.

olive oil. They had a broad distribution in the Mediterranean⁴⁰¹ and some specimens have been reported from as far as the Crimea (Panticapaeum)⁴⁰² on the Black Sea. The names of about twenty-five slaves can also be associated with the Visellius workshop. Their names usually appear together with the owner's name in the stamps on the two handles of the amphora⁴⁰³. Visellius's name appears in the genitive case on the stamps. In Ephesus, we have both the Viselli stamp, and the stamps of two of his slaves. Both stamps come from the excavations at the Tetragonos Agora. One of the stamps can be read as STABV(A)⁴⁰⁴ (no. 265), while the other one as Demetrius (no. 269), although the reading is controversial.

The Betilienus workshop⁴⁰⁵

Only a single [P]hilip(p)vs Betil(ieni) stamp corresponding to the one from Ephesus is known from the Brindisi "La Rosa" workshop⁴⁰⁶. The workshop owned by M. Betilienus manufactured these amphorae during the third quarter of the first century B.C.⁴⁰⁷. A number of stamped amphorae have been collected and published from the workshop situated a few miles from Brindisi. The names of Betilienus's slaves are also known from the stamps⁴⁰⁸. The amphorae of this workshop are found almost all over the Mediterranean. Lamboglia 2 amphorae for wine were also produced in the workshop. Some of them are among the vessels found in Ephesus⁴⁰⁹. The petrographical analyses show that the fabric of two Lamboglia 2 amphorae (nos. 276 and 291) is the same as the fabric of a Betilienus amphora (no. 266).

The Vehilius workshop

Menop(h)ilus stamps have been published from the workshops of Apani and Giancola⁴¹⁰. Menop(h)ilus was a slave of *Vehilius*⁴¹¹. The Vehilius workshop was in production in the second part of the first century B.C.⁴¹².

Distribution: They had a broad distribution in the Mediterranean (Tunisia, Spain, France, Germany, Italy, Greece, Turkey, Cyprus, Syria, Egypt) and the Black Sea⁴¹³.

Fabric: (analysed nos. 258, 259, 260, 266, 267, 270, 271, 272)

Visual Characteristics

The fabrics of the amphorae are not homogeneous.

1. Italian Fabric P, hard, fine fabric with some microfossils. Abundant amount of small limestone, white, red iron oxide, grey and mica inclusions, nos. 258 and 260 and 271.
Note: nos. 277 and 282 Lamboglia 2 amphorae belong to this group of Italian Fabrics.
2. Italian Fabric P1, nos. 259, 261, 266, 267, 272 were probably produced in "La Rosa" workshop. The piece with the Betilienus stamp belongs here (no. 266). Hard, fine fabric, with microfossils, white, red, grey and mica inclusions.
3. Italian Fabric R, fresh breaks and thin sections show that the fabric is similar to that of the Brindisi amphorae (P and P1). However, there is a high augite content in no. 270.

⁴⁰¹ Cipriano – Carre 1989, 95 f; Manacorda 1990, 382. Italy, Albania, France, Spain, Greece, Levant, Egypt.

⁴⁰² CIL III, 6243.3.

⁴⁰³ Manacorda 1994, 5; Manacorda 1995, 182.

⁴⁰⁴ [ST]ABVA / [V]ISELLI amphora stamp has been found in Azalia: Cabré Aguiló 1944, 24, fig. 15b 2; Beltrán 1970, 200, no.4; Beltrán 1982, 196; Desy 1989, 130 no. 982.

⁴⁰⁵ Palazzo 1989, 550–553.

⁴⁰⁶ Palazzo 1993, 232 f. Pl. 106, No. 5; Panella – Morizio forthcoming, no. 1148.

⁴⁰⁷ Desy 1989; Palazzo 1990.

⁴⁰⁸ Palazzo 1990, 150 Luc(rio), Marc(ipor), Metr(...), Aeneas, Philemon, Philippus and Rumas.

⁴⁰⁹ Palazzo 1992, T. XLVIII, no. 1

⁴¹⁰ CIL IX, 6079.41; Palazzo 1990, 146 f. no. 7 Pl. 85 nos. 1. 299.

⁴¹¹ Desy 1989, 85. 170. 176 nos. 558–564. 958.

⁴¹² Desy 1989; Palazzo 1990.

⁴¹³ Martin-Kilcher 2005, 208. 212; Cipriano – Carre 1989, 95 f.; Will 1987, 205; Will 1989, 301 f. fig. 6; Manacorda 1990, 382; Lund 2000, notes 84–90; Ehmig 2003, 45; Marangou – Marchand 2007, 248; Laubenheimer – Marlière 2010, 28–30; Bezeczky 2005b, Brindisian amphora.

4. Other Italian Fabrics:

- Two amphorae of the Visellius workshop belong to a different group. Hard, fine fabric. Sparse amount of black, grey, light brown, pale red and white grains. A few reaction rims surrounding voids, which once held limestone nos. 265, 830.
- Hard, very fine fabric, abundant amount of microfossils. White and colourless grains; very few brown grains. A few limestone or white reaction rims are visible nos. 257, 263 and 268.
- Hard, very fine fabric. Sparse white, red, grey and black inclusions nos. 262, 264, 269, 563.

Petrology

Italian Fabric P

Samples: nos. 258, 260 and 271

Matrix: nos. 258, 260 granular (oxidised sheet silicates, abundant fine grained carbonate particles), calcareous, optically active to inactive); no. 271 slightly micaceous and calcareous, optically active

Temper: Very frequent moulds of former carbonates, frequent monocrystalline quartz, subordinate alkali feldspars, muscovite, oxidised mica and iron oxide concretions, rare foraminifers very rare polycrystalline quartz, chert and heavy minerals and traces of plagioclase, biotite, carbonate grains, calcite bioclasts, siliceous bioclasts, siltstone/sandstone and crystalline rock fragments.

The *heavy mineral* assemblage (arithmetic mean of three samples) consists of garnet (48%), brookite/anatase (15%), epidote/zoisite (14%), rutile (8%), zircon (7%), hornblende (5%), titanite (1%), staurolite (1%), disthene (1%) and traces of augitic clinopyroxene and spinel.

Comment: Marine clay. The petrographical composition and the heavy mineral assemblage are similar to some Adriatic fabrics (Schörgendorfer 558 amphora Fabric Ac, Sauer 2005, 121).

Note: Amphorae nos. 277, 282 Lamboglia 2 also belong to this group.

R.S.

Italian Fabric P1

Samples: nos. 259, 266 and 272

Matrix: Light-orange, brownish, slightly micaceous, calcareous groundmass.

Temper: Mainly monocrystalline quartz, carbonate grains and moulds of former carbonates, subordinate K-feldspars, muscovite and iron oxide concretions, rare foraminifers and calcite bioclasts, very rare polycrystalline quartz, chert, biotite, oxidised mica, and heavy minerals and traces of plagioclase, siliceous bioclasts, crystalline rock fragment and volcanic rock fragments.

The *heavy mineral* assemblage (arithmetic mean of three samples) consists of garnet (39%), epidote/zoisite (21%), zircon (20%), rutile (11%), brookite/anatase (2%), titanite (2%), staurolite (1%), disthene (1%), hornblende (1%), augitic clinopyroxene (1%) and traces of monazite, tourmaline, chromium spinel, diopsidic clinopyroxene and melanite.

Note: Amphorae nos. 276, 291 Lamboglia 2 also belong to this group.

R.S.

Italian Fabric R

Sample: no. 270

Matrix: Slightly calcareous and micaceous.

Temper: Very frequent monocrystalline quartz (larger grains are partly well rounded), frequent carbonate grains, mica (mainly muscovite, rare biotite) moderate bioclasts (mainly foraminifers, partly broken) traces of corallinaceans, shell fragments, K-feldspar, rare heavy mineral grains (some large augite grains).

The *heavy mineral* composition is: Clinopyroxene (mainly augite): 86%, epidote/ clinozoisite: 6%, hornblende: 4%, garnet: 3%, zircon: 1%.

Comment: The thin section is similar to nos. 258, 272, 266 and 271, also more or less similar to nos. 259 and 260, but heavy mineral analysis is not comparable due to the very high augite content (different clay and fabric?).

R.S.

Sample: no. 267

Matrix: granular (oxidised fine grained sheet silicates plus fine carbonate particles), optically inactive

Comment: Thin section: similar to nos. 258 and 266, and more or less to nos. 273 and 271.

R.S.

Catalogue

Tetragonos Agora

257. Handle fr., 91/010 (1624), Trench 91/1, H = 10 cm, S = 3.3x3.5 cm, pale yellow (5Y 8/3–8/4), PLATES 23, 74
258. Rim, neck, handle fr., 93/059 (5), Trench 93/2, D = 16.3 cm, V = 3 cm, HD = 4 cm, DN = 10.8 cm, HN = 9.3 cm, H = 17.2 cm, buff (7.5YR 7/4–6/4), SF: white (10YR 8/2), PLATES 23, 74
259. Rim fr., 96/044 (273), Trench 96/1, D = 15 cm, V = 2.4 cm, H = 4 cm, reddish yellow (5YR 6/6), PLATES 23, 74
260. Rim, neck fr., 96/029 (272), Trench 96/1, D = 16.7 cm, V = 2.2 cm, HD = 3 cm, DN = 12 cm, H = 19.2 cm, reddish yellow (5YR 6/6), PLATES 23, 74
261. Rim, neck fr., 87/036 (1355), Trench 87/1, Dim: D = 15.3 cm, V = 1.1 cm, HD = 3.9 cm, DN = 12.6 cm, H = 8.5 cm, reddish yellow (5YR 6/6), PLATES 23, 74
262. Rim, neck, handle fr., 90/013 (1192), Trench 90/4, D = 16 cm, V = 2.5 cm, HD = 3 cm, DN = 11.4 cm, H = 11.2 cm, S = 3.5 cm, brown (7.5YR 5/4), PLATES 23, 74
263. Rim, neck, handle fr., 90/021 (1335), Trench 90/2, D = 16 cm, V = 2.2 cm, HD = 3.8 cm, DN = 12.2 cm, H = 20.2 cm, light red (2.5YR 6/6), SF: buff–light brown (7.5YR 7/4–6/4), Irregularly fired, PLATES 23, 74
264. Rim, neck, handle fr., 93/032 (1364), Trench 93/2, D = 15.6 cm, V = 2.2 cm, HD = 2.8 cm, H = 15.2 cm, buff (10YR 7/4), PLATES 23, 74
265. Handle fr., 86/23 (2050), Trench 23, Stamp: STABV., Stabu(a), H = 9.5 cm, S = 2.9x2.9 cm, reddish yellow (5YR 7/8), SF: reddish yellow (7.5YR 7/6), PLATES 23, 74
266. Handle fr., 95/199 (204), Trench 95/1, Stamp: [P] HILIPVS.BETIL, Philip(p)us Betil(ieni), H = 14.7 cm, S = 3.2x3.1 cm, reddish yellow (5YR 6/6), SF: reddish yellow (7.5YR 7/6), PLATES 23, 74
267. Handle fr., 01/... (1320), Stray find, next to the North Gate, Stamp: MENOPILVS, H–I–L in ligature, Menop(h)ilus (Vehilius workshop), H = 12.8 cm, S = 3.2x3.3 cm, light red (2.5YR 6/6), PLATES 23, 74
268. Rim, neck, handle fr., 87/032 (1161), Trench 87/1, D = 15 cm, V = 1.8 cm, HD = 2.1 cm, DN = 11.4 cm, H = 9.1 cm, light red (2.5YR 6/6–5/6), PLATES 24, 74
269. Handle fr., 87/032 (1282), Trench 87/1, Stamp: Demetrius? Illegible, H = 13 cm, S = 3.4x3.1 cm, light red (2.5YR 6/6), PLATES 24, 74
270. Rim fr., 88/017 (1308), Trench 88/2 (A), D = 16.5 cm, V = 1.7 cm, HD = 6.1 cm, H = 8.2 cm, reddish yellow (5YR 6/6), PLATES 24, 74
271. Rim, neck, handles, 87/042 (4), Trench 87/1, D = 19 cm, V = 2.8 cm, HD = 3.5 cm, DN = 13 cm, H = 30.2 cm, S = 4x4.6 cm, reddish yellow (7.5YR 6/6), PLATES 24, 75
272. Rim, neck, handles, 95/002 (3), Trench 92/2, D = 15.8 cm, V = 2.5 cm, HD = 3.2 cm, DN = 11.2 cm, HN = 12 cm, H = 30.3 cm, S = 3.5x3.5 cm, reddish yellow (5YR 6/6), PLATES 24, 75

Terrace House 2

563. Rim, 99/239 (603), C8, Stairway 3, D = 16 cm, V = 1.4 cm, H = 13.3 cm, brown (7.5YR 5/4), SF: buff (10YR 7/4), PLATES 42, 89

Serapeion

830. Name: handle, No: 90/059 (102), Trench 90/2, Stamp: [V]ISELLI, Viselli(i), H = 10.5 cm, S = 3,7x3,2 cm, buff (7.5YR7/4), PLATES 53, 96

Type 29

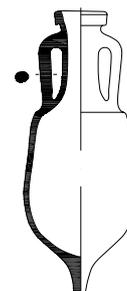
LAMBOGLIA 2

(Peacock – Williams 8)

Form: A thickened rim with a slight overhang, triangular to squarish in profile and a high cylindrical neck with thick oval handles. It has a fairly thick-walled, bag-shaped body, which has a pronounced carination on

the shoulder and a short pointed spike. Sometimes stamped on the rim and the handle⁴¹⁴. The forms of the Lamboglia 2 amphorae show a wide variation. The Dressel 6A amphorae which replaced the Lamboglia 2 amphorae are typologically very similar⁴¹⁵. The fabric is frequently the same, as they were produced in the same workshops. The Lamboglia 2 amphorae in Ephesus show a great variety in forms and fabrics. There are few amphorae of this type in Ephesus.

Chronology: The inception date for the production of the Lamboglia 2 amphorae was the end of the second century B.C.⁴¹⁶. The cessation of production cannot be established with certainty. It probably coincided with the appearance of Dressel 6A amphora in the last third of the first century B.C.⁴¹⁷.



The amphorae found in Ephesus

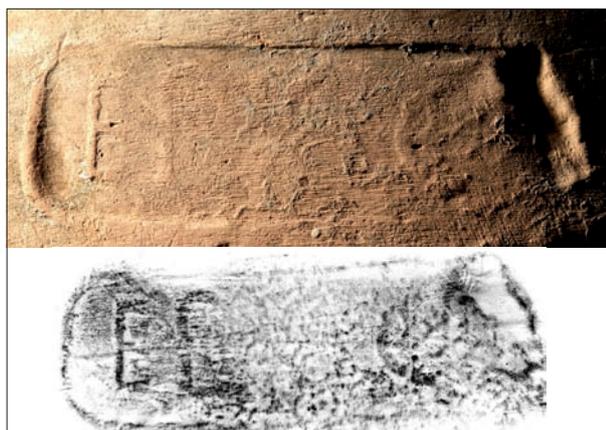
Agora

layers	Data range	nos.
Ph 1c	From mid to late second century B.C.	273
Ph 2a	Late second century B.C to mid first century B.C.: between surfaces of Streets I and II	274–277
Ph 2b	Late second century. B.C to mid first century. B.C.: surface of Street I	278–279
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	280
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	281–288
Ph 5b	A.D. 23 to 45: Agora Courtyard	289
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	290
Ph 11	Unstratified complexes	291–292

Terrace House 2

layers	Data range	nos.
2	First century B.C.	566–570
2a–3a	Late first century B.C. to early first century A.D.	565
3a	Late first century A.D.	564

Stamp: Most of the stamps published contain abbreviated names⁴¹⁸. We have six stamps in Ephesus. Three are on rims (nos. 278, 285 and 803), while the other three are on the top of the handles (nos. 284, 802, and 820).



ER...C stamp – no. 278

An ERTEC stamp has been reported from Cesano di Senigallia where it is on the rim of a Dressel 6A type amphora⁴¹⁹.

Bibl.: CIL XII 3825. An alternative reading could be: EPTAC(entus) CIL XVI 31; AE 1928, 165=IRPL 82.

⁴¹⁴ Lamboglia 1952, 164 f.; Lamboglia 1955, 262; Beltrán 1970, 349; Peacock – Williams 1986, 98 f.; Van der Werff 1986, 103; Tchernia 1986, 68; Cipriano – Carre 1989, 80 f.; Lindhagen 2009, 83.

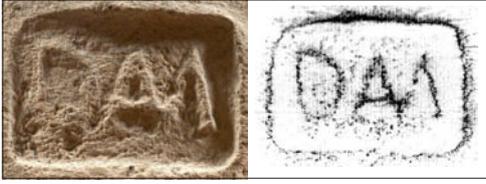
⁴¹⁵ Riley 1979, 153; Carre 1985, 211; Martin-Kilcher 1994, 429.

⁴¹⁶ Tchernia 1986, 53–56; Grace 1965, 11; Baldacci 1972, 109; Van der Werff 1986, 103; Peacock – Williams 1986, 100.

⁴¹⁷ Carre 1985, 211f.; Van der Werff 1986, 103; Peacock – Williams 1986, 100; Tchernia 1986, 134.

⁴¹⁸ Van der Werff 1986, 104. 129–132; Baldacci 1967–68, 13 fig. 6a–b; Baldacci 1972, 125–127; Cipriano 1994, 209 f.; The most detailed list has been assembled by Bruno 1995, 120–153; Desy 1989, 24–63.

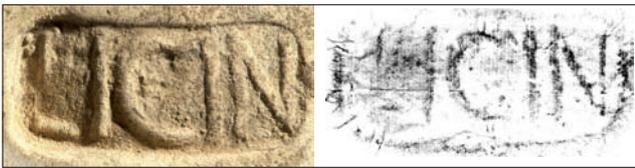
⁴¹⁹ Mercado 1979, 118 no. 4 fig. 30–31 b.



no. 803 – DAM, A and M in ligature.

Bibl.: CIL X, 8049.14 = Callender 1965, no. 511 (.AM) from Pompei; Egger 1963, 93 no. 4, Fig. 50, from Magdalensberg; Baldacci 1967–1968, 20 from Campania – Lazio; on a Brindisi type Desy 1989, 73, no. 450, Apani; Jöhrens 1999, 262 no. 889, from Athens;

The formal characteristics of the amphora with the DAM stamp in Ephesus are quite different from the ones found in Magdalensberg. This seems to be true even though we have only the upper parts of both amphorae. The amphora in Ephesus has a ribbon rim of 5.2 cm. The one in Magdalensberg is only half this size. The letters are written in *ligatures* in both stamps, but the shape of the letters is quite different. The fabric of the amphora in Ephesus is coarse, while the one in Magdalensberg has fine grains.



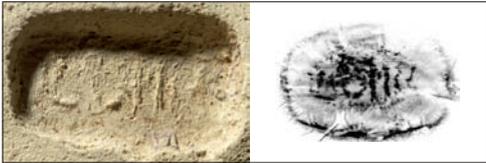
no. 284 – LICIN

Bibl.: CIL XII 5683.162 Vieille-Toulouse; Callender 1965, 867 c; Brecciaroli Taborelli 1987, 36, Pl. 15, LICI; Starac 2009, 130, SI. 12, 150 T. II. 1–2; Liou 1987b, 273, Fig. 4; Pascual 1 amphora.



no. 802 – LICIN

The LICIN stamps on the amphorae of the Agora and of the Basilica Stoa are different. The fabric, however, is the same.



no. 285 – C. OPIM? Almost illegible.

Bibl.: C. OPIM(ius) stamp has not yet been identified elsewhere; There are similar stamps: CON*sphaera* (?) in Museo Nazionale Taranto, Viola 1885, no. 256; COPNE Viola 1885, no. 255; The stamps on two amphora handles: COINE in Museo Nazionale Taranto, inv.no. 210925; CON in Museo Nazionale Taranto inv.no. 210926.⁴²⁰ CLEO Volpe 1988, 389–391.



no. 820 – CADMVS, A–D in ligature.

Bibl.: CIL IX, 6080.7a–b = Callender 1965, no. 215, at Civitella Casanova; Egger 1969, 365, no. 4, Fig. 49 from Magdalensberg. The CADMVS stamps in Ephesus and Magdalensberg are the same.

Origin: Seven possible Lamboglia 2 production sites on the coast between Aquileia and Brindisi have been published so far: Aquileia (Locavaz), Modena?, Cesenatico?, Potenza Picena?, Fermo?, Cologna Marina, Brindisi (Apani, Giancola and “La Rosa”) and Sermin (Slovenija)⁴²¹. A workshop on the island of Viš (Issa) in the eastern Adriatic region has also been mentioned⁴²². The area of Narona may have had workshops as well⁴²³. Recently, A. LINDHAGEN has stated that these amphorae were produced on the Dalmatian coast⁴²⁴. However, the petrological analyses show that the Lamboglia 2 amphorae were also produced in Brindisi.

⁴²⁰ I am grateful to D. MANACORDA for the data concerning the COINE and the CON stamps.

⁴²¹ Panella 1970, 117; Will 1970, 383–386; Empereur – Hesnard 1987, 33; Cipriano – Carre 1989, 85; Cipriano 1994, 207 fig. 3; Sciallano – Sibella 1994, Amphore Lamboglia 2; Bruno 1995, 83–92; Zupančič *et al.* 1998, 345–357.

⁴²² Kirigin *et al.* 2006, 193 f.

⁴²³ Cambi 1989, 321.

⁴²⁴ Lindhagen 2009.

Contents: It was first supposed that the vessels contained olive oil⁴²⁵. However, the analysis of the contents of the amphorae from the Madrague de Giens shipwreck suggests that it was wine⁴²⁶.

Distribution: The amphorae can be traced from Spain to the Greek regions and North Africa. The amphorae occur in many places in the western Mediterranean, northern Provinces⁴²⁷. In the eastern Mediterranean, they are found in Greece, Turkey, Levant, and Egypt⁴²⁸.

Fabric: (analysed nos. 273, 274, 276, 277, 278, 279, 281, 282, 284, 291)

Visual characteristics

A fairly soft, smooth, fine, slightly micaceous fabric. Some of the Lamboglia 2 and Brindisi amphorae produced on the Adriatic coast can be divided into four groups on the basis of petrological analyses. The known workshop in Brindisi also produced Lamboglia 2 forms. The results of the analyses show that two groups of the Brindisi and Lamboglia 2 amphorae have exactly the same fabric. They must have been produced in the same or neighbouring workshops. Since the piece with the Betilienus stamp (no. 266) is among the ones belonging to Fabric P1, it seems reasonable to suppose that these amphorae were produced in the vicinity of “La Rosa” workshop.

1. Italian Fabric O, small colourless and iron oxide inclusions, microfossils. A few reaction rims surrounding voids which once held limestone, nos. 281, 284, 285, 287, 292.

2. Italian Fabric P, white, dark brown and iron oxide inclusions, microfossils, a large quantity of mica. A few reaction rims surrounding voids which once held limestone. Marine clay, nos. 277 and 282.

Note: nos. 258, 260, 271 Brindisian amphora type amphorae belong here.

3. Italian Fabric P2. Many small colourless and grey inclusions. Many reaction rims surrounding voids which once held limestone. Typical are the presence of foraminifers and the relative low firing temperature, marine clay. A production area is possible in northern Italy or on the Dalmatian coast or the island of Viš (Issa) nos. 273–275, 278–280, 286.

1–3 Fabric group: The petrographical composition and the heavy mineral assemblage are similar to some Adriatic fabrics (Sauer 2005, 121, Schörgendorfer Fabric Ac)

4. Italian Fabric P1, extremely rich in carbonate grains. Low firing temperature; limestone in the matrix; with a few large grains of limestone and white. A few reaction rims surrounding voids which once held limestone. The production area is perhaps near Apulia, Brindisi, “La Rosa” workshop, nos. 276, 283, 288, 289 and 291.

Note: nos. 259, 272, 266 and 267 Brindisian type amphorae belong here.

The amphorae which have not been analysed petrologically have many colourless, white, dark brown, grey inclusions, relatively bigger iron oxide fragments up to 2–3 mm. Voids of limestone.

Petrology

Italian Fabric O

Samples: nos. 281, 284

Matrix: granular light coloured, extremely calcareous, optically inactive to active, partially totally recrystallised (calcite)

Temper: very frequent of moulds of former carbonates, frequent monocrystalline quartz and iron oxide concretions, subordinate alkali feldspars, moderate muscovite and oxidized mica, rare chert, very rare polycrystalline quartz, plagioclase, carbonate grains, foraminifers and heavy minerals and traces of biotite, calcitic bioclasts, siliceous bioclasts and crystalline rock fragments.

⁴²⁵ Lamboglia 1952, 164 f.; Lamboglia 1955, 262; Buchi 1973, 545.

⁴²⁶ Formenti *et al.* 1978, 95–100; Tchernia 1986, 53; Empereur – Hesnard 1987, 33.

⁴²⁷ Cintas 1950, Type 321; Tchernia 1986, 53–56, 69–74; Beltrán, 1970, 349–358; Grace, 1962, fig. 36; Cipriano – Carre 1989, fig. 14, 97–99; Bruno 1995, 83–275; Will 1987, 202–204; Martin-Kilcher 2005, 208, 212; Maier-Maidl 1992, 101–103; Zupančič *et al.* 1998, 345–357; Bezeczky 1994a, 13 fig. 1; Bezeczky 1998b, 228; Ehmig 2003, 46; Lindhagen 2009, 95, fig. 4.

⁴²⁸ Tchernia 1986, 68–74; Will 1989, 303, f. fig. 7–11; Lund 2000a, 84; Monsieur 2001, 75, fig. 12; Bezeczky 2001b, 11 T. 2–3; Bezeczky 2005b, Lamboglia 2; Lawall 2006, 272 f.

The *heavy mineral* assemblage (arithmetic mean of 2 samples) consists of zircon (38%), rutile (23%), brookite/anatase (8%), garnet (8%), titanite (7%), disthene (5%), epidote/zoisite (3%), hornblende (3%), staurolite (2%), sillimanite (1%), augitic clinopyroxene (1%), diopsidic clinopyroxene (1%) and traces of chromium spinel and not identified grains.

Comment: The petrographical composition and the heavy mineral assemblage are similar to some Adriatic fabrics (Schörgendorfer 558 amphora Fabric Ac, Sauer 2005, 121).

R.S.

Italian Fabric P

Samples: nos. 277, 282

Matrix: no. 277 very fine grained to slightly granular, calcareous, optically active to inactive, no. 282 slightly micaceous, weakly calcareous, optically active to inactive.

Temper: Frequent monocrystalline quartz and moulds of former carbonates, moderate alkali feldspars, muscovite, foraminifers and iron oxide concretions, rare chert, biotite and heavy minerals, very rare polycrystalline quartz, oxidised mica, carbonate grains and siltstone/sandstone and traces of plagioclase, calcite bioclasts and crystalline rock fragments.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of garnet (54%), epidote/zoisite (15%), zircon (14%), rutile (8%), hornblende (3%), disthene (2%), brookite/anatase (1%), titanite (1%), staurolite (1%), not identified grains (1%) and traces of tourmaline. Typical are the presence of foraminifers and the relative low firing temperature.

Comment: marine clay? with a possible northern Italy source. The petrographical composition and the heavy mineral assemblage are similar to some Adriatic fabrics (Schörgendorfer 558 amphora Fabric Ac, Sauer 2005, 121).

Note: Amphorae nos. 258, 260, 271 (Bridisian) also belong to this group.

R.S.

Italian Fabric P1

Samples: nos. 276, 291

Matrix: no. 276 granular, light coloured, strongly calcareous, optically inactive to active, partially recrystallised, no. 291 Fine grained, slightly, calcareous, optically active

Temper: Frequent monocrystalline quartz, subordinate muscovite, biotite, carbonate grains, moulds of former carbonates and iron oxide concretions, rare K-feldspars and oxidised mica, very rare polycrystalline quartz, chert, plagioclase, foraminifers, siltstone/sandstone, crystalline rock fragments and heavy minerals.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of garnet (68%), epidote/zoisite (10%), zircon (9%), rutile (6%), hornblende (2%), titanite (1%), augitic clinopyroxene (1%), brookite/anatase (1%), staurolite (1%), disthene (1%) and traces of tourmaline, chromium spinel and not identified grains.

Note: Amphorae nos. 259, 266, 272 (Bridisian) also belong to this group.

R.S.

Italian Fabric P2

Samples: nos. 273, 274, 278, 279

Matrix: Light-brownish, lime rich groundmass.

Temper: Frequent carbonate grains, subordinate monocrystalline quartz, muscovite and iron oxide concretions, moderate oxidised mica and moulds of former carbonates, rare K-feldspars, biotite and heavy minerals, very rare polycrystalline quartz, chert and foraminifers and in traces sanidine, plagioclase, siliceous bioclasts, siltstone/sandstone and crystalline rock fragments.

The *heavy mineral* assemblage (arithmetic mean of four samples) is composed of garnet (53%), epidote/zoisite (13%), hornblende (11%), zircon (7%), rutile (7%), brookite/anatase (2%), tourmaline (2%), disthene (2%), titanite (1%), staurolite (1%), traces chlorite, sillimanite, and augitic clinopyroxene.

Comment: Typical are the presence of foraminifers and the relative low firing temperature. Marine clay? With a possible northern Italy source. The petrographical composition and the heavy mineral assemblage is similar to some Adriatic fabrics (Schörgendorfer 558 amphora Fabric Ac, Sauer 2005, 121).

R.S.

Catalogue

Tetragonos Agora

273. Rim, neck, handle fr., 93/050 (420), Trench 93/2, D = 17 cm, V = 2.8 cm, HD = 4.2 cm, DN = 11 cm, H = 24.4 cm, reddish yellow (5YR 6/6), PLATES 24, 75
274. Neck, body, handle fr., 91/022 (177), Trench 91/1, H = 21.3 cm, S = 3.8x4.1 cm, light red (2.5YR 6/6), PLATES 24, 75
275. Handle fr., 93/048 (502), Trench 93/2, H = 10.6 cm, S = 2.7x3.8 cm, reddish yellow (5YR 6/6), PLATES 24, 75
276. Handle fr., 96/062 (503), Trench 96/1, H = 5.6 cm, S = 3.2x5.2 cm, light reddish brown (5YR 6/4), PLATES 24, 75
277. Rim, neck, handle fr., 90/099 (507), Trench 90/1, D = 17.6 cm, V = 2.4 cm, HD = 2.3 cm, , H = 8.5 cm, light reddish brown (5YR 6/4), PLATES 24, 75
278. Rim, neck, handle fr., 93/059 (17), Trench 93/2, Stamp on the rim: ER[.]C, D = 18 cm, V = 3 cm, HD = 4.5 cm, DN = 11.9 cm, H = 15.5 cm, light red (2.5YR 6/6), PLATES 25, 75
279. Rim, neck, handle fr., 93/059 (422), Trench 93/2, D = 16.5 cm, V = 3.1 cm, HD = 5.5 cm, , H = 12.5 cm, reddish yellow (5YR 6/6), PLATES 25, 75
280. Rim, neck fr., 87/028 (1336), Trench 87/2, D = 18 cm, V = 3.2 cm, HD = 4.3 cm, H = 7.1 cm, light red (2.5YR 6/6), SF: buff (10YR 8/3), PLATES 25, 75
281. Rim, neck, handle fr., 89/031 (250), Trench 89/2, D = 17 cm, V = 3.2 cm, HD = 4.8 cm, DN = 11.8 cm, H = 12.1 cm, olive yellow (2.5Y 6/4), SF: buff (10YR 8/3), PLATES 25, 75
282. Handle fr., 96/051 (270), Trench 96/1, H = 21.8 cm, S = 3.3x3.8 cm, light red (2.5YR 6/6), PLATES 25, 75
283. Rim, neck, handle fr., 92/030 (1278), Trench 92/2, D = 15.6 cm, V = 2.3 cm, HD = 4.8 cm, DN = 11.4 cm, H = 19.8 cm, S = 3.3x4.1 cm, reddish yellow (5YR 6/6), PLATES 25, 75
284. Neck, handle fr., 92/042 (406), Trench 92/2, Stamp on the handle: LICIN, DN = 12.6 cm, H = 14.6 cm, S = 3.3x5.3 cm, buff (10YR 7/4), PLATES 25, 75
285. Rim, neck fr., 90/188 (1210), Trench 90/1, Stamp on the rim: C.OPIM ?, D = 18.6 cm, V = 2.9 cm, HD = 3.5 cm, H = 4.4 cm, buff (10YR 8/3–7/3), PLATES 25, 75
286. Rim, neck, handle fr., 87/038 (1353), Trench 87/1, D = 15.4 cm, V = 2.7 cm, HD = 4.8 cm, DN = 11.8 cm, H = 12.9 cm, reddish yellow (5YR 6/6), PLATES 25, 76
287. Rim, neck, handle fr., 87/032 (1677), Trench 87/1, D = 16.5 cm, V = 2.6 cm, HD = 2.9 cm, DN = 10 cm, H = 19.3 cm, S = 3.3x3 cm, pink (7.5YR 7/4), PLATES 25, 76
288. Rim, neck, handle fr., 00/076 (1713), Trench 00/1, D = 16.8 cm, V = 2.6 cm, HD = 5 cm, DN = 13.6 cm, H = 24.3 cm, S = 3.3 cm, very pale brown (10YR 8/4), PLATES 26, 76
289. Rim, neck, handle fr., 93/064 (426), Trench 93/2, D = 17 cm, V = 3 cm, HD = 4.7 cm, DN = 10.6 cm, H = 33.6 cm, reddish yellow (5YR 6/6), PLATES 26, 76
290. Rim, neck fr., 89/007 (1200), Trench 89/2, D = 16.2 cm, V = 2.5 cm, HD = 4.3 cm, , H = 8 cm, S = cm, light reddish brown (5YR 6/4), PLATES 26, 76
291. Rim, neck, handle fr., 95/002 (18), Trench 92/2, D = 16.7 cm, V = 2.3 cm, HD = 4.1 cm, DN = 10.6 cm, H = 13.5 cm, S = 3.2x5.2 cm, light red (2.5YR 6/6), PLATES 26, 76
292. Rim, neck, handle fr., 96/007 (1350), Trench 96/1, D = 17 cm, V = 2.3 cm, HD = 4.2 cm, DN = 12 cm, H = 26.5 cm, buff (7.5YR 7/4), PLATES 26, 76

Terrace House 2

564. Rim, 99/644 (397), B6, Room 32c, D = 16.7 cm, V = 2.3 cm, HD = 3.5 cm, H = 5 cm, very pale yellow (10YR 7/4), SF: very pale brown (10YR 8/2–8/4), PLATES 42, 89
565. Rim, neck, 99/278 (52), WT 2, Stone-cutting saw, D = 16.8 cm, V = 2.8 cm, HD = 3.4 cm, H = 5 cm, pink (7.5YR 7/4), PLATES 42, 89
566. Rim, neck, handle, 99/675 (273), B6, Room 32c, D = 16.5 cm, V = 3 cm, HD = 4 cm, H = 13.5 cm, reddish yellow (5YR 7/6), SF: very pale brown (10YR 8/3), PLATES 42, 89
567. Rim, neck, handle, 99/694 + 99/711 + 99/674 (87+94+109), B6, Room 32c, D = 16 cm, V = 3 cm, HD = 3.7 cm, H = 22.8 cm, reddish yellow (5YR 6/6), PLATES 43, 89
568. Rim, neck, handle, 99/643 (394), B6, Room 32c, D = 16.5 cm, V = 2.5 cm, HD = 3.9 cm, H = 9.6 cm, S = 4.9x3.6 cm, light brown (7.5YR 6/4), SF: very pale brown (10YR 8/3), PLATES 43, 89
569. Neck, handle, 99/635 (98), B6, Room 32c, H = 11.9 cm, reddish yellow (7.5YR 7/6), PLATES 43, 89
570. Handle, 99/712 (105), B6, Room 32c, H = 11.4 cm, S = 3.9x3.7 cm, light reddish brown (5YR 6/4), PLATES 43, 89

State Agora, Basilica Stoa, Earlier excavations

802. Rim neck, handle fr., 62/1964, Stamp on the handle: LICIN, D = 18.1 cm, V = 2.7 cm, HD = 3.4 cm, H = 14.5 cm, pink (5YR 7/4 – 7.5YR 7/4), SF: buff (10YR 7/3), PLATES 53, 96
803. Rim neck, handle fr., 7115, Ki 94/1968, Sondage 8/68, –1.7 m, Stamp on the rim: DAM, A–M ligature, D = 13.8 cm, V = 2.6 cm, HD = 5.2 cm, H = 14.5 cm, pink (7.5YR 7/4 – 8/4), PLATES 53, 96

State Agora, Prytaneion, Earlier excavations

820. Handle fr., 61/69, S 21/1961, Stamp: CADMVS, A–D in Ligature, H = 4.2 cm, S = 5.6 x 3.2 cm, red (10R 5/8), PLATES 53, 96

The amphorae published from Ephesus:
Harbour: Zabełlicky 1996, Fig. 3; Terrace House 2: Ladstätter 2010c, A–K 130 T. 73.

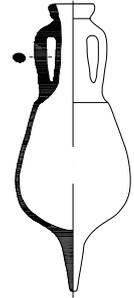
Type 30

DRESSEL 6A

(Baldacci 2; Buchi 6A; Early Roman amphora 5; Peacock – Williams 8; Augst 38)

Form: The Dressel 6A has many variants. These Dressel 6A amphorae were very often produced in Lamboglia 2 workshops and as a result it is often difficult to distinguish the two types from each other, especially when we are considering fragments. While the rims vary significantly, the rest of the amphora is usually quite similar. The handles run in a curve from below the rim to the upper part of the pear-shaped body which has a long, solid spike⁴²⁹. There are few amphorae of this type in Ephesus.

Chronology: The Dressel 6A amphorae were produced starting in the last third of the first century B.C. They are present in the amphora wall in Carthage (dated between 43 and 15 B.C.)⁴³⁰. Export of this type ended in the mid first century A.D., a date that is supported by an amphora found in Rome bearing a consular date of A.D. 36 and two new amphorae with consular dates (A.D. 38) in Magdalensberg⁴³¹. There are a few pieces in the Claudian layers in Ostia, but they are missing from the Flavian layers⁴³². The only pieces in the Pannonia occur at sites of the Amber Route occupied during the Augustan and Tiberian periods. These amphorae are missing from the northeastern areas which were occupied under Claudius. The amphora stamps can contribute to the dating: M. Herennius Picens was *consul suffectus* in 34 B.C., his son in A.D. 1 and proconsul of Asia in A.D. 6/7. L. Tarius Rufus was *consul suffectus* in 16 B.C. T. Helvius Basila, the producer of the amphorae with the T·H·B stamp was the *legatus* of Tiberius and Claudius⁴³³.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	293–294
Ph 4–5	30/27 B.C. to A.D. 5	295, 299
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	296
Ph 6	Mid first to late fourth centuries A.D.	297
Ph 8	Before mid(?) sixth century A.D.	298

Terrace House 2

layer	Data range	no.
11	Stray find	571

The only Dressel 6A amphora (no. 810) of the State Agora Well was found in a layer dated to the first quarter of the first century A.D.

⁴²⁹ Carre 1985, 211; Baldacci 1967–68, 7–49; Buchi 1973, 531–637. The transition period is shown by the amphorae of the Kerameikos excavations in Athens Böttger 1992, Fig. 1. nos. 3–5, T. 96, no. 3 T. 97.

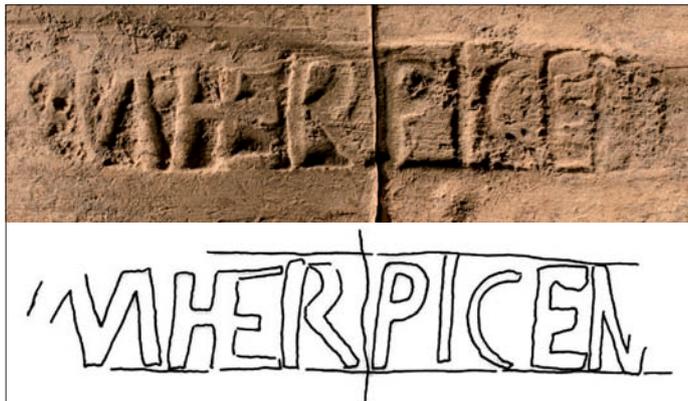
⁴³⁰ Delattre 1894, 89–110 = CIL VIII 3, 2200; Carre 1985, 211.

⁴³¹ CIL XV 4582; Carre 1985, 213; Piccottini 1997, 204 f. fig. 96.

⁴³² Carre 1985, 213.

⁴³³ Wiseman 1971, no. 205; Zevi 1966, 219; Zaccaria 1989, 481 note 83; Carre 1985, 214–217; Tchernia 1986, 134; Alföldy 1968, 100 f.; Maier-Maidl 1992, 84–87; Bezczy 1994a, 22–34.

Stamp: They are sometimes stamped on the rim or on the neck. However, there are stamps on the upper part of the body as well.



no. 296 – M.HER.PICENT, H–E and N–T in ligature, M. Her(enni) Picent(is)



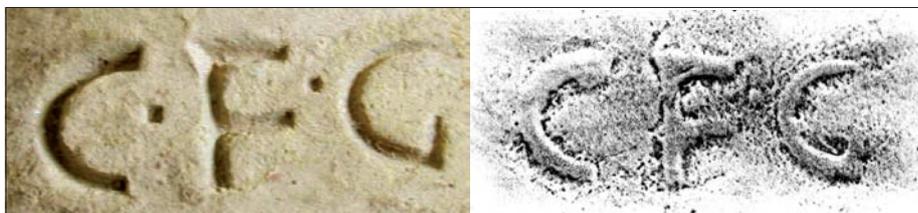
no. 298 – M.HER.PICENT, H–E and N–T in ligature, M. Her(enni) Picent(is)

Bibl.: CIL XV, 3466. a, b, Rome; CIL III, 7309.10, Athens; CIL VIII, 10477, 4 and 22637.50; Egger 1959, 129, nos. 7 and 8 fig. 107; Callender 1965, 183 no. 1101; Baldacci 1967–1968, 27 f. no. 36a; Buchi 1973, 573–575, no. 14; Maselli Scotti 1983, 56; Jobst – Piccottini 1986, 260 no. 2 T. XXIII; Toniolo 1991, 79, no. 24, 180 f., Fig. 147; Maier–Maidl 1992, 86; Buora 1995a, 183–187; Bezeczky 1998b, 230; Buora 1999, 127–131; Pesavento Mattioli – Zanini 1993, 47 fig. 49–51; Blanc–Bijon *et al.* 1998, nos. 863 f.; Mariotti *et al.* 2009, 573.



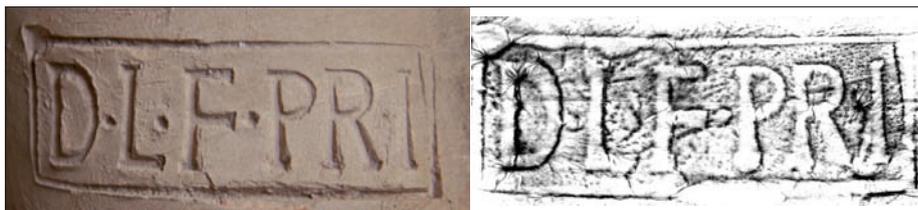
no. 804 – S.L.E.[P]

Bibl.: Callender 1965, no. 1632 = CIL VIII 2637.59, Carthage; Pesavento Mattioli – Zanini 1993, 51 Fig. 61–63, publ. as P.L.E.[–]; S.L.E stamp known Calvatone, Padova, Aquileia.



no. 810 – C.F.C

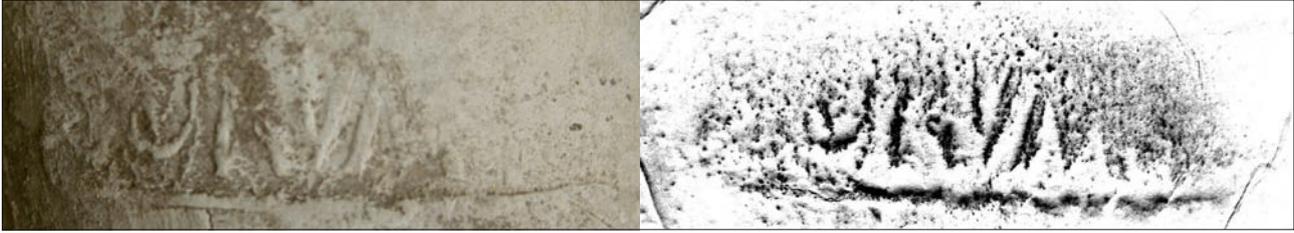
Bibl.: CIL XI, 6695.41, Parma; Athens⁴³⁴.



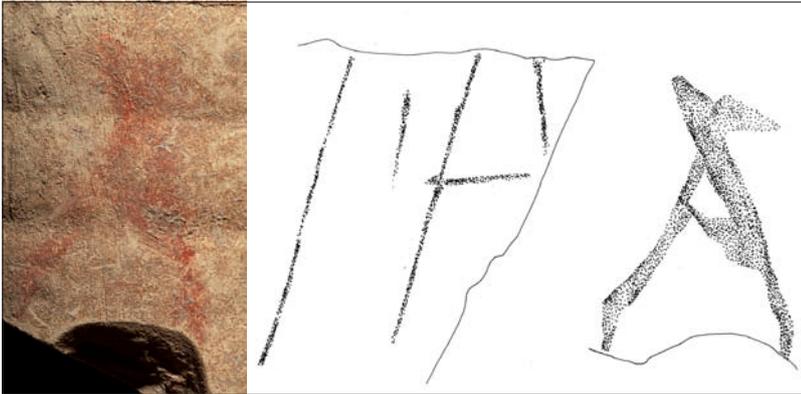
no. 647 – D.L.F.PRI

This stamp has not yet been identified elsewhere

⁴³⁴ SS 10.358; I am grateful to J. CAMP for the permission to study the amphorae.



no. 648 –.../. NVM.. This stamp is illegible. I misread it on the basis of a photo (Bezeczky 2001b, no. 9) This stamp has not yet been identified elsewhere.



There are two *tituli picti* on the neck and body of no. 299. The neck has A–T in ligature. The other one is not legible. Scale 1:2

Origin: It was thought for a long time that Istria was one of the production sites of the Dressel 6A amphorae. This idea gave rise to a long series of misunderstandings. In the wake of Dressel's publication, the Dressel 6A and the Dressel 6B types were not properly distinguished⁴³⁵. According to later research, the production centres of the Dressel 6A amphorae can be located on the Adriatic coast: Picenum (Ferme), between Cesena and Rimini, Brisighella (Faenza) and Parma (Sala Baganza) and perhaps Calabria/Apulia (?)⁴³⁶. L. Tarius Rufus who was mentioned by Pliny had properties in Picenum⁴³⁷. A *titulus pictus: praet/of* (with the stamp STTS) refers to the ager praetutianus in the southern part of Picenum⁴³⁸. The family of M. Herennius Picens also had properties in Picenum. T. Helvius Basila may have had property in Calabria⁴³⁹. Recent research has shown that Dressel 6A amphorae were also produced in Narona on the Dalmatian coast⁴⁴⁰.

Contents: The content of the Dressel 6A amphorae has been debated for some time. Many inscriptions refer to wine⁴⁴¹ though there is an amphora in Salzburg, the inscription of which refers to fish sauce⁴⁴². Most amphorae must have had wine, as the inner surface of many amphorae have a coat of resin which is characteristic of wine amphorae.

Distribution: The Dressel 6A amphorae can be found in many settlements on the Adriatic coastline. In addition, they occur in Greece, North Africa, Cisalpina, Noricum (Magdalensberg). They also reached Gallia, Spain, Italy (the Tyrrhenian coast), Pannonia, the eastern Mediterranean, Red Sea and India in fewer numbers⁴⁴³.

⁴³⁵ Dressel 1899, XV.2 e.g. 3466 formae 6; 3477 formae 6 similis.

⁴³⁶ Carre 1985, 214–218; Cipriano 1994, 205–218, map 3; Sciallano – Sibella 1994, Amphore Dressel 6A.

⁴³⁷ Pliny NH, XVIII, 37; Tchernia 1986, 131 f.

⁴³⁸ Tchernia 1986, 131.

⁴³⁹ Manacorda 1994.

⁴⁴⁰ Lindhagen 2009, 83–108.

⁴⁴¹ CIL XV, 4582. 4583. 4653. 4852; Zevi 1966, 217 f.

⁴⁴² Heger 1986, 132–135, Fig. 1.

⁴⁴³ Baldacci 1967–68, 27 f.; Riley 1979, 151–156; Carre 1985, 211–213; Tchernia, 1986, 129–133; Cipriano – Carre 1989, 85–88, fig. 17, 100; Maier-Maidl 1992, 86; Pesavento Mattioli – Zanini 1993, 47, fig. 49–51; Bezeczky 1995b, 156; Bruno 1995; Bruno 1997, 517; Bezeczky 1998b, 228–230; Martin-Kilcher 2005, 208. 212; Lund 2000a, 84; Bezeczky 2001b, 11 f. T. 2–4; Rizzo 2003, 149; Bezeczky 2005b, Dressel 6A; Lindhagen 2009, 96 fig. 5; Will 1987, 208; It seems to be a misunderstanding to suppose that the Istrian amphorae can be found in Athens, Will 1997, 124 f. fig.7. It was first P. Baldacci 1967–68, then E. Buchi 1973, and finally M.B. Carre 1985, who clearly described the differences between the wine amphorae of the Adriatic coastline (Dressel 6A) and the olive oil amphorae of Istria and northern Italy (Dressel 6B); Will 1989, 305 fig. 12; Ehmgig 2003, 47; Wintermeyer 2004, 111 type Am 1d.; Tomber 2005, 230.

Fabric: (analysed nos. 296 and 298)

Visual characteristics

Italian Fabric N, a fairly soft, smooth, very fine fabric. White, red, white and grey inclusions. Mica and microfossils with a few limestone or white reaction rims are visible. The amphorae which have not been analysed petrologically show similar characteristics of fabric.

Petrology

Italian Fabric N

Samples: nos. 296 and 298

Matrix: Light yellowish-greenish, strongly recrystallised, probably originally carbonate rich groundmass (over fired). Temper grains are partially/completely destroyed due to high degree of firing and therefore difficult to estimate.

The temper grains consist of very frequent moulds of former carbonates, subordinate monocrystalline quartz, muscovite and iron oxide concretions, moderate alkali feldspars, rare oxidized mica and carbonate grains, very rare polycrystalline quartz, chert and foraminifers and traces of plagioclase, biotite and heavy minerals.

Visible temper content: approx. 9 %, maximum grain size: 0.28 mm, moderate sorting.

The heavy mineral assemblage (no. 296) consists of zircon (43%), rutile (19%), brookite/anatase (18%), disthene (7%), titanite (4%), epidote/zoisite (3%), not identified grains (3%), chromium spinel (2%), sillimanite (1%) and traces of hornblende.

R.S.

Catalogue

Tetragonos Agora

293. Rim, neck fr., 89/019 (1339), Trench 89/2, D = 18 cm, V = 3 cm, HD = 3.9 cm, H = 7.8 cm, buff (7.5YR 7/4), SF: buff (7.5YR 8/4), PLATES 26, 76
294. Base fr., 87/041 (1168), Trench 87/1, BD = 5 cm, H = 14.2 cm, buff (2.5Y 8/4), PLATES 26, 76
295. Neck fr, handle, 90/007 (1343), Trench 90/2, HD = 10.6 cm, H = 31.5 cm, S = 3.1x4.5 cm, buff (10YR 8/4-7/4), PLATES 26, 76
296. Rim, neck fr., 89/007 (123), Trench 89/2, Stamp on the rim: M.HER.PICEN., M. Her(enni) Picen[t](is), D = 18 cm, V = 2.8 cm, HD = 5.5 cm, DN = 13 cm, H = 7.4 cm, buff (10YR 8/4), PLATES 27, 76
297. Rim, neck fr., 95/034 (1338), Trench 95/1, D = 18 cm, V = 3.3 cm, HD = 5.4 cm, H = 7.6 cm, buff (10YR 7/4), PLATES 27, 76
298. Rim, neck fr., 92/095 (1268), Trench 92/4, Stamp on the rim: M.HER.PICENT, M. Her(enni) Picent(is), D = 17 cm, V = 2.9 cm, HD = 4.8 cm, H = 6.3 cm, buff (2.5Y 8/2), PLATES 27, 76
299. Neck, handle and body fr., 90/007, (1625-1626), Trench 90/2, Titulus pictus: AT (...) in ligature, H = 17.7 + 9 cm, buff (very pale brown) (10YR 7/4), PLATES 27, 76

Terrace House 2

571. Rim, neck, handle, 99/254 (270), B9 Ost, 45c, D = 16.3 cm, V = 2.4 cm, HD = 4 cm, H = 16 cm, pale yellow (2.5Y 8/4), PLATES 43, 89

Earlier excavations, Terrace House 1

647. Rim, neck, handle, 84/024, Tab. V/2, Stamp on the neck, D.L.F.PRI, D(...) L(...) F(...) Pri(...), D = 15 cm, HD = 5 cm, DN = 11.5 cm, H = 31 cm, S = 4.4 x 3.6 cm, buff (7.5YR 7/4), PLATES 50, 94

Terrace House 2

648. Rim, neck, handles, 93/109, Room 46b, Trench 93/9 Stamp on the neck .../...NVMI, D= 16.8 cm, HD = 5 cm, DN = 10.8 cm, H = 38 cm, S = 5.3 x 4.4 cm, reddish yellow (5YR 7/6), SF: very pale brown (10YR 8/3), PLATES 50, 94

State Agora, Basilica Stoa

804. Rim, neck fr., Ki 50/1964, Sondage B2, N-Teil 33.55 m, Stamp on the rim: S.L.E.[F], D = 20 cm, V = 2.6 cm, HD = 4.6 cm, H = 8.4 cm, very pale brown (10YR 8/4), PLATES 53, 96

State Agora, Well

810. Body, base fr., Filling B1, Stamp on the upper part of the body: C.F.G, H = 73.5 cm, BD = cm, very pale brown (10YR 7/4), PLATES 53, 96

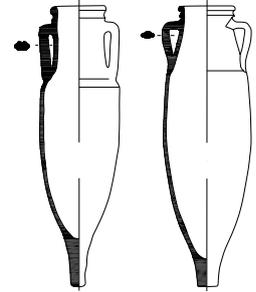
The amphora published from Ephesus:
State Agora, Well: Meriç 2002, 92 K 522.

Type 31

DRESSEL 21–22

(Schoene 4; Callender 4; Ostia 54; Peacock – Williams 7)

Form: This type has a very wide mouth which in some cases has a double rim⁴⁴⁴. The neck of the earliest pieces is almost as wide as the rim. The neck later disappeared or became a part of the bag-shaped body. There is a solid spike at the bottom. The handles are attached to the neck immediately below the rim and follow the body quite closely. The handles of the amphorae in Ephesus are flat in section. Sometimes there are two ribs along the handles. The rims of the earliest vessels with the POST.CVRT stamp are somewhat wider and thicker than those of the later pieces⁴⁴⁵. Recently, E. BOTTE has set up four major typological groups⁴⁴⁶. The amphorae in Ephesus belong to his groups 1a and 3. There are few amphorae of this type in Ephesus.



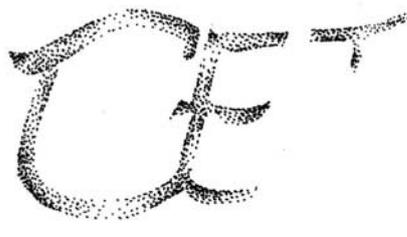
Chronology: The type was dated, mainly on the basis of the Italian amphorae, to the first century A.D.⁴⁴⁷. It is now thought that their production started in the last quarter of the first century B.C., and continued until the end of the first century A.D.⁴⁴⁸. The vessels from d'Alcamo Marina in Sicily are dated to the period between the end of the first century B.C. and the age of Tiberius⁴⁴⁹. The inception of the amphora production can be estimated at the middle of the first century B.C. on the basis of the stamps of Postumus Curtius.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	300–319
Ph 11	Unstratified complexes	320

Epigraphy, Inscription, Contents: The known inscriptions usually refer to the content of the amphorae. The *titulus pictus* CET of the amphorae in Spain, Sicily and Pompeii refer to fish-based food. The *titulus pictus* in: LIQ(uaminis) F(los) EXCE(l lens) also refers to fish-based food⁴⁵⁰.



CET – no. 316

The painted inscription CET is on the rim of the amphora. The reading of the final letter T is somewhat uncertain. This *titulus pictus* in red paint occurs on an amphora which was produced in Calabria or Sicily.

⁴⁴⁴ CIL XV, 21–22; CIL IV, Pl. II–III; Lamboglia 1955, 243 fig 2; Zevi 1966, 222; Peacock – Williams 1986, 96 f.; Panella 2001, 194, fig. 2 nos. 9–10; Botte 2009, 117–120.

⁴⁴⁵ Berlin 1997, 164, PW 539, Pl. 68, there is an important remark referring to the provenance of the vessel: “few medium and small black inclusions”. The description and the formal characteristics fit those of the amphorae that have the Postumus stamp.

⁴⁴⁶ Botte 2009, 121–162; Botte 2009a, 149–163.

⁴⁴⁷ Zevi 1966, 222; Panella 1970, 112 f., 120; Beltrán 1970, 511; Toniolo 1991, 29.

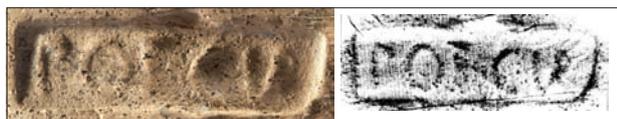
⁴⁴⁸ Panella 1973, 496; Domergue 1973, 112–115; Hesnard 1980, 150; Beltrán 1982, 214; Van der Werff 1986, 114; Peacock – Williams 1986, 97; Williams – Panella 2005, Dressel 21–22.

⁴⁴⁹ Botte 2009, 121–124, 132; Cerdá Juan 1980, 78, no. 132; Van der Werff 1986, 114; Étienne – Mayet 2002, 120.

⁴⁵⁰ CIL IV, 5716; Étienne – Mayet 2002, 118, 122; Giorgetti *et al.* 2006; Botte 2009, 120–158; It was supposed that the abbreviations CE can either refer to cherry (*cerasium*), or waxed plum (*cerinae*) and MAL refers to apple (*malum*), Dressel 1879, 166–172.

Stamp:

There are three different types of stamps on the amphorae in Ephesus.



no. 301 – POST.CVRT (S–T and V–R–T in ligature).
The stamp of *Gaius Curtius Postumus*, [Post](umii)
Curt(ii)



no. 308 – [PO]S[T].CVRT (S–T and V–R–T in ligature)

In an earlier publication of the Latin stamp (POST.CVRT) I could not identify the type of the rim⁴⁵¹. Two larger fragments (nos. 307 and 315) among the vessels which I came across later helped identify that they belonged to the Dressel 21–22 type amphorae⁴⁵². There is a similar stamped rim in Jerusalem. The rim is attached to a handle fragment. With help from D. ARIEL, we decided that it belonged to a Dressel 21–22 type⁴⁵³. The handle fragment in the Museum of Syracuse also proved helpful⁴⁵⁴. This is a fragment characteristic of the Dressel 21–22 type. It has the stamp POST.CVRT (S–T and R–T in ligature). It seems possible that the handle fragment published by D. MANACORDA belongs to this type as well⁴⁵⁵. See the details Appendix I.

Other stamps



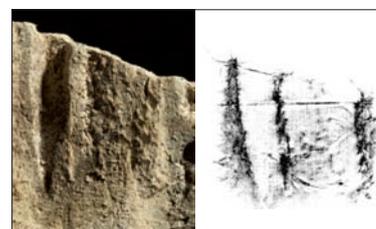
no. 311 – G or a symbol, occurs on the upper part of a handle fragment.



no. 318



no. 319



no. 320

nos. 318 and 319 and 320 – Anchor or symbol(?). Three amphorae have the same stamp. One of them is complete, the others are fragments.

Origin: It was suggested earlier that Dressel 21–22 were made in Campania and Lazio. This was confirmed by the petrological analyses of Peacock – Williams⁴⁵⁶. The finds of the d'Alcamo Marina (province de Trapani) workshop suggest that the form was also produced in Sicily. A number of pieces have been found in the northwestern part of the island⁴⁵⁷. The petrological analysis of the amphorae and the stamped tiles confirm that some of them were manufactured in Campania and also Calabria and Sicily⁴⁵⁸. The stamps and the fabrics of

⁴⁵¹ Bezczky 2001b, 11, no. 2.

⁴⁵² Bezczky 2006, 290, 299, no. 28, Pl. 4.

⁴⁵³ I am grateful for the help.

⁴⁵⁴ I am indebted to C. CIURCINA, the director of the Museum of Syracuse. See Appendix I no. 12.

⁴⁵⁵ Manacorda 1989, 451, note 32 and 44.

⁴⁵⁶ Peacock – Williams 1986, 97; CIL XV, 4783–4801; Zevi 1966, 222; Sciallano – Sibella 1994, Amphore Dressel 21–22.

⁴⁵⁷ Giorgetti *et al.* 2006, 505–516.

⁴⁵⁸ Bamonte 1918, 90, no. 4; CIL I² 2340b; CIL X 8042, 130; Sanginetto 2001, 207–209; Rizzo 2003, 149, 160; Botte 2009, 131, 135, 145, 158.

the amphorae in Belo Claudia, Zaragoza and Luni confirm they are Spanish⁴⁵⁹. This view is supported by the “El Rinconcillo” workshop recently uncovered near the modern city of Algeciras (province of Cádiz)⁴⁶⁰ where Dressel 21–22 amphorae were produced.

Distribution: Italy (Altino, Cumae, Gabii, Grado, Luni, Ostia, Padova, Pompeii, Rome, Solunto and Sicily (Syracuse), North Africa (Carthage), France (Lyon, Isolée, golfe de Fos), Spain, Germany (Oberaden), Pannonia (Baláca), Albania (Durazzo), Kos, Jerusalem⁴⁶¹. Two shipwrecks contain Dressel 21–22 amphorae. One of them is near the coast of Croatia⁴⁶². This is the ‘Mljet B’ shipwreck. The other one is near Sicily (in the vicinity of Solunto)⁴⁶³. This is the ‘Scoglio della Formica A’ shipwreck. This ship, on the basis of the Mana C amphorae present, was dated to the second century B.C. However, the middle of the first century B.C. seems more probable.

Fabric: (analysed nos. 301 – 304, 306, 308, 311, 316, 318)

Visual Characteristics

A number of groups can be distinguished.

1. Italian Fabric C1, hard, black sand fabric with lots of black volcanic particles, large white limestone grains, nos. 306, 314
2. Italian Fabric J, hard, finely grained fabric. Black volcanic, green augite and white limestone grains and microfossils, nos. 300, 302, 307, 309, 310, 312, 313 and perhaps nos. 315, 317. The amphorae with the Postumus stamp belong here: nos. 301 and 308.
3. Italian Fabric J1, hard, very fine fabric. Very few black volcanic and white limestone particles, no. 304.
4. Italian Fabric K, amphorae from Calabria or Sicily. Hard fabric, limestone or white reaction rims are visible. Lots of microfossils, white and grey grains, occasional iron oxide inclusions, nos. 303, 305, 311, 316, 318, 319, 320.

Petrology

Italian Fabric C1

Sample: no. 306

Matrix: granular, calcareous, abundant, light coloured spots (due to decomposed carbonates particles), optically inactive.

Temper: Very frequent moulds of former carbonates, frequent muscovite, augite and iron oxide concretions, subordinate alkali feldspars and volcanic rock fragments, very rare sanidine, volcanic plagioclase and heavy minerals.

The *heavy mineral* assemblage consists of augitic clinopyroxene (57%), diopsidic clinopyroxene (41%), spinel (1%) and traces of garnet and hornblende.

R.S.

Italian Fabric J

Samples: nos. 301 and 302

Matrix: Optically inactive, calcareous, dark brown clay groundmass

Temper: Frequent moulds of former carbonates, subordinate muscovite, oxidised mica and iron oxide concretions, moderate monocrystalline quartz and augite, rare K-feldspars and sanidine, very rare polycrystalline quartz, chert, biotite and foraminifers and traces of plagioclase, volcanic plagioclase, carbonate grains, crystalline rock fragments and volcanic rock fragments.

The *heavy mineral* assemblage (arithmetic mean of two samples) consists of augitic clinopyroxene (73%), diopsidic clinopyroxene (26%) and traces of garnet and spinel.

⁴⁵⁹ Domergue 1973, 112–115; Cerdá Juan 1980, 78 no. 132; Beltrán 1970, 147 no. 198 fig. 205, 1; Lusuardi Siena 1977, 239 note 90.

⁴⁶⁰ Sotomayor 1969, 389–399; Beltrán 1970, 399; Peacock 1974, 241; Lagóstena – Bernal 2004, 39–123.

⁴⁶¹ Dressel 1879, fig. 7–8 nos. 15–16; CIL X, 8051.26; Holwerda 1936, no. 1108; Loeschcke 1942, 105; Panella 1970, 112 f. 120; Beltrán 1970, 510–514; Panella 1973, 496 f.; Domergue 1973, 112–115; Lusuardi Siena 1973, 443; Vegas 1973, 129, fig. 47 no. 2; Lusuardi Siena 1977, 239; Cerdá Juan 1980, 78, no. 132; Hesnard 1980, 150; Tartari 1982, 239–279, 257, type 20 fig. 18; Van der Werff 1986, 113 f.; Becker *et al.* 1986, 86; Ciotola *et al.* 1989, 605; Ariel 1990, 78; Toniolo 1991, 153; Kelemen 1992, 25, fig 23 no. 6; Pesavento Mattioli *et al.* 1992, 46, 149; Sciallano – Sibella 1994; Mazzocchin – Pastore 1995, 105; Dell’Amico 1997, 109 fig. 38; Martin-Kilcher 2005, 208, 212.

⁴⁶² Radić – Jurišić 1993, 117–119; Parker 1992, 278, no. 704.

⁴⁶³ Parker 1992, 390 no. 1052; Tusa 1971, 265 f. fig. 2–3.

Sample: no. 308

Matrix: Optically inactive, calcareous, dark brown clay groundmass

Temper particles: Very frequent carbonate particles and carbonate pseudomorphs, frequent quartz, mica (muscovite and brown mica), iron oxide grains, rare–moderate large augite grains (partially zoned), rare feldspar, volcanic rock fragments, foraminifers (originally pyritised), bioclasts, heavy minerals (hornblende, melanite), very rare chert.

Comment: Typical are the abundant temper grains of volcanic origin (partially zoned augite), volcanic rock fragments, sanidine, volcanic plagioclase together with carbonate grains and microfossils. The heavy mineral composition clearly points more to sediments sourced predominantly by a volcanic hinterland.

A comparison with raw materials from the region around Capua showed that similar materials are available (e.g. alluvial deposits near the River Volturno in the hinterland of Capua). However, it is possible that similar deposits also occur elsewhere in the region.

R.S.

Italian Fabric J1

Sample: no. 304

Matrix: fine grained to slightly micaceous, slightly calcareous, optically active to inactive.

Temper: Very frequent monocrystalline quartz, frequent moulds of former carbonates and iron oxide concretions, subordinate alkali feldspars, muscovite and oxidised mica, rare polycrystalline quartz, chert, plagioclase, biotite, carbonate grains, foraminifers, augite and heavy minerals.

The *heavy mineral* assemblage consists of augitic clinopyroxene (80%), diopsidic clinopyroxene (18%) and traces of rutile, unidentified grains and melanite.

Comment: Volcanic area, most likely southern Italy (Campania).

R.S.

Italian Fabric K

Samples: nos. 303, 311, 316 and 318

Matrix: fine grained, slightly micaceous, strongly calcareous, mainly optically inactive

Temper: Frequent foraminifers, subordinate monocrystalline quartz, K-feldspars, muscovite, oxidised mica, moulds of former carbonates and iron oxide concretions, rare biotite and carbonate grains, very rare polycrystalline quartz, plagioclase, crystalline rock fragments, heavy minerals and traces of calcite bioclasts.

The heavy mineral assemblage (arithmetic mean of two samples nos. 303 and 316) consists of garnet (49%), hornblende (19%), zircon (10%), augitic clinopyroxene (7%), rutile (3%), brookite/anatase (3%), titanite (3%), epidote/zoisite (3%), diopsidic clinopyroxene (2%) and traces of staurolite, sillimanite and unidentified grains.

Comment: Non-volcanic region in southern Italy (Calabria, Sicily).

R.S.

Catalogue

Tetragonos Agora

- | | |
|--|--|
| <p>300. Rim, neck, handle fr., 96/053 (921), Trench 96/1, D = 17.6 cm, V = 2.1 cm, HD = 5 cm, DN = 14 cm, H = 14.1 cm, buff (7.5YR 7/4), PLATES 27, 76</p> | <p>303. Rim, neck fr., 96/029 and 96/044 (248), Trench 96/1, D = 18.4 cm, V = 1.7 cm, H = 7.5 cm, light red (2.5YR 6/6), SF: buff (7.5YR 8/4), PLATES 27, 77</p> |
| <p>301. Rim fr., 96/044 (15), Trench 96/1, Stamp on the rim: POST.CVRT, (S–T and V–R–T in ligature), Post(umi) Curt(i), D = 18.5 cm, V = 1.8 cm, HD = 5.8 cm, DN = 15.3 cm, H = 7.4 cm, reddish yellow (5YR 6/6), SF: buff (10YR 7/4), PLATES 27, 77</p> | <p>304. Rim, neck fr., 96/047 (247), Trench 96/1, D = 18.6 cm, V = 1.9 cm, HD = 6.1 cm, H = 10 cm, reddish yellow (5YR 7/6–6/6), SF: buff (7.5YR 8/4), PLATES 27, 77</p> |
| <p>302. Rim, neck fr., 96/044 (16), Trench 96/1, D = 19.5 cm, V = 2 cm, HD = 6.2 cm, H = 10.5 cm, light red (2.5YR 6/6), SF: buff (7.5YR 8/4), PLATES 27, 77</p> | <p>305. Handle fr., 89/077 (1133), Trench 89/2, H = 18 cm, S = 2.2x4.8 cm, reddish yellow (5YR 7/6), SF: buff (10YR 8/4), PLATES 27, 77</p> |

306. Rim, neck fr., 90/021 (307=1121), Trench 90/2, D = 19.5 cm, V = 1.9 cm, HD = 4.5 cm, DN = 15.4 cm, H = 11.6 cm, reddish yellow (5YR 6/6), SF: buff (10YR 8/3), PLATES 28, 77
307. Rim, neck fr., 93/032 + 92/030 (1120), Trench 93/2 + 92/2, D = 18.7 cm, V = 1.7 cm, HD = 5.8 cm, DN = 16.2 cm, H = 19.2 cm, buff – light brown (7.5YR 7/4–6/4), SF: buff (7.5YR 8/4), PLATES 28, 77
308. Rim, neck fr., 93/032 (1100), Trench 93/2, Stamp on the rim: ..S..CVRT, (V–R–T in ligature), [Po]s[t](umi) Curt(i), D = 18.3 cm, V = 1.8 cm, HD = 5.8 cm, DN = 14.4 cm, H = 11.2 cm, light red (2.5YR 6/6), PLATES 28, 77
309. Rim, neck fr., 93/032 (1105), Trench 93/2, D = 19 cm, V = 1.8 cm, HD = 6 cm, DN = 16.2 cm, H = 13.7 cm, reddish yellow (5YR 6/6), PLATES 28, 77
310. Rim, neck fr., 93/032 (1104), Trench 93/2, D = 18.5 cm, V = 1.8 cm, HD = 6.2 cm, H = 7.8 cm, light red (2.5YR 6/6), PLATES 28, 77
311. Handle fr., 93/032 (188), Trench 93/2, Stamp on the handle: G(...), H = 6 cm, pink (7.5YR 7/4), PLATES 28, 77
312. Rim, neck fr., 93/032 and 92/030 (1103), Trench 93/2, D = 20 cm, V = 1.7 cm, HD = 6.2 cm, H = 10.7 cm, reddish yellow (7.5YR 6/6), PLATES 28, 77
313. Rim, neck, handle fr., 89/029 (1110), Trench 89/2, D = 17.7 cm, V = 1.8 cm, HD = 4.8 cm, H = 10.9 cm, buff (10YR 7/3), PLATES 28, 77
314. Rim, neck, handle fr., 91/108 (1142), Trench 91/4, D = 20.5 cm, V = 1.9 cm, HD = 5.1 cm, H = 12.8 cm, reddish brown (2.5YR 5/4), SF: buff (5YR 7/4), PLATES 28, 77
315. Rim, neck, handle fr., 87/025 (1123), Trench 87/2, D = 18.5 cm, V = 1.8 cm, HD = 5.3 cm, DN = 17.2 cm, H = 19.2 cm, yellowish red (5YR 5/6), SF: buff (7.5YR 7/4), PLATES 28, 77
316. Rim, neck fr., 89/022 (1111), Trench 89/2, titulus pictus with red ink, on the neck: CE[T], D = 19 cm, V = 2 cm, HD = 4.3 cm, H = 9.3 cm, very pale brown (10YR 7/4), SF: buff (10YR 8/3), PLATES 29, 78
317. Rim, neck fr., 87/033 (1146), Trench 87/1, D = 19.5 cm, V = 1.9 cm, HD = 4.9 cm, H = 10 cm, light red – red (2.5YR 6/6–5/6), SF: buff (7.5YR 8/4), PLATES 29, 78
318. Rim, neck, handle fr., 92/030 + 92/032 (1118), Trench 92/2+93/2, Stamp on the handle: simbol? or E or anchor?, D = 19.2 cm, V = 1.7 cm, HD = 4.3 cm, H = 11.5 cm, S = 2.4x4.5 cm, buff (10YR 7/4), PLATES 29, 78
319. Handle fr., 89/029 (1134), Trench 89/2, Stamp on the handle: simbol? or E or anchor??. H = 15.2 cm, S = 2x4.5 cm, buff (10YR 7/4), PLATES 29, 78
320. Handle fr., 96/007 (1135), Trench 96/1, Stamp on the handle: anchor or simbol?, H = 16.7 cm, S = 1.9x4.6 cm, buff (10YR 7/4), PLATES 29, 78

Reference material

C. Postumus Curtius amphorae

All Postumus stamped amphorae share a very similar fabric (nos. 301, 308 and Appendix I, 1, 8, 14) to Eph Agora Post.Curt (no. 302). A provenance within the volcanic region of Campania (e.g. around Naples) seems to be very likely but a more exact definition of the provenance cannot be given without more reference material. The comparison with raw materials from the region around Capua showed that there are very similar raw materials available (e.g. alluvial deposits near the river Volturno, in the hinterland of Capua). But it is possible that similar deposits occur also elsewhere in the region.

Appendix I, no. 1

Dressel 1B

Pompeii

Matrix: Orange to brownish, optically inactive, originally calcareous groundmass.

Temper particles: Dominant carbonate grains or moulds of dissolved carbonates, frequent fine grained quartz, oxidised sheet silicates and mica, subordinate feldspars and coarse grained augite grains, iron oxide aggregates, rare traces of microfossils (foraminifera), siltstone, altered volcanic glass, volcanic rock fragments and chert.

Comment: Typical is the presence of abundant augite and weathered volcanic rock particles together with volcanic grains and microfossils.

Appendix I, no. 8

Dressel 2–4

Berlin 103

Matrix: Calcareous, iron oxide rich, inactive

Temper particles: Very frequent carbonate particles, frequent mica (muscovite and brown mica), iron oxide grains, large augite grains (partially zoned), very rare feldspar, quartz, traces of foraminifera (originally pyritised).

Comment: Very similar to Agora no. 301. Typical are the presence of large augite grains together with abundant carbonate particles and iron-oxide grains. Origin from a region with a mixture of volcanic sediments and sediments strongly influenced by carbonate detritus.

Appendix I, no. 14

Dressel 21–22
Jerusalem

Matrix: Calcareous, iron oxide rich, inactive to isotropic.

Temper particles: Very frequent carbonate particles (mainly carbonate pseudo morphs), frequent quartz and iron oxide grains, rare to moderate large augite grains (partially zoned), mica (muscovite and brown mica), very rare volcanic rock fragments, foraminifera, feldspar and polycrystalline quartz.

Comment: Similar to Agora no. 301. Slightly coarser grained quartz grains. Typical are the presence of large augite grains together with abundant carbonate particles and iron-oxide grains. Origin from a region with a mixture of volcanic sediments and sediments strongly influenced by carbonate detritus.

R.S.

Type 32

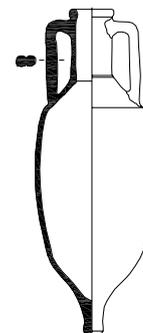
DRESSEL 2–4 ITALIAN

(Callender 2; Camulodunum 182; Camulodunum 183; Ostia 51; Peacock – Williams 10; Augst 5)

This form was an imitation of the Hellenistic Koan vessels. The lighter and more beneficial capacity/weight ratio of the Dressel 2–4 amphorae gradually replaced the big and less practical Dressel 1B wine amphorae. Since they were produced at a number of sites, the forms are quite varied⁴⁶⁴. This specific form was produced at a number of sites in Italy⁴⁶⁵. The type was very popular and often copied⁴⁶⁶.

Form: The type is characterised by a short, rounded rim, cylindrical neck, conical upper part of the body and a tapering lower part of the body with a spike. The handles attached to the neck under the rim start out either horizontally or slightly upward and approach the upper part of the body vertically. The handles are made of two separate rods⁴⁶⁷. There are few amphorae of this type in Ephesus.

Chronology: The production of the first Dressel 2–4 amphorae is dated to the second quarter of the first century B.C. Production was continuous until the second or third century A.D.⁴⁶⁸.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	321
Ph 4–5	30/27 B.C. to A.D. 45	323

⁴⁶⁴ CIL XV, T II, 2–4; Panella – Fano 1977, 133–177; Guenoche – Hesnard 1983, 192 fig. 1. 2; Farinas del Cerro *et al.* 1977, 179–206; Martin-Kilcher 1994, 332. 338–342.

⁴⁶⁵ Guenoche – Hesnard 1983, fig. 1; Tchernia 1986, 127–129; Sciallano – Sibella 1994, Amphore Dressel 2–4 d'Italie; Williams *et al.* 2005a, Dressel 2–4 Italian.

⁴⁶⁶ Empereur 1986, 599–608; Bonifay 2004, 146; Bonifay 2005, Dressel 2–4 African; César Carreras 2005, Dressel 2–4 Almadrava, Dressel 2–4 Baetican, Dressel 2–4 Catalan; Williams 2005, Dressel 2–4 Cilician, Dressel 2–4 Kos, Dressel 2–4 Egyptian, Dressel 2–4 Loire Basin, Dressel 2–4 Lyon 2; Williams – Panella 2005, Dressel 2–4 Flat-based.

⁴⁶⁷ Panella 2001, 194; Williams 2004, 444; Williams *et al.* 2005a, Dressel 2–4 Italian.

⁴⁶⁸ Williams *et al.* 2005a, Dressel 2–4 Italian; Freed 2000, 461; One of the earliest producers was Postumus Curtius. His Dressel 2–4 amphorae have not been found in Ephesus. However, they are found in Italy and Egypt see Appendix I.

Ph 5a	Around A.D. 23: West Stoa	326
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	322, 324–325
Terrace House 2		
layers	Data range	nos.
2a–3a	Late first century B.C. to early first century A.D.	573
3	First century A.D.	575
10	Debris	572
11	Stray find	574

Stamp: Three of the Dressel 2–4 amphora fragments have stamps. These stamps are well-known in the western Mediterranean and occur on the Grand Ribaud D shipwreck⁴⁶⁹.



no. 649 – L. EVMAC..., (V–M–A in ligature), L. Eumachi, *Bibl.*: Panella – Fano 1977, 156 f., fig. 1; Hesnard *et al.* 1988, 49, Pl. 22; Van der Werff 1989, 357–376; Parker 1992, 203, no. 477; Martin-Kilcher 1993, 276, 319 nos. 128–130; Carre *et al.* 1995, 52 nos. 110–111; Blanc-

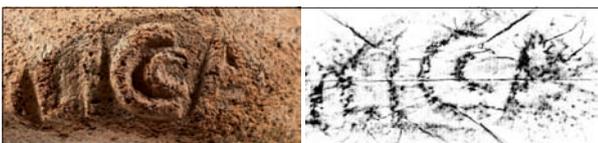
Bijon *et al.* 1998, 109 f., nos. 799 f.; Cipriano 2003, 241, Fig. 1; Laubenheimer – Marlière 2010, 158, no. 57.



no. 805 – [M] LIVI.CAVS [tri] / SV[r](us), A–V in ligature M. Livius Caustrius and Surus.

Bibl.: Tchernia – Zevi 1972, 40, note 3 fig. 3; Hesnard *et al.* 1988, 49, note 51–53, Pl. 22; Delattre 1894, 113, f. no. 32; Ettlinger 1959–1960, fig. 11; Tchernia 1992, 293 f.; Parker 1992, 203, no. 477, 318, no.

831; Carre *et al.* 1995, 52–55, nos. 108–109, 114, 116–122; Blanc–Bijon *et al.* 1998, 110, nos. 801–804.



no. 811 – LICCA, C–C in ligature.

Bibl.: Meriç 2002, 89, K 523 T. 44 and 98; A. HESNARD suggested that the name Licca should be read as Licca, Liccaus or Liccaius. She supposes, following W. SCHULZE, that the name is of Illyric origin. *Bibl.*: Schulze

1904, 31; Hesnard *et al.* 1988, 50, note 55; Parker 1992, 203, no. 477; Carre *et al.* 1995, 52, nos. 112–113;

The Eumachius family was well-known in and around Pompeii. The name is written in various forms in the stamps⁴⁷⁰. A Eumachius stamp was found in Izmir (Smyrna) near Ephesus. The name on the other stamp, Marcus Livius Caustrius, may belong to a well-known *gens* in the Bay of Naples area (Pompeii, Herculaneum and Sorrento). The stamps also have the name of a slave: Sur(us). The owner of the third stamp LICCA, with the double C in ligature, is well-known in Campania.

Origin: The Dressel 2–4 type was produced at a number of sites⁴⁷¹. A significant number of the pieces in Ephesus came from the vicinity of Vesuvius in Campania. The eruption of the volcano in A.D. 79 destroyed many vineyards and workshops⁴⁷².

⁴⁶⁹ Hesnard *et al.* 1988, 49–67; Parker 1992, 477 f.

⁴⁷⁰ Van der Werff 1989, 357–376.

⁴⁷¹ Italy: Peacock 1977b, 262–269; Panella 2001, 187 f.; Hesnard – Lemoine 1981, 245–249, 254–264; Desbat 2003, 45; Bonifay 2005, Dressel 2-4 African; César Carreras 2005, Dressel 2-4 Catalan; Williams 2005, Dressel 2-4 Lyon 2, Dressel 2-4 Loire Basin, Dressel 2-4 Cilician and Dressel 2-4 Egyptian; Grew – Seeley 2005, Dressel 2-4 in *Verulamium* Region White Ware.

⁴⁷² Williams 2004, 441–446.

Contents: Tituli picti from Pompeii tell us that this amphora type contained wine⁴⁷³.

Distribution: These amphorae were primarily shipped to the western Mediterranean, but they can be found in the northern provinces (Raetia, Noricum and Pannonia), and Egyptian, Red Sea and Indian sites as well⁴⁷⁴.

Fabric: (analysed nos: 321, 322, 323, 326)

Visual Characteristics

The amphorae belong to five groups. The fifth group contains amphorae with the distinctive volcanic “black sand” fabric. The other pieces were also produced in southern Italian areas.

1. Italian Fabric A, hard fabric, with abundant black volcanic particles. Few white limestone and iron oxide grains, no. 322.
2. Italian Fabric A1, hard fabric, large (0.5–0.7 mm) iron oxide grains, black, colourless inclusions, no. 326.
3. Italian Fabric B, hard fabric, moderate amount of black particles, sparse amount of white limestone grains, nos. 323 – 324, 326, perhaps nos. 572–573.
4. Italian Fabric H, hard fabric, large (0.5–0.7 mm) iron oxide grains, no. 321.
5. The “black-sand” fabric. Similar to Italian Fabric C. It may have been produced around the Pompeii or the Herculaneum region, nos. 325, 574–575, 805, 811.

Petrology

Italian Fabric A

Sample: no. 322

Matrix: granular due to decomposed fine grained carbonate particles, occasionally fine, oxidised sheet silicates, optically inactive.

Temper: Very frequent volcanic rock fragments and augite, subordinate monocrystalline quartz and sanidine, rare iron oxide concretions, very rare alkali feldspars, volcanic plagioclase, muscovite, biotite, carbonate grains, siltstone/sandstone, brown volcanic glass and heavy minerals.

The *heavy mineral* assemblage is characterised by augitic clinopyroxene (68%), diopsidic clinopyroxene (30%), garnet (1%), and hornblende (1%).

Comment: Origin: a volcanic area, most likely southern Italy (probably Campania).

Note: no. 204 Greco-Italic type amphora belongs to this group.

R.S.

Italian Fabric A1

Sample: no. 326

Matrix: light coloured, fine grained, originally strongly calcareous, optically mainly inactive

Temper: Frequent iron oxide concretions, subordinate moulds of former carbonates and heavy minerals, moderate volcanic rock fragments, rare carbonate grains, very rare mono- and polycrystalline quartz, alkali feldspars, volcanic plagioclase, siltstone/sandstone, crystalline rock fragments and opaque matter.

The *heavy mineral* assemblage consists of augitic clinopyroxene (51%), diopsidic clinopyroxene (15%) and hornblende (34%).

Comment: A volcanic source area, most likely southern Italy (probably Campania).

R.S.

⁴⁷³ CIL IV, 2556-2559, 5554, 5560–5561, 5592, *etc.* Panella 1980, 256.

⁴⁷⁴ Panella 1981, 55–80; Rizzo 2003, 144, 160; Tchernia 1986, 127–129; Will 1987, 205–207; Warner Slane 1991, 204–213; Will 1991; Joshi – Sinha 1991, 255–259; Martin-Kilcher 1994, 338–344; Martin-Kilcher 2005, 208, 212; Ehmig 2003, 46; Williams 2004, 447–449; Williams *et al.* 2005a, Dressel 2–4 Italian; Bezeczky 2005a, 37; Sauer 2005, 113 f.; Tomber 2005, 228; Tomber 2006, 161, Type 42–43.

Italian Fabric B

Sample: no. 323

Matrix: granular due to decomposed, fine grained carbonate particles, optically inactive, partially vitrified (high firing temperature).

Temper: Moulds of former carbonates and heavy minerals, rare opaque matter, very rare carbonate grains, siltstone/sandstone and volcanic rock fragments.

The *heavy mineral* assemblage consists of augitic clinopyroxene (67%), diopsidic clinopyroxene (31%), garnet (2%) and traces of chromium spinel.

Comment: A volcanic source area, most likely southern Italy (probably Campania).

Note: no. 256 Dressel 1 type amphora belongs to this group.

R.S.

Italian Fabric H

Sample: no. 321

Matrix: fine grained, light coloured, strongly calcareous, optically inactive, slightly recrystallised.

Temper: Very frequent volcanic fragments and augite, subordinate monocrystalline quartz and sanidine, rare iron oxide concretions, very rare alkali feldspars, volcanic plagioclase, muscovite, biotite, carbonate grains, siltstone/sandstone, brown volcanic glass and heavy minerals.

The *heavy mineral* assemblage is composed of augitic clinopyroxene (71%), diopsidic clinopyroxene (23%), hornblende (5%) and garnet (1%).

Comment: A volcanic source area, most likely southern Italy, (probably Campania).

R.S.

Catalogue

Tetragonos Agora

321. Rim, neck fr., 98/114 (1628), Trench 98/1, D = 14.5 cm, V = 1.8 cm, HD = 2.1 cm, H = 7.5 cm, reddish yellow (5YR 7/6), PLATES 29, 78
322. Rim, neck, handle fr., 88/013 (1234), Trench 88/2 (A), D = 13 cm, V = 1.6 cm, HD = 1.2 cm, H = 8 cm, S = 2.5 cm, red (2.5YR 5/6), PLATES 29, 78
323. Rim, neck, handle fr., 96/020 (1371), Trench 96/1, D = 13.4 cm, V = 1.4 cm, HD = 0.8 cm, H = 5.8 cm, S = 2x4.8 cm, grey (10YR 6/1), SF: light red (2.5YR 6/6), PLATES 29, 78
324. Neck, handle fr., 89/090 (1634), Trench 89/3, H = 8 cm, S = 2.4x4.8 cm, buff (10YR 7/4), PLATES 29, 78
325. Handle fr., 95/211 (1629), Trench 95/1, H = 18.8 cm, S = 2.7x5.4 cm, dark reddish grey (5YR 4/2), SF: light grey (10YR 7/2), PLATES 29, 78
326. Handle fr., 95/191 (151), Trench 95/1, H = 11.2 cm, S = 2.4x4.8 cm, light red (2.5YR 6/6), SF: buff (7.5YR 7/4), PLATES 29, 78

Terrace House 2

572. Rim, neck, 99/335 (212), C3, Stairway 3, D = 11.7 cm, V = 1.8 cm, HD = 2 cm, H = 5.5 cm, reddish yellow (7.5YR 7/6), SF: pinkish white (7.5YR 8/2), PLATES 43, 89

573. Rim, neck, 99/440 (53), WT 2, Stone-cutting saw, D = 12.5 cm, V = 2 cm, HD = 2.6 cm, H = 5.4 cm, yellowish red (5YR 5/8), PLATES 43, 89
574. Rim, neck, handle, 99/221 (62), C3, Stairway 3, D = 12.5 cm, V = 1.6 cm, HD = 2 cm, H = 4.5 cm, red (2.5YR 5/6), PLATES 43, 89
575. Handle, 99/062 (136), WT 2 Stone-cutting saw, H = 7.5 cm, S = 3x.. cm, reddish brown (2.5YR 5/4), PLATES 43, 89

Earlier excavations,

Terrace House 2

649. Handle, 93/098, Stairway 3, Stamp: L.EVMAC..., L. Eumach(i), H = 5.5 cm, S = 4.5 x 2.3 cm, light red (2.5YR 6/6), PLATES 50, 94

State Agora, Basilica Stoa

805. Handle fr., 1029, S 2/1963, Stamp: [M] LIVI.CAVS[tri] / SV[r](us), M.Livi Caustr(i) / Sur(us), H = 5.1 cm, S = 5.1x2.6 cm, red (10R 5/6), SF: pinkish white – pinkish grey (7.5YR 8/2 – 7/2), PLATES 53, 96

State Agora, Well

811. Handle fr., K 523, Filling B1, Stamp: LICCA, C–C in ligature, H = 19.8 cm, S = 5.4x2.7 cm, red (10R 5/6), PLATES 53, 96

The amphorae published from Ephesus:

Terrace House 1: Lang–Auinger – Outschar 1992, 151–154; Lang–Auinger – Outschar 1994, 8 f. 12; Outschar 1996, 61–63 T. 7 and 17 nos. 254?. 268. 281. 283; Well: Meriç 2002, 89. 92 T. 44 nos. K 523–531; Lucas Grave (Lukasgrab): Ladstätter 2010b, K 320.

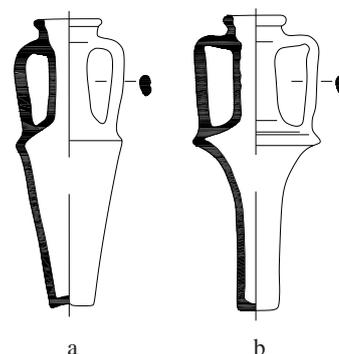
Type 33

SCHÖRGENDORFER 558

(Anfora troncoconica da oliva)

Form: The neck and the base are cylindrical. The body is composed of two joined, truncated cones. These amphorae have a number of variations. G. MUFFANTI MUSSELLI has published amphorae from northern Italy and she distinguished ‘A’ and ‘B’ subtypes⁴⁷⁵. Type ‘A’ differs from type ‘B’ in that it has flattened handles. The lower part of the body also has a different form and it tapers gradually towards the bottom. In addition, there is a smaller version, which has been found in Pannonia⁴⁷⁶. There are very few amphorae of this type in Ephesus.

Chronology: A. SCHÖRGENDORFER dated this type to the Late Imperial period⁴⁷⁷, while P. BALDACCİ stated that these amphorae were used in the Augustan period⁴⁷⁸. In Noricum and Pannonia they were used from the Claudian period to the middle or the end of the second century A.D.⁴⁷⁹.



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	327–328

Epigraphy, Inscriptions, Contents: The Schörgendorfer 558 type of amphorae often has *tituli picti*. The first four lines on the neck refer to the type of the olive (black or green), the quality (*excellens*), but there may also be a reference to the mode of the conservation (*ex dulcis*). The fifth line has numbers, referring to the weight. The reading of the rest is more or less uncertain, because the abbreviations and the various letters or names (*tria nomina*) cannot be unequivocally interpreted. The fragment in Ephesus has no inscription.

Stamp: The amphora in Ephesus has no stamp. The Schörgendorfer 558 amphorae has only one stamp, which is to be found on the lower part of the body. It is a negative stamp without a frame. The P.M.P. stamp found on a Type ‘A’ amphora in Altino offers no real clue as to where it was produced⁴⁸⁰. Similar stamps have not been published elsewhere.

Origin: Italian archaeologists thought that the Schörgendorfer 558 amphorae had been produced on the Istrian peninsula⁴⁸¹. However, petrological analyses show that these amphorae were not produced in Istria⁴⁸². R. SAUER’S

⁴⁷⁵ Muffanti Musselli 1987, 187–189; Bezczky 2005b, Schörgendorfer 558.

⁴⁷⁶ Bezczky 1987, 28; Measurements: the complete amphora height is 70–75 cm, the diameter of the rim is 14.5–16 cm, the diameter of the body is 27.3–29.8 cm, and the diameter of the base is 8.8–10 cm.

⁴⁷⁷ Schörgendorfer 1942, 65 f. 165.

⁴⁷⁸ Baldacci 1972, 27 f. fig. 8. 11; Carre 1985, 231–232 fig. 6.

⁴⁷⁹ Bezczky 1987, 31.

⁴⁸⁰ Toniolo 1991, 28 f., 155, fig. 364.

⁴⁸¹ Degrassi 1953, 60; Degrassi 1956, 108 f.; Baldacci 1972, 27 f.; Muffanti Musselli 1987, 201–206.

⁴⁸² Bezczky 1987, 33; Bezczky 1994a, 112–117.

petrographical analyses distinguish three different groups among the Schörgendorfer 558 amphorae in *Vindobona*⁴⁸³. On the basis of the geological data, the production site should be located in middle or northern Italy.

Distribution: There are several finds in Italy⁴⁸⁴, Raetia, Noricum, Pannonia, Upper Moesia and Dacia⁴⁸⁵. There are also some vessels in Berenice in Egypt and in Pergamon⁴⁸⁶.

Fabric: (analysed no. 327)

Visual characteristics

Fairly hard, fine fabric, containing a few white and colourless inclusions and voids, nos. 327, 328.

Petrology

Italian Fabric L

Sample: No. 327

Matrix: Optically inactive, originally lime rich, micaceous groundmass.

Temper: Very frequent monocrystalline quartz and muscovite, frequent oxidized mica and moulds of former carbonates, subordinate alkali feldspars, biotite, carbonate grains and iron oxide concretions, very rare polycrystalline quartz, chert, foraminifers, calcitic bioclasts, crystalline rock fragments, heavy minerals and traces of plagioclase.

The *heavy mineral* assemblage consists of garnet (63%), zircon (7%), epidote/zoisite (7%), rutile (6%), brookite/anatase (5%), titanite (3%), disthene (3%), hornblende (3%), tourmaline (1%), chromian spinel (1%), sillimanite (1%) and traces of unidentified grains.

Note: This amphora belongs to group Ac of the Schörgendorfer fabric, Sauer 2005, 121.

R.S.

Catalogue

Tetragonos Agora

327. Body, handle fr., 99/042 (1610), R–sewer, H = 12 cm, S = 2.2x4.7 cm, reddish yellow (5YR 6/6), SF: buff (7.5YR 8/4), PLATES 30, 78

328. Handle fr., 99/057 (1612), R–sewer, H = 7.8 cm, S = 1.9x5 cm, buff (7.5YR 7/4), PLATES 30, 78

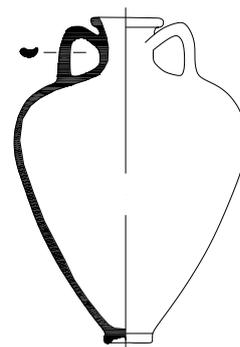
Type 34

GAULOISE 4

(Ostia 60; Peacock – Williams 27; Pélichet 47; Augst 12)

Form: This amphora is characterised by a fairly thick rounded rim and a short, curved handle, which is flat with a central depression and groove on its outer side. The neck is short and the body is round, tapering to a flat footring. There are very few amphorae of this type in Ephesus.

Chronology: These amphorae were produced from the middle of the first century A.D. until the end of the third century A.D.⁴⁸⁷.



⁴⁸³ Sauer 2005, 120 f.

⁴⁸⁴ Baldacci 1972, 7–28; Carre 1985, 231 f.; Muffanti Musselli 1987, 189–194 tav. 5; Toniolo 1991, 155 fig. 362–364.

⁴⁸⁵ Polaschek RE, XVII, 1, 1936, col 1040; Alzinger 1955, 18, nos. 140–142, T. 6, 140, T. 22, Inscr. 1; Bojović 1977, T. 64, 559; Bezczy 1987, 74–76, nos. 275–294; Kelemen 1988, 144, no. 4–5, 7–8 fig. 7; Martin-Kilcher 1991, 121, T. 42, 63–68; Bezczy 1994a, 112–117, Fig. 43; Zabeňlicky-Scheffenecker 1993, 266, Fig. 4, 48; Vidrih Perko 1994, T 6, 4–5; T 4, 3; Maier-Maidl 1992, 22; Bjelajać 1996, 19–23, nos. 22–25 fig. 3; Sakl-Oberthaler 1994, 10 f., T. 4, 14–21; Pichlerová 1996, 73–77; Ardeț 2001, 280–282; Bezczy 2005a, 53–57, 77 f.; Schimmer 2009, 62 f.

⁴⁸⁶ I am grateful to R. TOMBER for the data concerning the Egyptian finds, and to S. JAPP for the data concerning the amphora in Pergamon; Tomber 2007, 204 f.

⁴⁸⁷ Laubenheimer 2005, Gauloise 4.

The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 6	Mid first to late fourth centuries A.D.	329

Origin: These amphorae were manufactured in the region of Narbone, Languedoc and Provence in southern France⁴⁸⁸. They were also produced in smaller amounts in Spain⁴⁸⁹.

Inscription, contents: Based on *tituli picti* of finds in southern France and excavations in Raetia (Augst), the content of the amphorae was wine⁴⁹⁰.

Distribution: These Gauloise amphorae were primarily shipped to the western Mediterranean, as well as to Britain, Germany and Pannonia. They were shipped along the axes of the Rhône and Rhine rivers. Very few have been found in the eastern Mediterranean⁴⁹¹, but new Egyptian excavations have unearthed them in significant numbers⁴⁹². They reached southern India by the Red Sea route⁴⁹³.

Fabric: (analysed no. 329)

Visual characteristics

Hard, very fine fabric, with a few, small, grey and red grains and occasional grains of limestone.

Petrology

Sample: No. 329

Matrix: Optically inactive to recrystallised, calcareous groundmass.

Temper: Very frequent carbonate pseudomorphs, frequent quartz, moderate mica (muscovite, oxidised sheet silicates, feldspar, very rare chert, siliceous sponge spicula and crystalline rock fragments (schist, quartzite),

Comment: Not a typical fabric.

R.S.

Catalogue

Tetragonos Agora

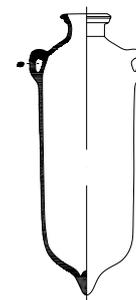
329. Rim, neck, handle fr., 99/045 (923), R-sewer, D = 12 cm,
V = 2.1 cm, HD = 2.8 cm, DN = 9.6 cm, H = 14.3 cm, S =
2.2x4.8 cm, buff (10YR 7/4), PLATES 30, 78

Type 35

EARLY ROMAN AMPHORA 11B BENGHAZI

(Keay 9/Tripolitanian 2; Peacock – Williams 37; Ostia I, 519; Sabratha Sub-type 16b)

Form: The type has an everted rim that is thickened and convex on the outer face with a narrow groove below the lip and a short upright neck. There is a long cylindrical body and a pointed base. The two small handles are on the upper part of the body. There are very few amphorae of this type in Ephesus.



⁴⁸⁸ Laubenheimer 1989, 133, fig. 12; Sciallano – Sibella 1994, Amphore Gauloise 4.

⁴⁸⁹ Laubenheimer 1985, 261–293; Peacock – Williams 1986, 142 f.; Laubenheimer 1989, 132–135; Martin-Kilcher 1994, 360–364; Laubenheimer 2005, Gauloise 4.

⁴⁹⁰ Liou – Marichal 1978, 145–151; Laubenheimer 1985, 399–403; Tchernia 1986, 283; Desbat *et al.* 1987, 142–144; Martin-Kilcher 1994, 368.

⁴⁹¹ Laubenheimer 2005, Gauloise 4; Riley 1979, 195 f.; Hayes 1983, Type 8, 145 f. fig. 21; Panella 1973, 543; Bezeczky 1997, 176, no. 19, fig. 5.

⁴⁹² Majcharek 1993, 220; Tomber 2006, 159, Type 40.

⁴⁹³ Tomber 2005, 229.

Chronology: The amphorae of this type can be found in various contexts from the first to the fourth century A.D. in Italy and North Africa⁴⁹⁴. According to J. RILEY, this form is common in the Augustan levels in Sabratha. The earliest context at Berenice is Deposit 55 (mid first century A.D.)⁴⁹⁵.

The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	330

Origin: A number of workshops are known in Tripolitania. This amphora (no. 330) may have been produced in Leptis Magna⁴⁹⁶.

Contents: It is generally agreed that the type contained olive oil. However, fish sauce and wine have also been suggested⁴⁹⁷.

Distribution: It is usually found in the western Mediterranean, but pieces were found in the eastern Mediterranean as well⁴⁹⁸.

Fabric:

Visual characteristics

Hard fabric, secondarily fired, it contains numerous white limestone grains or white reaction rims and some quartz inclusions.

Catalogue

Tetragonos Agora

330. Rim, neck fr., 96/051 (2), Trench 96/1, D = 17 cm, V = 2.4 cm, HD = 3.5 cm, DN = 10.2 cm, H = 6 cm, grey (5YR 5/1), SF: pink (5YR 8/4), PLATES 30, 78

Type 36

LOMBA DO CANHO 67 (LC 67)

Form: An everted rim separated from the neck by a ring. The cylindrical body has a short spike. The rounded handles are flat with ribbing on the outside. It is related to the Haltern 70 and Oberaden 83 amphorae and perhaps the Italian ovoid amphorae⁴⁹⁹. There are very few amphorae of this type in Ephesus.

Chronology: These amphorae appeared on the market in the western Mediterranean during the mid first century B.C. and production was continued into the Tiberian–Claudian period⁵⁰⁰.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	331

⁴⁹⁴ Riley 1979, 167 f.; Keay 1989, 42, sub type 16b.

⁴⁹⁵ Riley 1979, 167; Keay 1989, 43; Panella 1973, 563.

⁴⁹⁶ Personal discussion with M. BONIFAY; Panella 1973, 563; Arthur 1982; Bonifay 2004, 89–92; Bonifay 2005, Tripolitanian 2.

⁴⁹⁷ Panella 1973, 563; Panella 2001, 211; Keay 1984, 130; Arthur 1982; Bonifay 2004, 89–92; Bonifay 2005, Tripolitanian 2.

⁴⁹⁸ Riley 1979, 167; Zemer 1977, 48, no. 37; Bonifay 2005, Tripolitanian 2;

⁴⁹⁹ Molina Vidal 2000, 644; Carreras 2003, 87; Williams 2005, Lomba do Canho 67;

⁵⁰⁰ Gebelli – Díaz 2000, 1350; Molina Vidal 2000, 639–641.

Origin: Spain, at Cadiz and Algeciras, though mainly the Guadalquivir Valley⁵⁰¹.

Contents: Probably *defrutum* or *sapa*⁵⁰².

Distribution: Found primarily in the western Mediterranean, in Italy (Ostia), southern France, Spain and the coast of Portugal⁵⁰³.

Fabric: (analysed no. 331)

Visual characteristics

Hard, rough fabric. Reaction rims surrounding voids which once held limestone. Reddish–brown iron ore and microfossils are common.

Petrology

Spanish Fabric B

Sample: no. 331

Matrix: Highly fired, optically isotropic, high temper content.

Temper: Very frequent monocrystalline quartz, moderate polycrystalline quartz, chert, quartzite, iron oxide particles, moulds of carbonate grains, rare oxidized mica, crystalline rock fragments.

Comment: Description of Williams' web 2005 seems to fit well with the description of Lomba do Canho 67.

R.S.

Catalogue

Tetragonos Agora

331. Rim, neck fr., 87/036 (1356), Trench 87/1, D = 16.5 cm, V = 2.2 cm, HD = 4.2 cm, DN = 11.2 cm, H = 12.1 cm, light brown – reddish yellow (7.5YR 6/4–6/6), PLATES 40, 79

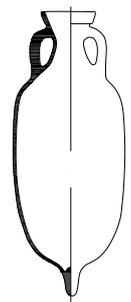
Type 37

HALTERN 70

(Camulodunum 185A; Oberaden 82; Peacock – Williams 15; Augst 19)

Form: The type has an everted collar rim with short handles. In Ephesus there are two different rim forms. One is thinner (V = 1.6 cm), the other one is thicker (V = 2.6 cm). The handle section is oval and has a fairly deep vertical groove. The body is almost completely cylindrical with a solid conical spike. A number of variants have been recently identified where the rim is higher, funnel-shaped, and the body is tapering or conical⁵⁰⁴. It seems related to the Lomba do Canho 67 form⁵⁰⁵. It also related to a form produced in the Rhône Valley⁵⁰⁶. There are very few amphorae of this type in Ephesus.

Chronology: It was suggested that the earliest Haltern 70 amphorae are dated after the mid first century B.C. A Haltern 70 was found on the Madrague de Giens shipwreck, but it was an



⁵⁰¹ Lagóstena – Bernal 2004, in Cadiz, 48–88 nos. 3. 21. 50. 63. 69. 94. 106.

⁵⁰² Williams 2005, Lomba do Canho 67.

⁵⁰³ Fabião 1989, 65–70, fig. 5; Molina Vidal 2000, 644; Carreras 2003, 87; Williams 2005, Lomba do Canho 67;

⁵⁰⁴ Loeschcke 1909, 99–101; Tchernia 1986, 140–142; Martin-Kilcher 1994, 385–387; Étienne – Mayet 2000, 82–84; Carreras 2003, 85–87; Puig 2004, 23–32.

⁵⁰⁵ Carreras 2003, 87; Molina Vidal 2000, 644 fig. 1; Morais – Carreras 2004, 108; Sealey 2003, 93 f. Ver 1908 and London 555 types:

⁵⁰⁶ Haltern 70 *similis*: Martin-Kilcher 1990, 391; Carreras 2003, 87; Desbat 2003, 47; Dangréaux – Desbat 1988; Marimon – Carreras 2004, 41–49.

Ovioid Spanish type⁵⁰⁷. The majority of datable finds are from the Augustan period⁵⁰⁸. Production probably ended in Flavian times⁵⁰⁹.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	332 – 333
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	334

Inscription, contents: *Tituli picti* most often mention *defrutum* and *sapa*. “*Defrutum* and *sapa* are wines obtained from reduced grape must”⁵¹⁰. Inscriptions referring to olives preserved in various ways are also frequent. The stamps are placed on the handle and the neck of the amphora. No such stamp occurs in Ephesus.

Origin: The fabric of these Baetican vessels is very similar to that of the Dressel 20 amphorae. It is supposed, on the basis of the same stamps, that both types were produced in the same workshops.⁵¹¹ These production workshops were situated in various areas of the Guadalquivir Valley, the Marismas region, the province of Huelva and the coastal region (Algeciras)⁵¹². The Early Imperial form was copied in the upper Rhône area and in southern Gallia⁵¹³.

Distribution: They can be traced from the western Mediterranean to North Africa from the mid first century B.C. to the mid first century A.D.⁵¹⁴.

Fabric: (analysed no. 332)

Visual characteristics

There are two groups of fabrics.

1. Spanish Fabric C, hard fabric, with a few large white and red grains (quartz and iron oxide), and abundant limestone and a few reaction rims surrounding voids which once held limestone nos. 332, 334.
2. Hard sandy fabric, abundant white, grey, and dark brown grains no. 333.

Petrology

Spanish Fabric C

Sample: no. 332

Matrix: calcareous groundmass inactive.

Temper: abundant foraminifers, quartzite.

R.S.

Catalogue

Tetragonos Agora

332. Rim, neck fr., 96/067 (1305), Trench 96/1, D = 18.5 cm, V = 1.6 cm, HD = 4 cm, H = 9 cm, pale yellow (5Y 8/3), PLATES 30, 79

334. Rim, neck, handle fr., 93/063 (423), Trench 93/2, D = 18.5 cm, V = 2.6 cm, HD = 4 cm, H = 9 cm, pink (7.5YR 7/4), SF: white: (10YR 8/2), PLATES 30, 79

333. Rim, neck fr., 96/067 (1306), Trench 96/1, D = 18.5 cm, V = 1.6 cm, HD = 4 cm, H = 9 cm, light yellowish brown (10YR 6/4), PLATES 30, 79

⁵⁰⁷ C. CARRERAS MONFORT personal communication; Tchernia 1986, 142; Tchernia *et al.* 1978, 17; Parker 1992, 250; Gebelli – Díaz 2000, 1350; Carreras 2003, 87 f.; César Carreras 2005, Haltern 70;

⁵⁰⁸ Desbat – Martin-Kilcher 1989, 344 f.; Carreras 2003, 87; Puig 2004, 31.

⁵⁰⁹ César Carreras 2005, Haltern 70; Carreras 2003, 87 f.; Tchernia 1986, 249 f.; At some sites it was produced until the Antonine period.

⁵¹⁰ Van der Werff 1984, 380; Étienne – Mayet 2000, 93–97; Carreras 2003, 88.

⁵¹¹ Mayet 1977, 141–143; Peacock – Williams 1986, 115; Martin-Kilcher 1994, 387; Sciallano – Sibella 1994, Amphore Haltern 70; Étienne – Mayet 2000, 87–89.

⁵¹² Peacock – Williams 1986, 115; César Carreras 2005, Haltern 70.

⁵¹³ Martin-Kilcher 1994, 386.

⁵¹⁴ Hesnard 1980, 146, fig. 3–4; Étienne – Mayet 2000, 216 f.; Ehmiq 2003, 45; Martin-Kilcher 2005, 208, 212; César Carreras 2005, Haltern 70; Tomber 2006, 158, Type 37.

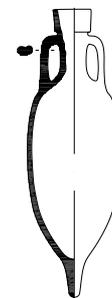
Type 38

PASCUAL 1

(Peacock – Williams 6)

Form: This type has a high, vertical rim, cylindrical neck, oval body and a long and solid spike. The handles are curved and round in section. There is a groove on the outside⁵¹⁵. There are very few amphorae of this type in Ephesus.

Chronology: Produced from the Late Republican period to the second third of the first century A.D. or perhaps to the first quarter of the second century⁵¹⁶.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 5b	A.D. 23 to 45: Agora Courtyard	335

Epigraphy: The stamps are frequently on the rim or on the base⁵¹⁷. The amphora in Ephesus has no stamp.

Origin: This type was produced Barcelona region of Catalonia. It may have also been made in southern France⁵¹⁸.

Contents: It mainly contained wine produced on the Spanish coast near Barcelona (*Tarraconensis*)⁵¹⁹.

Distribution: These amphorae primarily occur in the western Mediterranean. However, there are examples in the northern provinces as well: in Germania, Raetia, southern Pannonia, and in the region of the Black Sea⁵²⁰.

Fabric:

Visual characteristics

Hard, fine fabric with a few colourless, grey and brown inclusions.

Catalogue

Tetragonos Agora

335. Rim, neck fr., 89/009 (1194), Trench 89/2, D = 15 cm, V = 2.1 cm, HD = 6.2 cm, H = 7.4 cm, reddish yellow (5YR 6/6), SF: pink (5YR 7/4), PLATES 30, 79

Type 39

DRESSEL 20

(Beltrán 5; Callender 2; Haltern 71; Oberaden 83; Ostia 1; Peacock – Williams 24–25)

Form, chronology: The neck, handle and body of this globular amphora has different characteristics in each period. Formerly, three periods were distinguished: (a) Julio–Claudio to Trajan, (b) Antonine, and finally (c)

⁵¹⁵ Pascual Guasch 1962, 334–345; Beltrán 1970, 329–338; Tchernia 1971, 38–46; Peacock – Williams 1986, 94; Miró 1988, 70; Étienne – Mayet 2000, 110–113; César Carreras 2005, Pascual 1.

⁵¹⁶ Tchernia 1971, 52–54; Étienne – Mayet 2000, 112; Martin-Kilcher 1994, 335; César Carreras 2005, Pascual 1.

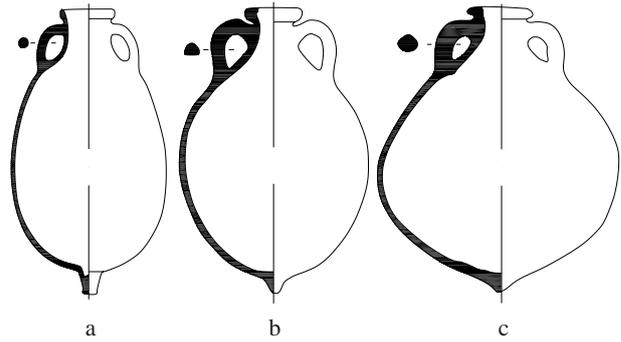
⁵¹⁷ Tchernia 1971, 51 f.; Beltrán 1970, 329–332; Miró 1988, 76 f.; Martin-Kilcher 1994, 336.

⁵¹⁸ Tchernia 1971, 38–46; Peacock – Williams 1986, 93; Miró 1988, 70–78; Sciallano – Sibella 1994, Amphore Pascual 1; Étienne – Mayet 2000, 118 f.; Martínez – Revilla 2008, 296 f.; César Carreras 2005, Pascual 1.

⁵¹⁹ Tchernia 1986, 144; Étienne – Mayet 2000, 118 f.

⁵²⁰ Tchernia 1971, 46–51; Tchernia 1986, 144–146; Peacock – Williams 1986, 94; Bezeczky 1995b, 171; Étienne – Mayet 2000, 218–223; Ehmig 2003, 46; Martin-Kilcher 2005, 208, 212; César Carreras 2005, Pascual 1.

Severan to post-Severan⁵²¹. S. MARTIN-KILCHER distinguished more dateable changes in the forms: 1 Augustan period, 2 around mid first century A.D., 3 Flavian period, 4 around mid to the late second century, and 5 the third century⁵²². P. BERNI MILLET recently has also distinguished five periods: 1 Claudian, 2 Neronian to Vespasian, 3 Flavian to Trajan, 4 Antonine, and 5 Severian to post-Severian⁵²³. When compared with the large body, the Dressel 20 base is rather small. Base fragment no. 339 has three fingerprints. The potter put a stopper into the bottom from the inside when he cut the body of the amphora from the wheel⁵²⁴. There are very few amphorae of this type in Ephesus.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	336
Ph 6	Mid first to late fourth centuries A.D.	337–339

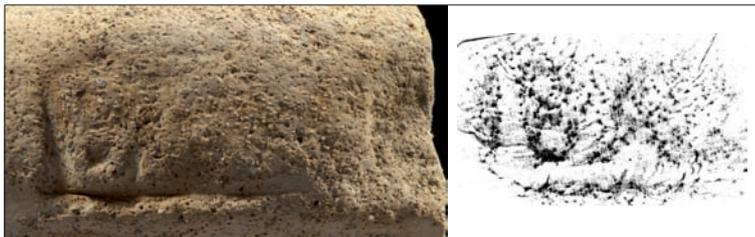
Terrace House 2

layers	Data range	nos.
10	Debris	580
11	Stray find	581

An amphora with a stamp on the rim (no. 336) was found in a layer dated to the first half of the first century A.D. The other fragments come from mixed layers. They can be dated on the basis of their stamps. The Q.ANT.R stamp (no. 337) can be dated to the Claudian–Flavian age. The no. 338 QIM group of stamps was dated to A.D. 149 on the basis of a similar *titulus pictus* at Monte Testaccio⁵²⁵.

Epigraphy: The various phases of the production, shipment, customs and storage can be seen on *tituli picti* from other sites⁵²⁶. We have no inscription on this form in Ephesus.

Stamp: The earliest Dressel 20 amphorae had the stamp on their rims. Such amphorae are rare. The rim fragment in Ephesus has only the first part of the stamp. This stamp is unknown on other amphorae.



no. 336 – BA.(...)

Bibl: On other stamps on the rim: Martin-Kilcher 1987, 144 f. nos. 143 and 147; Berni Millet 2008, 83.

⁵²¹ Rodríguez Almeida 1977, 227–238; Rodríguez Almeida 1984, 151–155.

⁵²² Martin-Kilcher 1987, 55 Fig. 28; Remesal Rodríguez 1986, 27–34 fig. 5; Sciallano – Sibella 1994, Amphore Dressel 20; Remesal Rodríguez 1997, 22–28; similar Beltrán 1970, 481–485.

⁵²³ Berni Millet 2008, 57–63.

⁵²⁴ Rodríguez Almeida 1984, 163 fig. 67.

⁵²⁵ Dressel CIL XV, 2934k, Titulus 4207; Callender 1965, no. 1464, A.D. 130–80?; Rodríguez Almeida 1981, 134.; Remesal Rodríguez 1997, no. 168; Martin-Kilcher 1987, 116, 179–180 A.D.

⁵²⁶ Dressel CIL XV, 2934k, Titulus 4207; Rodríguez Almeida 1989, 142, fig. 6; Remesal Rodríguez 1997, no. 168; Martin-Kilcher 1987, 116.

The handles were frequently stamped. We have two stamps in Ephesus.



no. 337 – Q() ANT () R() (A–N–T in ligature) The nomen is possibly *Antonius*, *Antius* or *Antistius*. He had another stamp as well: Q.ANT. RVG.

Bibl.: Callender 1965, 220, no. 1422; Beltrán 1970, 491; no. 5; Remesal Rodríguez 1982, 44 no. 14. 64; Chic 1985, 65 nos. 578–9 Fig. 30; Remesal Rodríguez 1997, no. 42; Carreras – Funari 1998, 107 f. no. 61, d. 4–e. 5–6; Berni Millet 2008, 322; Laubenheimer – Marlière 2010, 170 no. 83.



no. 338 – Q.I.M.F

Bibl.: CIL XV 2934 e; CIL XIII 267a, b, c; CIL XIII 268c = ORL 14.23, fig. 2; Callender 1965, no. 1464; Ponsich 1979, 128, no. 5. fig. 45; Will 1983, 408 no. 39; Chic 1985, 45; Martin-Kilcher 1987, 116 no 65; Funari 1996, 118, no. 123c; Remesal Rodríguez 1997, 125 no. 168b; Carreras – Funari 1998, 152 no. 246 i9; Berni Millet 2008, 403; Laubenheimer – Marlière 2010, 195–197, nos. 133a–g.

Origin: The Dressel 20 amphora was produced on the banks of the river Guadalquivir (between Seville and Cordoba) and the south Spanish coast. The stamped piece no. 337 was manufactured in the La Catria workshop⁵²⁷. The amphora no. 338 was produced in the workshop of Malpica/Tierras del Judío⁵²⁸.

The Dressel 20 type was also copied in *Hispania Tarraconensis*, along the coastal strip of *Baetica* and in *Germania*⁵²⁹.

Contents: Olive oil. The ancient sources mention the excellence of Baetican olive-oil; Pliny said it was as good as the Istrian oil⁵³⁰.

Distribution: The amphorae from Baetica can be found all over the Empire, especially in the western provinces⁵³¹. They also occur in smaller amounts in the eastern Mediterranean. The stamps are mostly known from Alexandria, Athens, Corinth, Rhodes, Antioch, Red Sea and India⁵³².

Fabric:

Visual characteristics

There are two main groups.

1. Hard, sandy fabric. Some white and colourless inclusions. Several grey and darker rock fragments no. 336.
2. Hard, sandy fabric. Some white, brown and colourless inclusions and several grey inclusions nos. 337, 338, 580, 581.

No. 339, similar to nos. 337 and 338, but less frequent inclusions.

No. 715, similar to no. 337, but the grain size is smaller.

⁵²⁷ Berni Millet 2008, 318–334.

⁵²⁸ Ponsich 1979, 127–132; Remesal Rodríguez 1997, 125 no. 168b; Berni Millet 2008, 402 f.

⁵²⁹ César Carreras 2005, Dressel 20 and Dressel 20 *similis* - Oliva 3; Ehmig 2000, 1143–1152; Schallmayer 1992.

⁵³⁰ Pliny NH, XV, 8; Martial XIII, 63.

⁵³¹ Callender 1965, 19–22; Beltrán 1970, 464–492; Chic 1985; Chic 1988; Martin-Kilcher 1987; Remesal Rodríguez 1997; Bezeczký 2000, fig. 3–4; Carreras – Funari 1998; Rizzo 2003, 150, 167 f.; Martin-Kilcher 2005, 208, 212; Ehmig 2003, 45.

⁵³² Will 1983; Tomber 2005, 229; Tomber 2006, 159, Type 39.

Catalogue

Tetragonos Agora

336. Rim fr, base fr., 95/100 (1286), Trench 95/2 (a), Stamp: Ba(...), D = 16.2 cm, V = 2.8 cm, HD = 3.9 cm, H = 6.5 cm, BD = 4.2 cm, BH = 7.8 cm, very pale brown (between 10YR 7/3 and 6/3), PLATES 30, 79
337. Handle fr., 89/005 (128), Trench 89/2, Stamp: Q.ANT.R, Q. Ant(...) R[ug](a), H = 13 cm, S = 4.6x4.9 cm, dark buff (7.5YR 6/4), PLATES 30, 79
338. Handle fr., 99/025 (922), R-sewer, Stamp: QIMF, Q. I() M() F(), H = 10.2 cm, S = 4x4.9 cm, yellowish red (5YR 5/6), PLATES 30, 79
339. Base fr., inside with three fingerprints, 99/068 (1661), R-sewer, H = 3.6 cm, buff – light brown (7.5YR 7/4 –7/6), PLATES 30, 79

Terrace House 2

580. Rim, neck, 99/270 (177), C8, Stairway 3, D = 15.5 cm, V = 3.2 cm, HD = 4 cm, H = 5 cm, pink (7.5YR 8/4), PLATES 44, 90
581. Handle, 99/291 (117), B9 Ost, 45c, H = 18.5 cm, S = 5 cm, light brown (7.5YR 6/4), PLATES 44, 90

Magnesian Gate

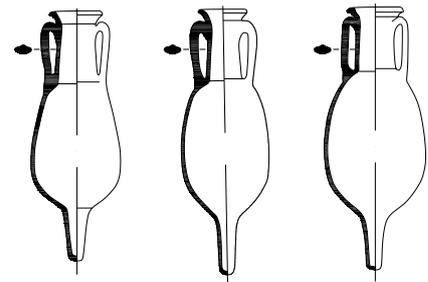
715. Handle fr., MT 99/1–8, H = 8.2 cm, S = 5.2x4 cm, light brownish grey (10YR 6/2), SF: pink (7.5YR 7/4), PLATES 52, 95

Type 40

BELTRÁN 1

(Included within Dressel 7–11)

On the basis of their common features, M. BELTRÁN LLORIS classified the Dressel 7, 8, 9, 10 and 11 amphorae as belonging to this group⁵³³. Their bodies and bases are very similar. They most frequently contained fish sauce or fish-based products⁵³⁴. This is known from the painted inscriptions⁵³⁵. There are very few amphorae of this type in Ephesus.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	344

Origin: Most of them were produced along the southern coast of Spain, in *Tarraconensis*, in *Lusitania* and on the western coast of Morocco⁵³⁶. 61 workshops have been published from the Spanish coast to the northern regions of the peninsula⁵³⁷.

Distribution: They can be found in the western Roman provinces, also in a few locations in North Africa and in the northern provinces⁵³⁸.

Fabric:

Visual characteristics

Buff, hard sandy fabric, with abundant white and colorless grains and voids.

⁵³³ Beltrán 1970, 388–420; Peacock – Williams 1986, 120 f.; Sciallano – Sibella 1994, Dressel 7-11; Martin-Kilcher 2003, 70.

⁵³⁴ Étienne – Mayet 2002, 27–53; Curtis 1991, 38–111; Sciallano – Sibella 1994, Dressel 7-11; Martin-Kilcher 2003, 69.

⁵³⁵ Zevi 1966, 229–247; Beltrán 1970, 415 – 420; Liou 1993, 131–148; Martin-Kilcher 1994, 402–409; Martin-Kilcher 2003, 78.

⁵³⁶ Peacock 1971, 168; Peacock 1974, 232–243; Peacock – Williams 1986, 120; Edmondson 1987, 157–188; Ponsich 1998, 103–228; Martin-Kilcher 1994, 393 – 395; Sciallano – Sibella 1994, Dressel 7-11; Panella 2001, 202 f.; Lagóstena 2001, 31–201; Étienne – Mayet 2002, 58–70, 159-177; Lagóstena – Bernal 2004, 86–88, 106; Lagóstena 2005, Dressel 7, 8, 9.

⁵³⁷ Étienne – Mayet 2002, 58–70, 159-177; Lagóstena – Bernal 2004, 86–88, 106.

⁵³⁸ Peacock – Williams 1986, 120; Riley 1979, 159; Bezeczky 1987, 22; Maier-Maidl 1992, 105; Martin-Kilcher 2005, 208, 212; Ehmig 2003, 47; Schimmer 2009, 52.

Catalogue

Tetragonos Agora

344. Rim, neck fr., 89/090 (1352); Trench 89/3, D = 18 cm, V = 2 cm, HD = 3.9 cm, H = 5.9 cm, buff (10YR 7/3), PLATES 31, 79

Magnesian Gate

714. Handle fr., MT 99/1–7, H = 7.6 cm, S = 2.5x5 cm, very pale brown (10YR 7/3 – 8/3), PLATES 52, 95

The amphora published from Ephesus:
Lucas Grave (Lukasgrab): Ladstätter 2010b, K 931.

Type 40 – 1

BELTRÁN 1 (DRESSSEL 7)

(Dressel 7–11; Augst 23 a)

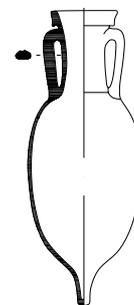
Form: Long, thick rim, cylindrical neck, oval body. The base is short. The long, flat handle is finely ribbed.

Chronology: The type was in production from the last third of the first century B.C. to the mid first century A.D.⁵³⁹. There are very few amphorae of this type in Ephesus.

The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	340



Origin: This type was produced along the southern Spanish coast (Cádiz and Málaga region) and Morocco⁵⁴⁰.

Distribution: They can be found in Italy and the western Roman provinces and in the northwestern Roman provinces and also in a few locations in the eastern Mediterranean⁵⁴¹.

Fabric:

Visual characteristics

Buff, hard fabric, with abundant white and colorless grains and voids.

Catalogue

Tetragonos Agora

340. Rim, neck fr., 89/029 (1317), Trench 89/2, D = 20 cm, V = 2.6 cm, HD = 4.5 cm, H = 11.2 cm, buff (10YR 7/4), PLATES 31, 79

⁵³⁹ Étienne – Mayet 2002, 124; Martin-Kilcher 2003, 73, 77; Lagóstena 2005, Dressel 7.

⁵⁴⁰ Peacock 1974, 234–241; Sciallano – Sibella 1994, Dressel 7; Lagóstena 1996, 156; Étienne – Mayet 2002, 58–70, 159–177; Lagóstena 2005, Dressel 7; Lagóstena – Bernal 2004, 86–88, 106.

⁵⁴¹ Martin-Kilcher 1994, 399; Bernal Casasola 2000, 940–962; Martin-Kilcher 2005, 208, 212; Ehmig 2003, 47; Lagóstena 2005, Dressel 7.

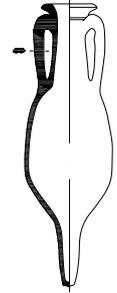
Type 40 – 2

BELTRÁN 1 (DRESSEL 8)

(Halterm 69; Peacock – Williams 17; Augst 25)

Form: The type is characterised by a slightly everted rim, a short, cylindrical neck and an oval body. The handles are attached to the neck below the rim in a characteristic way and curve down to the upper part of the body. There are very few amphorae of this type in Ephesus.

Chronology: These amphorae were produced from the end of the first century B.C. to the Flavian period⁵⁴².



The amphora found in Ephesus

Terrace House 2

layer	Data range	no.
11	Stray find	576

Origin: This type was produced along the southern Spanish coast (Cadiz, Málaga and Huelva region)⁵⁴³.

Distribution: The type occurs mainly in the western Mediterranean and in the northern provinces⁵⁴⁴.

Fabric:

Visual characteristics

Buff, hard fabric, with abundant white and colorless grains and voids.

Catalogue

Terrace House 2

576. Rim, neck, 99/310 (3), Stray find, D = 15.4 cm, V = 2.2 cm, HD = 4.4 cm, H = 10.3 cm, pale brown (10YR 6/3), PLATES 44, 90

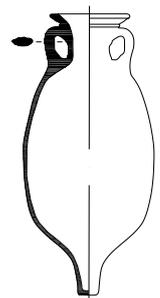
Type 40 – 3

BELTRÁN 1 (DRESSEL 9)

(Augst 24)

Form: The type is characterised by a wide, everted rim, a short, cylindrical neck and an oval body. Flat short handles join the neck and the shoulder. The long hollow base ends in a flat bottom. There are very few amphorae of this type in Ephesus.

Chronology: There is a difference of opinion concerning the inception date of production. The Augst excavation data suggest that the production started in the first century B.C. Other sets of data suggest the first amphorae were manufactured starting at the turn of the first century A.D. to the Flavian period⁵⁴⁵.



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	341–343

⁵⁴² Étienne – Mayet 2002, 124; Martin-Kilcher 2003, 73. 77; Lagóstena 2005, Dressel 8.

⁵⁴³ Peacock 1974, 234 – 241; Beltrán 1977, 110; Sciallano – Sibella 1994, Dressel 8; Étienne – Mayet 2002, 58–70, 159–177; Lagóstena 1996, 156; Lagóstena – Bernal 2004, 86–88. 106; Lagóstena 2005, Dressel 8.

⁵⁴⁴ Martin-Kilcher 1994, 400; Martin-Kilcher 2003, 73. 77; Martin-Kilcher 2005, 208. 212; Bezczyk 1987, 22; Bezczyk 1994a, 106 – 109; Ehmig 2003, 47; Lagóstena 2005, Dressel 8; Schimmer 2009, 53.

⁵⁴⁵ Martin-Kilcher 1994, 400; Martin-Kilcher 2003, 73. 77; Étienne – Mayet 2002, 124; Lagóstena 2005, Dressel 9.

Origin: This type was produced along the southern Spanish coast (Cadiz, Málaga and Huelva region)⁵⁴⁶.

Distribution: The type occurs mainly in the western Mediterranean and in the northern provinces⁵⁴⁷.

Fabric: (analysed no. 341)

Visual characteristics

The three rims belong to three fabric groups.

1. Spanish Fabric D, no. 341, buff, hard sandy fabric, with abundant white and colorless grains and voids.
2. The other two amphorae are very different. No. 342 was fired at a high temperature. Buff, hard, sandy fabric. There are reaction rims of voids of limestone and foraminifera.
3. No. 343 is entirely different, with brown and red inclusions, the size of the grains is 0.5–1 mm.

Petrology

Spanish Fabric D

Sample: no. 341

Matrix: Optically inactive, originally lime rich groundmass, artificially tempered with partially well rounded quartz grains.

Temper: Very frequent monocrystalline quartz and moulds of former carbonates, frequent iron oxide concretions, subordinate muscovite and foraminifers, rare K-feldspars and oxidised mica, very rare polycrystalline quartz, plagioclase and calcite bioclasts.

The *heavy mineral* assemblage is composed of zircon (31%), garnet (28%), rutile (9%), andalusite (8%), tourmaline (6%), hornblende (6%), epidote/zoisite (5%), titanite (3%), staurolite (2%), unidentified grains (2%) and traces of brookite/anatase, monazite, disthene and sillimanite.

Comment: The raw material is calcareous, marine clay, artificially tempered by fine to medium grained sand. Typical are the rounded quartz grains, the abundance of foraminifers and the heavy mineral assemblage dominated by zircon, garnet and a remarkable content of andalusite. The petrographical composition and the heavy mineral assemblage could be similar to some Spanish fabrics.

R.S.

Catalogue

Tetragonos Agora

- | | |
|---|--|
| <p>341. Rim, neck fr., 88/013 (700), Trench 88/2, D = 23 cm, V = 2.2 cm, HD = 4.3 cm, H = 8 cm, buff (10YR 8/4–7/4), PLATES 31, 79</p> <p>342. Rim, neck fr., 88/013 (701), Trench 88/2, D = 18 cm, V = 1.7 cm, HD = 3.4 cm, H = 4.6 cm, light olive grey (5Y 6/2), SF: pale yellow (5Y 8/4), PLATES 31, 79</p> | <p>343. Rim, neck fr., 88/013 (702), Trench 88/2, D = 18.2 cm, V = 1.9 cm, HD = 4.1 cm, H = 5.3 cm, reddish yellow (7.5YR 7/6), SF: buff (2.5Y 7/4), PLATES 31, 79</p> |
|---|--|

Type 41

DRESSSEL 12

(Beltrán 3; Ostia 52; Peacock – Williams 14; Augst 22)

Form: An everted rim, a widening neck, and an ovoid body with a short, solid base. The handles from below the rim run in a curve to the upper part of the body. There is a rib under the handles⁵⁴⁸. There are very few amphorae of this type in Ephesus.



⁵⁴⁶ Étienne – Mayet 2002, 58–70, 159–177; Sciallano – Sibella 1994, Dressel 9; Lagóstena 1996, 156; Lagóstena 2005, Dressel 9; Lagóstena – Bernal 2004, 86–88. 106.

⁵⁴⁷ Martin-Kilcher 2003, 73, 77; Martin-Kilcher 2005, 208, 212; Ehmig 2003, 47; Lagóstena 2005, Dressel 9.

⁵⁴⁸ Peacock – Williams 1986, 113 f; Étienne – Mayet 2002, 119 f., they have distinguished A and B variants; Williams 2005, Dressel 12.

Chronology: The type was in production from the middle of the first century B.C. up to the beginning of the first century A.D.⁵⁴⁹. Other sets of data suggest the first amphorae were manufactured starting from the middle of the first century B.C. to the later second century A.D.⁵⁵⁰.

The amphorae found in Ephesus

Terrace House 2

layer	Data range	nos.
2a	Late first century B.C.	578–579

Origin: This type was produced along the southern Spanish coast. The workshops may have been near Cádiz, Málaga and Algeciras⁵⁵¹.

Contents: Probably fish sauce.

Distribution: Spain, Italy, southern France, in the northern provinces and the eastern Mediterranean⁵⁵².

Fabric:

Visual characteristics

Hard fabric, with white, colourless and reddish (iron ore) inclusions and microfossils.

Catalogue

Terrace House 2

578. Neck, body, 99/689 (241), B 9 Nord, 45c, DB = 29.7 cm, H = 32.2 cm, pink (7.5YR 8/4), SF: white (10YR 8/2), PLATES 44, 90

579. Neck, body, 99/689 (240), B 9 Nord, 45c, DB = 29 cm, H = 34.8 cm, pink (7.5YR 8/4), SF: white (10YR 8/2), PLATES 44, 90

Type 42

BELTRÁN 2A

(Dressel 38; Pélichet 46; Callender 6; Peacock – Williams 18; Augst 27)

Form: This type has a broad neck with a wide hooked rim⁵⁵³. The handles run parallel to the neck. The section of the handles is oval. The body is pear-shaped with a conical base. The base is long and hollow. Two groups have been distinguished: larger (Beltrán 2A–1 or Pélichet 46) and a smaller (Beltrán 2A–2 or Augst 29)⁵⁵⁴. There are very few amphorae of this type in Ephesus.

Chronology: The production of this form started either during the Flavian period, or shortly before it. It was produced until the middle of the second century A.D.⁵⁵⁵.



The amphora found in Ephesus

Terrace House 2

layer	Data range	no.
11	Stray find	577

⁵⁴⁹ Martin-Kilcher 2003, 73, 77; Sciallano – Sibella 1994, Dressel 12;

⁵⁵⁰ Beltrán 1970, 449; Étienne – Mayet 2002, 120; Williams 2005, Dressel 12.

⁵⁵¹ Étienne – Mayet 2002, 58–70, 159–177; Sciallano – Sibella 1994, Dressel 12; Lagóstena 1996, 156; Williams 2005, Dressel 12; Lagóstena – Bernal 2004, 86–88, 106 f.

⁵⁵² Beltrán 1970, 448–456; Martin-Kilcher 1994, 398; Bernal Casasola 2000, 940–962; Ehmig 2003, 47; Williams 2005, Dressel 12; Schimmer 2009, 52.

⁵⁵³ Beltrán, 1970, 421–433, Peacock – Williams 1986, 122 f.; Étienne – Mayet 2002, 127 f.; Lagóstena 2005, Beltrán 2A; Sciallano – Sibella 1994, Dressel 38/Beltrán 2A.

⁵⁵⁴ Martin-Kilcher 1994, 400 f.; Martin-Kilcher 1994, 400 f.; Lagóstena 2005, Beltrán 2A.

⁵⁵⁵ Peacock – Williams 1986, 123; Martin-Kilcher 1994, 400 f.; Sciallano – Sibella 1994, Amphore Dressel 2A; Bezeczky 1994a, 125; Martin-Kilcher 2003, 73, 77; Étienne – Mayet 2002, 128; but Lagóstena 2005, Beltrán 2A: "Probably from the last years of the Augustan period to the middle of the second century AD (Beltrán 1970, 423–426; Peacock 1974). Earliest date: c. AD 10–15, Latest date: Mid second century AD."

Epigraphy, Inscription: *Tituli picti* on the fish-sauce amphorae from the Iberian peninsula often refer to the content. The inscriptions record the merchant, the quality and quantity of the fish sauce⁵⁵⁶. It rarely refers to a Roman *legio*, or a soldier's name and rank⁵⁵⁷.

Stamp: The type was rarely stamped⁵⁵⁸.

Origin: They were produced at many workshops in southern Spain⁵⁵⁹.

Contents: Fish-based products.

Distribution: Italy and mainly the western and northern provinces⁵⁶⁰, North Africa and the eastern Mediterranean⁵⁶¹.

Fabric:

Visual characteristics

Hard, rough fabric, grey and dark brown inclusions, the surface sometimes covered by buff slip.

Catalogue

Terrace House 2

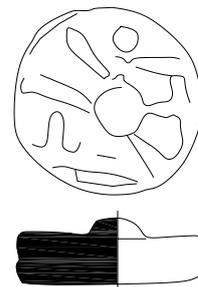
577. Handle, 99/310 (8), Stray find, H = 15.5 cm, S = 4.5x2.3 cm, light red (2.5YR 6/6), SF: light brown (7.5YR 6/4), PLATES 44, 90

The amphora published from Ephesus:
State Agora, Well: Meriç 2002, 90 T. 47 no. K 570.

Type 43

STOPPERS

There are a number of stoppers among the finds of the Tetragonos Agora. Such stoppers were used most often found with Lamboglia 2 and Dressel 6A amphorae⁵⁶².



The amphora stoppers found in Ephesus Agora

layers	Data range	nos.
Ph 1b	Third quarter of second century B.C.	358–360
Ph 3	Late second century. B.C. / ca. 60 B.C. to early Augustan period	361
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	363–366, 369
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	367
Ph 6–9	First to early seventh centuries A.D.	362
Ph 11	Unstratified complexes	368

⁵⁵⁶ Beltrán, 1970, 431 f.; Martin-Kilcher 1994, 402–409; Martin-Kilcher 2003, 78.

⁵⁵⁷ Bezczy 1996, 329–332; Ehmig 1997, 9–21.

⁵⁵⁸ Martin-Kilcher 1994, 402; Lagóstena 2001, 385–434.

⁵⁵⁹ Beltrán, 1970; Étienne – Mayet 2002, 58–70, 159–177; Lagóstena – Bernal 2004, 8–88, 107; Lagóstena 2005, Beltrán 2A.

⁵⁶⁰ Beltrán, 1970; Beltrán 1977, 111; Riley 1979, 161; Martin-Kilcher 1994, 400; Peacock – Williams 1986, 123; Kelemen 1990, 156–158; Bezczy 1995b, 168; Curtis 1991, 64 note 88; Bezczy 2000, 1361; Bernal Casasola 2000, 940–965; Ehmig 2003, 47; Lagóstena 2005, Beltrán 2A; Schimmer 2009, 53.

⁵⁶¹ Böttger 1992, 339 f. nos. 61–62 T. 99; Bernal Casasola 2000, 940–962; Martin-Kilcher 2005, 208, 213; Tomber 2006, 159, Type 38.

⁵⁶² Hesnard – Gianfrotta 1989, 393–441; Lindhagen 2009, 88 f.

Epigraphy: Some of the stoppers have letters and symbols. The inscription of no. 361 is probably FELIX. No. 362 is not legible. The symbol on no. 364 resembles the one published from Magdalensberg⁵⁶³. No. 368 has Greek letters (ΠΦΧΔΙΑ?).



no. 361



no. 364



no. 368

Origin: nos. 358–368 probably come from the Adriatic coast of Italy.

Fabric:

Visual characteristics

Fairly soft fabric. A number of groups can be distinguished.

1. Fine fabric, limestone and iron oxide inclusions, nos. 358, 360, 362 and 364
2. Very fine fabric, rare limestone inclusions, nos 359, 361 and 363
3. Limestone leaching. The microscope shows white reaction rims surrounding voids which once held limestone, nos. 365–366
4. Frequent microfossils, iron oxide inclusions, no. 367
5. The microscope shows white reaction rims surrounding voids which once held limestone. Black, over fired iron oxide inclusions, no. 368
6. Hard, red fabric no. 369

Catalogue

Tetragonos Agora

- | | |
|--|--|
| 358. Disc, 95/025 (168k), Trench 95/2, DS = 9.5 cm, VS = 1.3 cm, VM = 3 cm, pale yellow (5Y 8/4), PLATES 32, 80 | 364. Disc, 90/027 (338), Trench 90/2, Stamp: Simbol Ψ, DS = 9.5 cm, VS = 1.5 cm, VM = 2.5 cm, pinkish white (7.5YR 8/2), PLATES 32, 81 |
| 359. Disc, 95/025 (168h), Trench 95/2, DS = 10 cm, VS = 1.2 cm, VM = 3.5 cm, pink (5YR 7/4), PLATES 32, 80 | 365. Disc, 90/027 (1618), Trench 90/2, DS = 8.8 cm, VS = 1.5 cm, VM = 3 cm, greyish brown(2.5Y 5/2), PLATES 32, 81 |
| 360. Disc, 95/025 (168j), Trench 95/2, DS = 9.7 cm, VS = 1 cm, VM = 3 cm, buff (10YR 8/4), PLATES 32, 80 | 366. Disc, 87/025 (1722), Trench 87/2, DS = 8.8 cm, VS = 1.1 cm, VM = 1.8 cm, buff (10YR 8/4), PLATES 32, 81 |
| 361. Disc, 90/127 (1186=1710), Trench 90/3, Stamp: FELIX, DS = 9 cm, VS = 2.2 cm, VM = 3 cm, buff (10YR 8/4), PLATES 32, 81 | 367. Disc, 87/059 (1724), Trench 87/4, DS = 9.5 cm, VS = 2.5 cm, VM = 3.2 cm, pink (5YR 8/4), PLATES 32, 81 |
| 362. Disc, 91/043 (1731), Trench 91/2, DS = 8.6 cm, VS = 2 cm, VM = 3 cm, pale yellow (5Y 8/3), PLATES 32, 81 | 368. Disc, 1986 (1267), Strayfind, Stamp: ΠΦΧΔΙΑ???, DS = 9.5 cm, VS = 2 cm, VM = 3.1 cm, light grey (2.5Y 7/2), PLATES 32, 81 |
| 363. Disc, 87/020 (2005), Trench 87/1, DS = 9.2 cm, VS = 1.5 cm, VM = 2.8 cm, pink – reddish yellow (7.5YR 8/4–8/6), PLATES 32, 81 | 369. Disc, 89/019 (1341), Trench 89/2, DS = 10.2 cm, VS = 1 cm, VM = 4 cm, weak red (2.5YR 5/2), SF: red (2.5YR 5/6), PLATES 32, 81 |

⁵⁶³ Piccottini 1973, 121.

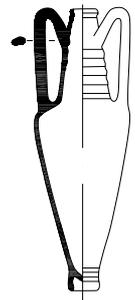
Type 44

KAPITÄN 2

(Niederbieber 77; Agora K 113, M 303, M 237; Ostia 6; Benghazi Mid Roman Amphora 7; Hollow Foot Amphora; Kuzmanov 7; Peacock – Williams 47; Zeest 79)

Kapitän 2 amphora is present in significant numbers at the Terrace House 1 and 2. There are two groups of Kapitän 2 amphorae. The kind with red fabric has a wide distribution and is represented in substantial numbers in Ephesus and was common both in the Mediterranean and elsewhere⁵⁶⁴. The amphorae of a buff colour are less frequent. The analysis of the fabric suggests that it may have been produced in the Cayster Valley (Küçük Menderes) and in the region of Ephesus (Samos can also be considered). They are also known from Pannonia (Vindobona) and Egypt (Alexandria)⁵⁶⁵. Interestingly, the locally produced Kapitän 2 amphorae can only be found at distant sites.

Form: There is a groove on the narrow, flat rim. The neck is conical with shallow horizontal grooves on the outside, with the body tapering to the base. The base is hollow and also has horizontal grooves on the outside. The thick handles are attached to the upper part of the neck, rising above the rim and returning almost vertically to the shoulder. There is a variation of shape and size within the type⁵⁶⁶. The rim, base and handle fragments at the Terrace House 2 are characteristic of the Kapitän 2 amphorae in Ephesus. They are different from the examples in Athens⁵⁶⁷. This type of amphora is common in Ephesus, but it is not represented in the Tetragonos Agora.



Chronology: In Mid and Late Imperial times, Kapitän 2 was one of the most common types of amphora. There are amphorae that date to the late second century A.D. in Ostia, but they were most common in the third and fourth centuries A.D.⁵⁶⁸. The examples in Britain published by D. PEACOCK were found in late third to early fourth century A.D. layers.⁵⁶⁹ They occur in the northern provinces in the third century A.D.⁵⁷⁰.

The amphorae found in Ephesus

Terrace House 2

layers	Data range	nos.
5	Third century A.D.	589
5a	Early third century A.D.	583–588, 591
11	Stray find	582, 590

Epigraphy: No stamp or inscription is known.

Origin: For a long time it was thought that this type of amphora came from production sites somewhere in the Aegean⁵⁷¹. Relying on morphological considerations, V. GRACE race thought that the amphorae came from Samos⁵⁷². C. PANELLA and S. KEAY have suggested Kos as a centre of production⁵⁷³. Recently P. REYNOLDS

⁵⁶⁴ Riley 1979, 189–192; Peacock – Williams, 1986, 193–195; Keay 1984, 641–643.

⁵⁶⁵ Bezczky 2005a, 45; Sauer 2005, 117 f.; Majcherek 1993, 218.

⁵⁶⁶ Oelmann 1914, 65, fig. 47.1; Kapitän 1961, 297, fig. 1–3; Kapitän 1972, 246, fig. 4; Zeest 1960, Type 79; Panella 1973, 596–599, fig 544–545; Riley 1979, 189 f. MR 7; Hayes 1983, 155; Keay 1984, 136–140.

⁵⁶⁷ Robinson 1959, K 113, L 33, M 237, M 274, M 303; Ephesus the average height of a Kapitän 2 amphora at the Terrace House 2 is 75 cm. The diameter of the rim varies between 6.5–7 cm, the volume is 8.5 litre.

⁵⁶⁸ Robinson 1959, K 113 (first half of the third century); Panella 1973, 596–599; Manacorda 1977, 228; Riley 1979, 190; Carandini – Panella 1981, 494; Keay 1984, 137, 140; Tomber 2007, 205.

⁵⁶⁹ Peacock 1977c, 297; Williams 2005, Kapitän 2.

⁵⁷⁰ Martin-Kilcher 1994, 440; Gassner 1989, 71; Kelemen 1990, 175–181; Bezczky 1995a, 52.

⁵⁷¹ Riley 1979, 192; Panella 1986, 617; Peacocok – Williams 1986, 193; Sciallano – Sibella 1994, Amphore Kapitän 2/Agora K 113; Warner Slane 2000, 303; Lund 2007, 184.

⁵⁷² Grace 1971, 72, note 51; Riley 1979, 192, but J. A. RILEY did not share this view; Majcherek 1993, 218.

⁵⁷³ Panella 1973, 598 f.; Keay 1984, 137; Panella 1986, 617.

suggested that these amphorae originated in the Black Sea (west of the Crimea?)⁵⁷⁴. As mentioned above, some of the Kapitän 2 amphorae were manufactured in the vicinity of Ephesus, but Samos can also be considered⁵⁷⁵.

Contents: Not known. It is supposed that they contained wine⁵⁷⁶.

Distribution: This type of amphorae was common both in the Mediterranean and in the provinces⁵⁷⁷. They have been found with Aegean marble on shipwrecks off the coast of Libya, Italy, Greece and Turkey⁵⁷⁸.

Fabric: (analysed nos. 582, 586, 589)

Visual characteristics

The fabrics of the amphorae at the Terrace House 2 are not homogeneous. There are six groups.

Aegean / eastern Mediterranean fabrics

1. Abundant colourless and white grains. Their size varies: 0.05–0.5 mm. A few grey and iron oxide grains. Their size is 0.5 mm, no. 582.
2. Similar to no. 582 but with fewer inclusions, nos. 583–587, 710–711.
3. Fine fabric. Some large grains, no. 588.
4. Fewer colourless and white grains. Occasional grey inclusions, no. 589.
5. Fine fabric. Abundant grey, red, yellow, colourless and white grains. It is different from the other fabrics, no. 590.
6. Fine fabric. A few grey, white and red grains 0.5 mm, no. 591.

Petrology

Sample: no. 582

Matrix: Reddish–brown, very fine grained, clayey, no carbonate content.

Temper: Frequent monocrystalline quartz, moderate plagioclase, polycrystalline quartz, rare chert, heavy minerals (zircon, rutile, hornblende), K-feldspar, crystalline rock fragments (quartzite, sericite–quartzite), very rare mica, volcanic plagioclase, iron oxide particles.

Sample: no. 586

Matrix: Very fine grained, clayey, no carbonate content, reddish–brown.

Temper: Very frequent monocrystalline quartz, moderate polycrystalline quartz, feldspar, rare chert, crystalline rock fragments (quartzite, sericite–quartzite), very rare mica, heavy minerals (epidote/clinozoisite), foraminifers, volcanic fragments and carbonate particles.

Sample: no. 589

Matrix: Probably calcareous.

Temper: Bimodally sorted, very frequent: feldspar (partly of volcanic origin, plagioclase and sanidine?), frequent. monocrystalline quartz (also traces of volcanic quartz?), very rare carbonate grains, volcanic rock fragments, polycrystalline quartz, iron oxide particles, rare mica (mainly dark).

R.S.

⁵⁷⁴ Reynolds 2010, 72, 109, 257, 261.

⁵⁷⁵ Sauer 1995, 117 f.

⁵⁷⁶ Panella 1973, 559; Keay 1984, 137.

⁵⁷⁷ Robinson 1959, K 113, L 33, M 237, M 274, M 303; Zeest 1960, 114, T. 33 No. 79; De Luca 1975, 100, no. 424, Pl. 78, no. 10; Love 1972, 67, T. 16/13; Manacorda 1977, 229; Riley 1979, 192; Adamsheck 1979, 113, f. RC 11 Pl. 26; Brukner 1981, Pl. 163 nos. 69, 70–75; Hayes 1983, 155 Type 37, A 86–87; Keay 1984, 137; Panella 1986, 626 f.; Peacock – Williams 1986, 193–195; Bezezcky 1987, 78; Gassner 1989, 71; Kelemen 1990, 175–181; Anderson-Stojanović 1992, Pl. 80, nos. 684–686; Böttger 1992, 348 f., no. 76 T. 102; Sciallano – Sibella 1994, Kapitän 2; Vidrih Perko 1994, 117; Lemaître 2000, 473, fig. 8,5–10; Vilvorder *et al.* 2000, fig. 3, 1–2; Benea 2000, 435 fig. 1.1; Dyczek 2001, 141–143; Opař 2004a, 13; Ehmig 2003, 48; Warner Slane 2004, 364 f.; Martin 2000, 429 fig. 1.4; Martin-Kilcher 2005, 208, 212; Bezezcky 2005a, 43–45; Williams 2005, Kapitän 2; Tomber 2006, 165, Type 50; Praschiv 2006, 87 f.; Majherek 2007, 18, with detailed bibliography; Tomber 2007, 205; Laubenheimer – Marlière 2010, 47, 103;

⁵⁷⁸ Parker 1992, nos. 22, 229, 567, 670, 695, 755, 1143, 1183.

Catalogue

Terrace House 2

582. Rim, neck, handle, 99/286 (324), Stray find, D = 6.3 cm, V = 1 cm, HD = 2.5 cm, H = 11.9 cm, S = 5.4x2.9 cm, yellowish red (5YR 5/6), SF: pink (5YR 7/4), PLATES 45, 90
583. Rim, neck, 99/462 (43), A3, Stairway 1, D = 7.2 cm, V = 1.3 cm, HD = 2.2 cm, H = 9.6 cm, red (2.5YR 5/6), PLATES 45, 90
584. Rim, neck, 99/606 (284), A3, Stairway 1, D = 7.2 cm, V = 1.2 cm, HD = 2.5 cm, H = 6.1 cm, red (2.5YR 5/6), PLATES 45, 90
585. Base, 99/610 (362), A3, Stairway 1, DF = 8.5 cm, H = 9.8 cm, dark brown (7.5YR 4/2), SF: red (2.5YR 5/6), PLATES 45, 90
586. Base, 99/598 (26), A3, Stairway 1, DF = 8.5 cm, H = 13.3 cm, red (2.5YR 5/6), PLATES 45, 90
587. Base, 99/580 (102), A3, Stairway 1, DF = 5.3 cm, H = 3.4 cm, yellowish red (5YR 5/6), PLATES 45, 90

588. Handle, 99/070 (129), A3, Stairway 1, H = 14.9 cm, S = 4.8x3.8 cm, reddish yellow (5YR 6/8), PLATES 45, 90
589. Handle, 99/331 (45), WT 2, Stone-cutting saw, H = 9 cm, S = 4.7x2.8 cm, reddish yellow (7.5YR 7/6), PLATES 45, 90
590. Handle, 99/436 (48), C3, Stairway 3, H = 7.2 cm, S = 4.2x2.5 cm, red (2.5YR 5/8), PLATES 45, 90
591. Handle, 99/070 (134), A3, Stairway 1, H = 31.3 cm, S = 4.9x2.9 cm, reddish yellow (5YR 6/6), PLATES 45, 91

Magnesian Gate

710. Handle fr., MT 99/1–21, H = 9 cm, S = 3x4.7 cm, red (2.5YR 4/8), PLATES 51, 95
711. Handle fr., MT 99/1–19, H = 9.7 cm, S = 2.6x4.7 cm, light red – red (2.5YR 6/6 – 5/6), PLATES 51, 95

The amphorae published from Ephesus:

Tetragonos Agora; South Gate: Gassner 1997, 182. 185 T. 60 no. 765–766; Terrace House 1: Lang–Auinger – Outschar 1992, 151–154; Outschar 1996, 60 T. 7, no. 276, 279; Terrace House 2: Ladstätter 2005, 242. 245. 335 T. 191, K 703. 259. 351, T. 201 K 848; Outschar 1993, 51 f. Fig. 3; Lucas Grave (Lukasgrab): Liko 2010, 249 no. 798.

Type 45

MID ROMAN AMPHORA 1 BENGHAZI

(Agora M 254; Ostia 1, 453; Peacock – Williams 40 B; Augst 68)

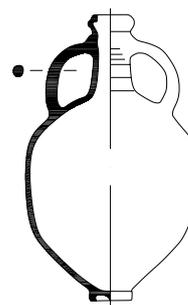
Form: This group has more than one form. The Peacock – Williams 40 B type has a thickened rim and a narrow neck. The body is oval. The handles, round in section, join the neck and the shoulder. The bottom of the vessel has a flat ring base⁵⁷⁹. There are very few amphorae of this type in Ephesus.

Chronology: The type was produced from the first to the fourth centuries A.D.⁵⁸⁰.

The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 10	From early seventh century A.D. to recent times	415



Origin: It was probably produced in North Africa, perhaps in Tripolitana. G. RIZZO and M. BONIFAY, relying on new research and petrological analyses, suggest Sicily as one of the sites of production⁵⁸¹.

Contents: Probably wine.

⁵⁷⁹ Riley 1979, 177–179; Peacock – Williams 1986, 175 f.; Sciallano – Sibella 1994, Amphore Agora M 254; Williams et al. 2005b, Agora M 254.

⁵⁸⁰ Riley 1979, 177; Williams et al. 2005b, Agora M 254.

⁵⁸¹ Panella 1973, 471; Manacorda 1977, 232; Freed – Wilson 1999, 268; Rizzo 2003, 157 f.; Bonifay 2004, 146–148.

Distribution: Mainly the western Mediterranean⁵⁸².

Fabric:

Visual characteristics

Hard fabric containing moderate small and some white, red and greyish inclusions. It has a self-slip.

Catalogue

Tetragonos Agora

415. Handle fr., 97/001 (2044), Chamber J, H = 14.2 cm, S = 2.4x3.6 cm, red (2.5YR 5/8), PLATES 37, 84

Type 46

TRIPOLITANIAN I

(Ostia 64; Peacock – Williams 36; Augst 62; Bonifay 4)

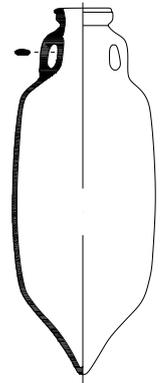
Form: This type has a thickened rim, a relatively high neck and a long cylindrical body which ends in a hollow conical spike. The short handles are attached to the neck⁵⁸³. There are very few amphorae of this type in Ephesus.

Chronology: These amphorae were produced between the first century A.D. and the mid second century A.D.⁵⁸⁴.

The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 6	Mid first to late fourth centuries A.D.	412



Origin: A number of production sites are known in Tripolitana⁵⁸⁵. The Ephesus amphora was probably produced either in southern Tunisia or in Tripolitana. Leptis Magna can be excluded⁵⁸⁶.

Contents: Olive oil⁵⁸⁷.

Distribution: This amphora was widespread in the western Mediterranean, Tunisia, Italy (Ostia and Pompeii), Raetia and Pannonia (Emona) and Egypt⁵⁸⁸.

Fabric:

Visual characteristics

Hard, rough fabric, contains numerous small inclusions of white limestone or white reaction rims. In addition, it has been tempered with grog, from reused ceramics.

⁵⁸² Panella 1973, 469–471; Riley 1979, 179; Sciallano – Sibella 1994, Agora M 254; Martin-Kilcher 1994, 449; Martin-Kilcher 2005, 208. 212; Vidrih Perko – Pavletić 2000, 266; Ehmig 2003, 47.

⁵⁸³ Bonifay 2005, Tripolitanian 1.

⁵⁸⁴ Panella 1973, 559; Peacock – Williams 1986, 167; Bonifay 2004, 105; Bonifay 2005, Tripolitanian 1.

⁵⁸⁵ Panella 1973, 562; Arthur 1982, 61–72; Mattingly 1988, 35–38; Sciallano – Sibella 1994, Amphore Bonifay 2005, Tripolitanian 1.

⁵⁸⁶ Personal discussion with M. BONIFAY and C. CAPELLI.

⁵⁸⁷ Panella 1973, 562.

⁵⁸⁸ Panella 1973, 560–562; Rizzo 2003, 182; Peacock – Williams 1986, 166–168; Martin 1999, 347 f.; Ciotola *et al.* 1989, 605; Martin-Kilcher 1994, 447; Bezczyk 1994b, 87 (where it is described as a Tripolitania II type); Ehmig 2003, 45; Bonifay 2005, Tripolitanian 1; Tomber 2006, 163, Type 45.

Catalogue

Tetragonos Agora

412. Rim, neck fr., 97/024 (1640), R–W–Stoa–Chamber M,
D = 16.3 cm, V = 2 cm, HD = 3.3 cm, H = 3.8 cm, light
red (10R 6/8), SF: pale yellow (5Y 8/4), PLATES 37, 84

The amphorae published from Ephesus:

Lucas Grave (Lukasgrab): Liko 2010, 236 no. 601(?). 242 no. 685 (described as Peacock Class 34).

Type 47

TRIPOLITANIAN 3

(Ostia 24; Keay 11; Peacock – Williams 37 B; Augst 64)

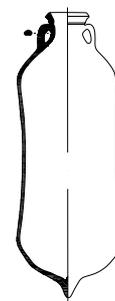
Form: This big amphora has an everted collar rim with a short, conical neck. The body is long and cylindrical. Some of them are a little narrower in the middle. It has a solid, conical base. The short, curved handles are attached to the neck. The handles are oval in section⁵⁸⁹. There are very few amphorae of this type in Ephesus.

Chronology: The type is dated between the second and mid fourth centuries A.D.⁵⁹⁰.

The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 11	Unstratified complexes	413



Origin: This amphora was produced in Tripolitana. A number of workshops are known in the area⁵⁹¹. The fabric makes it likely that the Ephesus amphora was produced in *Leptis Magna*⁵⁹².

Contents: The inscriptions reveal that this type contained olive oil⁵⁹³.

Distribution: This type is found in Tripolitana, Tunisia, Spain, southern France, Italy, Germany, Switzerland, Turkey and Levant⁵⁹⁴.

Fabric:

Visual Characteristics

The Tetragonos Agora has a rim–neck fragment. It has hard, very fine grains in the fabric with the exception of a few bigger (0.5 mm) white limestone inclusions.

Catalogue

Tetragonos Agora

413. Rim, neck, handle fr., 99/023 (1706), R–sewer, D = 13.5 cm,
V = 1.8 cm, HD = 3.5 cm, H = 9.9 cm, pale brown (10YR
6/3), SF: white (2.5Y 8/2), PLATES 37, 84

Magnesian Gate

718. Rim fr., MT 99/1–11, D = cm, V = 3.2 cm, HD = 3.2 cm,
H = 5.9 cm, reddish yellow (5YR 6/8), PLATES 52, 96

⁵⁸⁹ Bonifay 2005, Tripolitanian 3.

⁵⁹⁰ Panella 1973, 564–568; Manacorda 1977, 155 f.; Keay 1984, 136; Carandini – Panella 1981, 500; Bonifay 2004, 105; Bonifay 2005, Tripolitanian 3.

⁵⁹¹ Panella 1973, 569; Arthur 1982, 62; Sciallano – Sibella 1994, Amphore Tripolitaine; Bonifay 2005, Tripolitanian 3.

⁵⁹² Personal discussion with M. BONIFAY and C. CAPELLI.

⁵⁹³ Panella 1973, 568; Carandini – Panella 1981, 500; Keay 1984, 134; Bonifay 2004, 105; Bonifay 2005, Tripolitanian 3.

⁵⁹⁴ Panella 1973, 567–571; Manacorda 1976–77, 583, 597 fig. F; Keay 1984, 136; Peacock – Williams 1986, 170; Cipriano – Carre 1987, 486; Martin-Kilcher 1994, 447; Arthur – Oren 1998, 199; Wintermeyer 2004, 113, type Am 4.4; Bonifay 2005, Tripolitanian 3.

Type 48

AFRICANA 2 D `GRANDE`
(Keay 7; Bonifay 26)

Form: The amphorae in this group are long and cylindrical. The neck is very short and curved. The circular handles join the neck and the upper part of the body. The handles are round in section. The base is short. The Africana II type has been divided into five subtypes⁵⁹⁵. Only Africana II D is significant⁵⁹⁶ from our perspective. The type has a vertical rim. There are very few amphorae of this type in Ephesus.

Chronology: The type is dated to the period between the middle and the end of the third century AD, but some variants continue into the fourth century⁵⁹⁷.



The amphorae found in Ephesus

Agora

layer	Data range	no.
Ph 7	Late fourth to early fifth centuries A.D.	410

Terrace House 2

layer	Data range	no.
5a–6a	Early third to early fourth centuries A.D.	618

Origin: The type was probably produced in Africa Byzacena, perhaps at Hadrumetum (Sousse) in the Sahel region, and perhaps Leptis Minor (Lempta), Sullectum (Salakta), Thaenae (Thyna), Oued El-Akarit⁵⁹⁸.

Contents: Perhaps fish-sauce or wine⁵⁹⁹.

Distribution: There are quite a number of finds in the western Mediterranean, only a few in the eastern Mediterranean⁶⁰⁰.

Fabric: (analysed no. 410)

Visual characteristics

They were produced in different workshops.

1. African Fabric B. Hard, rough fabric, grains of quartz and limestone or white reaction rims are visible. The external surface has a white skin derived from salt water, no. 410.
2. Other Fabric 1. Hard fabric, tiny grains of quartz and limestone inclusions, no. 618.
3. Other Fabric 2. Hard fabric, small quartz and rare limestone inclusions, no. 717.

Petrology

Sample: no. 410

Matrix: Fine grained, calcareous, reddish–brown, artificially tempered.

Temper: Very frequent monocrystalline quartz (partly well rounded), moderate carbonate grains, rare echinoderms, shell fragments, very rare heavy minerals (tourmaline).

⁵⁹⁵ Zevi – Tchernia 1969, 173–214; Panella 1973, 580; Manacorda 1977, 166 f.; Keay 1984, 121; Bonifay 2004, 115.

⁵⁹⁶ Keay 1984, 121 f.; Bonifay 2005, Africana 2D Grande.

⁵⁹⁷ Zevi – Tchernia 1969, 185; Panella 1973, 581 f.; Manacorda 1977, 168–170; Carandini – Panella 1981, 499 f.; Keay 1984, 123–126; Peacock – Williams 1986, 157; Peacock *et al.* 1989, 199 f.; Sciallano – Sibella 1994; Freed 1995, 167; Bonifay 2004, 115–119; Bonifay 2005, Africana 2D Grande.

⁵⁹⁸ Zevi – Tchernia 1969, 181; Panella 1973, 590; Carandini – Panella 1981, 499 f.; Manacorda 1977, 185–190; Keay 1984, 123–126; Peacock – Williams 1986, 155–157; Peacock *et al.* 1989, 183–199; Sciallano – Sibella 1994, Amphore Africane II; Villa 1994, 389; Bonifay 2004, 117; Bonifay 2005, Africana 2D Grande.

⁵⁹⁹ Zevi – Tchernia 1969, 186 f., oil; Keay 1984, 123, oil and fish sauce; Whitehouse *et al.* 1985, 203, olive oil; Bonifay 2004, 117; Bonifay 2005, Africana 2D Grande.

⁶⁰⁰ Panella 1973, 589; Keay 1984, 126. 638 f.; Martin-Kilcher 1994, 448; Bonifay 2004, 115–117.

Comment: Typical is the presence of echinoderms, rounded quartz grains, no mica. A North African origin is possible.

R.S.

Catalogue

Tetragonos Agora

410. Rim, neck fr., 97/062 (1684), R–W–Stoa, D = 19 cm, V = 2.2 cm, HD = 4 cm, H = 5.2 cm, red (10R 5/8), SF: pink (7.5YR 8/4), PLATES 37, 84

Magnesian Gate

717. Base fr., MT 99/1–9, H = 13.5 cm, DF = 7 cm, red (10R 5/6 – 5/8), SF: reddish brown (5YR 5/3), PLATES 52, 96

Terrace House 2

618. Base, 99/055 (126), WT 2 Stone-cutting saw, DF = 6.7 cm, H = 15 cm, pale red (10R 6/4), PLATES 47, 92

The amphorae published from Ephesus:

Tetragonos Agora; South Gate: Gassner 1997, 182 T. 60, no. 762–763; Terrace House 2: Ladstätter 2005, 260. 355, T. 205, K 891; Vedius Gymnasium: Ladstätter 2008, 121. 160, T 312, K 445.

Type 49

OSTIA 59 / BONIFAY 15

Form: The rim is rounded, the neck is wide and cylindrical. The handles are short, curved and oval in section. The body is cylindrical with the bottom tapering to a flat base. There are very few amphorae of this type in Ephesus.

Chronology: The type was dated from the second half of the first to the middle of the second centuries A.D.⁶⁰¹. D. PEACOCK suggests a somewhat later period, from the late second to the third or possibly even the fourth centuries A.D.⁶⁰².



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 7–9	Late fourth to early seventh centuries A.D	409

Origin: Probably Tunisia. Peacock, Bejaoui and Ben Lazreg have published similar amphora rims from Bir Abbad and Salakta⁶⁰³.

Contents: Possibly olive-oil⁶⁰⁴.

Distribution: Mainly the western Mediterranean and northern provinces. The sites include Pompeii, Ostia, Luni, Augst, Fréjus, Tipasa, El Jem and Carthage⁶⁰⁵.

Fabric:

Visual characteristics

The Ephesus amphora has a hard, rough fabric with very many rounded quartz, white, grey and dark inclusions, microfossils and a few limestone grains.

⁶⁰¹ Panella 1982, 172; Bonifay 2004, 101.

⁶⁰² Peacock *et al.* 1989, 188.

⁶⁰³ Peacock *et al.* 1989, 188, fig. 11, 2–3, 192–194, fig. 17, 13.

⁶⁰⁴ Panella 1982, 172.

⁶⁰⁵ Manacorda 1977, 361; Panella 1982, 172; Bonifay 2004, 101.

Catalogue

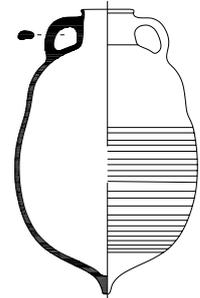
Tetragonos Agora

409. Rim, neck, handle fr., 97/029 (1656), R–W–Stoa–Room
 P1, D = 14.1 cm, V = 2.4 cm, HD = 2.6 cm, H = 15.3 cm,
 S = 2.3x3.8 cm, light red (2.5YR 6/8), SF: pinkish white
 (5YR 8/2), PLATES 37, 84

Type 50

AGORA M 273
 (Opait C3–1)

Form: The (wheel-ridged) amphora type found at the Athenian Agora is well-known at a number of sites around the Mediterranean⁶⁰⁶. The label “Agora M 273” is improperly used for a various set of vessels. It has been supposed that this was the forerunner of the Samos cistern type⁶⁰⁷. This type has a simple rounded rim, short neck, bulging oval body with ribbing, and the base is a small solid spike. The small handles are attached to the neck below the rim and to the upper part of the body. The section of the handles is oval, somewhat flattened on the upper side. There are very few amphorae of this type in Ephesus.



Chronology: The type can be dated from the fourth to the fifth century A.D.⁶⁰⁸.

The amphorae found in Ephesus Agora

layer	Data range	no.
Ph 7 – 9	Late fourth to early seventh centuries A.D	407

Terrace House 2

layer	Data range	nos.
11	Stray find	619–620

Epigraphy: Illegible red paint on the neck of no. 619.

Origin: These amphorae were probably produced in the eastern Mediterranean.

Contents: Probably wine⁶⁰⁹.

Distribution: Eastern Mediterranean, Black Sea region, Italy, and France⁶¹⁰.

Fabric: (analysed no. 619)

Visual Characteristics

Hard fabric, rich in limestone with many voids and few quartz inclusions.

Petrology

Sample: no. 619

Matrix: Micaceous, reddish-brown, optically inactive

⁶⁰⁶ Robinson 1959, 109 f.

⁶⁰⁷ Bonifay – Pieri 1995, 114; Arthur 1998, 167; Williams 2005, Agora M 273.

⁶⁰⁸ Williams – Zervos 1983, 15, no. 28, pl. 7/28; Opait 2004b, 303; Opait 2004a, 18;

⁶⁰⁹ Bonifay – Pieri 1995, 114; Williams 2005, Agora M 273.

⁶¹⁰ Bass – Van Doorninck 1971, fig. 9; Arthur 1998, 167; Scorpan 1976, 158; Opait 2004b, 303; Opait 2004a, 18; Auriemma – Quiri 2006, 236; Laubenheimer et al. 2007, 339, 343.

Temper: Very frequent muscovite, phlogopite, frequent monocrystalline quartz, moderate polycrystalline quartz, crystalline rock fragments (sericite-quartzite, mica schist), rare chert, albite, carbonate particles, heavy minerals (hornblende, epidote/clinozoisite), iron oxide, sandy limestone, traces of volcanic rock fragments.

Comment: Similar to some Ephesian fabrics also other parts of the Meander Valley and Samos could be similar. In principal similar to no. 400 (Samos cistern type), but slightly less coarse grained and less temper.

R.S.

Catalogue

Tetragonos Agora

407. Base fr., 97/016 (1678), Stoa–Room S1, BD = 2.3 cm, H = 6.2 cm, buff (10YR 7/3), PLATES 36, 84

Terrace House 2

619. Rim, neck, handles, 99/091 (601), BC 9, D = 10.7 cm, V = 1.2 cm, HD = 1.3 cm, H = 14 cm, S = 2.7x1.5 cm, light red – red (10YR 6/8–5/8), PLATES 48, 92

620. Base, 99/353 (208), Stray find, DF = 2.5 cm, H = 6.2 cm, reddish yellow (5YR 7/6), SF: pink (7.5YR 8/4), PLATES 48, 92

The amphorae published from Ephesus:

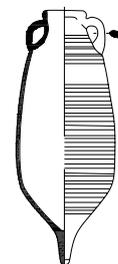
Vedius Gymnasium: Ladstätter 2008, 116. 146, T. 303, K 290; 121.162, T. 315, K 470.

Type 51

SAMOS CISTERN TYPE

Form: The rim is plain with a broad mouth. The neck is short, widening where it meets the body. The upper part of the body is almost cylindrical, curving slightly to the base spike. The handles are attached to the neck below the rim and to the upper part of the body. There is a groove on the handles and ribbing on the body. It has been supposed that this form is the continuation of Agora M 273 type⁶¹¹. There are very few amphorae of this type in Ephesus.

Chronology: This type of amphorae is dated to the sixth/seventh centuries A.D.⁶¹².



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 7–9	Late fourth to early seventh centuries A.D	400–401

Origin: Since large quantities of the so-called Samos Cistern type amphorae have been found in Samos, the region is regarded as one of the possible production centres⁶¹³. However, it seems likely that the type was produced in several places in the eastern Mediterranean (the west coast of Asia Minor, probably in the Meander Valley). Halicarnassus has been mentioned as a possible production centre because of its geological characteristics⁶¹⁴. A field survey produced similar amphorae at the port of Elea, north of Smyrna. J-Y. EMPEREUR and M. PICON have described a workshop there and it seems likely that the predecessors of this form were produced there⁶¹⁵.

⁶¹¹ Isler 1969; Keay 1984, 359; Arthur 1990, 283, fig. 4; Arthur 1998, 167 f.; Arthur 2005, Samos Cistern Type.

⁶¹² Arthur 1985, 252; Arthur 1998, 167; Keay 1984, 359; Aupert 1980, 440 f.; Arthur 2005, Samos Cistern Type.

⁶¹³ Arthur 1985, 252–255; Arthur 1990, 288 f.; Arthur 1998, 167.

⁶¹⁴ Williams 1990, 296.

⁶¹⁵ Arthur 2005, Samos Cistern Type.

Contents: The content is not known, perhaps wine. Strabo mentioned that Samos did not surpass the neighbouring islands or the mainland in wine production⁶¹⁶. The Island was fertile in other respects.

Distribution: It can be found primarily in Turkey, Italy, eastern Alps, Scythia–Black Sea, Argos, Georgia⁶¹⁷.

Fabric: (analysed no. 400)

Visual characteristics

The amphorae unearthed in the Agora have hard, smoothish micaceous fabric with many tiny limestone and other, dark inclusions. Their fabric is similar to those of amphorae on the Island of Samos⁶¹⁸.

Petrology

Sample: no. 400

Matrix: Micaceous, weakly carbonate bearing, reddish–brown

Temper: Very frequent muscovite, phlogopite, frequent monocrystalline quartz, carbonate particles, moderate polycrystalline quartz, crystalline rock fragments (sericite–quartzite, mica schist), rare chert, heavy minerals (hornblende, epidote/clinozoisite), iron oxide, sandy limestone.

Comment: Similar to some Ephesian fabrics (but no albite, no epidote), also other parts of the Meander Valley and Samos could be similar. Description of Williams 2005, Samos Cistern Type, petrology = Williams 1990 could be similar.

R.S.

Catalogue

Tetragonos Agora

400. Rim, neck, handle fr., 92/094 (1657), Trench 92/4, D = 10.3 cm, V = 1.2 cm, HD = 1.6 cm, H = 11 cm, S = 1.7x2.8 cm, light brown (7.5YR 6/4), PLATES 36, 83

401. Base fr., 92/094 (1666), Trench 92/4, H = 10.8 cm, light brown (7.5YR 6/4), PLATES 36, 83

The amphorae published from Ephesus:

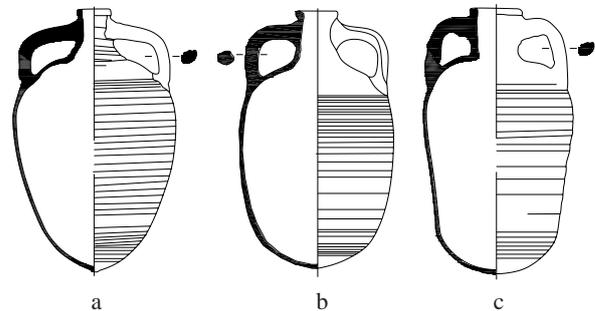
Tetragonos Agora; South Gate: Gassner 1997, 252 T. 76 no. H 104; Vadius Gymnasium: Ladstätter 2008, 121. 160 T. 312, K 444.

Type 52

LATE ROMAN AMPHORA 1

(Agora M 333; Ballana 6; British B2; Benghazi Late Roman Amphora 1; Carthage Late Roman Amphora 1; Keay 53; Kuzmanov 13; Peacock – Williams 44; Scorpan 8 B)

Form: This type has a number of variations⁶¹⁹ that are characteristic of different periods. In most cases the handle has a single central groove. The fourth century A.D. form has a narrow, long rim and neck. The body is small and pear shaped (a). The fifth century form has a narrow rim and neck. The upper part of the body widens and then tapers to the base (b). The fifth and sixth century forms are characterised by thickened rims with broad



⁶¹⁶ Strabo XIV 1, 15.

⁶¹⁷ Isler 1969, 202–230; Aupert 1980, 440 f.; Keay 1984, 359; Sotelazvili – Yakobson 1984, 194 f.; Arthur 1989, 83; Arthur 1990; Villa 1994, 408; Alpözen *et al.* 1995, 109 f.; Opaıt 1996, 211 f.; Arthur 1998, 167; Villa 1998, 278; Sagui 1998, 317; Ciarrocchi *et al.* 1998, 388 f.; Şenol – Kerem 2000, 99; Arthur 2005, Samos Cistern Type; De Mitri 2006, 203–205.

⁶¹⁸ I wish to express my thanks to B. KONNEMANN and H. KIENAST for making it possible to see the DAI stores in Samos.

⁶¹⁹ Sciallano – Sibella 1994, Amphore Late Roman 1; Pieri 2005, 69 discusses the research history of the form.

necks, and thick stumpy grooved handles. The body is oval and has ribbing (c). Later forms are more slender than the earlier pieces and sometimes very small⁶²⁰. The amphorae of the Paphos workshop were produced in three sizes.⁶²¹ There are few amphorae of this type in Ephesus.

Chronology: These amphorae were produced from the fourth to seventh centuries A.D.⁶²².

The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 7–9	Late fourth to early seventh centuries A.D.	370–374

Terrace House 2

layer	Data range	nos.
6–9	Fourth to seventh centuries A.D.	627–628

Epigraphy: Only one stamp has been published, which came from Histria. This could be either a personal name or the name of two towns in Cilicia⁶²³. A number of these amphorae have red cursive script at the neck and shoulder⁶²⁴. S. KEAY has distinguished three types of inscriptions⁶²⁵: “1) Commercial notations, usually referring to the Cypriot *modius*,⁶²⁶ 2) Tax notations⁶²⁷, 3) Religious formulae”⁶²⁸.

Origin: Recent data suggest that they may have been produced in Cilicia Pedias, Cyprus, Rhodes and Ismeler (in Caria)⁶²⁹. They could not have been produced in Egypt or in Ephesus⁶³⁰. A workshop has recently been uncovered near Halasarna (modern Kardamena) on the Island of Kos, which produced LR 1 and LR 13 amphorae⁶³¹.

Contents: These amphorae probably contained wine, but it is also supposed that they may have contained olive oil or even non-liquid goods⁶³². Athenaeus mentions (I. 33b) “...The Cilician wine called “Abates” is merely a laxative.” Resin and hyssop wine mentioned by Pliny⁶³³.

Distribution: This type is found in western Britain, in the south of France, Italy, Adriatic region, Moesia, and the eastern Alps, Greece, Egypt, Tunisia, Cyrenaica, Levant, Cyprus, the Aegean, Black Sea regions and India⁶³⁴.

⁶²⁰ Arthur 1998, 165; Pieri 2005, 70–77; Opař 2004b, 294; Opař 2004a, 8–10.

⁶²¹ Demesticha 2000, 549.

⁶²² Kuzmanov 1973, 18; Scorpan 1977, 278; Peacock 1984, 119; Keay 1984, 271 f.; Tomber – Williams 1986, 48; Peacock – Williams 1986, 187; Sazanov 1999, 265–279; Opař 2004b, 294; Pieri 2005, 70–77; Reynolds 2005, Late Roman Amphora 1; Sazanov 2007, 803 f.

⁶²³ Opař 2004b, 295 f.: Κωρικου can be a personal name, or Korikos can be the name of two towns.

⁶²⁴ Pieri 2005, 83–85; Whitehouse *et al.* 1985, 194–199.

⁶²⁵ Keay 1984, 271.

⁶²⁶ Lang 1976, 81, He 39 and He 42, which might contribute to the determination of the provenance.

⁶²⁷ Lang 1976, Pl. 49, I 14.

⁶²⁸ Pensabene 1981, 115 fig. 8.2.3 and 5.

⁶²⁹ Empereur – Picon 1989, 236–243; Keay 1984, 271; Peacock – Williams 1986, 186; Sciallano – Sibella 1994, Late Roman 1; Arthur 1998, 164; Demesticha 2000, 549–554; Williams 2005a, 162–167 fig. 5; Pieri 2005, 80 fig. 38; Reynolds 2005, Late Roman Amphora 1.

⁶³⁰ Williams 1982; Peacock 1984, 20; Outschar 1993, 51, U. OUTSCHAR supposed the production in Ephesus; Sauer 1995.

⁶³¹ Diamanti 2008.

⁶³² Dressel CIL XV, 4893; Panella 1993, 655 f., note 220; Arthur 1998, 164; Pieri 2005, 83–85; Williams 2005a, 161; Reynolds 2005, Late Roman Amphora 1.

⁶³³ Pliny NH XIV, 81. 109; Martial VIII, 14.

⁶³⁴ Robinson 1959, 115; Scorpan 1976, 163; Scorpan 1977, 277; Egloff 1977, 112 f.; Zemer 1977, 78 nos. 63–65; Riley 1979, 213–215; Adamscheck 1979, 117 f., RC 23; Riley 1981, 120; Fulford – Peacock, 1984, 119; Keay 1984, 271 f.; Cambi 1989, 335; Bonifay – Villedieu 1989, 23–25; Steckner 1989, 57–71; Abadie 1989, 52–54; Carignani – Pacetti 1989, 12; Turnovsky 1992, 49; Böttger 1992, 346; Lund 1993a, 131 f.; Villa 1994, 402; Bonifay – Pieri 1995, 108; Rautman 1995, 66. 73; Alpözen *et al.* 1995, 113; Opař 1996, 207; Bjelajac 1996, 72–76; Vidrih Perko 1998, 101; Arthur – Oren 1998, 201–203; Sagui 1998, 318; Volpe *et al.* 1998, 723–725; Tomber 1998, 178; Martin 1999, 356 f.; Tomber 1999, 300 f. 313; Abadie-Reynal 1999, 264; Sazanov 1999, 269–274; Vidrih Perko – Pavletić 2000, 266; Şenol – Kerem 2000, 93 no. 17; Demesticha 2000, 549; Warner Slane 2000, 310; Karagiorgou 2001, 133–155; Reynolds 2004, 230; Opař 2004a, 8–10; Swan 2004, 372–382; Pieri 2005, 74–77 fig. 32–33; Poblome *et al.* 2005, 228 fig. 3a; Reynolds 2005, Late Roman Amphora 1; Williams 2005a, 159; De Mitri 2006, 203–205; Tomber 2008, 40, 166.

Fabric: (analysed no. 372)

Visual characteristics

Hard, sandy fabric, There are limestone grains and quartz particles, grey and black inclusions, no mica, no. 372. The origin is Cyprus. It is the Kourion fabric published by David Williams⁶³⁵.

The fabric is usually hard and sandy. Amphorae nos. 370 and 374 contain many white limestone, and grey and dark brownish inclusions. No. 371 has very small grains, and inclusions of limestone or white reaction rims.

The amphorae nos. 627, 628 have a hard, micaceous fabric with a moderate or sparse number of rounded red and black grits.

Petrology

Sample: no. 372

Matrix: Calcareous, no mica.

Temper: Very frequent carbonates, frequent monocrystalline quartz, frequent to rare chert, feldspar, plagioclase, pyroxene, serpentinite, brown hornblende, epidote, foraminifers, echinoids, rare crystalline rock fragments.

R.S.

Catalogue

Tetragonos Agora

370. Rim, neck, handle fr., 92/094 (1660), Trench 92/4, D = 7 cm, V = 1 cm, HD = 2 cm, H = 15 cm, S = 3x3.4 cm, reddish yellow (5YR 7/6), PLATES 33, 81

371. Rim, neck, handle fr., 97/043 (1709), R–W–Stoa–Room Q, D = 10 cm, V = 1.3 cm, H = 16.7 cm, S = 2.1x cm, reddish yellow (5YR 6/6), PLATES 33, 81

372. Rim, neck, handle fr., 99/039 (1689), R–sewer, D = 10 cm, V = 1.5 cm, H = 11.5 cm, S = 2.6x3.8 cm, reddish yellow (5YR 6/6), Cypus Fabric A, PLATES 33, 81

373. Rim, neck fr., 99/011(1701), R–sewer, D = 11 cm, V = 0.8 cm, H = 7.3 cm, light red (2.5YR 6/6), PLATES 33, 81

374. Handle fr., 92/094 (1659), Trench 92/4, H = 4.8 cm, S = 3.4x2.8 cm, pink (5YR 7/4), PLATES 33, 81

Terrace House 2

627. Handle, 99/202 (327), C3, Stairway 3, H = 8 cm, S = 3.3x2.9 cm, reddish yellow (5YR 7/6), SF: pink (5YR 8/4), PLATES 48, 93

628. Handle, 99/202 (328), C3, Stairway 3, H = 7.2 cm, S = 3.4x2.8 cm, reddish yellow (5YR 7/6), SF: very pale brown (10YR 8/4), PLATES 48, 93

The amphorae published from Ephesus:

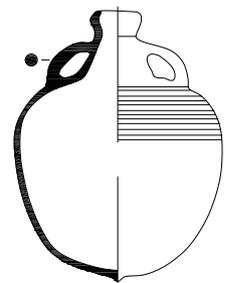
Tetragonos Agora, South gate: Gassner 1997, 182 T. 60 no. 767; Terrace House 1: Lang-Auinger – Outschar 1994, 9; Outschar 1996, 62 T. 8 no. 265; Outschar 1993, 51 Fig. 2; Vedius Gymnasium: Ladstätter 2008, 116. 146 T. 302, K 289; 120 and 155, T. 306, K 376; Local copy of LR 1, Ladstätter 2008, 122. 172 T. 324, K 584; 123. 173 T. 325, K 595; Lucas Grave (Lukasgrab): Liko 2010; 213, 199 no. 33; 214, no. 289? (described as LR 2); Ladstätter 2010b, K 220, 730.

Type 53

LATE ROMAN AMPHORA 2

(British B1; Benghazi Late Roman Amphora 2; Carthage Late Roman Amphora 2; Keay 65; Peacock – Williams 43; Kuzmanov 19; Scorpan 7 A)

Form: It has a short neck with a high curved rim and short handles attached to the upper part of the globular body. The upper part of the body is decorated with 'stylus grooving' which may be straight or undulating⁶³⁶. The lower part has a small basal knob.



⁶³⁵ Williams 2005a, 166.

⁶³⁶ Peacock 1984, 119; Keay 1984, 352 f.; Arthur 1998, 168.

The form has a number of variations⁶³⁷. The LR 2 amphora is related to the Dressel 24 type⁶³⁸. The scarcity of the information available does not permit any conclusions to be made. A LR 2 workshop has been uncovered on the Island of Chios, which makes the relationship of the two areas possible, as Dressel 24 amphorae were also produced in this area. There are amphorae from the second / third century A.D. that have the characteristics of the LR 2 type⁶³⁹. They have a long, funnel-shaped rim and an almost globular body. At that time the handles were much longer. There are few amphorae of this type in Ephesus.

Chronology: The LR 2 form dates from the fourth century A.D. to the late sixth or early seventh century A.D.⁶⁴⁰.

The amphorae found in Ephesus

Agora

layer	Data range	no.
Ph 7–9	Late fourth to early seventh centuries A.D.	375

Terrace House 2

layers	Data range	nos.
5a	Early third century A.D.	629–630
6–9	Fourth to seventh centuries A.D.	632
7–8	Fifth/sixth centuries A.D.	633
10	Debris	631

Origin: The production area of the classic LR 2 amphorae includes the Aegean and the Black Sea regions⁶⁴¹. Archaeologists suggest that the most important workshops were on the northeast Peloponnese and on the Island of Chios, Kounoupi in the Argolid and perhaps Knidos⁶⁴².

Contents: They probably contained wine, but it is also supposed that they may have carried oil⁶⁴³.

Distribution: The form is widespread in the Mediterranean: southern France, the west coast of Spain, Tunisia, Cyrenaica, Italy, Adriatic region, Black Sea region, Romania, Bulgaria, Greece, Turkey, Cyprus, Levant, Egypt, India and western Britain, Noricum, Upper Moesia, also in the Barbaricum (the Great Hungarian Plain) bordering on Pannonia⁶⁴⁴.

Fabric: (analysed no. 375)

Visual characteristics

1. Hard fabric, very fine grained with a few limestones and voids, nos. 375, 466, 732, 733 and sometimes larger limestone inclusions, no. 734.
2. Hard, fine fabric, with limestone and iron oxide inclusions, nos. 729 and 730. No. 731 is over fired.

⁶³⁷ Opaït 2004b, 296, fig. 7–10; Pieri 2005, 87, fig. 45; Williams 2005, Late Roman Amphora 2.

⁶³⁸ Opaït 2004b, 295 f.; Opaït 2007a.

⁶³⁹ Opaït 2004b, 295 fig. 6; Grace 1979, fig. 37.

⁶⁴⁰ Robinson 1959, 109, M 272; Riley 1981, 122; Peacock 1984, 119; Keay 1984, 354–357; Panella 1993, 663, 683; Arthur 1998, 168; Williams 2005, Late Roman Amphora 2; Sazanov 2007, 804.

⁶⁴¹ Riley 1979, 219; Tomber – Williams 1986, 47; Sciallano – Sibella 1994, Amphore Late Roman 2; Portale – Romeo 2000, 422.

⁶⁴² Karagiorgou 2001, 147; Tsaravopoulos 1986, fig. 36–37; Arthur 1998, 168 f.; Williams 2005, Late Roman Amphora 2; Opaït 2004a, 10–12; Opaït 2004b, 296; Pieri 2005, 90 f.; Tuna *et al.* 1987, 49.

⁶⁴³ Radulescu 1973, 202 f.; Scorpan 1976, 162; Keay 1984, 354; Arthur 1998, 169; Steckner 1989, 64 f.; Bjelajac 1996, 67–72; Karagiorgou 2001, 146–149.

⁶⁴⁴ Barnea 1966, 244, 254; Radulescu, 1976, 107; Scorpan 1976, 159, 161 f.; Scorpan 1977, 275; Riley 1979, 218; Adamsheck 1979, 114 f., RC 14 and 16; Thomas 1981; Fulford – Peacock, 1984; Keay 1984, 354–357; Tóth 1986, 51–54; Mackensen 1987, 249–251; Carignani – Pacetti 1989, 11; Bonifay – Villedieu 1989, 25 f.; Abadie 1989, 51 f.; Steckner 1989, 57–71; Villa 1994, 402 f.; Bonifay – Pieri 1995, 109 f.; Alpözen *et al.* 1995, 111; Bjelajac 1996, nos. 123–132; Opaït 1996, 208; Villa 1998, 281; Vidrih Perko 1998, 101; Ciarrocchi *et al.* 1998, 388 f.; Arthur – Oren 1998, 207; Volpe *et al.* 1998, 723–725; Vidrih Perko – Pavletić 2000, 266; Martin 2000, 429; Warner Slane 2000, 310; Karagiorgou 2001, 133–155; Reynolds 2004, 230; Swan 2004, 372–382; Wintermeyer 2004, 113, type Am 5.1 – Am 5.4; Warner Slane 2005, 255 no. 1–23 fig. 3; Williams 2005, Late Roman Amphora 2; De Mitri 2006, 203–205; Tomber 2008, 166.

Petrology

Sample: no. 375

Matrix: Calcareous, highly fired

Temper: Very frequent carbonate grains (partly very coarse grained), frequent to rare polycrystalline-quartz, chert, oxidized brownish mica, siltstone, rare feldspar, volcanic rock fragments.

Comment: Typical is the presence of abundant carbonate grains together with volcanic rock fragments.

R.S.

Catalogue

Tetragonos Agora

375. Body fr., 97/014 (1704), R–W–Stoa–Room O, H = 5 cm, very pale brown (10YR 8/3), PLATES 33, 81

631. Rim, 99/576 (348), C3, Stairway 3, D = 14 cm, V = 1.3 cm, H = 5.5 cm, pink (7.5YR 7/4), SF: coated, white (2.5YR 8/2), PLATES 49, 93

Terrace House 2

629. Rim, 99/609 (360), A3, Stairway 1, D = 16.1 cm, V = 1.9 cm, H = 9.9 cm, light reddish brown (5YR 6/4), PLATES 48, 93

632. Body, 99/202 (333), C3, Stairway 3, H = 7.2 cm, light red (2.5YR 6/6), SF: reddish yellow (7.5YR 7/6), PLATES 49, 93

630. Rim, 99/597 (21), A3, Stairway 1, D = 14.3 cm, V = 1.3 cm, H = 5.1 cm, red (2.5YR 6/6), SF: light grey (10YR 7/2), PLATES 48, 93

633. Body, 99/136 (337), WT 2 Stone–cutting saw, H = 4.3 cm, light red (2.5YR 6/6), SF: pink (7.5YR 7/4), PLATES 49, 93

The amphorae published from Ephesus:

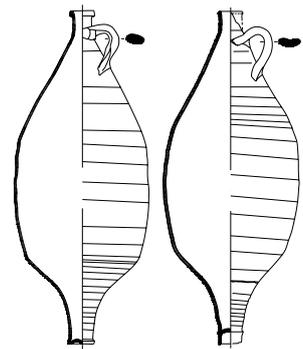
Tetragonos Agora; South Gate: Gassner 1997, 181 f. T. 60 no. 758; Vedius Gymnasium: Ladstätter 2008, 115. 141, T 296, K 222; 121 and 159, T 311, K 423–424.

Type 54

AGORA M 240–242, M 255–259, M 277, M 282
(Peacock – Williams 45; Mid Roman Amphora 3 Benghazi)

Form: This is a late variant of the one-handed jars. This type is characterised by a small, flat rim, a short curved neck and a handle that joins the neck and the upper part of the body. The lower and upper parts of the body are conical. The lower part is tubular, ending in a hollow foot. There is ribbing on the external surface. This type of amphora is common in Ephesus.

Chronology: This type is dated to the fourth century A.D. at the Athenian Agora.



The amphorae found in Ephesus.

Agora

layer	Data range	no.
Ph 10	From early seventh century A.D. to recent times	379

Terrace House 2

layers	Data range	nos.
5–8	Third/fourth to sixth centuries A.D.	602
11	Stray finds	601, 603

Epigraphy, inscription, contents: A number of *tituli picti* have been published in Athens⁶⁴⁵:

“Since these vessels are apparently very similar in weight and capacity, the three different legends must refer rather to contents or to the name of the producer or seller.

M 241 – inscription in black paint: *μη*

M 242, M 257 – below the handle, an inscription in black paint: *παλ*

M 255, M 256, M 258, M 259, M 278 – below the handle, an inscription in black paint: *προ*

προ would stand for *πρότροπος* (the sweet Mytilenean wine that first ran off the press); *παλ* would signify *παλαιός*; and *μη* would mean *μηλίτης* (apple of quince wine). Proper names beginning with the syllables *προ*, *παλ* and *μη* are so numerous as to allow no specific suggestions.”

Distribution: It is widely distributed in the Empire⁶⁴⁶.

Fabric: (analysed 601)

Visual characteristics

Hard, fine, micaceous fabric. Some very small white and colourless inclusions no. 601 and irregularly fired nos. 602, 603.

Petrology

Ephesus Fabric A

Sample: No. 601

Matrix: Non-calcareous, micaceous, optical active

Temper: *Very frequent:* muscovite and monocrystalline quartz; *frequent:* oxidized mica (biotite, phlogopite, oxidised sheet silicates), *subordinate:* K-feldspar, albite, *rare to very rare:* polycrystalline quartz, opaque particles, heavy minerals, crystalline rock fragments; plagioclase

The *heavy mineral* assemblage is dominated by amphibole and smaller amounts of garnet, kyanite, rutile, subordinately tourmaline, epidote/clinozoisite and staurolite can be observed.

Comment: probably an Ephesian fabric.

R.S.

Catalogue

Tetragonos Agora

379. Rim, neck fr., handle, 99/027 (1707), R–Sewer, D = 4 cm, V = 0.5 cm, HD = 0.7 cm, DN = 3.5 cm, H = 9 cm, S = 1.3x2.9 cm, reddish yellow (5YR 6/6), PLATES 34, 82

602. Base, 99/372 (225), WT 2, Stone-cutting saw, DF = 4.1 cm, H = 9.5 cm, reddish yellow (5YR 6/6), PLATES 46, 91

Terrace House 2

601. Rim, neck, handle, 99/215 (173), BC 9, D = 3.6 cm, V = 0.6 cm, HD = 1.1 cm, H = 13.3 cm, S = 2.8x1.4 cm, brown (7.5YR 4/4), SF: yellowish red (5YR 4/6), PLATES 46, 91

603. Base, 99/013 (121), BC 9, DF = 3.5 cm, H = 8.5 cm, light brownish grey (10YR 6/2), SF: red (2.5YR 5/6), PLATES 46, 91

The amphorae published from Ephesus:

Tetragonos Agora, South Gate: Gassner 1997, 186 T. 61 nos. 775–777; Terrace House 1: Lang-Auinger – Outschar 1994, 10. 12; Outschar 1996, 61 f. T. 7 and 10 nos. 251. 257–261. 272. 277–278;. Vedium Gymnasium: Ladstätter 2008, 112. 114. 121. 133. 138. 160. 163, T. 289, K 131, T. 292, K 183, T. 312, K 440–441 and T. 316, K 481; St. Mary Church: Turnovsky 2005, 217 fig. 1 no. 8; Lucas Grave (Lukasgrab): Liko 2010, 232 no. 548, 234 nos. 572–574.

⁶⁴⁵ Robinson 1959, M 241, 107 f.

⁶⁴⁶ Robinson 1959, 106; Lusuardi Siena 1977, 223 f.; Tomber 1988, 500, nos. 374–379 fig. 19; Abadie 1989, 48 fig. 2; Арсеньева – Науменко 1992, 149, fig. 29, 1; 158 fig. 38, 3–4; Oleson 1994, 16, A 18 fig. 4; Pieri 2005, 191–195; Vidrih Perko – Žbona Trkman 2005, 282, fig. 9, nos. 9, 12; Tomber 2006, 168, Type 54; Amores Carredano *et al.* 2007, 136, fig. 4, no. 30.

Type 55

LATE ROMAN AMPHORA 3

(Ballana 13a; Benghazi Late Roman Amphora 10; British B4; Carthage Late Roman Amphora 3; Caesarea 4; Keay 54 Bis; Kuzmanov 7; Peacock – Williams 45; Scorpan 5; Zeest 95)

This is one of the best-known small forms in the Late Roman period. The LR 3 form evolved from one-handed jars (see Agora F 65 type)⁶⁴⁷. Since one-handed (Agora M 275–277, 279–282) and two-handed versions (Agora M 307, M 335, M 373) of the vessel are known from the Late Roman / Byzantine period, it is useful to distinguish them.

Ephesian and non-Ephesian LR 3 amphorae can occasionally be distinguished by form (as in the case of Pieri A4 and B4 forms), but otherwise a distinction can only be made by recognising differences in fabric⁶⁴⁸. Microscopic analysis can identify mica rich Ephesian fabrics as well as other sources expected to be from the Island of Kos⁶⁴⁹.

Form: The rim is small. There are at least three versions: the slightly everted, the triangular and the flat. The slender neck is attached to a widening body with ribbing. The body tapers in a curve to the foot. The circular, flat handles are attached to the neck. There are differences among the shapes of the amphorae (nos. 380–382) excavated at the Tetragonos Agora. The LR 3 vessels have different bases⁶⁵⁰. There are no chronological differences among the rims and bases of the amphorae at the Agora. The formal differences probably go back to the different workshops in and around Ephesus⁶⁵¹. These questions can only be answered after the workshops are uncovered. Until then, not even the petrological analyses can help in distinguishing the formal variations. This type of amphora is common in Ephesus.

Chronology: This type can be dated from the end of the fourth century A.D. to the end of the sixth century, or perhaps even later⁶⁵².



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	385–386
Ph 7–9	Late fourth to early seventh centuries A.D.	380–384, 387–388

Terrace House 2

layers	Data range	nos.
10	Debris	604, 606, 610
11	Stray finds	605, 607–609

Epigraphy: The painted and scratched inscriptions may refer to the shippers or the merchants. The meaning of the inscription ἀφοροδίστιος on the Ravenna fragment is not clear⁶⁵³. The graffito on an Ephesian amphora is κωνδ that may refer to the type of the wine (κωνδπιον, *conditium*)⁶⁵⁴. A similar *titulus pictus* has been found on an amphora neck in Italy in a Late Roman cemetery⁶⁵⁵.

⁶⁴⁷ Robinson 1959, 17; Annis 1975, 31 nos. 1–2; Riley 1979, 229 f.; Riley 1981, 118 fig. 12; Peacock – Williams 1986, 188; Williams 1982, 103.

⁶⁴⁸ Pieri 2005, 95–98.

⁶⁴⁹ Didioumi 2011, 74.

⁶⁵⁰ Outschar 1996, 76, T 9; Remolà Vallverdú 2000, 211, fig. 4; Pieri 2005, 96, fig. 59.

⁶⁵¹ Ladstätter 2008, 180 f., Fig. 27.

⁶⁵² Robinson 1959, M 373; Panella 1973, 460–462; Riley 1979, 229; Peacock 1984, 12; Keay 1984, 287; Peacock – Williams 1986, 189; Sciallano – Sibella 1994, Amphore Late Roman 3; Lund 1993a, 125; Sazanov 2007, 804 f.

⁶⁵³ Fiaccadori 1983, 238 f., 23.1a–b; Pieri 2005, 100.

⁶⁵⁴ Ladstätter 2008, 181 Fig. 27, 5 (K 219).

⁶⁵⁵ Martin 1999, 358 “in cursive Greek letters: -κων-”.

Origin: Several centres of production have been supposed along the western coastline of Asia Minor⁶⁵⁶. The Caystros Valley, the vicinity of Ephesus and the Meander Valley have the same fabric. The amphorae found in Ephesus may have been produced nearby. The analyses of R. SAUER suggest Ephesian origins. No workshop has been discovered so far.

Contents: It has been supposed that they contained wine⁶⁵⁷. The chemical analysis suggests oil or some variety of unguent⁶⁵⁸. The internal surface of the amphorae in Athens and Berenice have traces of mastic and resin. This fact strongly suggests wine.

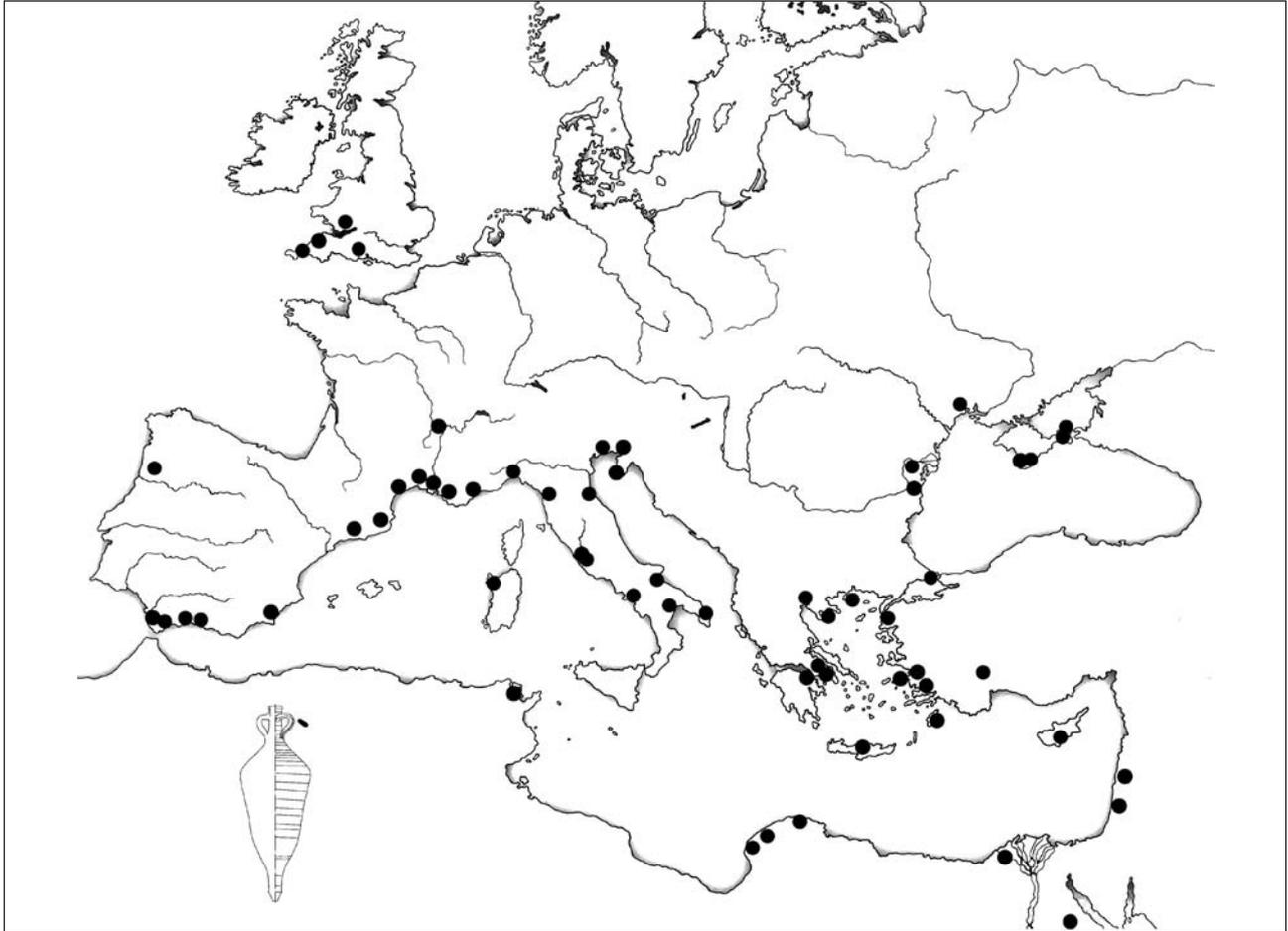


Fig. 25 Distribution of Late Roman Amphora 3

Distribution: It is widely distributed in the Empire from Britain to the eastern Alps region, from Spain to Asia Minor and the Black Sea region, and even India⁶⁵⁹.

⁶⁵⁶ Williams 1982, 104; Sardis region: Hayes 1976, 117; Peacock 1984, 22; Panella 1993, 663; Meander or Hermos Valleys, Ephesus and Sardis, Arthur 1998, 165; Villa 1994, 405; Reutman 1995, 81 mentioned Sardis production.

⁶⁵⁷ Panella 1993, 663; Outchar 1993, 52; Martin-Kilcher 1994, 441; Lemaître 1997, 317–319; Ladstätter 2008, 181.

⁶⁵⁸ Rothschild-Boros 1981, 79–89.

⁶⁵⁹ Zeest, 1960, 118 f.; Barnea 1966, 250; Scorpan 1976, 158; Hayes 1973, 116 f.; Egloff 1977, 116; Scorpan 1977, 273; Riley 1979, 185; Hautumm 1981, 223–225 nos. 184–189; Keay 1984, 287–289. 657; Arthur 1985, 250; Peacock 1984, 121; Adan-Bayewitz 1986, 101 f.; Tomber – Williams 1986, 49 f.; Peacock – Williams 1986, 189; Johnson 1988, 211; Tomber 1988, 500; Carignani – Pacetti 1989, 10 f.; Bonifay – Villedieu 1989, 27; Abadie 1989, 48–50; Toniolo 1991, 39 fig. 39; Hayes 1992, 63; Lund 1993a, 126; Villa 1994, 405; Bonifay – Pieri 1995, 111; Alpözen *et al.* 1995, 68; Rautman 1995, 66. 75; Opař 1996, 208; Sagui 1998, 318; Ciarrocchi *et al.* 1998, 388 f.; Vidrih Perko 1998, 100; Volpe *et al.* 1998, 723–725; Abadie-Reynal 1999, 263; Vidrih Perko – Pavletić 2000, 266; Şenol – Kerem 2000, 100 no. 26; Warner Slane 2000, 310; Bülow 2000, 212 f.; Del Rio *et al.* 2000, 451–456; Karagiorgou 2001, 133–155; Reynolds 2004, 230; Opař 2004a, 13 f. Pl. 7; Pasquinucci *et al.* 2005, 123; Martin 2005, 127 fig. 6; Warner Slane 2005, 263 no. 2. 27–28; Poblome *et al.* 2005, 228; Williams 2005, Late Roman Amphora 3; De Mitri 2006, 201–205; Amores Carredano *et al.* 2007, 136 fig. 6 no. 44; Tomber 2007, 206; Sazanov 2007, 805 f.; Tomber 2008, 166.

Fabric: (analysed no. 381, 852–853, 856, 859–860)

Visual characteristics

Ephesus Fabric B. The micaceous fabric is hard and fairly smooth. The photomicrographs show that neither the fabric used nor the firing was homogeneous. The colour is usually deep reddish brown.

Petrology

The analysis of LR 3 amphorae from Carthage, Berenice, and Tintagel, which are rich in mica, have all produced different results⁶⁶⁰. Both the Athens and the Lyon LR 3 amphorae have three types of fabric⁶⁶¹. Two of them are micaceous, while the third is free from mica and contains limestone. Similarly, two types of fabric were found in Berenice⁶⁶². The petrological analyses suggest that an Egyptian site of production is unlikely⁶⁶³.

Ephesus fabric B

Sample: no. 381

Matrix: Non-calcareous, optical active, reddish brown

Temper: Frequent: muscovite; moderate: oxidized mica, monocrystalline quartz, iron oxide particles; rare: K-feldspar, crystalline rock fragments, quartzite, heavy minerals.

Samples: nos. 852 – 853, 856, 859 and 860

Matrix: The samples show a micaceous, non-calcareous, optically active, oxidised groundmass. The temper content varies from 20–25%. The average grain size of the temper particles ranges from 0.07 to 0.1 mm, the maximum observed grain size in thin section is 1.3 mm. The temper grains show a moderate to poor sorting.

Temper: Dominant muscovite and monocrystalline quartz, frequent heavy minerals (mainly epidote/clinozoisite), iron oxide concretions, subordinate oxidised mica, moderate K-feldspars and albite (partly with inclusions of epidote/clinozoisite or black ore), very rare polycrystalline quartz, crystalline rock fragments and traces of plagioclase. The crystalline rock fragments consist mainly of mica schist, gneiss and albite–quartz fragments.

The *heavy mineral* assemblage consists of epidote/clinozoisite (85%), rutile (6%), disthene (5%), hornblende (1%), tourmaline (2%), and traces of zircon, titanite, brookite/anatase, garnet, sillimanite, chloritoid, augitic clinopyroxene and diopside clinopyroxene.

R.S.

Catalogue

Tetragonos Agora

380. Rim, neck, body fr., handles, 97/014 (1705), R–W–Stoa–Room O, D = 3.9 cm, V = 0.6 cm, HD = 0.6 cm, DN = 3.4 cm, H = 11.8 cm, S = 1.3x2.8 cm, light red (2.5YR 6/8), SF: buff (7.5YR 7/4), PLATES 34, 82

381. Rim, neck, body fr., handles, 97/016 (1652), Stoa–Room S1, D = 3.95 cm, V = 0.8 cm, HD = 1.1 cm, DN = 3.3 cm, H = 13.8 cm, S = 1.5x2.7 cm, yellowish red (5YR 4/6), PLATES 34, 82

382. Rim, neck, body fr., handle, 97/016 (1703), Stoa–Room S1, D = 3.7 cm, V = 0.5 cm, HD = 1.1 cm, DN = 3.2 cm, H = 11.2 cm, S = 1x3 cm, red (2.5YR 5/6), PLATES 34, 82

383. Base fr., 97/016 (1655), Stoa–Room S1, BD = 3.5 cm, H = 9.6 cm, red (2.5YR 4/8), PLATES 34, 82

384. Base fr., 99/011 (341), R–sewer, BD = 4 cm, H = 5.2 cm, yellowish red (5YR 4/6), PLATES 34, 82

385. Base fr., 99/015 (343), R–sewer, BD = 4.3 cm, H = 5.6 cm, red (10R 4/8), SF: red (10R 5/6), PLATES 34, 82

386. Base fr., 99/015 (342), R–sewer, BD = 4 cm, H = 10.3 cm, yellowish red (5YR 4/6), PLATES 34, 82

387. Base fr., 99/010 (1682), R–sewer, BD = 4 cm, H = 6.5 cm, red (2.5YR 4/8), PLATES 34, 82

388. Base fr., 99/011 (344), R–sewer, BD = 4.3 cm, H = 6.9 cm, red (2.5YR 4/8), PLATES 34, 82

Terrace House 2

604. Base, 99/192 (151), C3, Stairway 3, DF = 4 cm, H = 9.2 cm, red (2.5YR 4/8), PLATES 46, 91

605. Rim neck, handle, 99/221 (23), C3, Stairway 3, D = 3.6 cm, V = 0.5 cm, HD = 1 cm, H = 10.5 cm, S = 2.8x1.2 cm, dark red (2.5YR 3/6), PLATES 46, 91

⁶⁶⁰ Williams 1982, 107; Sauer 1995.

⁶⁶¹ Lang 1955, 277; Lemaître 1997, 312.

⁶⁶² Riley 1979, 183 “a dark buff non-micaceous clay, and a micaceous buff clay”.

⁶⁶³ Grace 1979, Pl. 67; Peacock 1984, 22.

606. Rim neck, handle from, 99/298 (233), C3, Stairway 3, D = 4 cm, V = 0.5 cm, HD = 0.9 cm, H = 10.3 cm, S = 3x0.8 cm, very dark greyish brown (10YR 3/2), SF: reddish yellow (5YR 6/6), PLATES 47, 92
607. Base, 99/310 (2), Stray find, DF = 4.1 cm, H = 9.5 cm, red (2.5YR 4/6), PLATES 47, 92
608. Base, 99/310 (6), Stray find, DF = 4.1 cm, H = 4 cm, red (2.5YR 4/6), PLATES 47, 92
609. Base, 99/310 (1), Stray find, DF = 4.1 cm, H = 9 cm, red (2.5YR 4/6), PLATES 47, 92
610. Base, 99/616 (378), C9, Stairway 3, DF = 2.4 cm, H = 5.2 cm, dark reddish brown (5YR 4/2), SF: light reddish brown (5YR 6/4), PLATES 47, 92
851. Handle fr., 07/ 20–1, H = 6.7 cm, S = 1.5x2.6 cm, red (2.5YR 5/6), SF: red (2.5YR 4/8), PLATE 54.
852. Handle fr., 07/ 16–2, H = 7.2 cm, S = 1.6x3.1 cm, red (2.5YR 5/6), SF: red (2.5YR 4/8), PLATE 54.
853. Handle fr., 07/ 19–1, H = 7.3 cm, S = 1.5x2.5 cm, red (2.5YR 5/6), SF: brown (7.5YR 5/2), PLATE 54.
854. Handle fr., 07/ 20–3, H = 3.9 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54.
855. Handle fr., 07/ , H = 4.2 cm, S = 1.5x2.6 cm, dark reddish grey (5YR 4/2), SF: brown (7.5YR 5/2), PLATE 54.
856. Base fr., 07/16–3, BD = 4.3 cm, H = 5.5 cm, red (2.5YR 5/8), SF: red (2.5YR 5/6), PLATE 54.
857. Base fr., 07/ , BD = 3.8 cm, H = 4.2 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54.
858. Base fr., 07/ , BD = 3.6 cm, H = 4.5 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54.
859. Base fr., 07/19–2, BD = 3.4 cm, H = 3.8 cm, dark reddish grey (5YR 4/2), SF: brown (7.5YR 5/2), PLATE 54.
860. Base fr., 07/15, BD = 3.2 cm, H = 2.8 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54.

Arap-Dere

The amphorae published from Ephesus:

Tetragonos Agora, South Gate: Gassner 1997, 183 T. 61 nos. 771–772. 776–778; Terrace House 1: Lang-Auinger – Outschar 1994, 11 f.; Outschar 1996, 61 f. T. 9, no. 263. 266 f.; Terrace House 2: Outschar 1993, 52 Fig. 4; Vedius Gymnasium: Ladstätter 2008, 113. 115. 116. 120. 121. 122. 123. 135. 136. 141. 146. 153. 155. 159. 160. 168. 173, T. 290, K 150–151, T. 291, K 166–168, T. 295–296, K 219. 227, T. 302, K 281–285, T. 304, K 356, T. 306, K 374, T. 311, K 426–428, T. 312, K 442–443, T. 321, K 534–438, T. 325, K 599; State Agora, Well: Meriç 2002, 91 T. 49 no. K 603–604; Harbour: Zabehlicky 1996 Fig. 6; Zabehlicky 1999, 483 f. T. 106; Lucas Grave (Lukasgrab): Liko 2010, 213 no. 275–287; 235–236, nos. 582. 599–600 and 249 nos. 800–801. 804–805; Ladstätter 2010b, K 11–12. 35. 124. 145. 147. 166. 219. 250. 263. 327. 346–347. 451–452. 732. 834. 1000–1005.

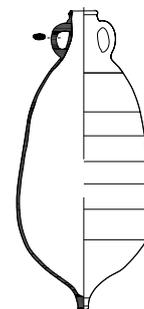
Type 56

EPHESUS 56

(Pear-shaped body Amphora)

Form: This type has a small rim, gently rounded or flat. It has a short, curved neck and a pear-shaped body. The circular handles are attached to the neck just below the rim and to the shoulder. The handles are oval in section. The base consists of a short, stubby, solid spike. The amphora is small, the diameter of the rim is between 5 and 6 cm, its height is 50–70 cm. The Arap-Dere research has pointed out that this type also had a large base. (nos. 862–864, 871). There is an upper part with a rounded rim and a base fragment of a large Ephesus 56 amphora in a cemetery in Zadar on the Dalmatian coast⁶⁶⁴. The diameter of the rim is 12.5 cm. This type of amphora is common in Ephesus. The form was copied on the Island of Kos (Mastichari)⁶⁶⁵.

Chronology: The dating is the same as that of the LR 3 amphorae⁶⁶⁶. This form occurs with LR 3 amphorae at most sites in Ephesus and can be dated from the end of the fourth century A.D. to the end of the sixth/beginning of the seventh century A.D.



⁶⁶⁴ Inv.no. 352, D = 12.5 cm, HD = 11.5 cm, H = 18.1 cm, I am grateful to S. GLUŠČEVIĆ for his help.

⁶⁶⁵ Didioumi 2011, 74.

⁶⁶⁶ Peacock 1984, 123, one of them (no. 9) was dated to c. A.D. 450-475, the other (no. 8) to c. A.D. 500.

The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 7–9	Late fourth to early seventh centuries A.D.	389–398

Terrace House 2

layers	Data range	nos.
6–9	Fourth to seventh centuries A.D.	615–616
10	Debris	613
11	Stray find	611–612, 614

Epigraphy: No stamp has been published so far. A neck fragment in Ephesus has the letter M.



M(...) – no 398
Graffito, cut after firing

Origin: No workshop has yet been discovered. A number of fragments have been found at the excavations in the city and in the Arap-Dere Valley near Ephesus (see Chapter 2.6). The form and fabric of the pieces found outside Ephesus make it possible that there might have been other workshops as well⁶⁶⁷.

Contents: Unknown, perhaps olive oil.

Distribution: This type of Ephesian amphora has only been found in a few places. D. PEACOCK initially and later R. TOMBER identified this type at the excavations of Carthage⁶⁶⁸. Only three complete amphorae have so far been found. One of them is in the Crypta Balbi collection in Rome, the other one in Bodrum and the third one in Ephesus. There are also pieces in Marseille, Brijuni, Zadar and Samos⁶⁶⁹.

Fabric: (analysed nos. 397, 861, 865, 869)

Visual characteristics

Ephesus Fabric B. Hard, very fine, highly micaceous reddish fabric. There are red iron oxide and colourless grains (0.5 mm). The differences in the fabric can be attributed to the quality of the firing. Some vessels appear to have been fired irregularly. The fine matrix has large quartz (1 mm) and limestone (0.2 mm) particles in only one example (no. 391). The fabric of the LR 3 amphorae is the same as that of the Ephesus 56 amphorae found in Carthage by Peacock⁶⁷⁰.

Petrology

Ephesus Fabric B

Sample: no. 397

Matrix: Non-calcareous, optically active, reddish brown.

Temper: Frequent: muscovite; moderate: oxidized mica, monocrystalline quartz, iron oxide particles; rare: K-feldspar, crystalline rock fragments, quartzite, heavy minerals (abundant epidote).

⁶⁶⁷ Kos may have been another site of production, see Didioumi 2011, 74.

⁶⁶⁸ Peacock 1984, 123 no. 8–9 fig. 36; Tomber 1988, 525, no. 532.

⁶⁶⁹ Marseille Bourse Inv.-nos. 6007-4, 2570-12; Brijuni, Castrum villa, section 209; Hautumm 1981, 224 no. 187, Fig. 332.

⁶⁷⁰ Peacock 1984, 22.

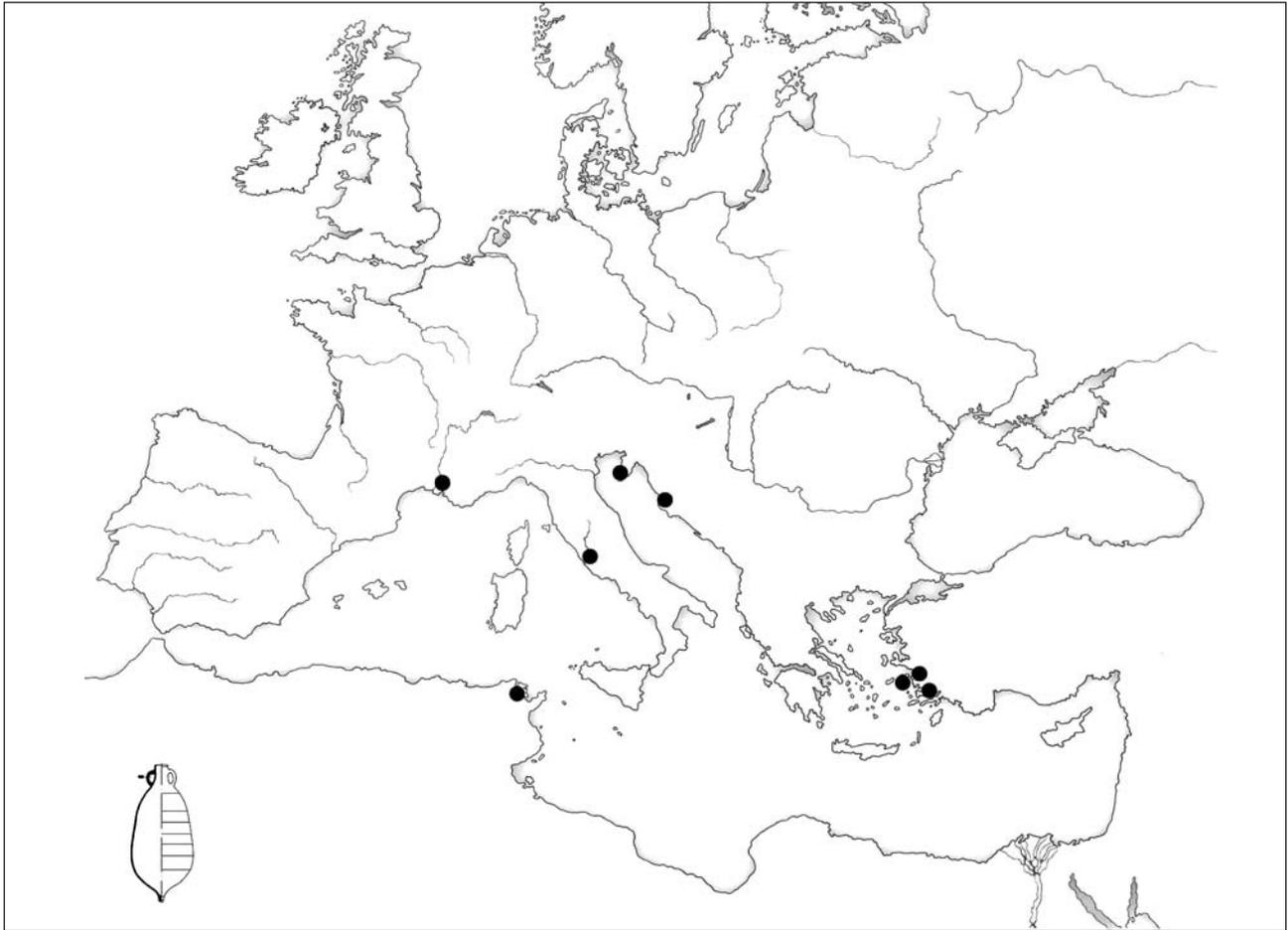


Fig. 26 Distribution of Ephesus 56 amphorae

Samples: nos. 861, 865 and 869

Matrix: The samples show a micaceous, non-calcareous, optically active, oxidised groundmass. The temper content varies from 20–25%. The average grain size of the temper particles ranges from 0.07 to 0.1 mm, the maximum observed grain size in thin section is 1.3 mm. The temper grains show a moderate to poor sorting.

Temper: Dominant muscovite and monocrystalline quartz, frequent heavy minerals (mainly epidote/clinozoisite), iron oxide concretions, subordinate oxidised mica, moderate K-feldspars and albite (partly with inclusions of epidote/clinozoisite or black ore), very rare polycrystalline quartz, crystalline rock fragments and traces of plagioclase. The crystalline rock fragments consist mainly of mica schist, gneiss and albite–quartz fragments.

The *heavy mineral* assemblage consists of epidote/clinozoisite (85%), rutile (6%), disthene (5%), hornblende (1%), tourmaline (2%), and traces of zircon, titanite, brookite/anatase, garnet, sillimanite, chloritoid, augitic clinopyroxene and diopsidic clinopyroxene.

R.S.

Catalogue

Tetragonos Agora

- | | |
|---|---|
| <p>389. Rim, neck, handle fr., 99/011 (1694), R–sewer, D = 5.2 cm, V = 0.6 cm, HD = 0.6 cm, DN = 4.6 cm, H = 7.8 cm, S = 1.1x2.1 cm, red (2.5YR 5/6), PLATES 35, 82</p> <p>390. Rim, neck, handle fr., 99/011 (1693), R–sewer, D = 5.2 cm, V = 0.7 cm, HD = 0.6 cm, DN = 4.6 cm, H = 9.6 cm, S = 1.3x2.3 cm, red (2.5YR 5/6), PLATES 35, 82</p> | <p>391. Rim, neck, handle fr., 99/011 (1691), R–sewer, D = 3.9 cm, V = 0.7 cm, HD = 0.5 cm, DN = 3.2 cm, H = 7.1 cm, S = 1x2.6 cm, red (2.5YR 4/8), PLATES 35, 83</p> <p>392. Rim, neck fr., handle, 99/011 (1692), R–sewer, D = 4.7 cm, V = 0.7 cm, HD = 0.3 cm, DN = 4.2 cm, H = 8 cm, S = 1.1x2.1 cm, red (2.5YR 4/6), PLATES 35, 83</p> |
|---|---|

393. Rim, neck fr., handle, 99/011 (1695), R–sewer, D = 5.6 cm, V = 0.7 cm, HD = 1.3 cm, DN = 5 cm, H = 10.2 cm, S = 1.1x2.2 cm, red (2.5YR 5/6), PLATES 35, 83
394. Rim, neck, body, base, handle fr., 97/016 (1653–54), Stoa–Room S1, D = 4.9 cm, V = 0.5 cm, HD = 0.6 cm, DN = 4.8 cm, BD = 2.1 cm, H = 10 cm, S = 1x2 cm, red (2.5YR 4/8), PLATES 35, 83
395. Base fr., 99/011 (1697), R–sewer, H = 5.8 cm, light red (2.5YR 6/8), SF: coated, pink (7.5YR 8/4), PLATES 35, 83
396. Base fr., 99/011 (1699), R–sewer, BD = 3 cm, H = 6.6 cm, yellowish red (5YR 4/6), PLATES 35, 83
397. Base fr., 99/011 (1698), R–sewer, BD = 2.1 cm, H = 5.3 cm, yellowish red (5YR 5/6), PLATES 35, 83
398. Neck fr., 99/011 (1696), R–sewer, Inscr.: M(...) graffiti cut after firing, H = 6.1 cm, weak red (2.5YR 5/2), SF: reddish yellow (5YR 6/6), PLATES 35, 83

Terrace House 2

611. Rim, neck handle, 99/217 (235), C3, Stairway 3, D = 5 cm, V = 0.7 cm, HD = 0.5 cm, H = 8.5 cm, S = 2.3x1.3 cm, red (2.5YR 5/6), PLATES 47, 92
612. Rim, neck handle, 99/353 (209), Stray find, D = 5.5 cm, V = 0.9 cm, HD = 0.5 cm, H = 4 cm, yellowish red (5YR 4/6), PLATES 47, 92
613. Rim, neck handle, 99/616 (379), C9, Stairway 3, D = 4.9 cm, V = 0.7 cm, HD = 0.7 cm, H = 3.9 cm, S = 2.4x0.9 cm, yellowish red (5YR 5/6), SF: light reddish yellow (5YR 6/6), PLATES 47, 92
614. Base, 99/594 (353), C9, Stairway 3, DF = 2.3 cm, H = 5.9 cm, red (2.5YR 4/8), SF: light brown (7.5YR 6/4), PLATES 47, 92
615. Base, 99/202 (330), C3, Stairway 3, DF = 2.5 cm, H = 5.2 cm, red (2.5YR 4/6), SF: light reddish brown (5YR 6/4), PLATES 47, 92
616. Base, 99/202 (329), C3, Stairway 3, DF = 2.1 cm, H = 4.4 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATES 47, 92

Arap-Dere

861. Handle fr., 07/19, H = 5.8 cm, S = 1.8x2.5 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
862. Base fr., 07/16, BD = 4.8 cm, H = 8.5 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
863. Base fr., 07/14, H = 8.4 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
864. Base fr., 07/14, H = 8.4 cm, strong brown (7.5YR 5/6), SF: light reddish brown (5YR 6/4), PLATE 54
865. Base fr., 07/16–1, H = 5.6 cm, strong brown (7.5YR 5/6), SF: light reddish brown (5YR 6/4), PLATE 54
866. Base fr., 07/17, H = 5.1 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
867. Base fr., 07/19, H = 4.5 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
868. Base fr., 07/, H = 4.4 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
869. Base fr., 07/20, H = 3.8 cm, red (2.5YR 4/8), SF: red (2.5YR 5/6), PLATE 54
870. Base fr., 07/20, H = 4.2 cm, red (2.5YR 5/6), SF: light red (2.5YR 6/6), PLATE 54
871. Base fr., 07/20, H = 8.1 cm, strong brown (7.5YR 5/6), SF: light reddish brown (5YR 6/4), PLATE 54

The amphorae published from Ephesus:

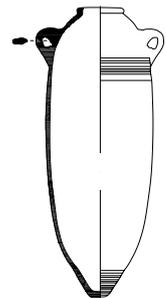
Tetragonos Agora, South Gate: Gassner 1997, 108 T. 36, no. 413; Vedium Gymnasium: Ladstätter 2008, 116. 122. 146. 168. 170 T. 302, K 286–287 T. 321, K 539 T. 323, K 567. 570–571; Nymphaeum Traiani: Quatember *et al.* 2008, 292 nos. 96. 124–125 Fig. 20, 96 Fig. 23, 29 Fig. 16, 35–36 Fig. 17, 59 Fig. 20, 87; Alytarchenstoa: Ladstätter – Steskal 2009, 93 no. 15 Fig. 10, 15; Kuretenstreet: Iro *et al.* 2009, 64 Fig. 28, 15; Lucas Grave (Lukasgrab): Ladstätter 2010b, K 125, 129, 738.

Type 57

LATE ROMAN AMPHORA 4 / GAZA JAR

(Carthage Late Roman Amphora 4; Almagro 54; Keay 54; Peacock – Williams 48–49; Kuzmanov 14; Zemer 53; Caesaraea type 2; Kellia type 182; Augst 54; Pieri LRA 4B)

Form: These amphorae are cigar-shaped. The type has a small everted rim with loop handles on the shoulders. “The body bears a series of grooves or ridges principally concentrated below the handles and around the base”⁶⁷¹. The different versions have been



⁶⁷¹ Peacock 1984, 121.

studied extensively⁶⁷². The early examples are small (Pieri A1–A2), the height of the later vessels (Pieri B1–B3) can reach 70–80 cm⁶⁷³. Only a few typical handle fragments have been found in the Tetragonos Agora, a few larger pieces have been unearthed at the Terrace House⁶⁷⁴.

Chronology: These amphorae were probably used between the fourth to sixth or seventh centuries A.D. “This form should doubtless be considered an earlier morphological variant within the LR 4 class, a variant which apparently did not appear before the middle of the 5th century AD”⁶⁷⁵.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	376
Ph 7–9	Late fourth to early seventh centuries A.D.	377

Terrace House 2

layers	Data range	nos.
5–8	Third/fourth to sixth centuries A.D.	635
11	Stray find	634

Origin: Important centres of production were Askelon, Ashdod and the territory of Gaza⁶⁷⁶. It is supposed that the type was also produced in the Nile delta⁶⁷⁷.

Contents: Probably wine but olive-oil and sesame-oil have recently been suggested⁶⁷⁸.

Distribution: D. PIERI has published a detailed distribution list of amphora finds⁶⁷⁹. This form is well-known in the eastern Mediterranean. It reached the Red Sea and North Africa, western Europe, the Black Sea region and was also present in the eastern Alps, southern Pannonia and Upper Moesia⁶⁸⁰.

Fabric:

Visual characteristics

The amphorae have a hard, thick, sandy fabric with tiny inclusions. There are few limestone and quartz grains visible.

Catalogue

Tetragonos Agora

376. Handle fr., 99/035 (1688), R–sewer, H = 11.2 cm, S = 1.5x2.5 cm, reddish yellow (5YR 6/6), PLATES 33, 82

377. Handle fr., 87/164 (1662), Trench 87/6, H = 8 cm, S = 1.6x3.2 cm, yellowish red (5YR 5/8), PLATES 33, 82

⁶⁷² Zemer 1977, 61 no. 49–53; Riley 1975, 27–31; Peacock 1984, 24. 121; Keay 1984, 278–285; Majcherek 1995, 163–178; Opař 2004a, 20–22, Pl. 7; Pieri 2005, 101–107; Reynolds 2005, Almagro 54.

⁶⁷³ Pieri 2005, 101–107; Reynolds 2005, Almagro 54.

⁶⁷⁴ Earlier excavations, inv.no. 82.31.a.

⁶⁷⁵ Majcherek 1995, 168; Sazanov 2007, 807.

⁶⁷⁶ Zemer, 1977, 61; Riley 1979, 220; Peacock 1984, 24; Sciallano – Sibella 1994, Amphore Late Roman 4; Reynolds 2005, Almagro 54.

⁶⁷⁷ Empereur – Picon 1989, 243.

⁶⁷⁸ Riley 1979, 222, suggests wine; Rothschild-Boros 1981, 86; Keay 1984, 280; Whitehouse *et al.* 1985, 203, oil and wine; Martin-Kilcher 1994, 443; Reynolds 2005, Almagro 54.

⁶⁷⁹ Pieri 2005, 197–200, Appendice 4.

⁶⁸⁰ Kuzmanov 1973, 18; Scorpan 1976, 165; Zemer, 1977, 61; Hayes 1978, 88; Riley 1979, 220–222; Brukner 1981, T 161, 56–58; Keay 1984, 280 f.; Peacock – Williams 1986, 199; Mackensen 1987, 246; Bonifay – Villedieu 1989, 27–29; Carignani – Pacetti 1989, 11 f.; Abadie 1989, 54; Empereur – Picon 1989, 243; Martin-Kilcher 1994, 443–446; Villa 1994, 406; Turnovsky 1992, 43–48; Kelemen 1993, 52, fig. 1; Alpözen *et al.* 1995, 66 f.; Bonifay – Pieri 1995, 112; Rautman 1995, 69; Majcherek 1995, 168; Opař 1996, 208 f.; Bjelajac 1996, nos. 50–52; Villa 1998, 281; Sagui 1998, 318; Ciarrocchi *et al.* 1998, 388 f.; Arthur 1998, 161 f.; Arthur – Oren 1998, 205; Vidrih Perko 1998, 101; Volpe *et al.* 1998, 723–725; Abadie-Reynal 1999, 264; Tomber 1999, 301, 313; Vidrih Perko – Pavletić 2000, 266; Martin 2000, 429; Şenol – Kerem 2000, 89; Warner Slane 2000, 310; Schmidt-Colinet 2001, 3; Kingsley 2002, 74–77; Ladstätter 2003a, 844 f.; Warner Slane 2005, 263, no. 2–25–26 fig. 5; Poblome *et al.* 2005, 228 fig. 3b; Reynolds 2004, 230; Reynolds 2005, Almagro 54; De Mitri 2006, 203–205; Tomber 2006, 163, Type 46.

Terrace House 2

634. Handle, 99/310 (7), Stray find, H = 10.1 cm, S = 3.4x2.7 cm, yellowish red (5YR 5/8), PLATES 49, 93

635. Handle, 99/058 (145), WT 2 Stone-cutting saw, H = 8.5 cm, S = 3.5x2.4 cm, yellowish red (5YR 5/6), PLATES 49, 93

The amphorae published from Ephesus:

Tetragonos Agora, South Gate: Gassner 1997, 182 T. 60 no. 764a; Terrace House 1: Lang-Auinger – Outschar 1994, 12; Vedius Gymnasium: Ladstätter 2008, 112. 114. 115. 133. 138. 141 T. 289, K 130 T. 293, K 187 T. 296, K 220–221. 226; Lucas Grave (Lukasgrab): Liko 2010, 214 nos. 291–292, 247 no. 772 and 249, no. 799.

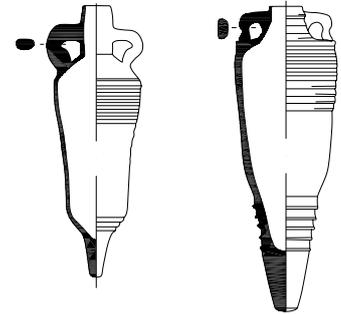
Type 58

LATE ROMAN AMPHORA 7

(Bailey Type B; Egloff 173; Egloff 174; Egloff 177; Peacock – Williams 52 B)

Form: The LR 7 amphora had a number of variants⁶⁸¹. The form is characterised by an upright rim, sloping or carinated shoulder, loop or strap handles. There are usually deep grooves on the tapering body. It has a solid base⁶⁸². There are very few amphorae of this type in Ephesus.

Chronology: The type was used from the late fourth century to the sixth, perhaps the seventh century A.D.⁶⁸³.



The amphora found in Ephesus.

Agora

layer	Data range	no.
Ph 11	Unstratified complexes	378

Origin: Kiln sites have been uncovered at Lake Mariout, in Middle Egypt and in the Nile Valley⁶⁸⁴.

Contents: Probably wine⁶⁸⁵.

Distribution: It is frequent at Alexandria. It is not very usual outside Egypt, but it occurs in Britain, Spain, Carthage, southern France, Italy, Pannonia, the Black Sea region and India⁶⁸⁶.

Fabric:

Visual characteristics

The colour is chocolate brown. It has a soft, fairly rough, sandy, micaceous fabric with visible imprints of plants.

Catalogue

Tetragonos Agora

378. Handle fr., 99/023 (1683), Sewer, H = 13.8 cm, S = 2.8x4.5 cm, strong brown (7.5YR 4/6), PLATES 33, 82

⁶⁸¹ Egloff 1977, 115; Peacock – Williams 1986, 206 f.; Empereur – Picon 1989, 244 f.; Hayes 1992, 66 f.; Panella 1993, 666; Tomber – Williams 2000, 45, Pl. 2, 8–9; Williams 2005, Late Roman Amphora 7.

⁶⁸² Tomber – Williams 2000, 45.

⁶⁸³ Egloff 1977, 115 f.; Riley 1979; Riley 1981, 121; Peacock – Williams 1986, 206; Panella 1993, 683.

⁶⁸⁴ Tomber – Williams 2000, 45 see note 29.

⁶⁸⁵ Riley 1979, 224 f.; Williams 2005, Late Roman Amphora 7.

⁶⁸⁶ Riley 1981, 121; Plesničar–Gec 1983, 148 T 38, no. 4; Bonifay – Villedieu 1989, 31–33; Panella 1993, 666; Villa 1994, 408; Bonifay–Pieri 1995, 114; Arthur 1998, 163; Arthur – Oren 1998, 207; Ciarrocchi *et al.* 1998, 388 f.; Tomber – Williams 2000, 46, with a new distribution map; Tomber 2008, 166.

Type 59

ZEEST 75

Form: This large amphora has a wide rim, a widening neck and a widening oval body ending in a small knob. The handles reach the upper part of the body from below the rim. There are (one or two) grooves on the internal and external parts of the handles. Two versions have been described by I. B. ZEEST⁶⁸⁷. The rims are different and the neck and body of one of the versions has horizontal ribbing. A. OPAIŦ has recently described four versions and a Zeest 75 similis version as well⁶⁸⁸. There are very few amphorae of this type in Ephesus.

Chronology: Second and third centuries A.D.⁶⁸⁹. The pieces in Ephesus were collected during a field survey.

Origin and Contents: Fish-based product, North Pontic region⁶⁹⁰.

Distribution: Mainly the Black Sea region, Athens and Rome⁶⁹¹.

Fabric:

Visual characteristics

There are two fabric groups.

1. Hard, fine fabric, a few white (limestone), iron oxide, grey and mica inclusions (perhaps quartz), no. 719.
2. Hard fabric, frequent colourless and grey inclusions, limestone and white reaction rims surrounding voids which once held limestone, nos. 720 and 721.

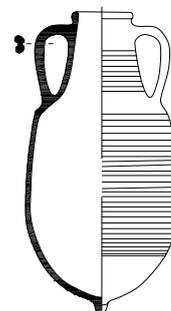
Catalogue

Magnesian Gate

719. Handle fr., MT 99/1–30, H = 9.7 cm, S = 3.5x5.9 cm, reddish yellow (5YR 6/8), PLATES 52, 96

721. Handle fr., MT 99/1–14, H = 22 cm, S = 3x6 cm, light red (2.5YR 6/8), PLATES 52, 96

720. Handle fr., MT 99/1–31, H = 10 cm, S = 3.5x6.2 cm, red (2.5YR 5/6), PLATES 52, 96

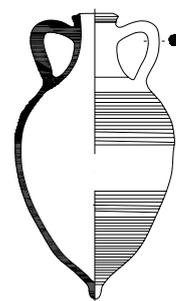


Type 60

ZEEST 80

(Knossos 38 /Mid Roman Amphora 5)

Form: A large amphora. “Wide neck with thickened flat-topped rim, marked off by deep groove(s) on outside...broad baggy body with ribbing, rounded or shallow conical bottom, ending in a short toe or knob, handles heavy, rounded-sectioned, with shallow external grooving”⁶⁹². Some of the amphorae (Mid Roman Amphora 5) of Berenice (Sidi Khrebish) have been published⁶⁹³. The early version is large with a volume of 100 litres. The later version contains 60–50 litres⁶⁹⁴. There is a rim fragment at the Terrace House 2. There are very few amphorae of this type in Ephesus.



⁶⁸⁷ Zeest 1960, 113.

⁶⁸⁸ OpaïŦ 2007b, 109.

⁶⁸⁹ Zeest 1960, 113; OpaïŦ 2007b, 110; Lund 2007, 187.

⁶⁹⁰ OpaïŦ 2007b, 110.

⁶⁹¹ Zeest 1960, 113; OpaïŦ 2007b, 109 f.; Lund 2007, 187.

⁶⁹² Zeest 1960, 114 f. Pl. 33; Hayes 1983, 155; Panella 1986, 627, fig. 26; Арсеньева – Науменко 1992, 142 f., Type 22; Abadie-Reynal 1999, 260 fig. 12.

⁶⁹³ Riley 1979, 188.

⁶⁹⁴ OpaïŦ 2004a, 26, Pl. 16.

Chronology: The type is dated from the end of the first century A.D. to the sixth century A.D.⁶⁹⁵. The third century A.D. saw the bulk of the export.

The amphora found in Ephesus

Terrace House 2

layer	Data range	no.
5a	Early third century A.D.	625

Origin: There are at least two manufacturing sites, perhaps in the central and northern Aegean area and a late variant in the Black Sea (Pontic) region⁶⁹⁶.

Distribution: There are pieces in Ostia, Berenike, Crete, Athens, Corinth, Dalmatia, Scythia, the Black Sea region, Tanais, Apollonia⁶⁹⁷.

Fabric:

Reddish brown (5YR 5/6), large (0.1–0.5 mm) grains of quartz, occasional iron oxide grains (1mm).

Catalogue

Terrace House 2

625. Handle, 99/069 (119), A3, Stairway 1, H = 13.2 cm, S = 4x3.7 cm, reddish brown (5YR 5/6), PLATES 48, 93

The amphora published from Ephesus:
Tetragonos Agora, South Gate: Gassner 1997, 252 T. 76, no. H 105.

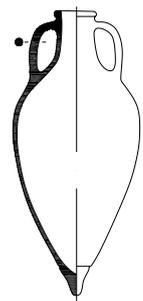
Type 61

ZEEST 84B

(Scorpan 10D; Radulescu 4; Popilian 66)

Form: This amphora has a cylindrical neck, small rim and oval body. The spike is separated from the body by a well-defined line. The rounded handles are attached to the neck below the rim and to the upper part of the body. The section of the handle is either circular or oval⁶⁹⁸. There are very few amphorae of this type in Ephesus.

Chronology: I.B. ZEEST suggests they are dated to the second or third centuries A.D.



The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 6	Mid first to late fourth centuries A.D.	399, 406
Ph 7–9	Late fourth to early seventh centuries A.D.	405

⁶⁹⁵ Zeest 1960, 114 f. Pl. 33; Hayes 1983, 155 Type 38; Panella 1986, 628; Lund 2007, 184; Williams 2005, Mid Roman Amphora 5.

⁶⁹⁶ Opař 2004a, 26.

⁶⁹⁷ Riley 1979, 188; Hayes 1983, 155; Williams – Zervos 1983, 15; Anderson-Stojanović 1992, Pl. 80 no. 682–683; Арсеньева – Хауменко 1992, 142 f.; Opař 2004a, 26; in Athens inv.no. P 25597–P 25598;

⁶⁹⁸ Zeest 1960, 116, T 35.

Terrace House 2

layers	Data range	nos.
4	Second century. A.D.	623
5a	Early third century A.D.	624

Origin: The European part of the Bosphorus has been suggested as the production site for these amphorae⁶⁹⁹.

Distribution: These can be found on the northern coast of the Black Sea (from the Bosphorus to the Crimean peninsula). They also occur in Moesia, Dacia and Pannonia⁷⁰⁰.

Fabric: (analysed nos. 406, 624)

Visual characteristics

It has a hard, rough fabric with a large number of white and colourless inclusions no. 399. The fragments nos. 405, 623 have a hard, rough fabric. There are many rough quartz grains, many voids and a few black inclusions.

Petrology

Sample: no. 406

Matrix: Reddish-brown, fine grained to micaceous, non-calcareous.

Temper: Frequent monocrystalline quartz, polycrystalline quartz, moderate to rare carbonate particles, oxidised serpentinite, plagioclase, volcanic plagioclase, K-feldspar, biotite, muscovite, heavy minerals (frequent hornblende, epidote, tourmaline, diallage?), very rare volcanic rock fragments, chert.

Comment: Seems to show a similar petrographical composition as no. 624. Typical is the presence of oxidised serpentinite together with volcanic rock fragments and some carbonate grains.

Sample: no. 624

Matrix: Micaceous, no carbonate content.

Temper: Frequent monocrystalline quartz, polycrystalline quartz, mica (muscovite and oxidised mica), iron oxide and opaque particles, subordinate to rare sanidine, volcanic plagioclase, altered volcanic rock particles (partially glass shards), heavy minerals (rare epidote, augite, frequent hornblende), plagioclase, crystalline rock fragments (quartz- mica- feldspar-fragments), chert, ? oxidised serpentinite grains, very rare carbonate grains.

Comment: Typical is the presence of altered volcanic rock particles and orange-reddish oxidised, probably serpentinite grains.

R.S.

Catalogue

Tetragonos Agora

399. Rim, neck, handle fr., 97/024 (1642), R-W-Stoa-Room M, D = 18 cm, V = 3.2 cm, HD = 1.9 cm, H = 10.4 cm, reddish yellow (5YR 6/6), SF: light red (2.5YR 6/6), PLATES 36, 83
405. Rim, neck fr., 99/024 (1712), R-sewer, D = 18 cm, V = 3.2 cm, HD = 1.8 cm, H = 9.7 cm, reddish yellow (5YR 6/6), SF: light red (2.5YR 6/6), PLATES 36, 83
406. Handle fr., 97/024 (1645), R-W-Stoa-Room M, H = 10 cm, reddish yellow (5YR 6/6), PLATES 36, 83

Terrace House 2

623. Rim, neck, handle, 99/589 (180), WT 2 Stone-cutting saw, D = 16.2 cm, V = 2.6 cm, HD = 2 cm, H = 11.8 cm, yellowish red (5YR 5/6), SF: pinkish grey (7.5YR 6/2), PLATES 48, 83
624. Handle, 99/612 (371), A3, Stairway 1, H = 30 cm, S = 4.2x4 cm, red (2.5YR 5/6), SF: reddish yellow (5YR 7/6), PLATES 48, 83

⁶⁹⁹ Zeest 1960, 116; Opaït 1980, 308.

⁷⁰⁰ Zeest 1960, 116; Radulescu 1976, 103 f.; Scorpan 1976, 163 f.; Opaït 1980, 308; it is uncertain whether it belongs to this type, Brukner 1981, T. 156, 9; Kelemen 1990, 172 fig. 5, 4; Bjelajac 1996, 61-65; Benea 2000, 435 f.; Dyczek 2001, 252; Bezeczký 1996, 332, Pl. XIIB, may belong to this type.

Type 62

KUZMANOV 9
(Sinopean Carrot)

Form: This type of amphora has not been uniformly defined. On the basis of their form, the carrot-shaped amphorae, which are supposed to have been produced near Sinope (Dermici), can also be regarded as belonging to this group⁷⁰¹. The neck is long and cylindrical. It has either a simple or a pulley-wheel rim. The handles are attached to the lower part of the neck and the upper part of the body. The upper part of the body is wide and tapers conically to the base. The production of similar forms have been discovered in a workshop in the area of Seleucia in Peireia⁷⁰². The Tetragonos Agora has only a few small fragments. A few complete amphorae were found at the Terrace House 2.



Chronology: Y. GARLAN and D. KASSAB TEZGÖR dated the type to the second part of the fourth to fifth centuries A.D.⁷⁰³.

The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 7–9	Late fourth to early seventh centuries A.D.	402–403

Terrace House 2

layer	Data range	no.
11	Stray find	626

Origin: The Demerci workshop near Sinop has been described by Y. GARLAN and D. KASSAB TEZGÖR⁷⁰⁴. Strabo mentioned the commercial links between Sinop and Ephesus⁷⁰⁵.

Contents: The content is not known, perhaps wine⁷⁰⁶.

Distribution: The vessel can be found in Athens, Turkey, Lebanon, Egypt and Romania⁷⁰⁷.

Fabric: (analysed no. 403)

Visual characteristics

It has a hard fabric with white and colourless grains. There are one or two larger black, probably volcanic, inclusions

Petrology

Sample: no. 403

Matrix: Fine grained to micaceous, carbonate free, reddish–brown.

Temper: Very frequent monocrystalline quartz, frequent polycrystalline quartz, augite, iron oxides, very rare volcanic rock fragments, chert, sericite–quartzite, volcanic plagioclase, heavy minerals (augite, epidote)

Comment: Typical are big augite grains, volcanic rock fragments and chert.

R.S.

⁷⁰¹ Garlan – Kassab Tezgör 1996, 331, Pl. 11; Kassab Tezgör – Tatlıcan 1998, 425.

⁷⁰² Empereur – Picon 1989, 232; Opaît 1996, 210.

⁷⁰³ Opaît 2004b, 297.

⁷⁰⁴ Garlan – Kassab Tezgör 1996, 331, Pl. 11; Kassab Tezgör 1999, 119.

⁷⁰⁵ Strabo XII 2, 10; Braund 2005, 124.

⁷⁰⁶ Opaît 2004b, 297.

⁷⁰⁷ Empereur – Picon 1989, 232, note 22; Böttger 1992, 350 no. 79 T. 102; Alpözen *et al.* 1995, 69; Opaît 1996, 210; Şenol – Kerem 2000, 93.

Catalogue

Tetragonos Agora

402. Base fr., 87/058 (1680), Trench 87/4, H = 8.5 cm, yellowish red (5YR 5/6), PLATES 36, 83

403. Base fr., 92/094 (1658), Trench 92/4, H = 6.2 cm, light red (10YR 6/8), PLATES 36, 83

Terrace House 2

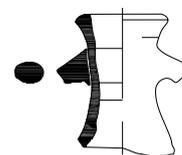
626. Base, 99/310 (4), Stray find, H = 6.2 cm, yellowish red (5YR 5/8), PLATES 48, 93

The amphorae published from Ephesus:
Terrace House 2: Ladstätter 2002, 23.

Type 63

EPHESUS 1690 / AEGEAN AMPHORA WITH EVERTED RIM

Form: This amphora has a slightly everted rim, long neck and handles which are circular or oval in profile. There are very few amphorae of this type in Ephesus.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 7-9	Late fourth to early seventh centuries A.D.	404

Origin: It may have originated in the Aegean region.

Content and distribution: Unknown.

Fabric:

Visual characteristics

The fabric is similar to that of the Ephesian LR 3 amphora. It is hard, fine, rich in mica with limestone and red iron ore inclusions.

Catalogue

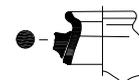
Tetragonos Agora

404. Rim, neck, handle fr.; 87/058 (1690); Trench 87/4;
D = 9.5 cm, V = 1.6 cm, HD = 6 cm, H = 14.9 cm, S =
2.2x2.9 cm; yellowish red (5YR 5/6), PLATES 36, 83

Type 64

SABRATHA SUB-TYPE 34N

Form: This amphora has an everted rim and a slightly conical neck. There are very few amphorae of this type in Ephesus.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 7-9	Late fourth to early seventh centuries A.D.	408

Origin: The fabric is similar to that of African amphorae.

Distribution: A similar form has been published from Sabratha, Sub-type 34N⁷⁰⁸.

Fabric:

Visual characteristics

Hard fabric. It has many limestone grains and voids and a number of black and colourless inclusions.

Catalogue

Tetragonos Agora

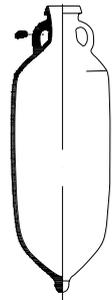
408. Rim, neck, handle fr.; 97/043 (1711); West Street, Room S1, D = 7.8 cm, V = 0.8 cm, HD = 1.4 cm, H = 8 cm, reddish yellow (5YR 6/6), PLATES 36, 84

Type 65

KEAY 34 / BONIFAY 53

Form: This form belongs to the large, cylindrical African amphorae types. The type has been described by M. BONIFAY on the basis of two complete amphorae in Tunisia⁷⁰⁹. He has complemented S. KEAY's description: "The rim consisted of a developed flange with an upright face and triangular section"⁷¹⁰. The short handles join the neck and the shoulder. They are oval/flat in section. The short neck is cylindrical. The body is almost completely cylindrical ending in a small base. Bonifay has distinguished two versions based on the rim and the neck. There are very few amphorae of this type in Ephesus.

Chronology: Most pieces have been dated to the sixth to seventh centuries A.D. A few early variants can be dated to the fifth century A.D.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 10	From early seventh century A.D. to recent times	411

Epigraphy, Inscription: There is a graffito on the base fragment.



no. 411– B(...), cut before firing.

Contents: Unknown.

⁷⁰⁸ Keay 1989, 55, no. 254 fig. 14.

⁷⁰⁹ Bonifay 2004, 143.

⁷¹⁰ Keay 1984, 231. 233, fig. 98.

Origin: The type occurs mainly along the coast of Tunisia⁷¹¹.

Distribution: Mainly in Tunisia, there are a few pieces in Catalonia, southern France, Italy, Romania (Tomi) and Egypt⁷¹².

Fabric:

Visual Characteristics

Hard, red fabric. Tiny grains of quartz and limestone or white reaction rims are visible, together with microfossils.

Catalogue

Tetragonos Agora

411. Base fr., 98/008 sewer (2025), Inscr.: B(...) graffiti cut before firing, BD = 6 cm, H = 8.8 cm, red (2.5YR 5/6), PLATES 37, 84

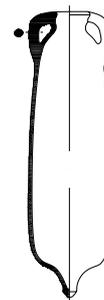
Type 66

ALMAGRO 50

(Key 22; Lusitana 6; Ostia 7; Peacock – Williams 22)

Form: It has a very short neck on a long, cylindrical body which tapers into a spike. Two handles are attached to the thick rim. The spike often has the form of a ring and semi-circular knob⁷¹³. Recent publications have suggested that the Key XVI type is similar to but not the same as the type described by M. ALMAGRO which is bigger and larger⁷¹⁴. There are very few amphorae of this type in Ephesus.

Chronology: They were used between the third and fifth centuries A.D.⁷¹⁵.



The amphorae found in Ephesus

Agora

layer	Data range	no.
Ph 6	Mid first to late fourth centuries A.D.	414

Terrace House 2

layer	Data range	no.
	Stray find	650

Stamp: There is a well-known stamp on the upper part of a handle in Terrace House 2.



no. 650 – OLYN(T)

Bibl.: Callender 1965, no. 1256 = Lagóstena 2001, 371; Manacorda 1977, 121 f., Fig. 254; Lusuardi Siena 1977, 249, T. 152,5; Étienne – Mayet 2002, 138 f. no. 7; Key 1984, 151; Lisbon, Museu Nacional de Arqueologia.

⁷¹¹ Bonifay 2004, 143.

⁷¹² Key 1984, 233; Bonifay 2004, 143; Opař 2004a, 37.

⁷¹³ Duarte 1990, 113, Pl. 18; Étienne – Mayet 2002, fig. 39–40.

⁷¹⁴ Fabião 1997; Fabião 2005, Almagro 50.

⁷¹⁵ Beltrán 1970, 540; Panella 1972, 100; Panella 1973, 606; Key 1984, 172 early fourth to fifth century A.D.; Peacock – Williams 1986, 131; Sciallano – Sibella 1994, Amphore Almagro 50; Bost *et al.* 1992, 128–132; Étienne – Mayet 2002, 138 f.; Parker 1989, 650 f.

Origin: The Almagro 50 type came from the Iberian peninsula⁷¹⁶. The amphorae produced in Baetica (Type 50A) are different from the kind produced in Lusitania (Type 50B)⁷¹⁷. Kiln sites are known in the Tejo and Sado valleys, as well as in Algarve in Portugal⁷¹⁸.

Contents: It probably contained fish products⁷¹⁹.

Distribution: The Almagro 50 was mainly used in the western Mediterranean and in Egypt⁷²⁰.

Fabric:

Visual characteristics

Hard, rough fabric. The fabric of the rim and handle fragment (no. 414) found in the Agora has colourless quartz, abundant white limestone and dark inclusions. The fabric of the stamped amphora (no. 650) has very small white and colourless particles together with iron ore.

Catalogue

Tetragonos Agora

414. Rim, neck, handle fr., 97/024 (1641), R–W–Stoa–Room
M, D = 14.6 cm, V = 2.9 cm, H = 7.7 cm, S = 3.2 x 6.5 cm,
reddish yellow (7.5YR 7/6), SF: pale yellow (2.5Y 8/4),
PLATES 37, 84

Terrace House 2

650. Rim, neck, handles, 80/031 (80/489), Stairway 1, Stamp:
OLYN..., Olyn(t), D = 15 cm, H = 9.6 cm, S = 4 x 2.9 cm,
reddish yellow (7.5YR 7/6), PLATES 50, 94

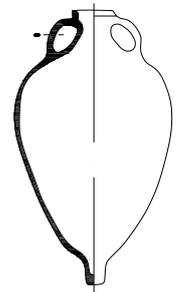
Type 67

ALMAGRO 51C

(Keay 19; Lusitana 4; Peacock – Williams 23)

Form: One of the distinctive traits of this type is that the handles are directly attached to the rim. There is a widening body below a short neck⁷²¹. The type has two or three versions (Étienne – Mayet A–B–C)⁷²². Versions A and B have a round belly and a hollow foot. C has a long belly and a solid base. A field survey near the Magnesian Gate revealed a rim fragment (no. 816) which belongs to version B. A few rim and handle fragments were found at the Terrace House 2 during earlier excavations⁷²³.

Chronology: This amphora form is dated to the period between the end of the second century or the beginning of the third century A.D. and the middle of the fifth century A.D.⁷²⁴. There are very few amphorae of this type in Ephesus.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 6	Mid first to late fourth centuries A.D.	416

Origin: Lusitania, probably the Tejo and Sado valley, perhaps Algarve⁷²⁵.

⁷¹⁶ Keay 1984, 169–172; Peacock – Williams 1986, 130; Manacorda 1977, 121; Carandini – Panella 1981, 501.

⁷¹⁷ Étienne – Mayet 2002, 138 f.

⁷¹⁸ Étienne – Mayet 2002, 139–141; Fabião 2005, Almagro 50.

⁷¹⁹ Carandini – Panella 1981, 501; Keay 1984, 170–172; Peacock – Williams 1986, 131; Fabião 2005, Almagro 50.

⁷²⁰ Panella 1973, 605 f.; Manacorda, 1977, 121 f.; Parker 1977, fig. 19–25; Keay 1984, 170. 646; Parker 1989, 650–653; Villa 1994, 378; Reynolds 1995, 83; Buora 1995b, 191 f.; Tomber 1988, 500, no. 380; Carreras 2000, 102 f.; Vidrih Perko – Pavletić 2000, 266; Fabião 2005, Almagro 50.

⁷²¹ Almagro 1955, 312 fig. 289; Manacorda 1977, 142–145; Keay 1984, 172–178; Parker 1977, fig. 2–6.

⁷²² Fabião 2005 has defined two forms, while Étienne – Mayet 2002, fig. 42–43 have three.

⁷²³ HH2 nos. 81/20, 80/262.

⁷²⁴ Beltrán 1970, 543; Keay 1984, 178; Fabião 2005, Almagro 51C; Étienne – Mayet 2002, 143.

⁷²⁵ Keay 1984, 173; Sciallano – Sibella 1994, Amphore Almagro 51 C; Panella 2001, 206; Étienne – Mayet 2002, 143–147.

Contents: Probably some kind of fish-based product⁷²⁶.

Distribution: Like the Almagro 50, it was mainly used in the western Mediterranean and also in the northern provinces of the Empire⁷²⁷.

Fabric: (analysed no. 416)

Visual characteristics

Hard fabric. Each piece has a different fabric.

No. 416 has very many red (iron oxide ?), and small, black particles, a few limestones, and large (0,5 mm) grey grains.

No. 716. has black, grey and colourless grains, a few red iron oxide particles.

Petrology

Lusitanian Fabric ?

Sample: no. 416

Matrix: Optically inactive, probably calcareous

Temper: Poorly sorted; very frequent monocrystalline quartz, frequent iron oxide, subordinate oxidised sheet silicates, crystalline rock fragments (quartzite, sericite-quartzite, phyllite), moderate polycrystalline quartz, muscovite, molds of carbonate grains and siltstone/ sandstone fragments, rare sanidine, plagioclase and volcanic rock fragments, very rare shards of volcanic glass (colourless and brown), chert, and heavy minerals (zircon, augite).

Comment: Typical is the abundance of sericite-quartzite and phyllite fragments together with volcanic rock fragments.

R.S.

Catalogue

Tetragonos Agora

416. Base fr., BoxNo: 99/019 (1685), R-sewer, BD = 4.5 cm, H = 8.1 cm, reddish yellow (5YR 7/6), SF: pale yellow (2.5Y 8/4), PLATES 37, 84

Magnesian Gate

716. Handle fr., MT 99/1-29, D = 10.5 cm, V = 1.9 cm, HD = 2.9 cm, H = 4.7 cm, light yellowish brown (10YR 6/4), PLATES 52, 96

Type 68

DRESSSEL 30

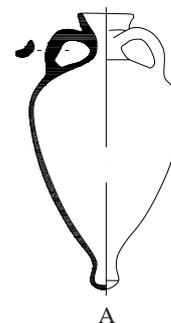
Form: Three basic forms have been distinguished⁷²⁸.

A. Type Key 1 A which is a copy of the Gauloise 4.

B. Type Key 1 B which has a higher rim and a different base (not always flat).

C. The Tunisian variant (Salakta and Cap Bon types). The type, in general, has a short neck and pear-shaped tapering body. The handles are curved and attached to the neck and the upper part of the body. The base is small.

Chronology: They are dated to the third to fifth centuries A.D.⁷²⁹. There are very few amphorae of this type in Ephesus.



⁷²⁶ Fabião 2005, Almagro 51C.

⁷²⁷ Manacorda, 1977, 143-145; Parker 1977, 36; Keay 1984, 172-178. 645; Martin-Kilcher 1994, 430 f.; Buora 1995b, 191 f.; Fabião 2005 Almagro 51C.

⁷²⁸ Panella 1973, 603; Manacorda 1977, 150; Keay 1984, 96. 99; Peacock - Williams 1986, 172; Bonifay 2004, 148-150; Bonifay 2005, Dressel 30.

⁷²⁹ Panella 1973, 603, but the starting date may have been in the late second century A.D.; Manacorda 1977, 150; Keay 1984, 96. 99; Peacock - Williams 1986, 172; Bonifay 2004, 148-150.

The amphora found in Ephesus

Terrace House 2

layer	Data range	no.
5a	Early third century A.D.	617

There is an almost complete example at the Terrace House 2 from an earlier excavation⁷³⁰.

Origin: The 1A amphorae were produced in the province of Mauretania Caesariensis⁷³¹. This is confirmed both by the stamps and the petrological analyses⁷³². The 1B amphorae were produced somewhere in North Africa. The 1C amphorae were produced in Tunisia⁷³³.

Contents: There was a large olive oil production centre near the city of Tubusuctu. This name appears on the stamps as well⁷³⁴.

Distribution: Such amphorae are primarily found in Algeria and Morocco. There are finds at a number of sites in the western Mediterranean and in Egypt⁷³⁵.

Fabric:

Visual characteristics

Hard fabric, grey and brownish inclusions and rare black grains.

Catalogue

Terrace House 2

617. Handle, 99/070 (135), A3, Stairway 1, H = 10.5 cm, S = 5.5x1.7 cm, pink (5YR 7/4), PLATES 59, 92

Type 69

AMPHORE ÉGYPTIENNE BITRONCONIQUE 3

Form: “Handles are attached on or just below the simple everted rim”⁷³⁶. Similar forms have been published from Caesarea.

Chronology: In Egypt, this type of amphora is dated second and third century A.D.⁷³⁷. In Carthage it is dated to the late fifth/early sixth century A.D.⁷³⁸. There are very few amphorae of this type in Ephesus.



The amphora found in Ephesus

Agora

layer	Data range	no.
Ph 6	Mid first to late fourth centuries A.D.	417

⁷³⁰ Inv.no. 24.

⁷³¹ Panella 1973, 602; Manacorda 1977, 150; Keay 1984, 96; Sciallano – Sibella 1994, Amphore de Maurétanie Césarienne/Dressel 30; Panella 2001, 206.

⁷³² Peacock 1977a, 270–272.

⁷³³ Bonifay 2005, Dressel 30.

⁷³⁴ Panella 1973, 601–605; Manacorda 1977, 150 f.

⁷³⁵ Riley 1979, 196; Panella 1973, 602; Manacorda 1977, 150; Keay 1984, 96–99; Peacock – Williams 1986, 171; Carignani – Pacetti 1989, 614; Martin-Kilcher 1994, 378 f.; Martin 1999, 349; Şenol – Kerem 2000, 86; Bonifay 2004, 148–150; Ehmig 2003, 47; Bonifay 2005, Dressel 30.

⁷³⁶ Tomber 1999, 313 no. 91.

⁷³⁷ Empereur – Picon 1998, 77.

⁷³⁸ Peacock 1984, 130 no. 44 Pl. 39.

Origin: The type comes from Egypt. It was produced in the region of Lake Mariout⁷³⁹.

Contents: Unknown.

Distribution: North Africa.

Fabric: (analysed no. 417)

Visual characteristics

The amphora has a “chocolate brown” colour. It has soft, fairly rough, sandy, micaceous fabric with visible imprints of plants.

Sample: no. 417

Matrix: Fine grained to micaceous, non-calcareous.

Temper: Poorly sorted, frequent monocrystalline quartz, K-feldspar, iron oxide particles, heavy minerals (epidote, clinopyroxene), rare volcanic rock fragments, volcanic plagioclase, siliceous bioclasts, plant fragments.

Comment: Typical Egyptian Nile mud fabric.

R.S.

Catalogue

Tetragonos Agora

417. Rim, neck, handle fr., 97/034 (100), R–W–Stoa–Chamber
M, D = 12 cm, V = 2 cm, H = 9.8 cm, S = 2.5 cm, red
(2.5YR 4/6), PLATES 37, 84

Type 70

SPATHEION

(Bonifay 31–33; Benghazi Late Roman Amphora 8; Keay 26; Ostia 4, Pl. 162–165; Peacock – Williams 51; Scorpan 16)

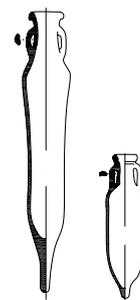
Form: This group of amphorae is characterised by a long, narrow, cylindrical body with a long tapering spike. The rim is everted. There are two short handles on the neck.⁷⁴⁰ M. BONIFAY has recently distinguished three basic types.⁷⁴¹ Two have been found in Ephesus. The taller Spatheion 1 and the small sized Spatheion 3.

Spatheion 1, on the basis of the shape of the rim, Bonifay has set up four groups (A – D)⁷⁴².

The Spatheion 3 has also been classified into four groups (A – D)⁷⁴³.

Chronology: The Spatheion 1 type is dated to the period between the late fourth to mid fifth centuries A.D.⁷⁴⁴.

The Spatheion 3 type is dated from the end of the sixth century to the end of the seventh A.D. (sometimes beginning of the eighth century A.D.)⁷⁴⁵.



The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 7–9	Late fourth to early seventh centuries A.D.	418–420

⁷³⁹ Empereur – Picon 1998, 75–84; Sciallano – Sibella 1994, Amphore de l'Égypte romaine.

⁷⁴⁰ Manacorda 1977, 211; Riley 1979, 226; Keay 1984, 212; Panella 1982, 178; Peacock – Williams 1986, 202.

⁷⁴¹ Bonifay 2004, 125–129; Bonifay 2005, Spatheion 1, 2, 3.

⁷⁴² Bonifay 2005, Spatheion 1.

⁷⁴³ Bonifay 2005, Spatheion 3.

⁷⁴⁴ Riley 1979, 228; Panella 1982, 178; Keay 1984, 212–219; Martin-Kilcher 1994, 449; Freed 1995, 167.

⁷⁴⁵ Panella 1982, 178; Keay 1984, Bonifay 2004, 125–129; Bonifay 2005, Spatheion.

Origin: There are workshops at a number of sites in North Africa. The large amphora was produced in the Nabeul region at Sidi Zahrani⁷⁴⁶. Production data have been published from Carthage (Spain)⁷⁴⁷. M. BONIFAY states that the Spatheion 3 type of variant C is attested to in the Zeugitana region at *Neapolis*⁷⁴⁸.

Contents: Olives, wine, garum, honey and lentils⁷⁴⁹.

Distribution: The Spatheion amphorae were widespread both in the western and in the eastern Mediterranean, in the northern provinces of the Empire and in the Black Sea region⁷⁵⁰.

Fabric:

Visual characteristics

Hard fabric, limestone, iron oxide and colourless inclusions, no. 418.

Hard fabric, limestone, black and colourless inclusions, no. 419.

Hard rough fabric, with tiny grains of limestone and voids, no. 420.

Catalogue

Tetragonos Agora

Spatheion 3C (small)

418. Rim, neck, handle fr., 99/039 (1687), R-sewer, D = 6.2 cm, V = 1.3 cm, HD = 1.8 cm, DN = 3.4 cm, H = 5.8 cm, S = 0.6x1.3 cm, buff (2.5Y 8/2), PLATES 37, 84

419. Rim, neck, handle fr., 99/010 (1681), R-sewer, D = 6.3 cm, V = 1.2 cm, HD = 1.4 cm, H = 4.6 cm, very pale brown (10YR 7/4), PLATES 37, 84

Spatheion 1A

420. Base fr., 97/016 (1679), Stoa-Room S1, BD = 4.2 cm, H = 8.2 cm, yellowish red (5YR 5/6), surface: very pale brown (10YR 8/4), PLATES 37, 84

The amphorae published from Ephesus:

Tetragonos Agora, South Gate: Gassner 1997, 185 T. 60, no. 764; Terrace House 1: Lang-Auinger – Outschar 1994, 12; Lucas Grave (Lukasgrab): Liko 2010, 242 nos. 687–688.

Type 71

MISCELLANEOUS AMPHORAE

71 – 1 Late Hellenistic and Early Roman Amphorae

1. These amphorae have everted rims. They were probably produced in Spain.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	347–348
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	345
Ph 6–9	First to early seventh centuries A.D.	346

⁷⁴⁶ Beltrán 1970, 571; Panella 1982, 179; Manacorda 1977, 217; Peacock – Williams 1986, 202; Bonifay 2004, 125–129; Bonifay 2005, Spatheion 1; Ghaliya *et al.* 2005.

⁷⁴⁷ Panella 1982, 178; Keay 1984, 215; Peacock – Williams 1986, 202.

⁷⁴⁸ Bonifay 2004.

⁷⁴⁹ Manacorda 1977, 220; Keay 1984, 215.

⁷⁵⁰ Riley 1979, 227; Brukner 1981 T. 163.79; Keay 1984, 219; Peacock – Williams 1986, 203; Bezeczky 1987, no 313; Mackensen 1987, 253–258; Bonifay – Pieri 1995, 97; Cipriano – Carre 1987, 488; Carignani – Pacetti 1989, 614; Alpözen *et al.* 1995, 103; Bjelajac 1996, 87–91; Opař 1996, 225; Villa 1998, 281; Sagui 1998, 312; Volpe *et al.* 1998, 723–725; Vidrih Perko 1998, 101; Martin 1999, 351 f.; Abadie-Reynal 1999, 262; Şenol – Kerem 2000, 84; Portale – Romeo 2000, 426; Vidrih Perko – Pavletić 2000, 266; Ladstätter 2000c, 166 f.; Ladstätter 2003a, 838–842; Opař 2004a, 38, Pl. 32.

Fabric:

Visual characteristics

Very small grains of limestone with reaction rims. Microfossil (foraminifera) voids.

Catalogue

Tetragonos Agora

345. Rim, neck fr., 96/005 (1366), Trench 96/1, D = 19 cm, V = 2.3 cm, HD = 4.7 cm, DN = 12.8 cm, H = 6.5 cm, light reddish brown (5YR 6/4), PLATES 31, 79
347. Rim, neck fr., 96/047 (279), Trench 96/1, D = 16 cm, V = 2 cm, HD = 4 cm, H = 5.2 cm, red (2.5YR 5/6), PLATES 31, 80
346. Rim, neck fr., 89/004 (1294), Trench 89/1, D = 19 cm, V = 2.8 cm, HD = 4.3 cm, H = 6.2 cm, light red (2.5YR 6/6), PLATES 31, 80
348. Rim, neck fr., 90/032 (1288), Trench 90/4, D = 17.5 cm, V = 2.2 cm, HD = 3.7 cm, DN = 14.2 cm, H = 8.4 cm, red (2.5YR 5/6), PLATES 31, 80

2. Wide rims. The form is unknown. They were probably produced in North Africa.

The amphorae found in Ephesus

Agora

layer	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	349–350

Fabric:

Visual characteristics

Hard, rough fabric, grains of quartz and limestone or white reaction rims are visible, perhaps North African, no. 349

Hard, rough fabric, irregularly fired, the external surface has a grey skin resulting from the use of saline water. Grains of quartz and limestone or white reaction rims are visible. Perhaps North African, Tunisian fabric, no. 350.

Catalogue

Tetragonos Agora

349. Rim, neck fr., 92/029 (2007), Trench 92/2, D = 17.2 cm, V = 1.8 cm, HD = 4 cm, H = 8.1 cm, light red – red (2.5YR 6/6 – 5/6), PLATES 31, 80
350. Rim, neck, handle fr., 93/032 (1365), Trench 93/2, D = 16.6 cm, V = 2 cm, HD = 3.6 cm, DN = 13.6 cm, H = 6.1 cm, red (2.5YR 5/6); SF: white coated, PLATES 31, 80

71 – 2 Miscellaneous Deposits Tetragonos Agora

Various shapes of rims. The fabric of each amphora is different.

The amphorae found in Ephesus

Agora

layers	Data range	nos.
Ph 4	30/27 B.C. to 3 B.C., up to A.D. 23	351, 353, 354, 357
Ph 5c	A.D. 23 to 45: West and North Halls, West Gate	352
Ph 6	Mid first to late fourth centuries A.D.	356
Ph 11	Unstratified complexes	355

Fabric: analysed no. 352

Sample: No. 352

Matrix: Optically inactive, slightly micaceous groundmass, artificially tempered.

Temper: Frequent monocrystalline quartz and iron oxide concretions, subordinate polycrystalline quartz, alkali feldspars, muscovite and molds of former carbonates, rare pyroxenes, very rare volcanic plagioclase, carbonate grains, crystalline rock fragments, heavy minerals and traces of siltstone/sandstone.

The *heavy mineral* assemblage consists of diallage (83%), garnet (8%), chromian spinel (5%), disthene (1%), not identified grains (1%) and traces of zircon, titanite, tourmaline, staurolite, hornblende and sillimanite.

Comment: Typical is the ultra basic heavy mineral assemblage dominated by diallage. The petrographical composition and the heavy mineral assemblage clearly points to a region with ultra basic rocks or a hinterland with an ultra basic source. Possible regions, for example, are Cyprus and Syria?

R.S.

Catalogue

351. Rim, neck fr., 96/029 (325), Trench 96/1, D = 17.5 cm, V = 1.7 cm, HD = 3.5 cm, H = 5.6 cm, red (10R 5/8). Hard, rough fabric. Frequent grey and colourless inclusions, microfossils. The microscope shows white reaction rims surrounding voids, which once held limestone; PLATES 31, 80
352. Rim, neck fr., 87/061 (205), Trench 87/4, D = 18.8 cm, V = 2.7 cm, HD = 3.7 cm, DN = 12.4 cm, H = 21 cm, red (2.5YR 5/6), SF: buff (10YR 8/3) Fabric: Z. Hard, rough fabric. Frequent rounded quartz; grey, white and colourless grains and with carbonate inclusions; PLATES 31, 80
353. Rim, neck, handle fr., 87/022 (1158), Trench 87/2, D = 14.6 cm, V = 1.6 cm, HD = 4.3 cm, H = 11.7 cm, light brown (7.5YR 6/4), SF: buff (7.5YR 8/4). Hard, micaceous fabric, lots of very small white grains, a few very small black grains (0.1 mm); PLATES 31, 80
354. Rim, neck fr., 96/044 (40), Trench 96/1, D = 16.6 cm, V = 2.1 cm, HD = 3.5 cm, H = 7.8 cm, light brown (7.5YR 6/4). Hard fabric, few very small light yellow carbonate grains (0.1 mm); PLATES 31, 80
355. Rim, neck fr., 95/002 (19), Trench 92/2, D = 17.6 cm, V = 2.3 cm, HD = 5.5 cm, H = 7.3 cm, buff (7.5YR 7/4). Hard fabric, frequent small red iron oxide particles, frequent small light yellow carbonate grains, a few grey and dark brown grains; PLATES 31, 80
356. Rim, neck fr., 87/019 (2008), Trench 87/2, D = 13.8 cm, V = 1 cm, HD = 3.5 cm, H = 4.9 cm, light brown (7.5YR 6/4). Hard fabric, a few large (0.5 mm) red iron oxides, colourless and light yellow carbonate grains, frequent small (0.1 mm) grey, light yellow carbonate and colourless inclusions; PLATES 31, 80
357. Rim, neck fr., 96/044 (39), Trench 96/1, D = 12 cm, V = 1.4 cm, HD = 1.8 cm, H = 5 cm, buff (7.5YR 7/4). Hard fabric, frequent 0.5 mm grey, brown, black, and red (ironoxide) particles, frequent 0.1 mm grey, light yellow and black grains; PLATES 31, 80

71 –3 Miscellaneous Deposits Terrace House 2

The amphorae found in Ephesus Terrace House 2

layers	Data range	nos.
3–7	First to fifth centuries A.D.	639
5a	Early third century A.D.	622, 636, 638, 640, 641, 644, 645
5–8	Third/fourth to sixth centuries A.D.	637, 646
10	Debris	555
11	Stray find	621, 642, 643

Catalogue

555. Rim, 99/270 (178), C8, Stairway 3, D = 16.8 cm, V = 1.5 cm, HD = 2.9 cm, H = 5.6 cm, yellowish red (5YR 5/6). Hard, fine fabric, a few white inclusions, some voids; PLATES 41, 88
621. Base, 99/353 (204), Stray find, DF = 2.3 cm, H = 5.9 cm, reddish yellow (5YR 7/6), SF: pink (7.5YR 8/4). Hard, fine fabric, frequent light red iron oxides, colourless particles, occasional black and grey inclusions; PLATES 48, 93
622. Base, 99/606 (286), A3, Stairway 1, DF = 3.3 cm, H = 8.2 cm, light red (2.5YR 6/8). Hard, very fine fabric, one or two large grains of quartz; PLATES 48, 93
636. Base, 99/582 (189), A3, Stairway 1, Graffito: ... (illegible), DF = 4 cm, H = 9.2 cm, reddish yellow (5YR 7/6), SF: pink (5YR 8/4). Hard, micaceous fabric, very small (0.05mm) red, grey and black grains; PLATES 49, 94
637. Rim, neck, handle, 99/372 (222), WT 2 Stone-cutting saw, D = 9.2 cm, V = 1.6 cm, H = 6 cm, S = 3.2x2 cm, brown (7.5YR 5/4). Hard, very fine fabric, frequent black and a few white grains. The microscope shows white reaction rims surrounding voids which once held limestone; PLATES 49, 94
638. Rim, neck, 99/597 (20), A3, Stairway 1, D = 12.8 cm, V = 2 cm, H = 5.2 cm, pink (7.5YR 7/4). Hard, fine fabric, a few colourless, grey and black inclusions; PLATES 49, 94

639. Rim, neck, handles, 99/276 (160), Stairway 3, D = 5.8 cm, V = 0.9 cm, HD = 1.7 cm, H = 16.5 cm, reddish yellow (5YR 7/6). Hard fabric, occasional large (0.5–1 mm) red and sandstone grains. Frequent colourless, light yellow and dark grey inclusions; PLATES 49, 94
640. Rim, 99/582 (190), A3, Stairway 1, D = 14.3 cm, V = 1.7 cm, H = 3.5 cm, reddish yellow (5YR 7/6). Hard, micaceous fabric, occasional golden mica, very small (0.05mm) grains of quartz, occasional large (0.5 mm) sandstone inclusions; PLATES 49, 94
641. Rim, neck, handle, 99/583 (197), A3, Stairway 1, D = 13 cm, V = 2.3 cm, HD = 1.5 cm, H = 11 cm, S = 3.3x2.6 cm, pink (7.5YR 8/4), SF: very pale brown (10YR 8/3). Hard, very fine fabric. Occasional large dark grey and light red grains; PLATES 49, 94
642. Rim, neck, handle, 99/181 (155), B9 West, 45c, D = 10.5 cm, V = 1.1 cm, HD = 3.1 cm, H = 15.6 cm, S = 3x1.7 cm, very pale brown (10YR 7/4). Hard sandy fabric, a few grey, colourless and iron oxide inclusions; PLATES 49, 94
643. Rim, neck, handle, 99/449 (34), B9, 45c, D = 11.2 cm, V = 0.9 cm, HD = 2.2 cm, H = 7.6 cm, S = 2.4x1.4 cm, reddish yellow (7.5YR 6/6). Hard fabric, red, white and a few colourless inclusions; PLATES 49, 94
644. Rim, neck, handle, 99/583 (196), A3, Stairway 1, D = 12 cm, V = 1.4 cm, HD = 4.4 cm, H = 9 cm, reddish yellow (5YR 7/6), SF: very pale brown (10YR 8/3). Hard, micaceous fabric, many grains of limestone and small quartz; PLATES 49, 94
645. Rim, neck, handle, 99/608–612 (373), A3, Stairway 1, D = 8.3 cm, V = 1.4 cm, HD = 1.7 cm, H = 7.8 cm, S = 5.4x1.6 cm, pink (7.5YR 7/4). Hard very fine fabric, many very small (0.05mm) grey and red inclusions; PLATES 50, 94
646. Rim, neck, handle, 99/372 (224), 5, WT 2 Stone-cutting saw, D = 7.5 cm, V = 0.9 cm, H = 15.5 cm, S = 3.4x2.5 cm, yellowish red (5YR 5/6). Hard rough fabric, microfossils, frequent large (1–1.5 mm) grains of quartz and white inclusions; PLATES 50, 94

5. AMPHORAE IN LAYERS

The Figure 27 includes the amphorae from the late Hellenistic to the late Roman layers at different sites. A significant amount of amphorae have been found at the Tetragonos Agora and at the Terrace House 2. The two Field Surveys have found relatively few amphorae. From among the objects at the Prytaneion, Basilica Stoa, Well and Serapeion, only some stamped Italian amphorae are included in the catalogue.

Production regions	Types	Agora	TH 2	Basilica	Well	Prytaneion	Serapeion	Mag. Gate	Arap-Dere	Total	
Ephesian region	Mushroom rim	140	71							211	
	Agora F 65–66	233	22	1						256	
	Agora M 45, J 46–47, M 125	182	106					4		292	
	Local Aegean 1	430	11					1		442	
	Local Aegean 2	41								41	
	Rhodian	2								2	
	Cup-shaped rim / Dressel 24 – predecessor	2								2	
	Agora M 240, M 255–257, M 277, M 282	28	71							99	
	Late Roman Amphora 3	383	76						53	512	
	Ephesus 56	147	11						120	278	
	Ephesus 63 (Aegean Amphora with everted rim)	1								1	
	Aegean	Rhodian	439	27					1		467
		Chian	52	4							56
Knidian		226	3					2		231	
Koan		637	99					2		738	
Cup-shaped rim / Dressel 24–predecessor		161	3					1		165	
Dressel 35		7								7	
Cretan AC 4 / Amphore Crétoise 4		3								3	
Cretan AC 2 / Amphore Crétoise 2		2								2	
Dressel 5		3						1		4	
Agora M 54		1						1		2	
Agora G 198		2								2	
Koan style with Pinched Handles		3	1							4	
Agora G 199		9								9	
Ephesus 17 (Broad chalice rim amphora)		5								5	
Ephesus 18 (Amphora with Furius stamp)		1								1	
Ephesus 19 (Chalice rim amphora)		1								1	
Dressel 25		40	2							42	
Kapitän 2			147						18	165	
Agora M 273		12	7							19	
Samos Cistern Type		5								5	
Late Roman Amphora 1		32	6							38	
Late Roman Amphora 2		29	10							39	
Palestinian		Baggy jar / Phoenician Jar	28								28
	Late Roman Amphora 4 / Gaza Jar	6	2							8	

Production regions	Types	Agora	TH 2	Basilica	Well	Prytaneion	Serapeion	Mag. Gate	Arap-Dere	Total	
Italian	Greco-Italic	14								14	
	Dressel 1	27	2							29	
	Dressel 1A	10	3							13	
	Dressel 1B	15								15	
	Dressel 1C	71	3							74	
	Brindisian and Adriatic ovoid amphora	59	1				1			61	
	Lamboglia 2	140	20	2		1				163	
	Dressel 6A	47	4	1	1					53	
	Dressel 21–22	74								74	
	Dressel 2–4	41	8	2	1					52	
	Schörgendorfer 558	6								6	
	Mid Roman 1 Amphora 1 Benghazi	1								1	
	Gaulish	Gauloise 4	2								2
Iberian peninsula											
Iberian peninsula	Lomba do Canho 67	1								1	
	Haltern 70	5								5	
	Pascual 1	2								2	
	Dressel 20	8	2					1		11	
	Beltrán 1	7	1					1		9	
	Beltrán 1 – Dressel 7	1								1	
	Beltrán 1 – Dressel 8	6								6	
	Beltrán 1 – Dressel 9	4								4	
	Dressel 12		2							2	
	Beltrán 2A	1	2							3	
	Almagro 50	3	1							4	
	Almagro 51C	1						1		2	
	African	Amphorae of the Punic tradition (Van der Werff 1–2–3)	16								16
Early Roman Amphora 11B		1								1	
Tripolitanian 1		1								1	
Tripolitanian 3		1					1			2	
Africana 2 D `Grande´		1	1					1		3	
Ostia 59 / Bonifay 15		1								1	
Keay 34 / Bonifay 53		1								1	
Dressel 30		1	1							2	
Spatheion		3	1							4	
Spatheion small		5								5	
Sabrata Sub-Type 34N		1								1	
Egyptian		Egyptian Amphora AE 2	3								3
		Late Roman Amphora 7	1	2							3
	Amphore Égyptienne Bitroconique 3	1								1	
Black Sea and Northern Aegean	Zeest 75							4		4	
	Kuzmanov 9	5	1							6	
Northern Aegean	Zeest 80		1							1	
	Zeest 84b	8	2							10	
	Miscellaneous	17	9							26	
	Total	3906	746	6	2	1	1	40	173	4875	

Fig. 27 The relative proportions of the individual types

The distribution of the amphorae among the various layers of the Tetragonos Agora provides interesting insights. Roughly five percent of the area has been excavated so far. More than sixty percent of the amphorae come from the Early Roman reconstruction layers. Ten percent come from the Middle and Late Roman period layers, and a little less from the Late Hellenistic layers. The amphorae from the 1999 excavation at the Terrace House 2 show different proportions. Both the Late Hellenistic and the Mid Roman layers yielded thirty percent, the Early Roman fifteen percent and the Late Roman and mixed layers twenty-six percent of the amphorae. The mixed layers had a number of Late Roman vessels (Fig. 28).

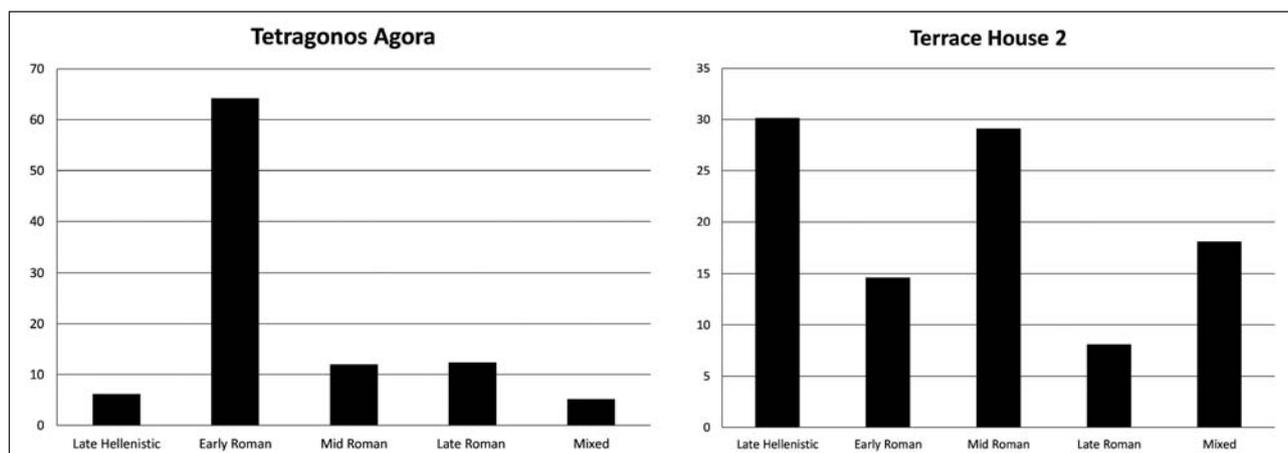


Fig. 28 Temporal distribution of the amphorae

The layers of the Tetragonos Agora show (Fig. 29) that the Italian and Spanish amphorae represent about thirty percent in the first half of the first century B.C. By the period of Augustus, this went below twenty percent and stayed there. Within the twenty percent, however, the proportion of the Italian amphorae diminished by the end of the Early Roman period. Wine and olive oil amphorae from the eastern Mediterranean always dominate. They are never less than seventy percent. During the Late Roman period, this number went beyond ninety percent. The number of African, Black Sea and Egyptian amphorae is not very high. The Terrace House 2 has similar proportions. However, there is a difference. During the Mid-Imperial period, the Italian and Spanish amphorae almost completely disappear. The number of the amphorae produced in the vicinity of Ephesus is significant at every site, with the possible exception of the Magnesian Gate.

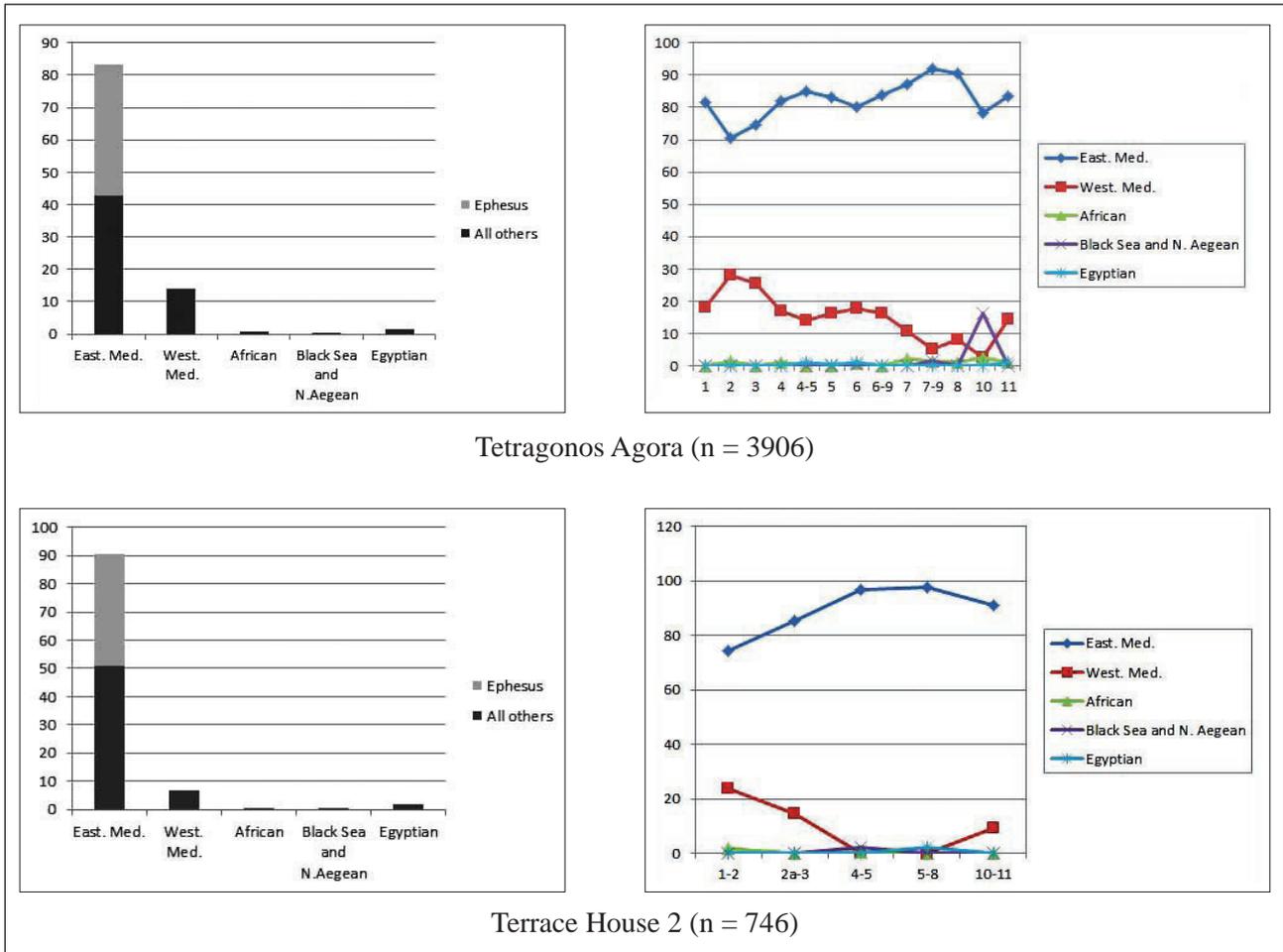


Fig. 29a The relative proportion of local and regional production and their distribution in the layers.

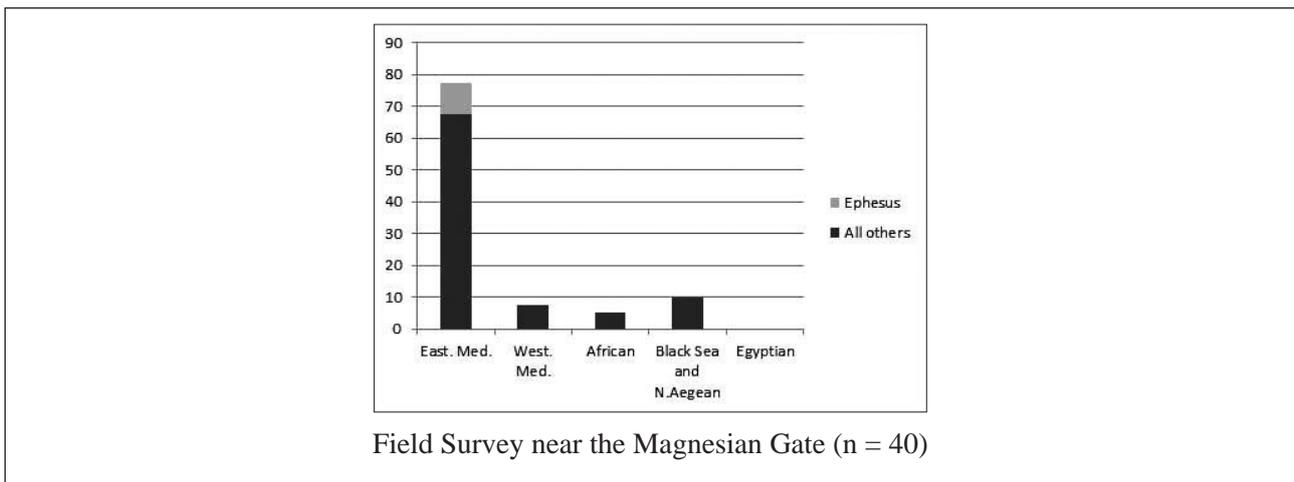


Fig. 29b The relative proportion of local and regional production and their distribution in the layers.

6. DISCUSSION

The study of the amphorae in Ephesus provides new information about the commerce of foodstuffs in the eastern Mediterranean region. Some of the typological, epigraphic and petrological data have confirmed our previous knowledge, other information is new.

The bulk of the amphorae from the Hellenistic period come from local production. They are mixed with amphorae from neighbouring Greek areas (Rhodes, Knidos, Kos, the northern Aegean, central Asia Minor). After the second Punic war, a number of well-known Romans visited Ephesus during the beginning of the second century B.C. There are, however, very few amphorae from the western Mediterranean. Whenever the port was under blockade, the inhabitants could buy from Asia what they needed. Ephesus and the Greek areas were able to produce all the necessary foodstuffs for themselves and export the surplus. The situation changed after the Roman victory at Pydna (168 B.C.). The Hellenistic economic structure was transformed by the growing commercial role of Delos and the Roman inheritance of Pergamon. The special needs of the immigrant military and commercial administration were now satisfied from western Mediterranean import.

It is well-known that amphorae were produced in the vicinity of Ephesus and in the Cayster Valley. However, it is only now that petrological analyses have proved that the same raw material was used to produce the classical hydria and the Hellenistic (Nikandros group) and Late Hellenistic (Local 1 and 2) amphorae. It is also known that from the middle of the first century B.C., from the very beginning of the Augustan period, the one-handle jars of new design, the Late Roman 3 and Ephesus 56 amphorae, were made from similar micaceous fabrics. However, the raw material used was not entirely homogeneous. There are two groups. One of them contained large amounts of garnet, the other epidote. There are very fine, fine and coarse fabrics within both groups. The distribution of the Hellenistic Nikandros group amphorae in the eastern Mediterranean is well-known. No Local 1 and 2 amphorae have been found at other sites. The distribution of the new one-handle jars is wider from the end of the first century B.C. They are found in France, in the Rhône Valley, in the new military camp of Haltern in the north, in the Magdalensberg commercial centre, in Comacchio in the northern Adriatic region, in Athens and Pergamon. Ephesian amphorae spread to new areas in the second and third centuries A.D. It is significant that when the Emperor Diocletian introduced price limits, Ephesus was mentioned in three contexts (Alexandria, Nikomedia, and the East). This may not reflect all the commercial relationships Ephesus had at the time. The occurrence of Ephesian amphorae at various sites provides more reliable data. The LR 3 amphorae are found everywhere from Britain to India in the Late Imperial period. This may be related to the Late Roman reform of the military and the *annona militaris*.

One-handle jars were produced outside Ephesus as well. There are hardly any centres of production known, but there must have been workshops near Pergamon and Sardis, as the shapes and finish of these vessels found at the latter two sites was different from the ones produced in Ephesus. Three types of fabric can be distinguished on the basis of the amphorae found in Athens, Carthage, Britain and France. The jars produced outside Ephesus co-occur with the ones (e.g. Agora M 125) from Ephesus in the second and third centuries A.D., especially at the settlements around the Black Sea and, to some extent, around the Mediterranean region. Copies of the LR 3 amphorae (Pieri B4) are found in association with LR 3 amphorae in the Late Roman period. The copies are micaceous but they have volcanic grains as well. Perhaps they were produced on the Island of Kos (Mastichari).

We now know that there are Rhodian and Cup-shaped amphorae (produced in the vicinity of Ephesus or in the Cayster Valley) in the Augustan layer of the Ephesian Agora. Their quantity does not seem significant. Their shape and provenance is known.

Petrological analyses of Rhodian amphorae showed that they were produced at five sites in Rhodes and the Rhodian Paraea. In addition, the only evidence that the Rhodian type amphorae was produced on the Island of Kos in the first century B.C. can be found among the amphorae of Ephesus. One of these amphorae even

has the Rhodian trade mark, the rose. The petrological analyses of the amphorae of the workshop found in the New Cemetery in the City of Rhodes can be used as a clue in the identification of the amphorae produced on the Island.

What kind of effect did the Roman political and military buildup in the eastern Mediterranean during the first century B.C. have on the economy? There are only two politically significant figures, C. Curtius Postumus and P. Vedius Pollio, who can be connected to the amphorae found in Ephesus. Postumus produced wine and fish products on his estates in Italy during the middle of the first century B.C. He used the forms Dressel 1B, Dressel 2–4 and Dressel 21–22 amphorae and sent them to the eastern Mediterranean. His business in Ephesus and in the eastern region was organised by his freedmen. He had close connections with Curtius Nikias the tyrant of Kos. They must have had some sort of economic relationship as well. Although hard to prove, it is possible that he switched from the Dressel 1B to the more economical Dressel 2–4 type, patterned on the Koan amphorae, on the basis of his experience in Kos. The Dressel 2–4 amphora was started near Brindisi and Pompeii during the 70's B.C. Varieties of this type were produced for a long time. Vedius Pollio, in addition to his official mission in Ephesus, used his influence on the Greek islands⁷⁵¹. His stamps occur on Koan and Chian amphorae.

The petrological analyses have raised a number of issues. There was a demand for wine from Campania and Adria, olive oil from Brindisi. They came in Dressel 1, Lamboglia 2 and Brindisi amphorae. Some of the Dressel 1C amphorae came from Campania. They contained wine. Other Dressel 1C amphorae came from Spain (Algeciras). They probably contained fish sauce.

The petrological data show that there were at least four Lamboglia 2 centres of production that sent amphorae to Ephesus. Three centres produced both Brindisi and Lamboglia 2 amphorae. The other group was probably produced on the Dalmatian coast. The data published recently suggest that there was production on the Island of Issa, around the area of Naron and on the neighbouring islands.

The last third of the first century B.C. brought prosperity to the Empire. The supply of the armies in the provinces demanded greater agricultural output. A number of amphora types were replaced by new ones. The well-known Dressel 1B was replaced by the Dressel 2–4 and the Lamboglia 2 by the Dressel 6A. M. Herennius Picens was not only a politician, but a wine producer as well. He was *consul suffectus* and became the proconsul of *Asia* under Augustus.

Significant pieces of evidence of the Early Imperial production in *Baetica* have been found. They contained wine, olive oil, fish sauce and *defrutum/sapa*. The Haltern 70 and the Lomba do Canho 67 amphorae were rarities in the eastern provinces.

There is an unsolved problem in the Mid-Imperial period. The provenance of the Kapitän 2 amphorae, despite various proposals and examinations, can still be regarded as a problem. None of the amphorae found in Ephesus were produced locally, even if they were supposed to have been produced near the Magnesians gate. The petrological analyses do not support such a hypothesis. The fabric of the amphorae produced locally is entirely different. The problem is even more complex because the fabric of the Kapitän 2 amphorae found in Egypt and in the northern provinces is characteristic of Ephesus. The search for the production workshops continues.

Ephesus had a different role in the Late Roman period. The Temple of Artemis was destroyed by the Christians, and the city was damaged by earthquakes. Two important synods of the new religion were held in Ephesus. New temples were erected and some of the old buildings were reconstructed. The quantity of wine and olive oil produced in the Cayster Valley grew. The number of amphorae present increased significantly, which can be pointed out throughout the Mediterranean⁷⁵².

⁷⁵¹ Syme 1961; Scherrer 1990.

⁷⁵² See Types 5–7. 20–21. 54–56.

6. TARTIŞMA

Efes’de gerçekleştirilen amfora araştırması Doğu Akdeniz Bölgesindeki gıda maddeleri alışverişi hakkında yeni bilgiler kazandırdı. Elde edilen bazı tipolojik, epigrafik ve petrolojik sonuçlar bilimin şuan ki seviyesini doğrulasada, bazı elde edilen diğer bilgiler ise yeniydi. Bulunan helenistik amforaların büyük bir bölümü yerel üretimden elde edilmiştir ve bunun yanısıra bazı amforalar Rhodos, Knidos, İstanköy, Kuzey Ege ve Küçükasya gibi Yunan bölgelerine aittir. İkinci Pön Savaş’ından sonra, MÖ ikinci yüzyılda birçok Romalı Efes’e gelmiştir, fakat Batı Akdeniz Bölgesine ait çok az amfora bulunmuştur. Liman kapalı olduğu zaman yerliler ihtiyaç duyulan gıda maddelerini Asya bölgesinden elde ediyorlardı. Efes ve diğer Yunan bölgeleri sayesinde gerekli olan gıda maddeleri bu bölgelerde üretiliyor ve fazlalık ise ihracat ediliyordu. MÖ 168 yılında Roma’lıların Pydna savaşını kazanmasıyla bu durum değişti: Yunan ekonomisi Delos kentinin giderek gelişen ekonomik rolü sayesinde ve Pergamon kentinin Roma’lılardan kalan mirasıyla değişim yaşamaya başladı. Askeri ve ekonomik yönetiminin özel istekleri bundan sonra Batı Akdeniz Bölgesinden ithalat sayesinde tatmin ediliyordu.

Amforaların Efes ve Küçük Menderes yakınlarında üretilmiş olduğu bilinmektedir. Elde edilen petrografik sonuçlar sayesinde bulunan ana maddenin klasik Hydria amforasının yapımında, bunun yanısıra hem helenistik Nikandros grubu amforaların hemde geç helenistik amforaların (Local 1 ve Local 2) yapımında kullanıldığı ortaya çıkmıştır. Bunun dışında bildiğimiz, MS birinci yüzyılda, İmparator Augustus zamanının başlangıcında, yeni imalat edilen tek kulplu testilerin (Geç Romalı 3 ve Efes 56 amforaları) bu ana maddeye benzer Mika içerikli bir maddeden yapılmış olmalarıdır. Fakat ana madde tamamiyle homojen değildi ve iki gruba ayrılıyordu: yüksek oranla Garnet ağırlıklı birinci grup ve Epidot ağırlıklı başka bir ikinci grup. Bu iki grup arasında çok ince yapı farklılıkları bulunmaktaydı. Nikandros grubuna ait olan helenistik amforaların Doğu Akdeniz Bölgesindeki yüksek dağılımı bilinmektedir. Local 1 ve 2 buluntuları başka hiçbir bölgede bulunmamıştır. Fakat MÖ birinci yüzyılın sonundan itibaren üretilen tek kulplu yeni testiler çok daha fazla tanınıyordu. Bu tarz testiler Fransa’da, Rhône vadisinde, Haltern bölgesinin kuzeyindeki yeni Castrum’da, Magdalensberg bölgesindeki iktisat merkezinde, Adria’nın Kuzey kısmındaki Comacchio kentinde, Atina ve Pergamon’da bulunmuştur. MS ikinci ve üçüncü yüzyılda bu tarz Efes amforaları başka yeni alanlara dağıtılmıştır. Roma İmparatorlarından Diocletianus’un fiyat sınırlaması yapmasından sonra, Efes kentinin adı üç farklı konumda anılmaktadır (İskenderiye, Nikomedia ve Doğu’da). Tabiki bu isimler o zamanki Efes’deki tüm alışveriş ilişkilerini yansıtmamaktadır. Efes amforalarının birçok farklı bölgelerinde bulunması bu alışveriş ilişkileri hususunda daha emin sonuçlar vermektedir. Geç Antik zamanından kalan LR 3 amforaları Britanya’dan Hindistan’a kadar bulunmaktadır. Bu gerçek herhalde büyük ihtimalle zamanın askeri şekillenmesiyle ve *annona militaris adi verilen* senelik askeriye vergisiyle bağlantılıdır.

Tek kulplu testiler Efes kenti sınırları etrafında da üretiliyordu. Tanınmış üretim alanları halen bilinmese de, Pergamon ve Sardis yakınlarında imalat yerlerinin bulunmuş olması lazım, çünkü orda bulunan testilerin şekil ve yüzeyleri Efes’de üretilen testilere benzemiyordu. Atina, Kartaça, Britanya ve Fransa’da elde edilen amforalar sayesinde üç farklı malzeme çeşiti ayırt edilmektedir. MS ikinci ve üçüncü yüzyılda Efes sınırları dışında üretilen testiler, Efes sınırları içinde (mesela Agora M 125 modeli gibi) üretilen testilerle aynı anda bulunmaktadır. Bunlar özellikle Karadeniz Bölgesi ve kısmen Akdeniz Bölgesinde bulunmaktaydı. Antik Çağ sonunda Pieri B4 amfora kopyaları LR 3 amforalarıyla aynı zamanda bulunmuştur. Kopyalar Mika içerikli-dirler ve vulkanik granüllerle kaplıdır. Büyük bir ihtimalle İstanköy adasında üretilmişlerdir bunlar. Rhodos bölgesine ait ve fincan şeklindeki Efes ve Küçük Menderes bölgesinde imalat edilen amforaların ise, İmparator Augustus zamanı Efes Agorasında varolduğunu bugün biliyoruz. Sayıları önemli derecede yüksek olmasada, amforaların şekilleri ve bulunduğu bölgeler bilinmektedir.

Rhodos amforalarının petrolojik araştırmaları sonucunda, bu çeşit testilerin Rhodos ve Rhodos’a ait Paraca bölgesinde beş farklı kısımlarda üretildiği ortaya çıkmıştır. Efes amforalarının arasında bulunan bir ima

bizlere MÖ birinci yüzyılda İstanköy’de Rhodos amforalarının imalat edildiğini göstermektedir. Bu amforaların birinde Rhodos amforalarının belirgin sembollerinden biri olan gül şekli bulunmaktadır. Rhodos kentinin yeni mezarlığında bulunan amforaların petrolojik araştırmaları sonucunda bulunan imalat yeri bu ada kapsamında üretilen amforaların belirlenmesinde bir ima olarak algılanabilir. MÖ birinci yüzyılda Doğu Akdeniz Bölge’sindeki Roma’lıların politik ve askeri silahlanmalarının ekonomiye hangi etkisi vardı? Siyasi alanda önemli olan sadece iki şahıs - C. Curtius Postumus ve P. Vedius Pollio - Efes’de bulunan amforalarla alakalı olabilirler. MÖ birinci yüzyılın ortasında *Postumus* İtalya’da bulunan mülkiyetinde şarap ve balık ürünleri imalat ediyordu. Kendisi Dressel 1B, Dressel 2-4 ve Dressel 21-22 amfora çeşitlerini kullanıyordu ve bunları Akdeniz Bölgesinin doğu bölgesine gönderiyordu.

Bu şahsın Efes ve Doğu’daki işlerini serbest bıraktığı kişiler yürütüyordu. *Postumus* İstanköy zalim hükümdarı *Curtius Nikeas*’la iletişim içerisindeydi. Bu iki şahıs büyük ihtimalle ekonomik ilişkiler içerisinde bulunuyorlardı. Kanıtlanması zor olsada, kendisinin İstanköy’de edindiği deneyimler sayesinde Dressel 1B amfora modelinden İstanköy amforasına benzer, daha ekonomik Dressel 2-4 modeline geçiş yaptığı büyük bir ihtimaldir. Dressel 2-4 amfora şekli Brindisi ve Pompeji bölgeleri yakınlarında, MÖ 70 yılında şekillenmeye başlamıştır. Bu şeklin benzerleri uzun bir süre üretilmiştir. P. Vedius Pollio’nun Efes’deki bilinmiş çalışmalarının yanı sıra, onun Yunan adalarındaki etkisi büyüktü⁷⁵³ ve Pollio’nun damgaları İstanköy/ Sakız Adası amforalarında bulunmaktadır.

Petrolojik araştırmalar birçok konuya değindi. Campania ve Adria asıllı şarap ve Brindisi asıllı zeytin yağı o zamanlar aranılıyordu. Bu maddeler Dressel 1, Lamboglia 2 ve Brindisi amforalarında transport ediliyorlardı. Dressel 1C amforalarının bazıları Campania bölgesinden geliyor ve içlerinde şarap taşınyordu. Diğer bulunan Dressel 1C amforaları İspanya’dan (Algeciras) geliyorlar ve büyük ihtimalle balık sosu içerikliydiler. Petrolojik sonuçlar gösteriyor ki Lamboglia 2 amforaları için en az dört imalat yeri bulunuyordu ve bu ürünler Efes’e gönderiliyordu. Üç imalat yerlerinde ise Brindisi ve Lamboglia 2 amforaları üretiliyordu. Diğer grup büyük ihtimalle Dalmaçya kıyısında imalat ediliyordu. Yeni yayınlanmış olan sonuçlar şunu gösteriyor ki, amforalar Norona bölgesi yakınlarındaki İssa adasında ve diğer yakın adalarda üretiliyordu.

MÖ birinci yüzyılın son otuz yıllık döneminde Roma İmparatorluğu zenginlik yaşıyordu. İmparatorluk ilçelerindeki askeri ordunun varolması daha büyük yöresel üretim ihtiyacını ortaya koyuyordu. Birçok amfora çeşitleri değiştirildi bu zamanda. En tanınmış Dressel 1B amfora şekli Dressel 2-4 amfora modeliyle değiştirildi ve Lamboglia 2 modeli ise Dressel 6 modeliyle yer değiştirdi. Herennius Picens sadece politikacı değildi, aynı zamanda bağcılıkla uğraşıyordu; kendisi *consul suffectus* görevindeydi ve İmparator Augustus altında Asya’nın Prokonsül görevini üstlendi.

Hispania Baetica bölgesinde İmparatorluğun başlangıç zamanına ait üretimlere dair önemli kanıtlar bulunmuştur. Bu amforalarda şarap, zeytin yağı, balık sosu ve *defrutum/spata* bulunmaktaydı. Haltern 70 ve Lomba do Canho 67 amforaları doğu eyaletlerinde nadir bulunurdu.

İmparatorluğun orta döneminde çözülmemiş bir sorunla karşılaşılıyor burda. Kaptan 2 amfora şeklinin nereden geldiğini farklı önerilere ve araştırmalara rağmen halen bilmiyoruz. Efes’de bulunan hiçbir amfora, Magnesia kapısı yakınlarında üretilmiş denildiği halde, yerli imalat değildir.

Petrolojik analizler bu hipotezi desteklemektedir, çünkü yerel üretilen amforaların bileşimi tamamen başkadır. Sorun fazla boyutlu olmaktadır, çünkü Mısır ve kuzey eyaletlerde bulunan kaptan 2 amfora Efes için karakteristiktir. İmalat yerinin arayışı halen devam etmektedir.

Antik Çağ sonlarında Efes daha başka bir rol oynuyordu. Artemis Tapınağı Hıristiyanlar tarafından yıkılmıştı ve kent depremler sayesinde alt üst edilmişti. Yeni inancın iki önemli kilise meclisi Efes kentinde buluştu. Yeni tapınaklar yapıldı ve bazı eski binalar tekrar yenilendi. Küçük Menderes’de üretilen şarap ve zeytin yağının miktarı çoğaldı ve böylelikle kullanılan amfora sayısı belirgin bir sayıda yükseldi. Tüm bu gelişmeler Akdeniz Bölgesi’nin tamamında gözlemlendi.⁷⁵⁴

⁷⁵³ Syme 1961; Scherrer 1990.

⁷⁵⁴ Siehe Typen 5-7.20-21.54-56.

7. PETROLOGY

The principal objective of this study was to assess the mineralogical and petrographical composition of Tetragnonos Agora and Terrace House 2 amphora sherds and to compare them with data from former analyses, published data, and raw materials⁷⁵⁵.

135 amphora fragments have been investigated and described, collected at a number of sites in Ephesus. In addition 39 reference samples⁷⁵⁶ have been analysed.

How to use the tables and graphs

Analytical methods

The amphora samples were studied using petrographical thin sections and, where possible, also using heavy mineral analysis.

Thin section analysis

Petrographical thin sections were used to characterise the various amphorae fabrics by their typical texture (optical properties of matrix, amount of temper, grain size, sorting, etc.) and also to obtain some provenance information by analysing the mineralogical–petrographical composition of their inclusions (temper).

Detailed semi-quantitative analyses have been performed only with thin sections of appropriate sample size and quality.

First by point-counting the proportion of matrix to temper was estimated (= volume percent).

Grains $> \approx 15\mu$ were considered as “temper”.

For a standardised characterisation of the “temper” particles and to enable graphical presentation of the results, the following method described below was applied.

The relative grain proportions were classified as follows:

Occurrences within one (representative) field of view		
“dominant”	(more than 20 grains):	a (80)
“very frequent”	(10–19 grains):	b (50)
“frequent”	(5–9 grains):	c (30)
“subordinate”	(2–4 grains):	d (15)
Occurrences within five fields of view		
“moderate”	(5–9 grains):	e (10)
“rare”	(2–4 grains):	f (5)
The very rare constituents were classified as follows:		
“very rare”	(more than one occurrence per thin section)	g (3)
“traces”	(one occurrence)	h (1)

All samples were analysed with the same magnification (x 200).

For graphical presentation, the estimated verbal frequencies were replaced by the numbers (given in parentheses).

⁷⁵⁵ Sauer 1995; Ladstätter – Sauer 2002.

⁷⁵⁶ Thin sections were partially provided by T. BEZECZKY. Preparation of additional petrographical thin sections and the heavy mineral separation was organised by B. PICHLER of the Institute of Art and Technology/Archaeometry.

Graphical comparisons with results derived by conventional particle counting (e.g. 300 temper grains per thin section) showed a very good comparability within the main constituents.

But the applied method is significantly faster. Furthermore, it also showed better results for the minor, but often more significant constituents, due to the fact that one is forced to screen the entire thin section. Grain size was estimated by the measuring of 50 temper grains. Sorting and roundness was estimated by standard comparison charts.

Heavy mineral analysis

Heavy mineral analyses were used to get independent provenance information and to facilitate the differentiation between the imported amphorae and local products. It was also possible to compare the results with available published and unpublished analyses of raw materials and local ceramic products⁷⁵⁷.

The heavy minerals were identified with the polarising microscope. If possible, 200 translucent heavy mineral grains (0.04 mm–0.125 mm) were counted per sample⁷⁵⁸.

⁷⁵⁷ Numerous, unpublished, heavy mineral analyses exist for raw materials and local pottery of Ephesus performed during former projects (e.g. Sauer 1995).

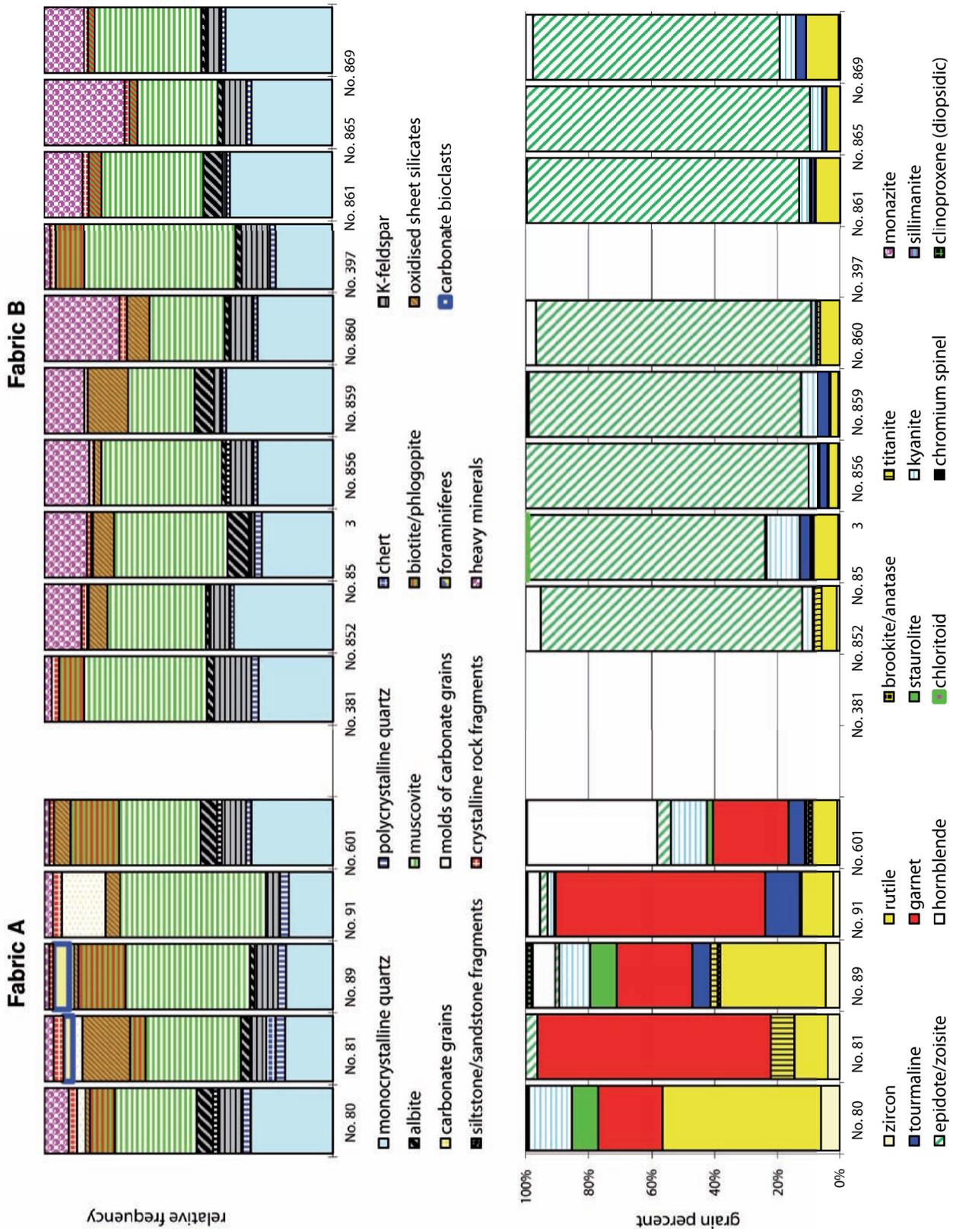
⁷⁵⁸ The details of the applied technique are described in Sauer 2005, 110 f.

**Petrological
tables and graphs**

Table 1

7. Petrology

Thin Section Results															
	No. 80	No. 81	No. 89	No. 91	No. 601	No. 381	No. 852	No. 853	No. 856	No. 859	No. 860	No. 397	No. 861	No. 865	No. 869
catalogue number															
monocrystalline quartz	b	d	c	d	b	c	a	b	b	a	b	c	a	b	a
polycrystalline quartz	f	g	f	g	g	g	g	f	g	g	g	g	g	g	g
chert		g					h			h					h
K-feldspar	d	f	d	f	d	d	d	g	d	f	d	d	g	d	e
plagioclase	g				g		h	h	g		h				h
albite	e	g	g		e	g	g	d	g	d	g	g	d	g	g
muscovite	b	c	a	b	b	b	a	a	a	b	b	a	a	b	a
biotite	d	f	c		c	e						d			
oxidised mica/biotite	g	d	g	f	e		d	d	f	c	d		e	f	f
carbonate grains			g				h	h							
molds dissolved carbonates	f	g		d											
foraminifera															
calcite bioclasts		g	e												
paste fragments non resorbed			h												
crystalline rock fragments	f	g	g	g	g	g	f	g	g	g	f	g	f	g	g
heavy minerals	d	g	g	g	g	g	c	c	c	c	b	g	c	b	c
opaque matter								b		c				b	
iron oxide concretions	d	d	c	d	d	d	a		b		b	d	b		b
vitrified particles/slag															
LEGEND: for further explanations see text (methodology)															
frequency: a: dominant, b: very frequent, c: frequent, d: subordinate, e: moderate, f: rare, g: very rare, h: traces															
Heavy Mineral Results															
	No. 80	No. 81	No. 89	No. 91	No. 601	No. 381	No. 852	No. 853	No. 856	No. 859	No. 860	No. 397	No. 861	No. 865	No. 869
catalogue number															
zircon	5,9	3,7	4,4	2,0	0,8	n.a.	0,9	0,5	0,5	0,5		n.a.			0,5
rutile	50,7	11,1	33,6	10,5	8,3	n.a.	4,7	8,2	2,9	2,3	6,1	n.a.	7,7	4,3	10,3
brookite/anatase			0,9	0,5	1,2	n.a.		0,5		0,5		n.a.			
titanite		7,4	2,2		0,8	n.a.	2,8	0,5	0,5		0,9	n.a.	0,5		
monazite					0,4	n.a.						n.a.			
tourmaline			5,8	11,0	5,1	n.a.	0,5	3,4	2,4	3,8	0,9	n.a.	1,0	1,4	3,3
garnet	20,5	74,1	23,9	66,5	24,0	n.a.			0,5			n.a.	0,5		
staurolite	8,3		8,4	0,5	2,0	n.a.						n.a.			
kyanite	13,7		9,7	2,0	11,4	n.a.	3,3	10,6	3,4	5,6	1,4	n.a.	3,4	3,8	5,2
sillimanite	0,5					n.a.		0,5				n.a.			
epidote/zoisite		3,7	1,3	2,5	4,3	n.a.	83,0	75,5	89,8	86,4	87,3	n.a.	86,5	90,4	78,4
hornblende	0,5		7,1	4,0	41,3	n.a.	4,7			0,5	3,3	n.a.			2,3
chloritoid						n.a.		0,5				n.a.			
andalusite			0,4			n.a.						n.a.			
chromium spinel						n.a.						n.a.			
clinoproxene (diopsidic)			0,4			n.a.				0,5		n.a.			
clinopyroxene (augitic)			1,3	0,5		n.a.						n.a.	0,5		
not identified			0,4		0,4	n.a.						n.a.			
grains counted	205	27	226	200	254	n.a.	212	208	205	213	213	n.a.	207	208	213



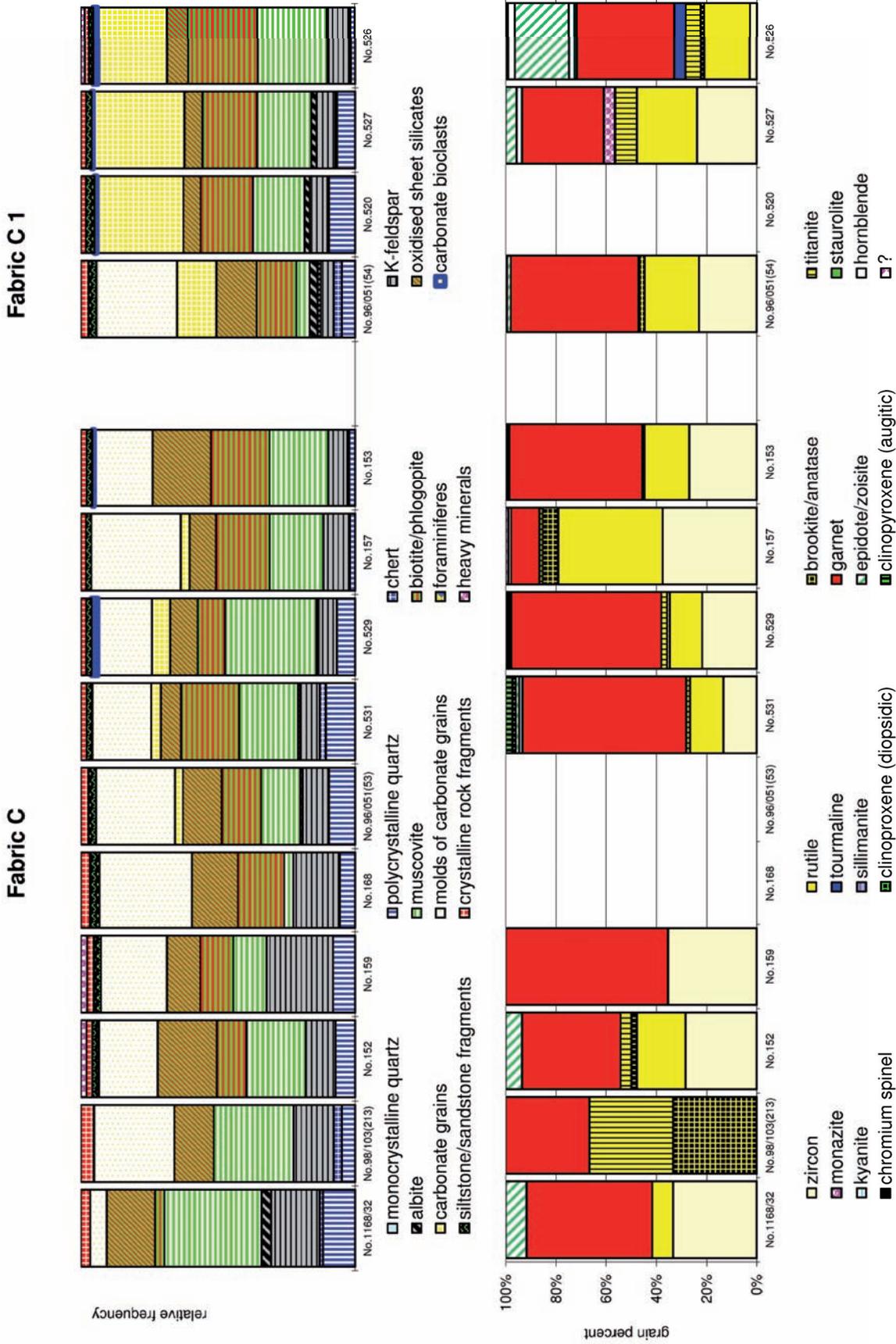
Ephesus Fabric A and B

Table 2

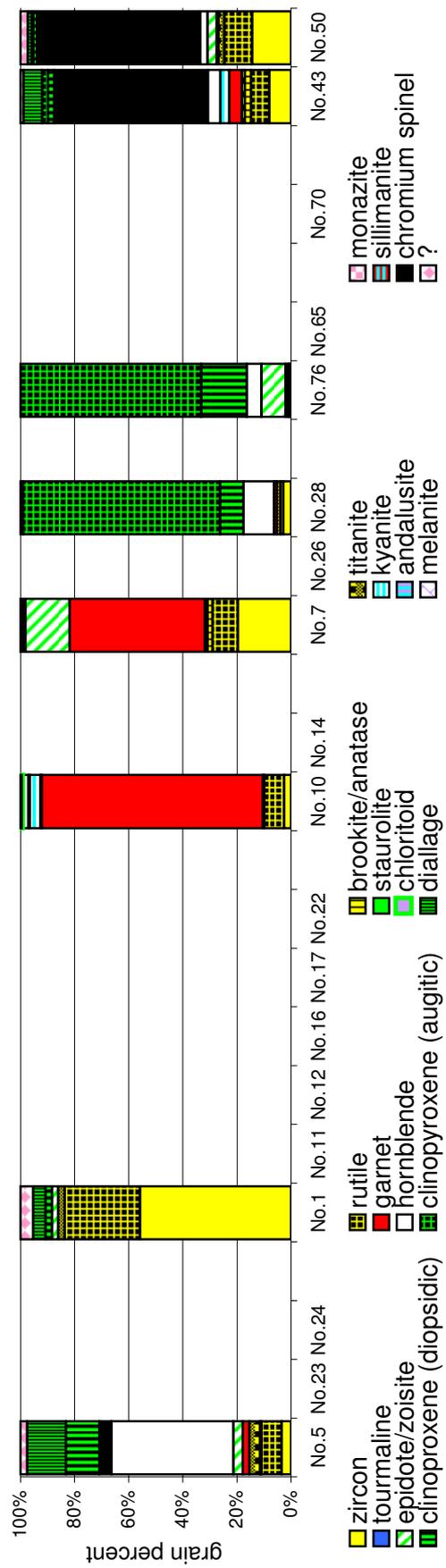
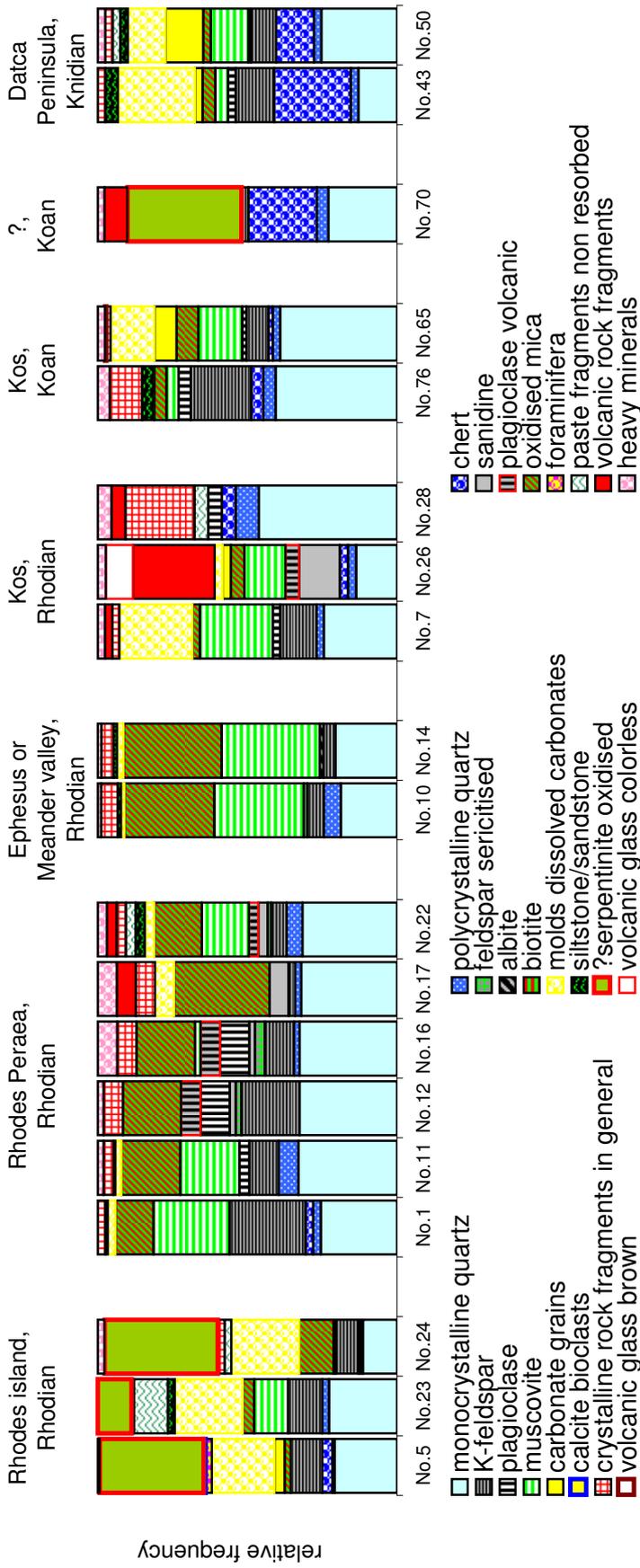
7. Petrology

Thin Section Results														
	No.1168/32	No.98/103(213)	No.152	No.159	No.168	No.96/051(53)	No.531	No.529	No.157	No.153	No.96/051(54)	No.520	No.527	No.526
catalogue number	b	b	c	c	c	b	c	c	c	c	b	c	c	c
monocrystalline quartz	e	f	e	e	f	e	d	e	g	g	f	d	e	g
polycrystalline quartz	h	g					g				h	g	h	h
chert	d	d	d	c	d	e	e	e	d	e	f	e	e	d
K-feldspar							h	h			h			h
plagioclase	g					h					g	g	g	
albite														
plagioclase volcanic														
muscovite	c	c	c	d	g	d	c	b	c	c	f	c	c	b
biotite	g		d	d	d	d	c	d	c	c	d	c	c	b
oxidised mica/biotite	d	d	c	d	d	d	e	d	d	c	d	e	e	d
carbonate grains						g	f	e	f		d	b	b	b
molds dissolved carbonates	f	c	c	c	c	c	c	c	b	c	c			
foraminifera														
calcite bioclasts								g		h		h	h	g
siliceous bioclasts														
plant remains														
siltstone/sandstone fragments			g	g	g	g	g	g	g	g	g	f	g	g
paste fragments non resorbed													g	h
crystalline rock fragments	g	f	g	g	g	g	g	g	g	g	g	g	g	g
heavy minerals			g	g										g
opaque matter														
iron oxide concretions	c	c	c	c	c	b	b	c	c	c	b	c	c	b
vitrified particles/slag														
LEGEND: for further explanations see text (methodology)														
frequency: a: dominant, b: very frequent, c: frequent, d: subordinate, e: moderate, f: rare, g: very rare, h: traces														
Heavy Mineral Results														
	No.1168/32	No.98/103(213)	No.152	No.159	No.168	No.96/051(53)	No.531	No.529	No.157	No.153	No.96/051(54)	No.520	No.527	No.526
catalogue number	33,3		28,3	35,3	n.a.	n.a.	13,3	21,8	37,5	26,9	23,1	n.a.	23,9	2,7
zircon	8,3		19,6		n.a.	n.a.	13,3	12,8	41,7	17,8	21,6	n.a.	23,9	18,3
rutile		33,3	2,2		n.a.	n.a.		1,1	6,3	0,9	2,0	n.a.		1,4
brookite/anatase		33,3	4,3		n.a.	n.a.	1,3	2,2	1,0			n.a.	8,7	5,9
titanite					n.a.	n.a.						n.a.	4,3	
monazite					n.a.	n.a.					0,5	n.a.		4,6
tourmaline	50,0	33,3	39,1	64,7	n.a.	n.a.	65,3	59,8	11,5	53,0	50,8	n.a.	32,6	38,8
garnet					n.a.	n.a.						n.a.		0,9
staurolite					n.a.	n.a.	1,3	0,6	1,0	0,5		n.a.	2,2	2,3
kyanite					n.a.	n.a.						n.a.		
sillimanite	8,3		6,5		n.a.	n.a.	1,3	0,6		0,5	1,5	n.a.	4,3	21,5
epidote/zoisite					n.a.	n.a.				0,5	0,5	n.a.		2,7
hornblende					n.a.	n.a.						n.a.		
chloritoid					n.a.	n.a.						n.a.		
andalusite					n.a.	n.a.						n.a.		
chromium spinel					n.a.	n.a.		0,6				n.a.		
clinoproxene (diopsidic)					n.a.	n.a.	1,3					n.a.		
clinopyroxene (augitic)					n.a.	n.a.	2,7	0,6				n.a.		0,5
diallage					n.a.	n.a.						n.a.		
grains counted	12	3	46	17	n.a.	n.a.	75	179	96	219	199	n.a.	46	219

Ephesus Fabric C and C1



Ephesus Fabric C and C1

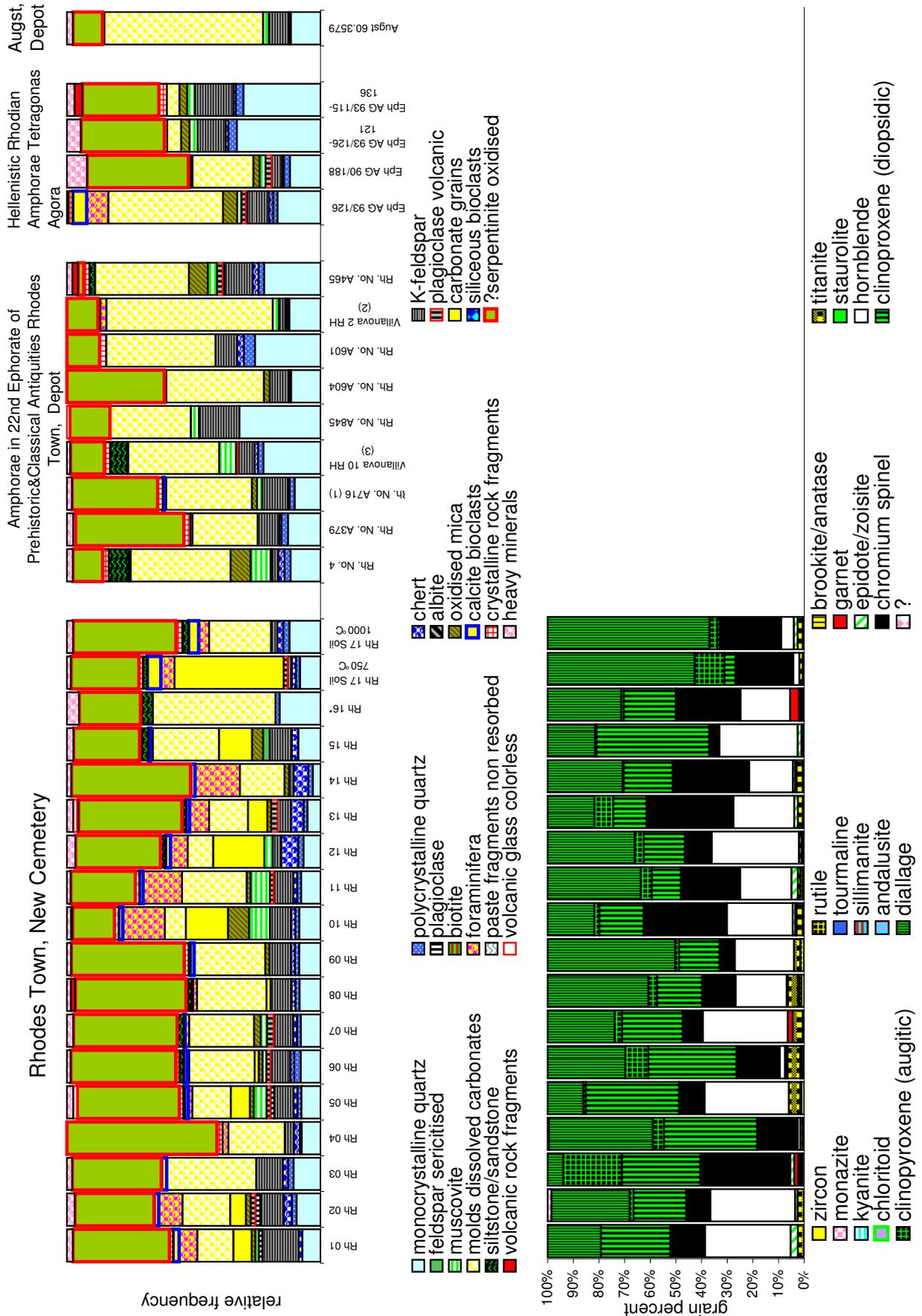


Rhodian, Knidian Ephesian and Koan Fabric

Table 4

7. Petrology

Thin Section Results																																		
petrographical composition of the temper grains																																		
	Rh 01	Rh 02	Rh 03	Rh 04	Rh 05	Rh 06	Rh 07	Rh 08	Rh 09	Rh 10	Rh 11	Rh 12	Rh 13	Rh 14	Rh 15	Rh 16*	Rh 17 Soil 750°C	Rh 17 Soil 1000°C	Rh. No. 4	Rh. No. A379	Rh. No. A716 (1)	Rh. No. Villanova 10 RH (3)	Rh. No. A845	Rh. No. A604	Rh. No. A601	Rh. No. Villanova 2 RH (2)	Rh. No. A465	Eph AG 93/126	Eph AG 90/188	Eph AG 93/126-121	Eph AG 93/115-136	August 60.3579		
catalogue number																																		
monocrystalline quartz	d	d	d	e	d	d	d	d	d	d	d	d	d	d	d	e	d	d	d	d	d	d	b	c	d	c	d	c	c	d	c	d		
polycrystalline quartz		g	g	h	g	f	g	g	g	g	g	g	g	g	g	h	g	g	g	g	g	g	f	c	d	c	d	c	d	c	d			
chert	g	f	g	g	g	g	g	g	g	g	g	g	g	g	g	e	h	g	g	g	g	g	g	h	h	g	g	g	g	h	h	h		
K-feldspar	c	d	d	f	d	c	d	d	d	d	d	d	e	e	e	e	g	g	g	g	e	d	d	d	e	e	g	d	d	f	e	d	e	
feldspar sericitised																g																		
plagioclase	g	g			g														h								h							
albite																																		
plagioclase volcanic		g			g	g	f			g		f					g						h				g	g	g					
muscovite	g				e	g	f			d	d	f							e	g	d	g				g	f	g	g	g	g	g		
biotite																																		
oxidised mica/biotite	g	g			g	g	f		g	d	g		g	g	f				e	g				g			e	e	g	g	g	g		
carbonate grains	d	e			d	g		g		c		c	d		d		a																	
molds dissolved carbonates	c	c	b	c	c	b	b	b	b	d	b	d	c	c	c	c	c	c	b	c	b	a	c	b	b	a	b	a	c	f	f	a		
foraminifera	d	d		g	g	h	g	g		c	c	e	d	c	h		e	f		h	h	h				g		d						
calcite bioclasts	f	g	g		g	g	h		g	g	g	g	g	g	g	h	e	f		h	h	h												
siliceous bioclasts								h											h															
siltstone/sandstone fragments					h	g	f	g	h			g	g			g	g	g	g	e			d				g		h					
paste fragments non resorbed										g	g																							
crystalline rock fragments	g			g	g	g		h	g							h		g	g	g	g	g	f		h	g	h	g	h	h	g	h		
?serpentine oxidised	a	b	b	a	a	a	a	a	a	c	b	b	a	a	c	d	b	b	d	b	b	c	d	b	d	d	g		b	c	c	d		
volcanic rock fragments								g		h			h														g							
volcanic glass (colourless)					g								g							h				h										
heavy minerals	f	f	g		f	g	f	g	g	g	g	f	f	g	g	g	g	g	g	g	g	g	g	h			g	h	e	f	g	g		
opaque matter	e	e	g		e	d	e	e	f	d	e	g																						
iron oxide concretions																																		
vitrified particles/slag			d	e																														
LEGEND: for further explanations see text (methodology)																																		
frequency: a: dominant, b: very frequent, c: frequent, d: subordinate, e: moderate, f: rare, g: very rare, h: traces																																		
Heavy Mineral Results																																		
	Rh 01	Rh 02	Rh 03	Rh 04	Rh 05	Rh 06	Rh 07	Rh 08	Rh 09	Rh 10	Rh 11	Rh 12	Rh 13	Rh 14	Rh 15	Rh 16*	Rh 17 Soil 750°C	Rh 17 Soil 1000°C	Rh. No. 4	Rh. No. A379	Rh. No. A716 (1)	Rh. No. Villanova 10 RH (3)	Rh. No. A845	Rh. No. A604	Rh. No. A601	Rh. No. Villanova 2 RH (2)	Rh. No. A465	Eph AG 93/126	Eph AG 90/188	Eph AG 93/126-121	Eph AG 93/115-136	August 60.3579		
catalogue number																																		
zircon				0,8	1,0	0,5														n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
rutile			0,8	0,5	0,5	0,5	0,5	1,0	1,5		0,5	1,0	0,5	0,5	0,5	0,5	0,5	0,5	0,5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
brookite/anatase			0,8			0,5		0,5												n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
titanite	2,4	2,5		1,0	4,5	5,0	3,9	3,9	2,5	2,5	1,0	1,0	1,9	2,4	0,5				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
monazite																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
tourmaline									0,5											n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
garnet			1,5			0,5	2,0			0,5				0,5		3,5				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
staurolite																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
kyanite																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
sillimanite																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
epidote/zoisite	2,9	1,0	1,5			0,5				1,0	2,5		1,4	1,0	1,5			1,5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
hornblende	33,3	33,0	0,8	1,0	32,8	2,0	33,0	19,9	23,2	25,6	20,1	34,0	23,7	17,1	30,5	19,3	2,3	5,0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
chloritoid																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
andalusite																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
apatite																				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
chromium spinel	13,5	9,5	34,4	15,9	10,0	16,9	7,9	13,1	5,9	32,5	23,0	10,5	33,8	29,8	4,0	25,2	22,5	23,9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
clinopyroxene (diopsidic)	27,1	20,5	30,5	36,2	36,3	34,3	23,6	17,5	15,8	17,2	11,3	16,0	13,0	19,0	44,0	20,3	4,2	1,0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
clinopyroxene (augitic)		1,5	22,9	4,3	1,0	9,0	3,0	3,4	1,5	2,0	4,4	3,5	7,2	0,5	0,5	1,0	11,7	3,0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
diallag	20,8	30,5	6,1	40,6	13,9	30,3	26,1	39,3	49,8	18,2	36,3	34,0	18,4	29,3	18,5	28,7	57,3	63,2	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
not identified		1,5		0,5															n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
grains counted	207	200	131	207	201	201	203	206	203	203	204	200	207	205	200	202	213	201	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	



Rhodian Reference Fabric

Table 5

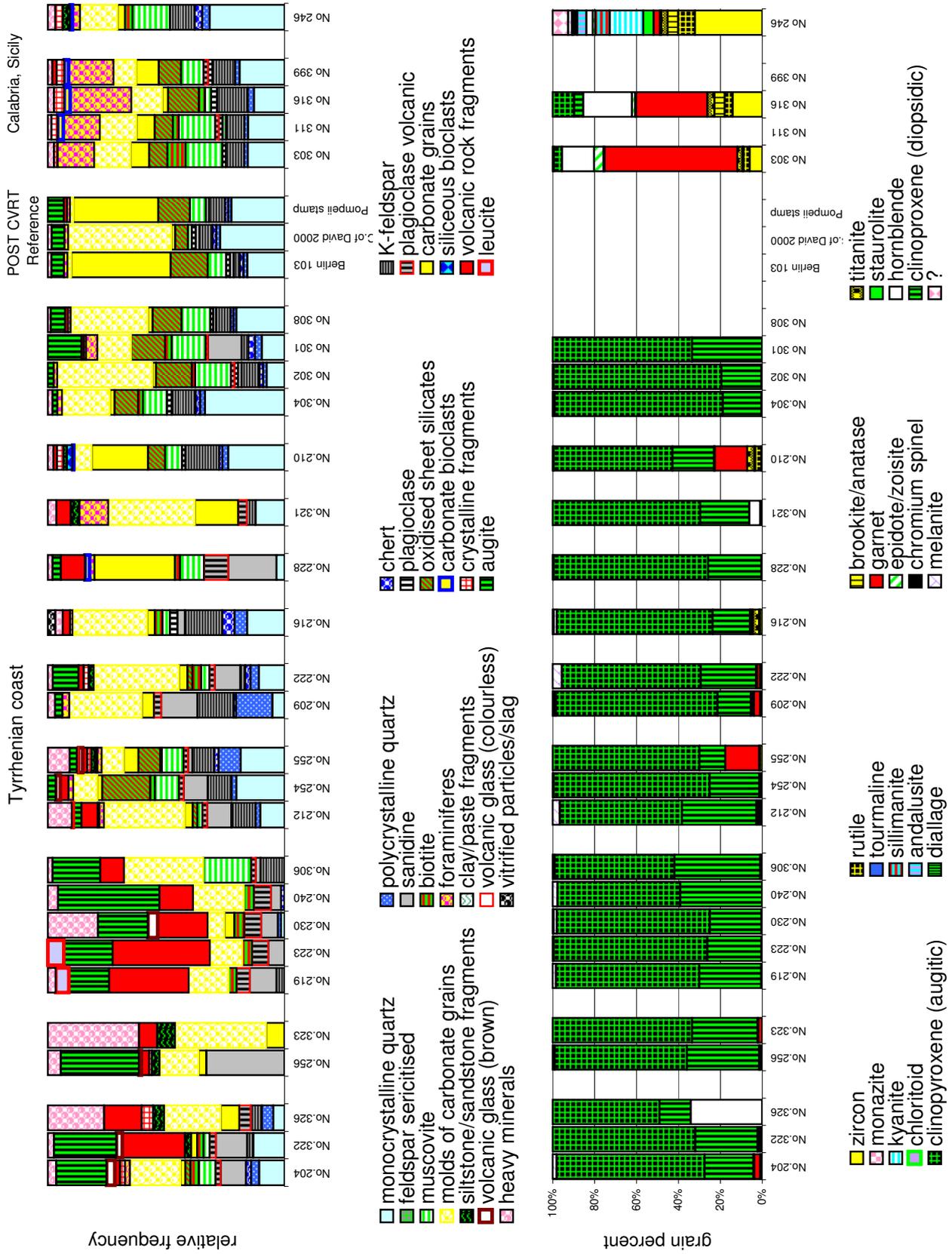
7. Petrology

Thin Section Results																																	
petrographical composition of the temper grains																																	
catalogue number	No.204	No.322	No.326	No.256	No.323	No.219	No.223	No.230	No.240	No.306	No.212	No.254	No.255	No.209	No.222	No.216	No.228	No.321	No.210	No.304	No.302	No.301	No.308	Berlin 103	City of David 2000	Pompeii stamp	No.246	No.311	No.316	No.399	No.246		
monocrystalline quartz	d	d	g					h			d	c	c	f	d	d	f	e	b	b	d	e	b	c	b	b	c	c	d	c	c		
polycrystalline quartz	f	g	g					h			g	g	d	d	f	f				g	g	g	g	g	g	g	g	g	g	g	g		
chert	g								h				g	h	g	f				g	g	e	g	g	g	g	g	g	g	g	g		
K-feldspar		g	g			g				d	d	d	d	d	g	d		g	c		d	d	g	d	f	e	d	d	d	d	e		
feldspar sericitised																																	
microcline																																	
perthite																																	
sanidine	d	d		c		e	f	f	g	g	d	d	g	d	d	g	c					g	d	g	g	g	g						
plagioclase																g				g	g	g		g	g	g		g	g	g	g		
albite																																	
plagioclase volcanic	g	g	g			f	f	f	f	g	g	g	g	g	g	d	g				g	h						g	g	g	g		
muscovite	e	g								c	g	d	d	f	g	d		d	d	d	c	d	c	d	g	d	c	c	g	g	d	d	
biotite	f	g				g	g	g	g				g	h		f	g	g			g	g	g	g			d	f	g	g	g		
oxidised mica/biotite	g												g	c	d	g				d	d	c	d	c	c	e	c	d	d	d	d		
carbonate grains	g	g	f	g	g			g			f	g	e	f	f	g	b	d	b	g	g		f	a	g	a	d	d	d	d	d	g	
molds dissolved carbonates	c	d	d	d	d	e	f	d	b	b	d	d	c	b	c			c	d	c	a	d	a	g	a	g	c	c	d	d	d	d	
foraminifera	g									g	g	g	g	g			g	e	h	g	g	f	g	g	g	g	c	c	c	c	g	h	
calcite bioclasts																	g		h									f	g	g	h		
siliceous bioclasts											h		h							f													
plant remains																																	
siltstone/sandstone fragments		g	g	g	g									g	g					g	g												g
paste fragments non resorbed																																	
crystalline rock fragments	g		g	h										g		g	h			6			h				g	f	f	f	g		
?serpentinite oxidised																																	
volcanic rock fragments	g	c	e	g	g	c	c	d	e	d	e	f	g		g	g	d	f	g			h	g			g						g	
tuff volcanic																																	
volcanic glass (brown)	f	g		h				g					g	g																			
volcanic glass (colourless)																																	
augite	c	c		c		d	d	d	c	c	f	f	f	g	d		f			g	f	d	d	e	e	d							
leucite						f	f				h																						
heavy minerals	f	g	d	f	d	g		d	g	g	d		d	g	g	g	g	g	f	g			g	g	g		f	g	g	g	g	g	
opaque matter			g	d	f			d	g				d		d																		
iron oxide concretions	d	f	c			g	f			c	c	d		d		c	d	d	c	c		c	d	e	d	c	c	d	d	d	d	e	
vitrified particles/slag															g																		

LEGEND: for further explanations see text (methodology)
 frequency: a: dominant, b: very frequent, c: frequent, d: subordinate, e: moderate, f: rare, g: very rare, h: traces

Heavy Mineral Results

catalogue number	No.204	No.322	No.326	No.256	No.323	No.219	No.223	No.230	No.240	No.306	No.212	No.254	No.255	No.209	No.222	No.216	No.228	No.321	No.210	No.304	No.302	No.301	No.308	Berlin 103	City of David 2000	Pompeii stamp	No.246	No.311	No.316	No.399	No.246			
zircon																																		
rutile	0,5										0,5		1	0,5	1				0,5		0,5			n.a.	n.a.	n.a.	n.a.	5,9	n.a.	14	n.a.	32		
brookite/anatase							0,5						0,5			0,5								n.a.	n.a.	n.a.	n.a.	3	n.a.	3,9	n.a.	8		
titaniite	0,5										1					3			3,4					n.a.	n.a.	n.a.	n.a.	2,5	n.a.	3,4	n.a.	3,1		
monazite																								n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0,6		
tourmaline																								n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
garnet	2,8	0,9		1	1,8	0,5				0,5	1	1	16	3	1,4	1	0,5	1	15			0,5		n.a.	n.a.	n.a.	n.a.	63	n.a.	34	n.a.	3,1		
staurolite																								n.a.	n.a.	n.a.	n.a.	0,5	n.a.	n.a.	n.a.	4,9		
kyanite																0,5								n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16		
sillimanite	0,5																							n.a.	n.a.	n.a.	n.a.	n.a.	0,5	n.a.	n.a.	6,8		
epidote/zoisite												0,5												n.a.	n.a.	n.a.	n.a.	4,5	n.a.	1,5	n.a.	1,2		
hornblende		0,9	34	0,5				0,5		0,5					0,5									n.a.	n.a.	n.a.	n.a.	15	n.a.	23	n.a.	3,1		
chloritoid																								n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
andalusite																								n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4,3	
chromium spinel		0,5			0,5									1,5						0,5				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,9		
clinoproxene (diopsidic)	23	30	15	34	31	30	26	25	39	41	35	24	12	16	26	18	25	23	20	18	19	33	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4,4	n.a.	0,6
clinopyroxene (augitic)	71	68	51	63	67	68	73	73	59	57	58	74	70	77	66	74	74	70	57	80	80	67	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
diallage																				0,5				n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
melanite	1,9			1	1,5		1,4	2,3	1	3,3	0,5			1	4,3	1,5	0,5			0,5	0,5		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,9	
not identified						0,5	0,5							0,5		0,5					0,5			n.a.	n.a.	n.a.	n.a.	n.a.	0,5	n.a.	n.a.	n.a.	7,4	
grains counted	211	216	202	203	221	203	206	208	220	208	209	207	204	202	208	203	205	210	208	213	206	206	n.a.	n.a.	n.a.	n.a.	n.a.	202	n.a.	206	n.a.	162		

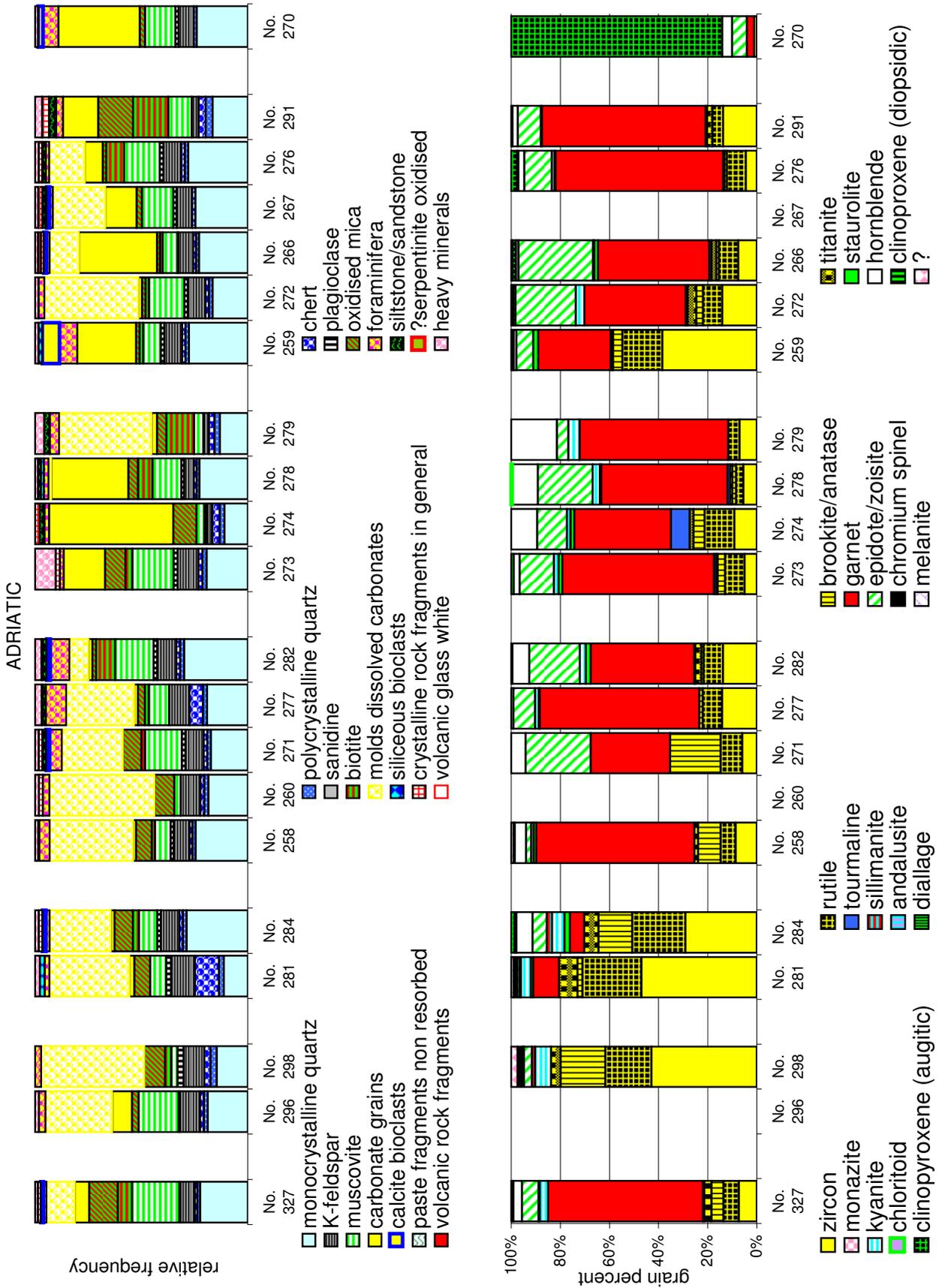


Italian Fabric Tyrrhenian Coast

Table 6

7. Petrology

Thin Section Results																					
petrographical composition of the temper grains																					
catalogue number	No. 327	No. 296	No. 298	No. 281	No. 284	No. 258	No. 260	No. 271	No. 277	No. 282	No. 273	No. 274	No. 278	No. 279	No. 259	No. 272	No. 266	No. 267	No. 276	No. 291	No. 270
monocrystalline quartz	b	c	d	d	b	b	c	c	c	b	c	d	b	d	b	c	b	b	b	d	b
polycrystalline quartz	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
chert	g	g	g	d	g	g	g	g	e	g	g	f	g	g	g	g	g	g	g	g	g
K-feldspar	d	d	e	d	d	d	d	d	d	d	d	g	e	g	d	d	d	d	d	g	d
feldspar sericitised																					
microcline																					
perthite																					
sanidine												h									
plagioclase	h	h	g	g	g	g		g		g	g	h	g		g	g	h	g	g		g
albite																					
plagioclase volcanic																					
muscovite	b	c	g	e	d	d	f	c	d	c	c	f	c	f	d	c	d	c	c	e	c
biotite	d	g		f	g	g	g	g	d	f	d	d	d	d	g	g	g	g	d	d	
oxidised mica/biotite	c	f	e	e	d	d	d	d	f	g	d	d	e	f	g	g	g	f	g	d	f
carbonate grains	d	d		g	g	g			g	g	c	a	a	g	b	g	a	c	d	d	a
molds dissolved carbonates	c	b	b	b	b	a	a	b	b	d			g	b		a	c	b	c		
foraminifera	g	f	g	g	g	e	f	e	d	d	g	g	f	f	d	f	g	g	g	g	d
calcite bioclasts	g			g				g		g					d		g	g			f
siliceous bioclasts				g		h							g		g			h			
plant remains																					
siltstone/sandstone fragments								g	g	g		g	g	g				g	g	g	
paste fragments non resorbed																					
crystalline rock fragments	g				g		g	g		h	g	g					g	g	g	g	
?serpentinite oxidised																					
volcanic rock fragments																	g				
tuff volcanic																					
volcanic glass (brown)																					
volcanic glass (colourless)																		h			
augite																					
leucite																					
heavy minerals	g	g		g	g	g	g	g	f	f	d		g	f	g	g	g	g	g	g	g
opaque matter																		g			f
iron oxide concretions	d	d	d	c	c	c	c	d	c	d	d	d	c	d	d	d	c	d	c	d	c
vitrified particles/slag																					
LEGEND: for further explanations see text (methodology)																					
frequency: a: dominant, b: very frequent, c: frequent, d: subordinate, e: moderate, f: rare, g: very rare, h: traces																					
Heavy Mineral Results																					
catalogue number	No. 327	No. 296	No. 298	No. 281	No. 284	No. 258	No. 260	No. 271	No. 277	No. 282	No. 273	No. 274	No. 278	No. 279	No. 259	No. 272	No. 266	No. 267	No. 276	No. 291	No. 270
zircon	7,3	n.a.	42,9	47,0	29,0	8,6	n.a.	5,9	14,1	13,7	5,0	9,1	5,4	7,0	38,4	14,0	7,5	n.a.	4,4	13,7	n.a.
rutile	6,3	n.a.	18,8	24,0	21,7	6,1	n.a.	8,8	7,8	7,8	8,0	12,1	3,0	4,7	16,3	7,9	8,0	n.a.	7,8	4,4	n.a.
brookite/anatase	4,9	n.a.	18,2	2,0	13,8	9,1	n.a.	20,6	1,5	1,0	3,0	4,5	1,5		3,7	2,6	1,0	n.a.	1,0		n.a.
titanite	2,9	n.a.	3,9	7,5	5,8	1,5	n.a.			2,5	0,5	1,5	1,0		0,5	3,5	2,0	n.a.	0,5	2,2	n.a.
monazite		n.a.					n.a.								0,5	0,9		n.a.			n.a.
tourmaline	0,5	n.a.					n.a.			0,5	1,0	7,6	1,0				1,0	n.a.		0,5	n.a.
garnet	63,1	n.a.		10,5	5,8	64,5	n.a.	32,4	64,9	42,2	61,7	39,4	51,5	60,5	29,5	41,2	45,3	n.a.	68,3	66,7	n.a.
staurolite		n.a.		1,0	2,2	1,0	n.a.		0,5	2,0	1,5	1,5	0,5		2,1		1,5	n.a.	0,5	0,5	n.a.
kyanite	3,4	n.a.	6,5	4,0	5,1	1,0	n.a.		1,5	2,5	2,0		3,0	4,7		3,5	0,5	n.a.	1,0		n.a.
sillimanite	0,5	n.a.	1,3	0,5	2,2		n.a.					1,5						n.a.			n.a.
epidote/zoisite	6,8	n.a.	3,2	1,0	5,8	2,0	n.a.	26,5	8,8	20,6	13,9	12,1	22,3	4,7	6,8	24,6	30,3	n.a.	11,2	9,3	n.a.
hornblende	3,4	n.a.	0,6		6,5	4,6	n.a.	5,9		6,9	2,5	10,6	10,4	18,6	1,1		1,0	n.a.	2,4	2,2	n.a.
chloritoid		n.a.					n.a.						0,5					n.a.			n.a.
andalusite		n.a.					n.a.											n.a.			n.a.
chromium spinel	0,5	n.a.	1,9	1,0			n.a.								0,5			n.a.	0,5		n.a.
clinoproxene (diopsidic)		n.a.		0,5	0,7		n.a.									0,9		n.a.			n.a.
clinoproxene (augitic)		n.a.			1,4	0,5	n.a.				1,0					0,9	1,5	n.a.	2,4		n.a.
diallage		n.a.					n.a.											n.a.			n.a.
melanite		n.a.				1,0	n.a.								0,5		0,5	n.a.			n.a.
not identified	0,5	n.a.	2,6	1,0			n.a.		1,0	0,5								n.a.		0,5	n.a.
grains counted	206	n.a.	154	200	138	197	n.a.	34	205	204	201	66	202	43	190	114	201	n.a.	205	183	n.a.



8. APPENDIX I

The Ephesian connections of a Roman banker. The case of Gaius Curtius Postumus

The amphorae stamped POST.CVRT on their rim reached Ephesus during the middle of the first century B.C. These Dressel 21–22 amphorae were unearthed at the Tetragonos Agora. The stamp identifies the producer as Gaius Curtius Postumus. He is well-known from the letters of Cicero as Postumus, Curtius, Curtius Postumus⁷⁵⁹. He also appears in the works of Caesar, Appian, Josephus Flavius and Horace⁷⁶⁰. His name can be found on stone inscriptions and on a papyrus discovered recently⁷⁶¹. H. DESSAU pointed out that his name was originally Gaius Curtius Postumus. He was adopted by his uncle C. Rabirius, whose name he used thereafter (Gaius Rabirius Postumus)⁷⁶².

C. Curtius Mithres, a freedman of Postumus, had a house in Ephesus. Cicero has nice words to say about Curtius Mithres and mentions that he spent some time in his house⁷⁶³. They kept in touch after Cicero left Ephesus. It seems likely that the freedman of Postumus represented his master in his business ventures in Asia Minor and that the business involved amphora commerce⁷⁶⁴. The amphorae of Postumus are not only pieces of direct evidence that link him to Ephesus, but are also valuable dating tools. The pieces found recently help to explain some details in his life and economic activities.

C. CURTIUS POSTUMUS' life and his role in Egyptian politics

Postumus started his career as a banker. He secured loans for Ptolemy XII Theos Philopator Philadelphos Neos Dionysos from a number of investors. The nickname of the king was Auletetes, i.e. flutist. Ptolemy was exiled in 58 B.C. In Rome he tried to gain the support of the Senate in order to return to Egypt with the backing of the Roman army. He lived in the Alban Villa of Pompey the Great⁷⁶⁵. He spent a large fortune and enormous loans to have the members of the Senate on his side. According to Suetonius, Caesar and Pompey received a bribe of six thousand talents⁷⁶⁶. However, the decision of the Senate was continually delayed, and Pompey was not authorised to conduct military maneuvers in the eastern Mediterranean region. Ptolemy got into an awkward position when some of the envoys sent from Egypt to Rome were killed and he decided to move to Ephesus in 56 B.C.⁷⁶⁷. He was still waiting for a favorable decision of the Senate. Ptolemy was joined by Postumus who was hoping that the loans could be repaid. The Senate did not support the invasion of Egypt. Gaius Portius Cato referred to the oracle in the Sibylline Books which stated that “the restoration of the King

⁷⁵⁹ Siani-Davies 2001, 38. The introduction to a new translation of Cicero discusses the life of Postumus, his political and economic activities.

⁷⁶⁰ Appian B.C. 2, 58, 59; Caesar B.Afr. 8 and 26; Horace Ode 2, 14; T. Josephus Ant. Jud. XIV, 10, 20; mentions Gaius Rabirius as a (pro)consul, although this has recently been debated; Eilers 2003, 7–13.

⁷⁶¹ CIL I², 773 = CIL, 7239; ILLRP, 399; Balconi 1993, 4 f.

⁷⁶² Cicero pro Rab. Post 17, 45; Dessau 1912, 320; The adoption may have taken place in 63–54 B.C., Siani-Davies 2001, 45; REI. A1. col.25 no. 6, ILS 9445; Callender 1965, 214; Wiseman 1971, 255 no. 353 C. Rabirius; Nicolet 1974, 863; Tchernia 1986, 117 note 234; Desy 1989, 225. 1154; Manacorda 1989, 451 note 32. 44; White 1995; Panella – Morizio forthcoming, no. 1480–1481.

⁷⁶³ Cicero Fam. 13, 69.

⁷⁶⁴ Bezeczky 2001b, 13.

⁷⁶⁵ Cicero Fam. 7, 17, 1; Cicero pro Rab. Post 6; Dio 39, 14, 3–4; Strabo XVII 1, 11.

⁷⁶⁶ Suetonius, Caesar 54.

⁷⁶⁷ Cassius Dio 29. 16. 3, 39. 16. 3, 39. 55. 1; Cicero Fam. 1, 1, 1; Cicero Att. 15, 15, 2; Cicero Har. 28; Siani-Davies 2001, 24. The Alexandrian delegation against Ptolemy was brutally attacked, probably in order to silence them. This may have been one of the reasons for the sudden departure.

by military force was forbidden by the gods⁷⁷⁶⁸. Ptolemy promised ten thousand talents to the governor of Syria, Aulus Gabinius to restore him to the throne⁷⁶⁹ and Gabinius invaded Egypt in 55 B.C.⁷⁷⁰. Mark Anthony took part in the campaign as a cavalry commander/legate⁷⁷¹.

Postumus followed Ptolemy to Alexandria. Neither the Treasury of Egypt, nor Ptolemy could repay the king's debts. New taxes were needed⁷⁷². Ptolemy placed Postumus in charge of debt repayment (*dioikētēs*)⁷⁷³. Postumus must have been somewhat unpopular as he ended up in prison after just one year. However, he escaped and went back to Rome only to discover that the Senate had charged him with using Roman troops for private purposes. Cicero, an old family friend, defended him successfully⁷⁷⁴. Some of the facts may have been distorted during the trial⁷⁷⁵. However, the ships were royal monopoly under Egyptian state control, and Postumus was the finance minister⁷⁷⁶. Although Postumus was acquitted of the charges against him, he probably used his power in Egypt to recover the investments of the Roman creditors⁷⁷⁷. These events are described in Cicero's letters. He mentions the father of Postumus and his economic activities⁷⁷⁸.

Postumus Curtius was more involved in politics than other bankers of the period. After his trial he handled the economic and financial matters of Julius Caesar. His biographers think Appian refers to him in connection with the movement of Caesar's army from Brindisi to Dalmatia⁷⁷⁹. Caesar also mentions this movement. Postumus joined Caesar in his African campaign⁷⁸⁰, where he had a similar logistical role as before at Brindisi. It seems likely he also helped Octavian with his finances. We do not know much about his old age and death. He may have retired to one of his villas. One of Horace's odes may be about this⁷⁸¹.

He became senator probably between 53 and 49 BC.⁷⁸² New research suggests that he did not return to Ephesus in 47 B.C. as the proconsul of Asia⁷⁸³. Still, his amphorae can be found in the Tetragonos Agora. It seems unlikely that he relied entirely on his freedman to handle his economic affairs in the eastern Mediterranean region.

Estates

The sources say he had estates in Campania and Apulia⁷⁸⁴. Cicero mentions that Rabirius's house in Naples was sold in 68 B.C.⁷⁸⁵. Cicero's friend Atticus wanted to buy the house. Horace mentions that Postumus had Caecuban wine in his cellar⁷⁸⁶:

⁷⁶⁸ Cicero pro Rab. Post. 2, 4; Fam. 1, 4, 2; 1, 7, 4.

⁷⁶⁹ Cicero pro Rab. Post. 8, 21; Plutarch, Antony 3, 2–5; Cassius Dio 39, 55, 3; Appian, Syr. 51.

⁷⁷⁰ Strabo XII 3, 34; Livy CV.

⁷⁷¹ Plutarch, Antony 3.

⁷⁷² Strabo XVII 1, 13.

⁷⁷³ Postumus was hoping to get back the money he lent. Strabo XVII 1, 13 referring to Cicero's remarks that the king's income from taxes was 12500 talents. The papyrus was published by Balconi 1993, 4 f.; Hölbl 2001, 229.

⁷⁷⁴ Cicero pro Rab. Post.; Strabo XVII 1, 11 says that when the exiled Ptolemaios Auletes arrived in Rome, he was received by Pompeius Magnus who recommended him to the Senate and achieved his return to Egypt.

⁷⁷⁵ Cicero pro Rab. Post. 14, 40; Siani-Davies 2001, 202–205.

⁷⁷⁶ Siani-Davies 2001, 204: "...those goods were nothing more than cheap imitations made from paper, linen, and glass; and, although many ships were loaded with these, the whole lot together could not equal the debt..."; Rostovtzeff 1998, 172.

⁷⁷⁷ Cicero pro Rab. Post. 8, 28.

⁷⁷⁸ Cicero pro Rab. Post. 2, 3.

⁷⁷⁹ Appian B.C. 14, 58 and 59, Postumius = Postumus; White 1995, 155; Siani-Davies 2001, 59.

⁷⁸⁰ Caesar B.Afr. 8, 26, 44; Cassius Dio 43, 6, 3.

⁷⁸¹ Horace Car. 2, 14; I am grateful for J. GYÖRGY SZILÁGYI who pointed out that Horace always wrote his poems to existing people. The information in his poems, however general, may contain references to the addressee.

⁷⁸² 49 B.C., Cicero, Ad fam. 2, 16, 7.

⁷⁸³ Siani-Davis 2001, 57.; Eilers 2003, 8–10.

⁷⁸⁴ Cicero Rab. Perd. 7–8; for his connections in Apulia see Siani-Davis 2001, 50 note 40; Wiseman 1971, 194 f.; Manacorda 1994, 49; Two Dressel 2–4 handle fragments thought to have been produced in Apulia: Blanc-Bijon *et. al.* 1998, 104 no. 782.

⁷⁸⁵ Cicero Att. 1, 6, 1. The house was bought by M. Fonteius in 68 B.C.

⁷⁸⁶ Horace Car. 2, 14; Pliny NH XIV, 61 remarks that the *Caecuban* wine production was discontinued: "Previously *Caecuban* wine had the reputation of being the most generous of all; it was grown in some popular woods on marshy ground on Bay of Amyclae, but the vineyard has now disappeared owing to the neglect of the cultivator".

*Absumet heres Caecuba dignior
Servata centum clavibus et mero
Tinguet pavimentum superbo,
Pontificum potiore cenis.*

This does not necessarily mean he had estates in that region. The workshops in his estates produced wine amphorae as well.

The amphorae and tegulae found in Paestum and Salernum may help to identify his estates⁷⁸⁷. Finding his workshop or workshops in Campania and Bruttium requires further research. The petrographical analyses of the amphorae exclude the possibility that they were produced in Apulia⁷⁸⁸. The heavy minerals are characteristic of the Campanian coast.

Amphorae

The POST.CVRT stamp and its variants have been found in a number of places. Recent research suggests that the Postumus workshops produced three different amphora types. The Dressel 1B and the Dressel 2–4 amphorae contained wine, Dressel 21–22 amphorae contained fruit or fish based products.

Dressel 1B

His Dressel 1B amphora (Fig. 30, no. 1) with a stamp on its handle was found in Pompeii⁷⁸⁹. This amphora and the Dressel 2–4 amphorae can show how two different types of amphora were produced consecutively or simultaneously within the same workshop.

Dressel 2–4

The other amphora type produced by the workshop of Postumus was the Dressel 2–4. The amphorae produced in Postumus's workshop probably belong to the earliest series of Dressel 2–4 type amphorae, although they cannot be dated precisely. They may have been produced during the middle of the first century B.C.

J. G. MILNE published a handle fragment with Postumus's stamp (no. 6) from the Cairo Museum in 1905⁷⁹⁰. The description leaves no doubt that it was a Dressel 2–4 amphora: "A double handle, formed of two small handles side by side: both are stamped." It has the stamp of the *vilicus* as well: DION(...). There are other Dressel 2–4 amphorae produced by Postumus in Egypt. The handle fragment (no. 7) found in Fayoum (Crocodyopolis – Arsinoé) has the stamp POST.CVRT (S–T and R–T in ligature) and the stamp of the *vilicus*: DI(...)⁷⁹¹. E. BRECCIA published a similar stamp from the Museum of Alexandria (no. 3). L. CRISCUOLO also mentioned this. His data were made more exact by J.–Y. EMPEREUR⁷⁹². There is another stamped handle fragment in the Museum of Alexandria (no. 2). This was mentioned by A. TCHERNIA⁷⁹³. The stamp (no. 8), now in the Berlin Antikensammlung, probably belongs to the same series⁷⁹⁴. Another type of stamp on a Dressel 2–4 amphora (no. 4) was found during the most recent excavation in Alexandria (the Diana Theater)⁷⁹⁵. Beside the POST.CVRT (S–T and R–T in ligature) stamp there is a symbol. The amphora also has the stamp of the *vilicus*: PAP (A–P in ligature). A similar stamp can be seen on the amphora in Blanda Iulia (Tortora, prov. Cosenza)⁷⁹⁶ (no. 5). The handle fragment in Paestum with the POS CVR stamp is an "ansa bifida"⁷⁹⁷.

⁷⁸⁷ CIL I² 2340d; Panella – Morizio forthcoming, no. 1480–1481; But Siani-Davis 2001, 40, an inscription found near Capua suggests that the Curtii came from Campania.

⁷⁸⁸ See Type 31, Dressel 21–22, reference material C. Postumus Curtius amphorae.

⁷⁸⁹ I am grateful for C. PANELLA for the photo and the sample.

⁷⁹⁰ Milne 1905, no. 26121.

⁷⁹¹ Criscuolo 1982, 131 no. 194; Desy 1989, 149 no. 1160.

⁷⁹² Breccia 1921, 20, note 9 inv. no. P 11603 (= Criscuolo 1982, 131), Empereur 1983, 310.

⁷⁹³ I am grateful for A. TCHERNIA, who has the photos of two different amphorae from Alexandria, for this piece of information. Blanc-Bijon *et. al.* 1998, 104 no. 782 mentioned as a Dr. 2–4 Apulien.

⁷⁹⁴ I am grateful to U. KÄSTNERNEK for granting me access to the collection. I am grateful to C. BÖRKER for mentioning that H. VON GAERTRINGEN had bought this handle in Paris during the 1920's or 1930's. He suggests its origin was Alexandria.

⁷⁹⁵ I am grateful for J.–Y. EMPEREUR, G. ŞENOL and K. ŞENOL for the rubbings and line drawing.

⁷⁹⁶ Panella – Morizio forthcoming, no. 1554b; Sangineto 2001, 208 fig. 1–2; Mollo 2001, 95 no. 9.

⁷⁹⁷ CIL X, 8042, 130; CIL I² 2340,b; Bamonte 1918, 90 no. 4; Desy 1989, 148 no. 1154; Nonnis 2001.

Dressel 21–22

The third type is represented by the Dressel 21–22 amphorae. The Ephesian amphorae are stamped on the rim: POST.CVRT (S–T and V–R–T in ligature). The same rim fragment and stamp (no. 14) was published from Jerusalem⁷⁹⁸. At first it was not possible to identify the type of the amphora on the basis of the rim alone. But the excavations in Ephesus produced a number of upper body parts and handle fragments which made it clear that these amphorae represent an early version of the Dressel 21–22 type. The handle fragments in Syracuse and in Vienna also belong to here⁷⁹⁹. The stamps were written in the same way but the actual die used was different. The handle fragment in Tarentum with the POST.CVRT (R–T in ligature) stamp has the stamp of the *vilicus* with Greek characters ΠΑ (Π–Α in ligature)⁸⁰⁰.

Another handle fragment with the stamp POS.CVR (V–R in ligature) was found in Koblenz. This fragment has been lost. The record states that the handle belonged to a large vessel⁸⁰¹. The amphora may have been taken to Germania during Caesar's campaigns. He crossed the river Rhine twice⁸⁰².

The stamps

The POST.CVRT stamps were first used on the Dressel 1B amphorae when Postumus was called C. Curtius Postumus, i.e. before his adoption by his uncle C. Rabirius. The adoption took place between 63 and 54 B.C.⁸⁰³. Postumus did not change his name on the amphorae. He used POST.CVRT as some kind of trade mark. The known pieces make it clear that he had more than one die. The stamps found make it clear that the POST.CVRT stamps had the letters S and T in ligature, as well as the letters R and T. On the other hand, the Dressel 21–22 amphorae had the letters S and T, and V, R, and T in ligature. The lost stamp of Koblenz also belongs here.

The handle fragment in Tarentum with the POST.CVRT stamp (R–T in ligature) has the stamp of the *vilicus* (ΠΑ) with Greek characters (Π–Α in ligature)⁸⁰⁴. This stamp is different from the previous two. However, the shape of the handle is similar to that of the Dressel 21–22 amphorae.

The stamps of the *vilicus* / workshop managers

In addition to the name of Postumus, there are three abbreviations on the amphorae: ΠΑ or ΑΠ with Greek characters and PAP, DI and Dion with Latin characters.

D. MANACORDA suggested that ΑΠ or Π–Α should be read as Ap(elles). In contrast, C. PANELLA reads them as Pa(...). There is an amphora in *Blanda Iulia* that has a PAP (with the A–P in ligature) stamp. The same stamp was found in a recent rescue excavation in Alexandria. Both the Postumus Curtius and the PAP stamps are entirely different than the rest of the stamps. There is a faded sign or symbol after the R–T ligature in the Postumus stamp.

Some scholars suggest that the abbreviation DI should be read either as Diphilus or as Dion(ysos)⁸⁰⁵. The amphora in Cairo has a Dion stamp. And it should not be forgotten that one of the freedmen of Postumus was called Dicaeus⁸⁰⁶.

⁷⁹⁸ Jerusalem, Ariel 1990, 78 no. 467.

⁷⁹⁹ Syracuse inv.no. 699, CIL I² 2340a = ILLRP, 1184 = CIL X 8051, 26; Callender 1965, 214 no. 1371; Desy 1989, 47 no. 225, mentioned as Lamboglia 2; Vienna, Kunsthistorisches Museum, Collection of Greek and Roman Antiquities inv.no. 479.

⁸⁰⁰ Tarentum (near S. Lucia), Viola 1885, 281 no. 203; CIL I² 2340c, Taranto National Museum inv.no. 210870; Callender 1965, 214 no. 1371; Manacorda 1989, 451 fig. 15 notes 32 and 44; I am grateful for D. MANACORDA.

⁸⁰¹ Dessau, 1912, 320, "breiter Henkel eines großen Krugs früher Form", Desy 1989, 52 no. 270, he listed in Lamboglia 2 amphorae.

⁸⁰² Caesar B.G. IV, 16–18 and VI, 9.

⁸⁰³ Siani-Davis 2001, 45.

⁸⁰⁴ See note 798.

⁸⁰⁵ Manacorda 1989, 455; C. PANELLA remarked that the Dressel 2–4 DION (N retrograde) stamp in the Cairo Museum may come from the workshop of Postumus. See Desy 1989, no. 1161; Milne 1905, 128 no. 26121.

⁸⁰⁶ The Dressel 2–4 amphorae often have the DICAË stamp. The amphorae in Pompeii and Vindobona are dated to later periods. Panella – Fano 1977, 176 fig. 45; CIL III, 15212 = Kenner 1900, 7 fig. 16 = Bezczy 2005a, 38.

The name of Postumus was given to a number of freedmen and women⁸⁰⁷. “Inscriptions found in and around Rome testify to his manumission of a woman called Helena and a number of men including Phileros, Bello, Hermodorus, Helnus, Dicaeus, and M. Hordeonius, the latter apparently being in the service of both Postumus and M. Hordeonius. It also has been suggested that the textual critic Nikias of Cos, known from Cicero’s letters and whom Suetonius called ‘Curtius Nikias’, could have been associated with Postumus, who was active in the eastern lands and possibly possessed a property in Kos, where Nikias was either a slave or a freedman’s son”⁸⁰⁸. Although Nikias was a *grammaticus* he had a political career and even had the supreme power for a few years, on the Island of Cos⁸⁰⁹. He ruled most certainly with the approval of Mark Antony who had power over the eastern provinces. It is an open question how the Greek amphora workshops were acquired by Roman aristocrats in the first century B.C. So far, only the stamps of Vedius Pollio have been found on amphorae produced in the Islands of Kos and Chios.

⁸⁰⁷ Dessau 1911, 618.

⁸⁰⁸ Siani-Davis 2001, 51 and note 44.

⁸⁰⁹ Höghammar 1993, 31.

1.		Pompeii, Dressel 1B, rim, neck, handle
2.		Alexandria, Inv. No. 722.18 K 0676 Dressel 2-4, Rim, neck, handle Tchernia 1986, 117
3.		Alexandria, Inv.No. P 11603, 103.12 Dressel 2-4, Rim, neck, handle Breccia 1921, 53, no. 282; Desy 1989, 149, no. 1159
4.	  	Alexandria, Inv.No. DI 0384 Dressel 2-4, Rim, neck, handle unpublished
5.		Blanda Iulia, Inv.No. 55560 Dressel 2-4, Handle Sanginetto 2001, 108.
6.		Cairo Dressel 2-4, Handle? Milne 1905, 128. no. 26121
7.		Fayoum Dressel 2-4, Handle Criscuolo 1982, 131, no. 194

Fig. 30 Stamps of Postumus amphorae

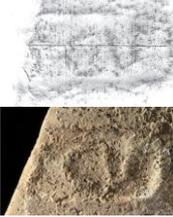
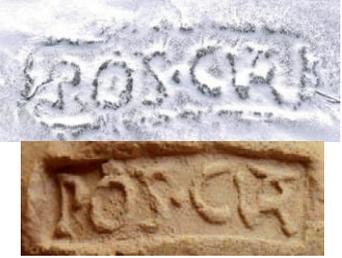
8.  Berlin, Inv.No.
Dressel 2-4, Handle
9. **POS CVR**
Paestum
CIL X, 8042, 130; CIL I² 2340,b; Bamote 1819, 90, no.
10.  Ephesus Cat. No.301
Dressel 21-22, Rim
11.  Ephesus Cat. No. 308
Dressel 21-22, Rim
12.  Syracuse, Inv.No. 699
Dressel 21-22, Handle
CIL X, 8051,26; CIL, I², 2340a; Desy 1989, no. 225
13.  KHM, Inv. No. 479, from Athens 1885
Dressel 21-22, Handle
14.  Israel, E3/12839, L. 1527
Dressel 21-22, Rim
Ariel 1990, 78, S 467
15.  Tarentum Nat. Mus. Inv.No. 210870
Dressel 21-22? Handle
Manacorda 1989, 457, Fig. 15.
16. **POST.CVR**
Koblenz
Type?
Dessau 1912, 320, (V-R in ligature)

Fig. 30 Stamps of Postumus amphorae

9. APPENDIX II

Caius Laecanius Bassus Caecina Paetus in Ephesus

The name of Laecanius Bassus occurs in an inscription in Ephesus. However, the amphorae of the Laecanius workshop are not among the objects recovered in any of the excavations. The Laecanius name was well-known from the age of Augustus to the reign of Vespasian. Two members of the equestrian family, father and son with the same name, C. Laecanius Bassus, were consuls in A.D. 40 and 64⁸¹⁰.

They produced olive oil on the Istrian peninsula and on the island of Brijuni in the northern Adriatic region. They delivered olive oil for the markets of four northern provinces: Raetia, Noricum, Pannonia and Dacia and also northern Italy. The workshop was started during the Middle/Late Augustan period⁸¹¹. Their stamped Dressel 6B amphorae have been found in more than 50 settlements and military camps. The amphorae had two stamps. One of them indicated the name of the owner, that is, the name of Laecanius, while the other indicated the name of the *vilicus*/estate manager⁸¹². The Laecanius amphora workshop and one of their villas was found in Fazana (9 kilometers north of Pula). Three other villas were found on the island of Brijuni⁸¹³. According to Pliny, the younger Laecanius, the consul for the year A.D. 64, died in 77⁸¹⁴. The older Laecanius, probably in an attempt to save the family's wealth, adopted one of the members of the Caecina senatorial family. However, the older Laecanius failed to rescue the wealth. After his death, the Emperor Vespasian took over the property and integrated it into the *res privata*. The amphorae were then stamped with the names of the Emperors up to Hadrian. The continuity of the workshop from Laecanius to the Emperors was reconstructed on the basis of the estate manager's stamps⁸¹⁵.

The adopted C. Laecanius Bassus Caecina Paetus was the proconsul of *Asia*. This was probably a compensation for the property Vespasian took away. It is supposed that he took office in Ephesus between A.D. 78 and 81⁸¹⁶. The water reservoir (Hydrekdochieion) C. Laecanius Bassus Caecina Paetus built was excavated in the 1970's⁸¹⁷. The building was decorated with statues and inscriptions. The whole area (including the ceramic pieces, the statues, columns) was recently re-investigated. The Greek inscription refers to him as Gaius Laecanius Bassus⁸¹⁸. It is not entirely clear why the proconsul's name was not mentioned as C. Laecanius Bassus Caecina Paetus⁸¹⁹. The members of the Laecanius family managed to keep and develop their property in a period characterized by proscriptions and intrigue. The name of the family must have commanded some respect. The adopted Laecanius may have been interested in his own political career. He had properties near Minturnae, which is known from the inscriptions of his freedmen⁸²⁰. His son was C. Laecanius Bassus Caecina Flaccus⁸²¹, who died in Brindisi at the age of 18.

⁸¹⁰ PIR2, L 30 and 31; PWRE, XII 1, 1924, 396 f.; Alföldy 1982, 330 no 3–4; Tassaux 1982, 244–269; Bezczky 1998a, 14 f.

⁸¹¹ Bezczky 1998a, 22–28; Martin-Kilcher 2000, 508.

⁸¹² Bezczky 1998a, 29–43; The names of more than 45 successive *vilici*/estate managers are preserved in the stamps (ADEL, AMETHYSTI, AMICUS, BAR, BARB, CAR, CLARVS, CLYMEN, COM, CRESCENTIS, DATI, DI, EVCHARISTI, FELIX, HER, HERME, HOM, IALIS, MARTI, OPTA, PAGANI, PIERI, PTOLEM, SYNT, SPERATVS, VRBA, VIAT, ...); Mange – Bezczky 2006, 427–458.

⁸¹³ Gnirs 1910, 79–88; Tassaux 1982, 251; Matijašić 1982, 56 f.; Zaccaria 1989, 477; Bezczky – Pavletić 1996, 148–151; Bezczky 1998a, 49–68.

⁸¹⁴ Pliny NH XXVI, 5.

⁸¹⁵ Bezczky 2001a, 421–423; the *vilici* stamps CLYMEN, DATI, PAGANI cooccur with the Laecanius and the Imperial stamps.

⁸¹⁶ Tassaux 1982, 260 (A.D. 80–82); Dräger 1993, 233–237: 78/79.

⁸¹⁷ Scherrer 2000, 76 f.

⁸¹⁸ IK 13, 695; his Nymphaeum in Ephesus: Fossel – Langmann 1972–1975, Beibl. 301–310; Taeuber 2011.

⁸¹⁹ PIR2, C 104 and L 33; PWRE, XII 1, 1924, 397, no. 6; Alföldy 1982, 330 No 5.

⁸²⁰ MEFRA 1907, 498 = ILS 9247.

⁸²¹ PIR2, L 32.

The Dressel 6B amphorae were produced for over a century. Many of them were stamped. No Dressel 6B amphora has been found in the eastern Mediterranean region, to the author's knowledge. A few Dressel 6B amphorae have been found in India⁸²².

⁸²² Will 1996, 339–341.

10. BIBLIOGRAPHY

Ancient sources

- Ammianus Marcellinus Ammianus Marcellinus, Roman History vol. II, Tr: J.C. Rolfe, LCL 315,
 Apicius Apicius, The Roman cookery book, Tr: B. Flower – E. Rosenbaum (London 1958)
 Appian Appian, Roman History, vol. 1–4, Tr: H. White, LCL 4, 5
 Athenaeus Athenaeus, The Deipnosophists vol. I, Tr: C.B. Gulick, LCL 204
 Caesar
 Gallic War, Tr: H.J. Edwards, LCL 72
 Alexandrian, African, and Spanish Wars, Tr: A.G. Way, LCL 402
 Cassius Dio Cassius Dio, Tr: E. Cary – H.B. Foster, LCL 283
 Cato Cato and Varro, On Agriculture, Tr: H. B. Ash, LCL 283
 Cicero
 Letters to friends vol. I–III, Tr: D.R. Shackleton Bailey, LCL 205, 216, 230
 Letters to Atticus vol. I–IV, Tr: D.R. Shackleton Bailey, LCL 7, 8, 97, 491
 Columella L.J.M. Columella, On Agriculture: vol III, Tr: E.S. Forster – H. E. Heffner, LCL 408
 Dioscorides Dioscorides, The Greek Herbal of Dioscorides, Tr: J. Goodyear (Oxford 1933)
 Eutropius Eutropius, Breviarium ab urbe condita, Bibliotheca scriptorum Graecorum et Romanorum
 Teubneriana (Stuttgart 1975)
 Expositio Totius Mundi et Gentium Expositio Totius Mundi et Gentium, Tr: J. Rougé, Sources chretiennes, 124, (Paris 1966)
 Historia Augusta Historia Augusta vol III, Tr: D. Magie, LCL 263
 Horace Horace Odes and Epodes, Tr: N. Rudd, LCL 33
 Juvenal Juvenal and Persius, Tr: S. Morton Braund, LCL 91
 Jordanes Jordanes, Iordanis Romana et Getica, MGH AA 5.1 (Berlin 1882)
 Josephus Josephus, Jewish Antiquities, vol VI, Tr: R. Marcus – A. Wikgren, LCL 490
 Livy Livy, History of Rome, vol. XIV, Tr: A.C. Schlesinger – J. Obsequens, LCL 404
 Martial Martial, Epigrams, Vol II–III, Tr: D.R. Shackleton Bailey, LCL 95, 480
 Petronius Petronius, Satyricon, Tr: M. Heseltine, LCL 15
 Philostratus Philostratus vol V, Lives of the Sophists. Eunapius: Lives of the Philosophers and Sophists, Tr:
 W.C. Wright, LCL 134
 Pliny Pliny the Elder,
 Natural History vol. IV, V, Tr: H. Rackham, LCL 370, 371
 Natural History vol. VII, Tr: W.H.S. Jones – A.C. Andrews, LCL 393
 Plutarch
 vol. IV, Alcibiades and Coriolanus. Lysander and Sulla, Tr: B. Perrin, LCL 80
 vol. V, Agesilaus and Pompey. Pelopidas and Marcellus, Tr: B. Perrin, LCL 87
 vol. IX, Demetrius and Antony. Pyrrhus and Gaius Marius, Tr: B. Perrin, LCL 101
 Strabo Strabo, vol, V, VI, VIII, Tr: H. L. Jones, LCL 211, 223, 267
 Suetonius Suetonius,
 The Lives of Caesars vol I, Tr: J.C. Rolfe, LCL 31
 The Lives of Caesars vol II, Tr: J.C. Rolfe, LCL 38
 Varro Varro On Agriculture, Tr: H. Boyd Ash, LCL 283
 Vitruvius Vitruvius, On Architecture, vol II, Tr: F. Granger, LCL 280

Modern sources

- Abadie 1989 C. Abadie, Les amphores protobyzantines d'Argos (IVe–VIe siècles), in: V. Déroche – J.-M.
 Spierser (eds.), Recherche sur la céramique byzantine, BCH Suppl. 18, 1989, 47–56.
 Abadie-Reynal 1999 C. Abadie-Reynal, Les amphores Romaines en mer Noire (I–IV s.). Production et commer-
 ce des amphores anciennes en mer Noire, Actes du colloque internationale d'Istanbul,
 25–28 mai 1994 (1999) 255–264.

- Abadie-Reynal 2004 C. Abadie-Reynal, Les amphores méditerranéennes d'importation trouvées à Zeugma. Présentation préliminaire, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002*, Monographs of the Danish Institute at Athens 5 (Aarhus 2004) 15–21.
- Adamsheck 1979 B. Adamsheck, *Kenchreai. Eastern Port of Corinth IV, The Pottery* (Leiden 1979).
- Adan-Bayewitz 1986 D. Adan-Bayewitz (1986), The pottery from the Late Byzantine Building (Stratum 4) and its Implications, in: L. Levine – E. Netzer (eds.), *Excavation at Caesarea Maritima 1975, 1976, 1979. Final Report*, QEDEM 21, (Jerusalem 1986) 90–129.
- Alföldy 1968 G. Alföldy, *Senatoren in der römischen Provinz Dalmatia*, Epigraphische Studien 5 (Wiesbaden 1968).
- Alföldy 1982 G. Alföldy, *Senatoren aus Norditalien Regiones IX, X und XI*, in: *Epigrafia e ordine senatorio*, II. TITVLI 5 (Roma 1982) 309–368.
- Almagro 1955 M. Almagro, *Las Necropolis de Ampurias*, Vol. II (Barcelona 1955).
- Alpözen *et al.* 1995 T. O. Alpözen – A. H. Ozdas – B. Berkaya, Commercial amphoras of the Bodrum Museum of underwater archaeology. Maritime trade of the Mediterranean in ancient times, *Bodrum Museum of Underwater Archaeology publication 2* (Bodrum 1995).
- Alzinger 1955 W. Alzinger, *Kleinfunde von Aguntum aus den Jahren 1950 bis 1952*, Beiträge zur Römerzeitlichen Bodenforschung in Österreich (Wien 1955).
- Alzinger 1970 RE Suppl. XII (1970) 1588–1704, bes. 1601–1604 s. v. Ephesos B. Archäologischer Teil (W. Alzinger).
- Alzinger 1972–1975 W. Alzinger, *Das Regierungsviertel*, ÖJh 50, 1972–1975, Beibl. 229–300.
- Amores Carredano *et al.* 2007 F. Amores Carredano – E. Garcia Vargas – D. González Acuña, *Ánforas tardoantiguas en Hispalis (Sevilla, España) y el comercio Mediterráneo*, in: M. Bonifay – J.-C. Trégliat (eds.) *LRCW 2, BARIntSer 1662* (Oxford 2007), 133–146.
- Anderson-Stojanović 1992 V. R. Anderson-Stojanović, *Stobi. The Hellenistic and Roman pottery* (Princeton 1992).
- Annis 1975 B. Annis, *Amphora Sixti*, in: *Festoen opgedragen aan A.N. Zadoks–Josephus Jitta bij haar zeventigste verjaardag*, Groningen–Bussum 1975, *Scripta Archaeologica Groningana* 6, 1975, 29–40.
- Ardeț 2001 A. Ardeț, *Amphoren Dressel 6B und Schörgendorfer 558B in Dakien*, *ReiCretActa* 37, 2001, 279–282.
- Arévalo Gonzáles *et al.* 2004 A. Arévalo Gonzáles – D. Bernal-Casasola – A. Torremocha Silva, *Garum y Salazones en el Circulo del Estrecho*, Museo Municipal de Algeciras (Algeciras 2004).
- Ariel 1990 D. T. Ariel, *Excavations at the City of David Directed by Yigal Shiloh 2. Imported Stamped Handles, Coins, Worked Bone and Ivory, and Glass*. QEDEM 30 (Jerusalem 1990).
- Арсеньева – Науменко 1992 T. M. Арсеньева – С. А. Науменко, *Усадьбы Танаис (Tanais villas)* (Москва 1992).
- Arthur 1982 P. Arthur, *Amphora production in the Tripolitanian Gebel*, *LibSt* 13, 1982, 61–72.
- Arthur 1985 P. Arthur, *Naples. Notes on the economy of Dark Age city*, in: C. Malone – S. Stoddart (eds.), *Papers in Italian Archaeology IV*, *BARIntSer* 246 (Oxford 1985) 247–259.
- Arthur 1989 P. Arthur, *Aspects of Byzantine Economy. An Evaluation of Amphora Evidence from Italy*, *recherches sur la céramique Byzantine*, *BCH Suppl.* 18, 1989, 79–93.
- Arthur 1990 P. Arthur, *Anfore dell'alto adriatico e il problema del 'Samos Cistern Type, Aquileia Nostra LXI*, 1990, 281–296.
- Arthur 1991 P. Arthur, *Romans in Northern Campania*, *BSR* 1 (London 1991).
- Arthur 1998 P. Arthur, *Eastern mediterranean amphorae between 500 and 700. A view from Italy*, in: L. Sagù (a cura di), *Cerámica in Italia. VI–VII, Atti del convegno in onore di John W. Hayes*. Biblioteca di Archeologia Medievale, Roma (Firenze 1998) 157–184.
- Arthur 2005 P. Arthur, *Samos Cistern Type*, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005). http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Arthur – Oren 1998 P. Arthur – E. R. Oren, *The North Sinai survey and the evidence of transport amphorae for Roman and Byzantine trading patterns*, *JRA* 11, 1998, 193–212.
- Aupert 1980 P. Aupert, *Objets de la vie quotidienne à Argos en 585 ap. J.-C.*, *Études argiennes*, *BCH* 105, 1980, 395–457.
- Auriemma 2000 R. Auriemma, *Le anfore del relitto di Grado e il loro contenuto*, *MEFRA* 112, 2000, 27–51.
- Auriemma – Quiri 2004 R. Auriemma – E. Quiri, *Importazioni di anfore orientali nell' Adriatico tra primo e medio impero*, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International colloquium at the Danish Institute at Athens, September 26–29, 2002*, Monographs of the Danish Institute at Athens 5 (Aarhus 2004) 43–55.
- Auriemma – Quiri 2006 R. Auriemma – E. Quiri, *Importazioni di anfore orientali nel Salento tra primo e medio Impero*, in: *Les routes de l' Adriatique Antique. Géographie et économie, Actes de la Table ronde du 18 au 22 septembre 2001* (Zadar) (Bordeaux – Zadar 2006) 225–251.

- Bagnall *et al.* 2000 R. S. Bagnall – Ch. Helms – A. M. F. W. Verhoogt, Documents from Berenike vol. 1. Greek ostraka from the 1996–1998 seasons, *Papirologica Bruxellensia* 31 (Bruxelles 2000).
- Bailey 1992 D. M. Bailey, Gaza Jars not Baggy Amphorae, *ZPE* 94, 1992, 295–296.
- Balconi 1993 C. Balconi, Rabirio Postumo dioeketes d’Egitto in P. Med. inv. 68.53?, *Aegyptus* 73, 1993, 1–20.
- Baldacci 1967–68 P. Baldacci, Alcuni aspetti dei commerci nei territori cisalpini, in: Atti del Centro studi e documentazione sull’Italia romana I (Milano – Varese 1967–68) 7–50.
- Baldacci 1972 P. Baldacci, Le principali correnti del commercio de anfore romane nella Cisalpina dal III sec. a.C. al II sec. d.C. in: I problemi della ceramica romana di Ravenna, della Valle Padana e dell’alto Adriatico. Atti Conv. Int. Ravenna 10–12 maggio 1969 (Bologna 1972) 103–131.
- Ballet – Picon 1987 P. Ballet – M. Picon, Recherches preliminaries sur les origins de la céramique des Kellia (Egypte), *Cahiers de la Céramique Egyptienne* 1, 1987, 17–48.
- Bammer 1988 A. Bammer, Ephesos. Stadt an Fluß und Meer (Graz 1988).
- Bamonte 1918 G. Bamonte, Le antichità pestane (Naples 1918).
- Barnea 1966 I. Barnea, L’incendie de la cité de Dinogetia au VIe siècle, *Dacia* 10, 1966, 237–259.
- Bass – Van Doorninck 1971 C. F. Bass – F. H. Van Doorninck, A Fourth Century Shipwreck at Yassi Ada, *AJA* 75, 1971, 27–37.
- Becker *et al.* 1986 C. Becker – C. Constantin – A. Desbat – L. Jaquin – J.–P. Lascoux, Le dépôt d’amphores augustéen de la rue de la Favorite à Lyon, *Figlina* 7, 1986, 65–89.
- Beltrán 1970 M. Beltrán Lloris, Las Ánforas Romanas en España (Zaragoza 1970).
- Beltrán 1977 M. Beltrán Lloris, Problemas de la morfología y del concepto histórico geográfico que recubre la noción tipo. Aportaciones a la tipología de las ánforas béticas, in: Méthodes classiques et méthodes formelles dans l’étude des amphores, *CEFR* 32 (Rome 1977), 97–131.
- Beltrán 1982 M. Beltrán Lloris, El comercio del aceite en el valle del Ebro a finales de la Republica y comienzos del Imperio romano, in: Producción y comercio del aceite en la antigüedad. Primer Congreso International (Madrid 1980) 187–224.
- Benea 2000 D. Benea, Les amphores de Tibiscum, les relations commerciales entre la Dacie et les territoires de la Méditerranée orientale, *ReiCretActa* 36, 2000 435–438.
- Benndorf 1898 O. Benndorf, Vorläufige Berichte über die Ausgrabungen in Ephesus, *ÖJh*, 1, 1898, Beibl. 53–72.
- Benoit 1962 F. Benoit, Relations commerciales entre le monde ibéro-punique et le Midi de la Gaule de l’époque archaïque à l’époque romaine, *REA*, 63, 1962, 321–330.
- Berg Briese 2005 M. Berg Briese, Halikarnassian wine-production? The evidence from two households, in: M. Berg Briese – L. Eric Vaag (eds.), Trade Relations in the Eastern Mediterranean from the Late Hellenistic Period to Late Antiquity, the ceramic Evidence (Odense 2005) 184–201.
- Berlin 1997 A. Berlin, The Plain Wares, in: S.C. Herbert (ed.) *Tel Anafa II, I, The Hellenistic and Roman pottery*, *JRA Suppl.* 10, II. i; Kelsey Museum Fieldwork Series. (Ann Arbor 1997) 1–244.
- Bernal Casasola 2000 D. Bernal Casasola, Las ánforas béticas en los confines del imperio. Primera aproximación a las exportaciones a la pars orinetalis, in: Congreso Internacional Ex Baetica Amphorae, Écija y sevilla, 17 al 20 de Diciembre de 1998, (Ecija 2000) 935–988.
- Bernal *et al.* 2003 D. Bernal – A. Arévalo – A. Lorenzo – L. Aguilera, Imitations of Italic amphorae for fish sauce in Baetica. New evidence from the salt–fish factory of Baelo Claudia (Hispania), *ReiCretActa* 38, 2003, 305–313.
- Bernal *et al.* 2007 D. Bernal – A. Arévalo – A. M. Sáez, Nuevas evidencias de la ocupación en época republicana (ss. II–I a.C.), in: A. Arévalo – D. Bernal (eds.), *Las Cetariae de Baelo Claudia. Avance de las investigaciones arqueológicas en el barrio meridional 2000–2004* (Cadiz 2007) 237–353.
- Berni Millet 2008 P. Berni Millet, Epigrafía anfórica de la Bética. Nuevas formas de análisis, *Collecció Instrumenta* 29 (Barcelona 2008).
- Berti 1985 F. Berti, La nave romana di Valle Ponti (Comacchio), *RStLig* 51, 1985, 553–570.
- Berti 1986 F. Berti, Le anfore di età romana del ferrarese. Primo contributo ad una loro classificazione, in: *La civiltà comacchiese e pomposiana dalle origini pre storiche al tardo medioevo. Atti del Convegno nazionale di Studi storici, Comacchio 1984* (Bologna 1986) 183–209.
- Bezczky 1987 T. Bezczky, Roman amphorae from the Amber Route in Western Pannonia, *BARIntSer* 386 (Oxford 1987).
- Bezczky 1993 T. Bezczky, Knidische Amphoren in den nördlichen Provinzen des römischen Reiches, *Carinthia* 183, 1993, 237–244.
- Bezczky 1994a T. Bezczky, Amphorenfunde vom Magdalensberg und aus Pannonien. Ein Vergleich, *Archäologische Forschungen zu den Grabungen auf dem Magdalensberg* 12 (Klagenfurt 1994).
- Bezczky 1994b T. Bezczky, Amphorae from the Forum of Emona, *ArchVest* 45, 1994, 81–93.
- Bezczky 1995a T. Bezczky, Amphorae from Gorsium, *Specimina Nova* 10, 1995, 39–56.

- Bezeczky 1995b T. Bezeczky, Roman Amphora Trade in Pannonia, in: G. Hajnóczy (ed.), *La Pannonia e l'Impero Romano. Atti del convegno internazionale, Accademia d'Ungheria e l'Istituto austriaco di cultura, Roma 13–16 gennaio 1994* (Milano 1995) 155–175.
- Bezeczky 1996 T. Bezeczky, Amphora Inscriptions – Legionary Supply? *Britannia* 27, 1996, 329–336.
- Bezeczky 1997 T. Bezeczky, Amphorae from the south area of the auxiliary fort at Carnuntum, Preliminary report, in: M. Kandler (Hrsg.), *Das Auxiliarkastell Carnuntum 2. Forschungen seit 1989, SoSchrÖAI 30* (Wien 1997) 173–181.
- Bezeczky 1998a T. Bezeczky, The Laecanius Amphora Stamps and the Villas of Brijuni, *DenkschrWien* 261 (Wien 1998).
- Bezeczky 1998b T. Bezeczky, Amphora types of Magdalensberg, *ArchVest* 1998, 225–242.
- Bezeczky 2000 T. Bezeczky, Baetican Amphorae from the North–Eastern Provinces, of the Roman Empire, in: *Congreso Internacional Ex Baetica Amphorae, Écija y Sevilla, 17 al 20 de Diciembre de 1998, (Ecija 2000)* 1359–1369.
- Bezeczky 2001a T. Bezeczky, The chronology of the end of the Laecanius workshop, in: *Carinthia Romana und die römische Welt, Festschrift für Gernot Piccottini* (Klagenfurt 2001) 421–423.
- Bezeczky 2001b T. Bezeczky, Late Hellenistic–Early Roman amphora stamps from Ephesus, in: F. Krinzinger (ed.), *Studien zur hellenistische Keramik in Ephesos, ÖJh Ergh. 2*, 2001, 11–19.
- Bezeczky 2003 T. Bezeczky, Amphoren, in: C. Lang–Auinger (Hrsg.), *Das Hanghaus 1 in Ephesos. Funde und Ausstattung, FiE 8, 4* (Wien 2003) 38, 68.
- Bezeczky 2004 T. Bezeczky, Early Roman Food Import in Ephesus. Amphorae from the Tetragonos Agora, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002, Monographs of the Danish Institute at Athens 5* (Athens 2004) 85–97.
- Bezeczky 2005a T. Bezeczky, Roman Amphorae from Vindobona, in: F. Krinzinger (Hrsg.), *Vindobona, AF 1, 2* *DenkschrWien* 328 (Wien 2005) 35–108.
- Bezeczky 2005b T. Bezeczky, Brindisian amphora, Dressel 6A, Dressel 25, Lamboglia 2, Schörgendorfer 558, in: S. Keay – D. F. Williams, *Roman amphorae: a digital resource* (University of Southampton 2005), http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Bezeczky 2005c T. Bezeczky, Late Roman Amphorae from the Ephesian Agora, in: F. Krinzinger (Hrsg.), *Spätantike und mittelalterliche Keramik aus Ephesus, AF 13*, 2005, 203–223.
- Bezeczky 2006 T. Bezeczky, Consumer behaviour in Ephesus in the first century BC, in: D. Malfitana – J. Poblome – J. Lund (eds.), *Old pottery in a new century. Innovating perspectives on Roman pottery studies, Atti del Convegno Internazionale di Studi Catania, 22–24 Aprile 2004* (Catania 2006) 287–308.
- Bezeczky 2007 T. Bezeczky, Roman Amphorae from the Basilica and the Prytaneion, in: V. Mitsopoulos-Leon – C. Lang–Auinger (eds.), *Die Basilika am Staatsmarkt in Ephesus, 2. Teil. Funde klassischer bis römischer Zeit, FiE 9, 2, 3* (Wien 2007) 61–63.
- Bezeczky – Pavletić 1996a T. Bezeczky – M. Pavletić, New objects from the *figlina* of C. Laecanius Bassus, *ÖJh* 65, 1996, 143–163.
- Bjelajac 1996 L. Bjelajac, *Amfore gornjomezijskog Podunavlja* (Amphorae of the Danubian basin in Upper Moesia) (Beograd 1996).
- Blanc-Bijon *et al.* 1998 V. Blanc-Bijon – M.–B. Carre – A. Hesnard – A. Tchernia, *Recueil de timbres sur amphores romaines, 1987–1988* (Aix–en–Provence 1998).
- Bonifay 2004 M. Bonifay, *Études sur la céramique romaine tardive d'Afrique. BARIntSer 1301* (Oxford 2004).
- Bonifay 2005 M. Bonifay, Dressel 2–4 African, Van der Werff type 1, 2, 3, Tripolitana 1 and 3; in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource*, (University of Southampton 2005), http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Bonifay – Pieri 1995 M. Bonifay – D. Piéri, Amphores du Ve au VIIe s. à Marseille. Nouvelles données sur la typologie et le contenu, *JRA* 8, 1995, 94–120.
- Bonifay – Villedieu 1989 M. Bonifay – F. Villedieu, Importations d'amphores orientales en Gaule (Ve–VIIe siècle), in: V. Déroche – J. M. Spieser (eds.), *Recherches sur la céramique byzantine, BCH Suppl. 18* (Paris 1989) 17–46.
- Bost *et al.* 1992 J.-P. Bost – M. Campo – D. Coll – V. Guerro, L'épave Cabrera III (Majorque). Échanges commerciaux et circuits monétaires au milieu du III^e siècle après Jésus–Christ, *Publications du Centre Pierre Paris 23* (Paris 1992).
- Bonsor 1931 G.E. Bonsor, *An Archaeological Sketch–Book of the Roman Necropolis at Carmona* (New York 1931).
- Botte 2009 E. Botte, *Salaisons et sauces de poissons en Italie du sud et en Sicile durant l'Antiquité, Collection du Centre Jean Bérard 31* (Naples 2009).

- Botte 2009a E. Botte, *Le Dressel 21–22. Anfore da pesce Tirreniche dell'alto impero*, in: S. Pesavento Mattioli – M.-B. Carre (eds.), *Olio es pesce in epoca romana. Produzione e commercio nelle regioni dell'alto Adriatico*, Atti del convegno, Padova, 16 Febbraio 2007, *Antenor Quaderni* 15 (Roma 2009) 149–171.
- Börker – Burow 1998 C. Börker – J. Burow, *Die hellenistischen Amphorenstempel aus Pergamon*, PF 11 (Berlin – New York 1998).
- Böttger 1992 B. Böttger, *Die kaiserzeitlichen and spätantiken Amphoren aus dem Kerameikos*, AM 107, 1992, 315–381.
- Braund 2005 D. Braund, *Across the Black Sea. Patterns of maritime exchange on the northern periphery of Roman Asia Minor*, in: S. Mitchell – C. Katsari (eds.), *Patterns in the Economy of Roman Asia Minor* (Wales 2005) 115–138.
- Breccia 1921 E. Breccia, *Rapport sur la marche du Service du Musée pendant l'exercice 1919–1920* (Alexandrie 1921).
- Brecciaroli Taborelli 1987 L. Brecciaroli Taborelli, *Per una ricerca sul commercio della Transpadana occidentale in età romana: ricognizione sulle anfore di Vercellae*, in: Atti del convegno di studi nel centenario della morte di Luigi Bruzza (Vercelli 1987) 129–207.
- Brukner 1981 O. Brukner, *Rimska keramika u Jugoslovenskom delu provincije donje Panonije*, *Dissertationes et Monographie* 24 (Beograd 1981).
- Brun 2004 J.-P. Brun, *Archéologie du vin et de l'huile dans l'Empire romain* (Paris 2004).
- Bruno 1995 B. Bruno, *Aspetti di storia economica della Cisalpina Romana. Le anfore di tipo Lamboglia 2 rinvenute in Lombardia* (Roma 1995).
- Bruno 1997 B. Bruno, *Contenitori da trasporto. I consumi di olio, vino e di altre derrate*, in: F. Filippi (ed.), *Alba Pompeia. Archeologia della città dalla fondazione alla tarda antichità*, *QuadAPiem* 6, 1997, 516–532.
- Bruno 2002 B. Bruno, *Importazione e consumo di derrate nel tempo. L'evidenza delle anfore*, in: F. Rossi (ed.), *Nuove ricerche sul Capitolium di Brescia*, Scavi, studi e restauri (Milano 2002) 277–307.
- Buchi 1973 E. Buchi, *Banchi di anfore romane a Verona. Note sui commerci cisalpini*, in: *Il territorio veronese in età romana. Atti del convegno tenuto a Verona, 22–24 ottobre 1971* (Verona 1973) 531–637.
- Buora 1995a M. Buora, *Presenza di anfore tipo Dressel 6A con il marchio M. HER PICEN*, *QuadFriulA* 5, 1995, 183–189.
- Buora 1995b M. Buora, *Anfore Almagro 50 e Amagro 51 nell'Alto Adriatico*, *QuadFriulA* 5, 1995, 190–192.
- Buora 1999 M. Buora, *Nota sui bolli delle anfore rinvenute a Codroipo*, in: *Quadrivium. Sulla strada di Augusto, dalla preistoria all'età moderna*, *Archeologia di frontiera* 3, 1999, 127–131.
- Bülow 2000 G. Bülow, *Anmerkungen zur Keramik aus dem spätantiken Limeskastell Iatrus (Moesia secunda)*, *ReiCretActa* 36, 2000, 211–216.
- Büyükkolancı – Engelmann 1998 M. Büyükkolancı – H. Engelmann, *Inchriften aus Ephesus*, ZPE 120, 1998, 65–82.
- Cabré Aguiló 1944 A. Cabré Aguiló, *Corpus Vasorum Hispanorum, Ceramica de Azaila* (Madrid 1944).
- Callender 1965 M. H. Callender, *Roman amphorae with Index of Stamps* (London 1965).
- Cambi 1989 N. Cambi, *Anfore romane in Dalmazia*, in: *Amphores romaines et histoire économique. Dix ans de recherche. Actes du colloque de Sienna (22–24 mai 1986)*, organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome, CEFR 114 (Rome 1989) 311–337.
- Cankardeş-Şenol 2010 G. Cankardeş-Şenol, *Nikandros Group. Matrix studies on the amphora stamps of the group*, *Olba* 17, 2010, 125–139.
- Carandini – Panella 1981 A. Carandini – C. Panella, *The trading connections of Rome and Central Italy in the late second and third centuries. The evidence of the Terme del Nuotatore excavations, Ostia*, in: A. King – M. Henig (eds.), *The Roman west in the third century*, BARIntSer 109 (Oxford 1981) 487–503.
- Carignani – Pacetti 1989 A. Carignani – F. Pacetti, *Le importazioni di anfore bizantine a Roma fra IV e V secolo. Le evidenze di alcuni contesti urbani*, in: V. Déroche – J. M. Spieser (eds.), *Recherches sur la céramique byzantine*, BCH Suppl. 18 (Athènes 1989) 5–16.
- Carre 1985 M. B. Carre, *Les amphores de la Cisalpine et de l'Adriatique au debut de l'Empire*, MEFRA 97, 1985, 207–245.
- Carre *et al.* 1995 M. B. Carre – V. Gaggadis–Robin – A. Hesnard – A. Tchernia, *Recueil de timbres sur amphores romaines, 1987–1988* (Aix-en-Provence 1995).
- Carreras 2000 C. Carreras Monfort, *Economía de Britannia romana. La importación de alimentos*, *Colleció Instrumenta* 8 (Barcelona 2003).
- Carreras 2003 C. Carreras Monfort, *Haltern 70. A review*, in: *Amphorae in Britain and the western Empire*, JRomPotSt 10, 2003, 85–91.

- Carreras 2004 C. Carreras Monfort, Geografia de la producció de les Haltern 70, in: *Culip VIII i les àmfores Haltern 70*, Monografies del CASC 5 (Girona 2004) 75–81.
- César Carreras 2005 C. Carreras, Dressel 2–4 Almadrava, Dressel 2–4 Baetican, Dressel 2–4 Catalan, Dressel 20, Dressel 20 *similis* – Oliva 3, Haltern 70, Pascual 1, in: S. Keay – D. F. Williams, *Roman amphorae*. A digital resource (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Carreras – Funari 1998 C. Carreras – P. P. A. Funari, Britannia y el Mediterráneo. Estudios sobre el Abastecimiento de Aceite Bético y Africano en Britannia, *Collectio Instrumenta* 5 (Barcelona 1998).
- Carreté *et al.* 1995 J.-M. Carreté – S. Keay – M. Millet, A Roman Provincial Capital and its Hinterland. The survey of the territory of Tarragona, Spain, 1985–1990, *JRA Suppl.* 15 (Ann Arbor 1995).
- Cerdá Juan 1980 D. Cerdá Juan, La nave romano–republicana de la Colonia de Sant Jordi, *Monografías del Museo de Mallorca* 8 (Palma de Mallorca 1980).
- Charlin *et al.* 1978 G. Charlin – J.-M. Gassend – R. Lequément, L'Épave antique de la Baie de Cavalière (Le Lavandou, Var), *Archaeonautica* 2, 1978, 9–93.
- Chic 1985 G. Chic, Epigrafía anfórica de la Bética I. Las marcas impresas en barro sobre ánforas olearias (Dressel 19, 20 y 23) (*Écija* 1985).
- Chic 1988 G. Chic, Epigrafía anfórica de la Bética II. Los rotulos pintados sobre ánforas olearias. Consideraciones sobre la Annona (*Écija* 1988).
- Ciarrocchi *et al.* 1998 B. Ciarrocchi – C. M. Colletti – A. Martin – L. Paroli – C. Pavolini, Ceramica comune tardoantica da Ostia e Porto (V–VII secolo), in: L. Saguí (ed.), *Ceramica in Italia VI–VII secolo*. Atti del Convegno in onore di John W. Hayes, Roma 11–13 maggio 1995 (Firenze 1998) 383–420.
- Cintas 1950 P. Cintas, *Céramique Punique* (Paris 1950).
- Ciotola *et al.* 1989 A. Ciotola – S. Picciola – R. Santangeli Valenzani – R. Volpe, Roma. Tre contesti 1. Via Nova–Clivo Palatino, 2. Crypta Balbi, 3. Via Sacra–Via Nova, in: *Amphores romaines et histoire économique*. Dix ans de recherche, Actes du colloque de Sienne (22–24 mai 1986), organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome, CEFR 114 (Rome 1989) 604–609.
- Cipriano 1994 M. T. Cipriano, La raccolta dei bolli sulle anfore italiche trovate in Italia, in: *Epigrafia della produzione e della distribuzione*, CEFR 193 (Rome 1994) 205–218.
- Cipriano 2003 S. Cipriano, Il consumo di derrate ad *Altinum* tra I secolo a.C. e II secolo d.C.: I dati dei contenitori da trasporto, in: G. Cresci Marrone – M. Tirelli (a cura di), *Produzioni, merci e commerci in Altino preromana e romana*, Atti del convegno Venezia 12–14 dicembre 2001 (Rome 2003) 235–259.
- Cipriano – Carre 1987 M. T. Cipriano – M. B. Carre, Note sulle anfore conservate nel Museo di Aquileia, *Antichità Altoadriatiche* 29, 1987, 479–494.
- Cipriano – Carre 1989 M. T. Cipriano – M. B. Carre, Production et typologie des amphores sur la Côte Adriatique de l'Italie, in: *Amphores romaines et histoire économique*. Dix ans de recherche, actes du colloque de Sienne (22–24 mai 1986), organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome, CEFR 114 (Rome 1989) 67–104.
- Criscuolo 1982 L. Criscuolo, Bolli d'Anfora Greci e Romani. La Collezione dell'Università Cattolica di Milano, *Studi di Storia Antica* 6 (Bologna 1982).
- Curtis 1991 R. I. Curtis, *Garum and Salsamenta*. Production and commerce in materia medica (New York 1991).
- D'Arms 1981 J. H. D'Arms, *Commerce and Social Standing in Ancient Rome* (Cambridge 1981).
- Dangréaux – Desbat 1988 B. Dangréaux – A. Desbat, Les amphores du dépotoir flavien du Bas-de-Loyasse à Lyon, *Gallia* 45, 1988, 115–153.
- Davies – Fentress 1984 S. M. Davies – E. Fentress, The Dipinti, Stamps and Graffiti, in: M. G. Fulford – D. P. S. Peacock, *Excavation at Carthage*. The British Mission, The Avenue du Président Bourguiba: Pottery and Other Ceramic Objects. Vol. I, 2. (Sheffield 1984) 141–154.
- Degrassi 1953 A. Degrassi, Aquileia e l'Istria in età romana, *Studi Aquileiesi offerti a G. Brusin* (Aquileia 1953) 51–65.
- Degrassi 1956 A. Degrassi, L'esportazione di olio e di olive istriane nell'età romana, *AMSI* 4, 1956, 104–112.
- Delattre 1894 A. L. Delattre, Le mur à amphores de la colline Saint-Louis à Carthage, *Bulletin archéologique du Comité des travaux historiques et scientifiques*, 1894, 89–119.
- Dell'Amico 1997 P. Dell'Amico, Il relitto di Grado. Considerazioni preliminari. *Archeologia subacquea*. Studi, ricerche e documenti II, 1997, 93–128.
- Del Rio *et al.* 2000 A. Del Rio – S. Menchelli – C. Capelli – G. Puppo, Anfore orientali nell'Etruria settentrionale costiera (II sec. a.C. VII sec. d. C.), *ReiCretActa* 36, 2000, 449–457.

- De Luca 1975 G. De Luca, Die Funde, in: O. Ziegenhaus – G. de Luca, Das Asklepieion. Der nördliche Temenosbezirk und angrenzende Anlagen in hellenistischer und frühromischer Zeit, *AvP* 11 (Berlin 1975) 84–145.
- Demesticha 2000 S. Demesticha, The Paphos kiln. Manufacturing techniques of LR 1 amphoras, *ReiCretActa* 36, 2000, 549–554.
- De Mitri 2006 C. De Mitri, Ceramica d'importazione orientale (V – VI sec. d.C.) nel Basso Salento. Problemi di distribuzione, in: S. Čače – A. Kurilić – F. Tassaux (eds.), *Les Routes de l'Adriatique Antique. Géographie et Économie, Actes de la Table ronde du 18 au 22 septembre 2001*, Zadar (Bordeaux–Zadar 2006) 195–207.
- Desbat 2003 A. Desbat, Amphora from Lyon and the question of Gaulish imitations of amphorae, *JRomPotSt* 10, 2003, 45–49.
- Desbat – Martin–Kilcher 1989 A. Desbat – S. Martin–Kilcher, Les amphores sur l'axe Rhône–Rhin à l'époque d'Auguste, in: *Amphores romaines et histoire économique. Dix ans de recherche, actes du colloque de Sienne (22–24 mai 1986)*, organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'École française de Rome, *CEFR* 114 (Rome 1989) 339–365.
- Desbat – Picon 1986 A. Desbat – M. Picon, Les importations d'amphores de Méditerranée orientale à Lyon (fin du Ier siècle avant J.C. et Ier siècle après), in: J.-Y. Empereur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, *BCH Suppl.* 13, 1986, 637–648.
- Desbat *et al.* 1987 A. Desbat – R. Lequément – B. Liou, Inscriptions peintes sur amphores, Lyon et Saint-Romain-en-Gal, *Archaeonautica* 1987, 140–166.
- Dessau 1911 H. Dessau, Gaius Rabirius Postumus, *Hermes* 46, 1911, 613–620.
- Dessau 1912 H. Dessau, Gaius Rabirius Postumus. Nachtrag zu *BD. XLVI S. 613*, *Hermes* 47, 1912, 320.
- Desy 1989 P. Desy, Les timbres amphoriques de l'Apulie républicaine, *BARIntSer* 554 (Oxford 1989).
- Diamanti 2008 C. Diamanti, Stamped Late Roman/Proto–Byzantine amphoras from Halasarna of Kos, *ReiCretActa* 41, 2010, 1–8.
- Didioui 2011 S. Didioui, Local production and imported pottery from Cos island, Greece (4th – 8th c. A.D. Abstracts, Posters, *LRWC 4 International Conference, Thessaloniki, 7–10 April (Thessaloniki 2011)* 73–74.
- Dignas 2005 B. Dignas, Sacred revenues in Roman hands. Economic dimension of sanctuaries in Western Asia Minor, in: S. Mitchell – C. Katsari (eds.), *Patterns in the Economy of Roman Asia Minor (Wales 2005)* 207–224.
- Domergue 1973 C. Domergue, *Belo 1. La stratigraphie*, Publications de la Casa de Velázquez, Série Archéologie I (Paris 1973).
- Dräger 1993 M. Dräger, Die Städte der Provinz Asia in der Flavienzeit. Studien zur kleinasiatischen Stadt- und Regionalgeschichte, *Europäische Hochschulschriften, Reihe III*, 576 (Frankfurt 1993).
- Dressel 1879 H. Dressel, Di un grande deposito di anfore rinvenuto nel nuovo quartiere del Castro Pretorio, *BullCom* 39–112, 1879, 143–196.
- Dressel 1899 H. Dressel, *CIL XV, Pars 2, Fasc. 1.* (Berlin 1899).
- Duarte 1990 A. L. C. Duarte, Quinta do Rouxinol. A produção de ânforas no vale do Tejo, as ânforas Lusitanas, tipologia, produção, comércio, *Actas das jornadas de estudo realizadas em Conimbriga em 13 et 14 de Outubro 1988 (Conimbriga – Paris 1990)* 97–115.
- Dyczek 2001 P. Dyczek, Roman amphorae of the 1st–3rd centuries AD found on the lower Danube. Typology (Warsaw 2001).
- Edmondson 1987 J. C. Edmondson, Two industries in Roman Lusitania. Mining and Garum Production, *BAR-IntSer* 362 (Oxford 1987).
- Egger 1959 R. Egger, Die Ausgrabungen auf dem Magdalensberg 1956 und 1957. Die Inschriften, *Carinthia I*, 1959, 3–143.
- Egger 1963 R. Egger, Die Ausgrabungen auf dem Magdalensberg 1960 und 1961. Die Inschriften, *Carinthia I*, 1963, 93–111.
- Egger 1969 R. Egger, Die Ausgrabungen auf dem Magdalensberg 1965 bis 1968. Die Inschriften, *Carinthia I*, 1969, 365–409.
- Egloff 1977 M. Egloff, *Kellia. La poterie copte*, 2 vols. (Geneva 1977).
- Ehmig 1997 U. Ehmig, M – Eine Amphore sucht ihren Inhalt, *CarnJb* 1977, 9–21.
- Ehmig 2000 U. Ehmig, *Dressel 20/30: Ex Baetica originalis – Imitatio ex Germania Superiore*, in: *Congreso Internacional Ex Baetica Amphorae, Conservas, aceite y vino de la Bética en le Impero Romano, Sevilla – Écija, 17 al 20 de diciembre de 1998 (Écija 2000)* 1143–1152.
- Ehmig 2003 U. Ehmig, Die römischen Amphoren aus Mainz, *Frankfurter Archäologische Schriften* 4 (Mainz 2003).
- Eilers 2003 C. Eilers, *Josephus' Caesarian Acta. History of a Dossier*, SBL Josephus Seminar (York University 2003).

- Eiring *et al.* 2002 J. Eiring –M.-C. Boileau – I. K. Whitbread, Local and Imported Transport Amphorae from a Hellenistic kiln site at Knossos. The Results of Petrographic Analyses, in: F. Blondé – P. Ballet – J.-F. Salles (eds.), *Céramiques hellénistiques et romaines. Productions et diffusion en Méditerranée orientale (Chypre, Égypte et côte syro-palestinienne)*, Travaux de la Maison de l'Orient Méditerranéen 36 (Lyon 2002) 59–65.
- El-Ashmawi 1998 F. El-Ashmawi, Potter kiln and wine-factory at Burg El-Arab, in: J.-Y. Empereur (ed.), *Commerce et artisanat dans l'Alexandrie hellénistique et romaine. Actes du Colloque d'Athènes 1988*, BCH Suppl. 33, 1998, 55–64.
- Empereur 1983 J.-Y. Empereur, Recension e Bibliografia. Lucia Criscuolo, Bolli d'Anfora Greci e Romani, La Collezione dell'Università Cattolica di Milano, Studi di Storia Antica 6 (Bologna 1982) 309–311.
- Empereur 1986 J.-Y. Empereur, Un atelier de Dressel 2–4 en Egypt au III^e siècle de notre ère, in: J.-Y. Empereur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, BCH Suppl. 13, 1986, 599–608.
- Empereur 1998 J.-Y. Empereur, Les amphores complètes du Musée d'Alexandrie. Importations et productions locales, in: J.-Y. Empereur (ed.), *Commerce et artisanat dans l'Alexandrie hellénistique et romaine. Actes du Colloque d'Athènes 1988*, BCH Suppl. 33, 1998, 393–399.
- Empereur – Hesnard 1987 J.-Y. Empereur – A. Hesnard, Les amphores hellénistiques du monde égéen, in: P. Lévêque – J.-P. Morel (eds.), *Céramiques hellénistiques et romaines 2* (Paris 1987) 9–71.
- Empereur – Picon 1986 J.-Y. Empereur – M. Picon, A la recherche des fours d'amphores, in: J.-Y. Empereur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, BCH Suppl. 13, 1986, 103–126.
- Empereur – Picon 1989 J.-Y. Empereur – M. Picon, Les régions de production d'amphores impériales en Méditerranée orientale, in: *Amphores romaines et histoire économique. Dix ans de recherche. Actes du colloque de Sienne (22–24 mai 1986)*, organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome, CEFR 114 (Rome 1989) 223–248.
- Empereur – Picon 1998 J.-Y. Empereur – M. Picon, Les ateliers d'amphores du Lac Mariout, in: J.-Y. Empereur (ed.), *Commerce et artisanat dans l'Alexandrie hellénistique et romaine. Actes du Colloque d'Athènes 1988*, BCH Suppl. 33, 1998, 75–91.
- Empereur – Tuna 1988 J.-Y. Empereur – N. Tuna, Zenon de Caunos et Lepave de Serçe Limani, BCH 112, 1988, 341–357.
- Empereur – Tuna 1989 J.-Y. Empereur – N. Tuna, Hieroteles, potier Rhodien de la Perée, in: V. Deroche – J. M. Spieser (eds.), *Recherches sur la céramique Byzantine*, Athens 1987, BCH Suppl. 18, 1989, 277–299.
- Empereur *et al.* 1991 J.-Y. Empereur – C. Kritzas – A. Marangou, Recherches sur les amphores Crétoises II. Les centres de fabrication d'amphores en Crète centrae, BCH 115, 1991, 481–523.
- Empereur *et al.* 1999 J.-Y. Empereur – A. Hesse – N. Tuna, Les Ateliers d'Amphores de Datça, Peninsule de Cnide, in: Y. Garlan (ed.), *Production et Commerce des Amphores Anciennes en Mer Noire (Aix en Provence 1999)* 105–115.
- Engelmann 1986 H. Engelmann, Degustation von Götterwein (IvE 2076), ZPE 63, 1986, 107.
- Engelmann 2001 H. Engelmann, Inschriften und Heiligtum, in: U. Muss (ed.), *Der Kosmos der Artemis von Ephesos*, SoSchrWien 37 (Wien 2001) 33–44.
- Étienne – Mayet 2000 R. Étienne – F. Mayet, Trois clés pour l'économie de l'Hispanie romaine. Le vin hispanique (Paris 2000).
- Étienne – Mayet 2002 R. Étienne – F. Mayet, Trois clés pour l'économie de l'Hispanie romaine. Salaison et sauces de poisson hispaniques (Paris 2002).
- Ettlinger 1959–1960 E. Ettlinger, Die Keramik, Vindonissa, Grabungen Areal Oelhafen. Jahresbericht der Gesellschaft Pro Vindonissa 1959–1960, 24–31.
- Ettlinger – Simonett 1952 E. Ettlinger – C. Simonett, Römische Keramik aus dem Schutthügel von Vindonissa (Basel 1952).
- Fabião 1989 C. Fabião, Sobre as ânforas do acampamento romano da Lomba do Canho (Arganil) (Lisboa 1989).
- Fabião 1997 C. Fabião, Duas notas sobre ânforas lusitanas, Al-Madan, II série, 1997, 55–68.
- Fabião 2005 C. Fabião, Almagro 50, 51C, in: S. Keay – D. F. Williams, Roman amphorae. A digital resource (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Falkener 1862 E. Falkener, Ephesus and the Temple of Diana (London 1862).
- Farinas del Cerro *et al.* 1977 L. Farinas del Cerro – W. Fernandez de la Vega – A. Hesnard, Contribution à l'établissement d'une typologie des amphores dites «Dressel 2–4», in: *Méthodes classiques et méthodes formelles dans l'étude des amphores*, CEFR 32 (Rome 1977) 179–206.
- Fentress 2001 E. Fentress, Villas, wine and kilns. The landscape of Jerba in the late Hellenistic period, JRA 14, 2001, 249–268.
- Fiaccadori 1983 G. Fiaccadori, I frammenti iscritti, in: G. Bermond Montanari (ed.), *Ravenna e il porto di Classe. Venti anni di ricerche archeologiche tra Ravenna e Classe* (Imola 1983) 238–241.

- Finkielsztejn 2000 G. Finkielsztejn, Chronologie et diffusion des dernières amphores timbrées rhodiennes. Étude préliminaire, *ReiCretActa* 36, 2000, 407–415.
- Finkielsztejn 2001 G. Finkielsztejn, Chronologie détaillée et révisée des éponymes amphoriques rhodiens, de 270 à 108 av. J.-C. environ, *BARIntSer* 990 (Oxford 2001).
- Finkielsztejn 2004 G. Finkielsztejn, Koan amphorae imported in the Southern Levant in the Hellenistic period, in: K. Hörhammer (ed.), *The Hellenistic polis of Kos. State, economy and culture*, Proceedings of an International Seminar organized by the Department of Archaeology and Ancient History, Uppsala University, *Boreas* 28 (Uppsala 2004) 153–164.
- Finkielsztejn 2006a G. Finkielsztejn, P. Vadius Pollio. Producteur de vin à Chios et Cos et fournisseur d'Hérode le Grand. Grecs, Juifs et Polonais, A la recherche des origines de la civilisation européenne, Actes du colloque international dédié à Joseph Mélèze-Modrzejewski (Paris, 14 novembre 2003, Varsovie, Académie polonaise des Sciences, Paris 2006) 123–139.
- Finkielsztejn 2006b G. Finkielsztejn, Some remarks on amphora productions and trade in the Southern Levant. Territories and ethnicity, in: D. Malfitana – J. Poblome – J. Lund (eds.), *Old pottery in a new century. Innovating perspectives on Roman pottery studies*, *Atti del Convegno Internazionale di Studi Catania*, 22–24 Aprile 2004 (Catania 2006) 253–263.
- Fitzpatrick 1985 A. P. Fitzpatrick, The Distribution of Dressel 1 Amphorae in North–West Europe, *OxfJA* 1985, 305–340.
- Fitzpatrick 2003 A. P. Fitzpatrick, Roman amphorae in Iron Age Britain, *JRomPotSt* 10, 2003, 10–25.
- Forchheimer 1923 Ph. Forchheimer, Wasserleitungen, in: *FiE* 3 (Wien 1923) 224–255.
- Formenti *et al.* 1978 F. Formenti – A. Hesnard – A. Tchernia, Une amphore 'Lamboglia 2' contenant du vin dans l'épave de la Madrague de Giens, *Archaeonautica* 2, 1978, 95–100.
- Forstenpointner *et al.* 1993 G. Forstenpointner – P. Scherrer – O. Schultz – H. Sattmann, Archäologisch-paläoanatomische Untersuchungen an einer hellenistischen Brunnenanlage in Ephesos, *Wiener Tierärztliche Monatsschrift* 80, 1993, 216–224.
- Forstenpointner *et al.* 2002 G. Forstenpointner – G. Weissengruber – A. Galik, Banquets at Ephesos. Archaeozoological evidence of well stratified Greek and Roman kitchen waste, in: H. Buitenhuis – A. M. Choyke – M. Mashkour – A. H. Al-Shiyab (eds.), *Archaeozoology of the Near East V*, Proceedings of the fifth international symposium on the archaeozoology of southwestern Asia and adjacent Areas (Groningen 2002) 282–304.
- Foss 1979 C. Foss, Ephesus After Antiquity: a Late Antique, Byzantine and Turkish City (Cambridge, New York 1979).
- Fossel – Langmann 1972–1975 C. Fossel – G. Langmann, Nymphaeum des C. Laekanius Bassus, *ÖJh* 50, 1972–1975, Beibl. 301–310.
- Fraser – Bean 1954 P. M. Fraser – G. Bean, *The Rhodian Peraea and Islands* (Oxford 1954).
- Fraser – Matthews 1987 P. M. Fraser – E. Matthews (eds.) *A lexicon of Greek personal names*, Vol. I (Oxford 1987).
- Fraser – Matthews 2005 P. M. Fraser – E. Matthews (eds.) *A lexicon of Greek personal names*, Vol. IV (Oxford 2005).
- Fraser – Matthews 2010 P. M. Fraser – E. Matthews (eds.) *A lexicon of Greek personal names*, Vol. VA (Oxford 2010).
- Freed 1995 J. Freed, The late series of Tunisian cylindrical amphoras at Carthage, *JRA* 1995, 155–191.
- Freed 1996 J. Freed, Early Roman Amphoras in the collection of the Museum of Carthago, *Echos du monde Classique, Classical View* 15, 1996, 119–155.
- Freed 2000 J. Freed, Adoption of the form of the Koan amphora to the production of 'Dressel 2–4' amphoras in Italy and Northeastern Spain, *ReiCretActa* 39, 2000 459–466.
- Freed – Wilson 1999 J. Freed – R.J.A. Wilson, Sicilian Naxian Wine amphoras: A new Look at Wine in North Africa, (paper presented to 100th Annual Meeting of the AIA, 27 December 1998), *American Journal of Archaeology* 103, 1999, 268. (abstract)
- Frova 1977 A. Frova, Scavi di Luni II, *Relazione delle campagne di scavo 1972–1973–1974* (Roma 1977).
- Funari 1996 P. P. A. Funari, Dressel 20 Inscriptions from Britain and the Consumption of Spanish Olive Oil, *BAR* 250 (Oxford 1996).
- Galik *et al.* 2010 A. Galik – G. Forstenpointner – G. Weissengruber, The expression of demand for particular fish food implied by aquatic facilities in living areas of noble households, in: S. Ladstätter – V. Scheibelreiter (eds.), *Städtisches Wohnen im östlichen Mittelmeerraum* 4. Jh. v. Chr. – 1. Jh. n. Chr. Akten des internationalen Kolloquiums vom 24. – 27. Oktober 2007 an der Österreichischen Akademie der Wissenschaften, *AF* 18, *DenkschrWien* 397 (Wien 2010) 667–671.
- Garlan – Kassab Tezgör 1996 Y. Garlan – D. Kassab Tezgör, Prospection d'ateliers d'amphores et de céramiques de Sinope, *Anatolia Antiqua* 4, 1996, 325–334.
- Gassner 1989 V. Gassner, Amphoren aus Carnuntum, Überlegungen zu ihrem wirtschaftsgeschichtlichen Ausgewert, *MünstBeitr* 8, 1989, 52–72.
- Gassner 1997 V. Gassner, Das Südtor der Tetragonos-Agora. Keramik und Kleinfunde, *FiE* 13, 1, 1 (Wien 1989).

- Gebelli – Díaz 2000 P. Gebelli – M. Díaz, Importaciones Béticas en Tarraco en contextos pre-Augusteos, in: Congreso Internacional Ex Baetica Amphorae, Conservas, aceite y vino de la Bética en le Impero Romano, Sevilla – Écija, 17 al 20 de diciembre de 1998 (Écija 2000) 1349–1358.
- Georgopoulos 2004 V. Georgopoulos, The archaeological evidence of Coan amphorae from Kardamaina (Ancient Halasarna), in: K. Hörhammer (ed.), The Hellenistic polis of Kos. State, economy and culture, Proceedings of an International Seminar organized by the Department of Archaeology and Ancient History, Uppsala University, Boreas 28 (Uppsala 2004) 129–136.
- Georgopoulos 2005 V. Georgopoulos, The dissemination of transport amphorae from Cos. A contribution to the study of the Coan trade in the Eastern Mediterranean during the Hellenistic period, in: M. Berg Briese – L. Eric Vaag (eds.), Trade Relations in the Eastern Mediterranean from the Late Hellenistic Period to Late Antiquity. The ceramic Evidence, Halicarnassian studies 3 (Odense 2005) 179–183.
- Ghalia *et al.* 2005 T. Ghalia – M. Bonifay – M. Capelli, L'atelier de Sidi-Zahrani. Mise en évidence d'une production d'amphores de l'Antiquité tardive sur le territoire de la cité de *Napolis* (Nabeul, Tunisie), in: J. M. Gurt i Esparraguera – J. Buxeda i Garrigós – M. A. Cau i Ontiveros (eds.), Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean. Archaeology and Archaeometry, BARIntSer 1340 (Oxford 2005) 495–507.
- Giorgetti *et al.* 2006 D. Giorgetti – X. Gonsales Muro – E. Botte, Nouvelles considérations sur la production d'amphores Dressel 21–22. L'atelier d'Alcamo Marina (Province de Trapani), Sicile, SFECAG, Actes du congrès de Pézenas, 25–28 mai 2006. Productions, approvisionnements et usages de la vaisselle en Languedoc du 1^{er} au 4^e siècle apr. J.-C. Actualité des recherches céramiques (Marseille 2006) 505–516.
- Giuliani 2004 A. Giuliani, Namenssignaturen hellenistischer Lampenwerkstätten, *ÖJh* 73, 2004, 137–157.
- Gnirs 1910 A. Gnirs, Eine römische Tonwarenfabrik in Fasana bei Pola, *Jahrbuch für Altertumskunde* 4, 1910, 79–88.
- Grace 1934 V. R. Grace, Stamped Amphora Handles Found in 1931–1932, *Hesperia* 3, 1934, 197–300.
- Grace 1949 V. R. Grace, Standard Pottery Containers of the Ancient Greek World, in: Commemorative Studies in Honor of Theodore Leslie Shear, *Hesperia Suppl.* 8, 1949, 175–189.
- Grace 1952 V. R. Grace, Timbres amphoriques trouvés à Délos, *BCH* 76/2, 1952, 514–540.
- Grace 1953 V. R. Grace, The Eponyms Named on Rhodian Amphora Stamps, *Hesperia* 22, 1953, 116128.
- Grace 1956a V. R. Grace, Small objects from the Pnyx II, *Hesperia Suppl.* 10, 1956, 113–189.
- Grace 1956b V. R. Grace, The Canaanite Jar, in: S.S. Weinberg (ed.) *The Aegean and the Near East*, Studies Presented to Hetty Goldman. (New York 1956) 80–109.
- Grace 1962 V. R. Grace, Stamped Handles of Commercial Amphoras, in: H. D. Colt, *Excavations at Nessana (Auja Hafir) Palestine 1* (London 1962) 106–130.
- Grace 1965 V. R. Grace, The commercial amphoras from the Antikythera Shipwreck. *Transactions of the American Philosophical Society* 55/3, 1965, 5–17.
- Grace 1971 V. R. Grace, Samian Amphoras, *Hesperia* 40, 1971, 52–95.
- Grace 1974 V. R. Grace, Stamped Amphora Handles, in: J. Bouzek (ed.), *Anatolian Collection of Charles University, Kyme I* (Prague 1974) 89–98.
- Grace 1979 V. R. Grace, Amphoras and ancient wine trade, *Excavations of the Athenian Agora*, Picture Book No. 6 (Athens 1979).
- Grace – Savvatianou-Pétropoulakou 1970 V. R. Grace – M. Savvatianou-Pétropoulakou, Les timbres amphoriques grecs, in: P. Bruneau, *L'îlot de la maison des comédiens, Délos 27*, (Paris 1970) 277–382.
- Grace – Empereur 1981 V. R. Grace – J.-Y. Empereur, Un groupe d'amphores ptolémaïques estampillées, *BIFAO* 81, *Supplément du Centenaire* 1981, 409–426.
- Grew – Seeley 2005 F. Grew – F. Seeley, Dressel 2–4 Verulamium Region White ware, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Groh *et al.* 2006 S. Groh – V. Lindinger – K. Löcker – W. Neubauer – S. Şeren, Neue Forschungen zur Stadtplanung in Ephesus, *ÖJh* 75, 2006, 47–116.
- Guenoche – Hesnard 1983 A. Guenoche – A. Hesnard, Typologie d'amphores romaines par une méthode logique de classification, *Computers and the Humanities* 17, 1983, 185–198.
- Hatzfeld 1919 J. Hatzfeld, Les trafiquants italiens dans l'Orient hellénique, *BEFAR* 115 (Paris 1919).
- Hautumm 1981 W. Hautumm, Studien zu Amphoren der spätrömischen und frühbyzantinischen Zeit (Bonn 1981).
- Hayes 1971 J. W. Hayes, Four Early Roman Groups from Knossos, *BSA* 66, 1971, 249–276.
- Hayes 1973 J. W. Hayes, The Pottery, in: J. Boardman – J. W. Hayes, *Excavations at Tocra 1963–1965. The Archaic Deposits II and Later Deposits*, *BSA Suppl.* 10, 1973, 108–118.
- Hayes 1976 J. W. Hayes, Pottery: stratified Groups and Typology. In: J.H. Humphrey (ed.) *Excavations at Carthage 1975*, conducted by the University of Michigan. (Tunis 1976) 47–123.

- Hayes 1978 J. W. Hayes, Pottery report – 1976, in: J. H. Humphrey (ed.), *Excavations at Carthage 1976*, conducted by University of Michigan 4, (Ann Arbor 1978) 23–98.
- Hayes 1983 J. W. Hayes, *The Villa Dionysos Excavations. Knossos, the Pottery*, BSA 78, 1983, 97–169.
- Hayes 1991 J. W. Hayes, *Paphos III. The Hellenistic and Roman Pottery* (Nicosia 1991).
- Hayes 1992 J. W. Hayes, *Excavations at Sarāḡhane in Istanbul. The Pottery*, vol. 2 (Princeton 1992).
- Hayes 1996 J. W. Hayes, *The pottery*, in: S. E. Sidebotham – W. Z. Wendrich (eds.), *Berenike 1995. Preliminary Report of the 1995 Excavations at Berenike (Egyptian Red Sea Coast) and Surway of the Eastern Desert* (Leiden 1996) 147–178.
- Heger 1986 N. Heger, *Frühromische Amphoren aus der Stadt Salzburg (Mozartplatz 4)*, BayVgBl 51, 1986, 131–161.
- Hesnard 1980 A. Hesnard, *Un dépôt augustéen d’amphores à la Longarina, Ostia. The Seaborne Commerce of Ancient Rome*, MemAmAcc 36, 1980, 141–156.
- Hesnard 1986 A. Hesnard, *Imitations et raisonnement archéologique: A propos des amphores de Rhodes et de Cos*, in: J.-Y. Empereur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, BCH Suppl. 13, 1986, 69–79.
- Hesnard *et al.* 1988 A. Hesnard – M.-B. Carre – M. Rival – B. Dangréaux, *L’Épave romaine Grand Ribaud D (Hyères, Var)*, *Archaeonautica* 8, 1988.
- Hesnard *et al.* 1989 A. Hesnard – M. Rico – P. Arthur – M. Picon – A. Tchernia, *Aires de production des greco-italiques et des Dressel 1*, in: *Amphores romaines et histoire économique. Dix ans de recherches, actes du colloque de Sienne (22–24 mai 1986)*, organisé par l’Università degli studi di Siena, l’Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l’Ecole française de Rome, CEFR 114 (Rome 1989) 21–65.
- Hesnard – Gianfrotta 1989 A. Hesnard – P. Gianfrotta, *Les bouchons d’amphore en pouzzolane*, in: *Amphores romaines et histoire économique. Dix ans de recherches, actes du colloque de Sienne (22–24 mai 1986)*, organisé par l’Università degli studi di Siena, l’Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l’Ecole française de Rome, CEFR 114 (Rome 1989) 393–441.
- Hesnard – Lemoine 1981 A. Hesnard – C. Lemoine, *Les amphores du Cecube et du Falerne. Prospections, typologie, analyses*, MEFR 93, 1981, 243–295.
- Hogarth 1908 D. G. Hogarth, *Excavations at Ephesus* (London 1908).
- Holwerda 1936 J. H. Holwerda, *Het Laat-Grieksche en Romeinsche gebruiksaardewerk uit het Middellandsche-Zeegebied in het Rijksmuseum van oudheden te Leiden* (‘s-Gravenhage 1936).
- Höghammar 1993 K. Höghammar, *Sculpture and society, a study of the connection between the free-standing sculpture and society on Kos in the Hellenistic and Augustan periods*, *Boreas* 23 (Uppsala 1993).
- Hölbl 2001 G. Hölbl, *A History of the Ptolemaic Empire* (London, New York 2001).
- Hueber 1984 F. Hueber, *Der Embolos, ein urbanes Zentrum von Ephesos*, AW 15/4, 1984, 3–30.
- ILind Lindos. Fouilles et recherches 1902–14. 2, *Inscriptions*, C. Blinkenberg, (Berlin – Copenhagen 1941).
- Iro *et al.* 2009 D. Iro – H. Schwaiger – A. Waldner, *Die Grabungen des Jahres 2005 in der Süd- und Nordhalle der Kuretenstraße. Ausgewählte Befunde und Funde*, in: S. Ladstätter – J. Auinger – I. Kowalleck – H. Thür (Hrsg.), *Neue Forschungen zur Kuretenstraße von Ephesos. Akten des Symposiums für Hilke Thür, vom 13. Dezember 2006 an der Österreichischen Akademie der Wissenschaften*, AF 15, *DenkschrWien* 382 (Wien 2009) 53–87.
- Isler 1969 H. P. Isler, *Heraion von Samos. Eine frühbyzantinische Zisterne*, AM 84, 1969, 202–230.
- Jobst 1983 W. Jobst, *Embolosforschungen I. Archäologische Untersuchungen östlich der Celsusbibliothek in Ephesos*, ÖJh 54, 1983, Beibl. 149–250.
- Jobst – Piccottini 1986 W. Jobst – G. Piccottini, *Die Inschriften*, in: H. Vettters – G. Piccottini (eds.), *Die Ausgrabungen auf dem Magdalensberg 1975 bis 1979 (Klagenfurt 1986)* 227–277.
- Johnson 1988 B. L. Johnson, *The Pottery*, in: G. D. Weinberg (ed.), *Excavation at Jalame. Site of a Glass Factory in Late Roman Palestine* (Columbia 1988) 137–226.
- Johnsson 2004 H. Johnsson, *The export of wine to the south-eastern Mediterranean area during the Hellenistic period*, in: K. Hörghammer (ed.), *The Hellenistic polis of Kos. State, economy and culture, Proceedings of an International Seminar organized by the Department of Archaeology and Ancient History, Uppsala University*, *Boreas* 28 (Uppsala 2004) 133–152.
- Joncheray 1975 J.-P. Joncheray, *Étude de l’épave Dramont D. Les objets métalliques*, CahASubaqu 4, 1975, 21–48.
- Jones 1971 A. H. M. Jones, *The Cities of the Eastern Roman Provinces* (Oxford 1971).
- Jöhrens 1999 G. Jöhrens, *Amphorenstempel im Nationalmuseum von Athen. Zu den von H. G. Lolling aufgenommenen „unedierten Henkelinschriften“, mit einem Anhang: Die Amphorenstempel in der Sammlung der Abteilung Athen des Deutschen Archäologischen Instituts* (Mainz 1999).

- Jöhrens 2001 G. Jöhrens, Amphorenstempel hellenistischer Zeit aus Tanais, *EurAnt* 7, 2001, 367–479.
- Joshi – Sinha 1991 M. C. Joshi – A. K. Sinha, Discovery of an Amphora handle from Mathura, in: C. Margabandhu – K. V. Soundara Rajan (eds.), *Indian Archaeological Heritage*. Shri K. V. Soundara Rajan Festschrift, *Agam indological series* 11 (Delhi 1991) 255–258.
- Józsa *et al.* 1994 S. Józsa – R. Sauer – Gy. Szakmány – T. Weiszbürg, in: T. Bezaczy, Amphorenfunde vom Magdalensberg und aus Pannonien, ein Vergleich. *Archäologische Forschungen zu den Grabungen auf dem Magdalensberg* 12 (Klagenfurt 1994) 143–166.
- Καντζιά 1994 X. Καντζιά, Ένα κεραμικό εργαστήριο αμφορέων του πρώτου μισού του 4ου αι. π.Χ. στην Κω, in: *Γ' ΕλλΚερ* 1994, 323–354.
- Kapitän 1961 G. Kapitän, Schiffsfrachten antiker Baugesteine und Architekturteile vor den Küsten Ostsiziliens, *Klio* 39, 1961, 276–318.
- Kapitän 1972 G. Kapitän, Le anfore del relitto romano di Capo Ognina (Siracusa). *Recherches sur les amphores Romaines*, *CEFR* 10 (Rome 1972) 243–252.
- Karagiorgou 2001 O. Karagiorgou, LR2. A Container for the Military *annonna* on the Danubian Border?, in: S. Kingsley – M. Decker (eds.), *Economy and Exchange in the East Mediterranean during Late Antiquity*. Proceedings of a Conference at Somerville College, Oxford, 29th May, 1999 (Oxford 2001) 129–166.
- Karwiese 1995 S. Karwiese, Groß ist die Artemis von Ephesos. Die Geschichte einer der großen Städte der Antike (Wien 1995).
- Karwiese 1997 S. Karwiese, Das Südtor der Tetragonos Agora in Ephesos. Die archäologische Evidenz aus den Fundamentsondierungen, *ÖJh* 66, 1997, Beibl., 253–318.
- Karwiese 1998 S. Karwiese, Türkei – Ephesos, 1. Agora, *ÖJh* 67, 1998, Beibl., 7–12.
- Kassab Tezgör 1999 D. Kassab Tezgör, Types amphoriques fabriqués à Demirci près de Sinope, in: Y. Garlan (ed.), *Production et commerce des amphores anciennes en Mer Noire*. Colloque International à Istanbul, 25–28 mai 1994 (Aix-en-Provence 1999) 117–123.
- Kassab Tezgör – Tatlıcan 1998 D. Kassab Tezgör – I. Tatlıcan, Fouilles des ateliers d'amphores à Demirci près de Sinope en 1996 et 1997, *Anatolia Antiqua* 6, 1998, 423–442.
- Keay 1984 S. J. Keay, Late Roman amphorae in the Western Mediterranean. A typology and economic study, the Catalan evidence, *BARIntSer* 196 (Oxford 1984).
- Keay 1989 N. Keay, The amphorae, in: M. Fulford – M. Hall (eds.), *Excavations at Sabratha 1948–1951* Vol. 2. Part I: The finds, (Gloucester 1989) 5–85.
- Keil 1908 J. Keil, Zur Topographie der ionischen Küste südlich von Ephesos, *ÖJh* 11, 1908, Beibl., 135–168.
- Keil 1922–24 J. Keil, Zur Topographie und Geschichte von Ephesos, *ÖJh* 21/22, 1922–24, 96–112.
- Kelemen 1988 H. K. Kelemen, Roman Amphorae in Pannonia 2, *ActaArchHung* 40, 1988, 111–150.
- Kelemen 1990 H. K. Kelemen, Roman Amphorae in Pannonia 3, *ActaArchHung* 42, 1990, 147–193.
- Kelemen 1992 H. K. Kelemen, Amphora, in: K. Biróné Sey (ed.), *A balácai villagazdaság főépületének pincéje* (Keller des Hauptgebäudes der Balácer Gutshofes) *Balácai Közlemények* 2, 1992, 23–26.
- Kelemen 1993 H. K. Kelemen, Roman Amphorae in Pannonia 4, *ActaArchHung* 44, 1993, 45–73.
- Kingsley 2002 S. A. Kingsley, A Sixth-Century AD Shipwreck off the Carmel Coast, Israel, *BARIntSer* 1065 (Oxford 2002).
- Kirbihler 2007a F. Kirbihler, Die Italiker in Kleinasien, mit besonderer Berücksichtigung von Ephesos (133 v. Chr. – 1. Jh. n. Chr.), in: M. Meyer (ed.), *Neue Zeiten – Neue Sitten*. Zu Rezeption und Integration römischen und italischen Kulturguts in Kleinasien (Wien 2007) 19–35.
- Kirbihler 2007b F. Kirbihler, P. Vedius Rufus, père de P. Vedius Pollio, *ZPE* 160, 2007, 261–271.
- Kirigin *et al.* 2006 B. Kirigin – T. Katunarić – L. Šešelj, Preliminary notes on some economic and social aspects of amphorae and fine ware pottery from central Dalmatia, 4th–1st B.C., in: *Rimini e l'Adriatico nell'età delle guerre puniche*. Atti del Convegno Internazionale di Studi Rimini, Musei Comunali, 25–27 marzo 2004 (Bologna 2006) 191–225.
- Knibbe 1985 D. Knibbe, Der Asiarch M. Fulvius Publicianus Nicephorus, die ephesischen Handwerkszünfte und die Stoa des Servilius, *ÖJh* 56, 1985, 71–77.
- Knibbe 1995 D. Knibbe, Via Sacra Ephesiaca. New aspect of the cult of Artemis Ephesia, in: H. Koester (ed.), *Ephesos Metropolis of Asia*, *Harvard theological studies* 41, 1995, 141–155.
- Knibbe 1998 D. Knibbe, Ephesos. Geschichte einer bedeutenden antiken Stadt und Portrait einer modernen Großgrabung (Frankfurt 1998).
- Knibbe 2000 D. Knibbe, History and research history of Ephesus, in: P. Scherrer (ed.), *Ephesus. The new guide* (Istanbul 2000) 14–37.
- Knibbe – Langmann 1993 D. Knibbe – G. Langmann, Via Sacra Ephesiaca I. *ÖAI BerMat* 3 (Wien 1993)
- Kraft *et al.* 2000 J. C. Kraft – I. Kayan – H. Brückner – G. Rapp Jr., A geologic analysis of ancient landscapes and the harbours of Ephesus and the Artemision in Anatolia, *ÖJh* 69, 2000, 175–233.
- Kraft *et al.* 2005 J. C. Kraft – H. Brückner – I. Kayan, The sea under the city of ancient Ephesus, in: B. Brandt – V. Gassner – S. Ladstätter (eds.), *Synergia*. Festschrift für Friedrich Krinzinger (Wien 2005) 147–156.

- Kuzmanov 1973 G. Kuzmanov, Typologie et chronologie des amphores de la haute époque byzantine, (bulg. m. franz. Res.), *ArcheologijaSof* 15, 1, 1973, 14–21.
- Ladstätter 2000a S. Ladstätter, Feldforschung, Jahresbericht 1999 des ÖAI, *Ephesos, ÖJh*, 69, 2000, 372–373.
- Ladstätter 2000c S. Ladstätter, Die materielle Kultur der Spätantike in den Ostalpen. Eine Fallstudie am Beispiel der westlichen Doppelkirchenanlage auf dem Hemmaberg, *MPK* 35, 2000.
- Ladstätter 2002 S. Ladstätter, Die Chronologie des Hanghauses 2, in: F. Krinzinger (Hrsg.), *Das Hanghaus 2 in Ephesos. Studien zu Baugeschichte und Chronologie*, *AF* 7, *DenkschrWien* 302 (Wien 2002) 9–40.
- Ladstätter 2003a S. Ladstätter, Zur Charakterisierung des spätantiken Keramikspektrums im Ostalpenraum, in: H. Sennhauser (Hrsg.), *Frühe Kirchen im östlichen Alpengebiet. Von der Spätantike bis zur ottonischen Zeit*, *Bayrische Akademie der Wissenschaften, phil.-hist. Klasse, Abhandlungen N. F.* 123 (München 2003) 831–857.
- Ladstätter 2003b S. Ladstätter, Keramik, in: C. Lang-Auinger (Hrsg.), *Hanghaus 1 in Ephesos. Funde und Ausstattung*, *FiE* 8, 4 (Wien 2003) 22–83.
- Ladstätter 2005 S. Ladstätter, Keramik, in H. Thür (Hrsg.) *Hanghauses 2 in Ephesos. Die Wohneinheit 4. Baubefund, Ausstattung, Funde*, *FiE* 8, 6 (Wien 2005) 230–358.
- Ladstätter 2008 S. Ladstätter, Funde, in: M. Steskal – M. La Torre (Hrsg.), *Das Vediusgymnasium in Ephesos. Archäologie und Baubefund*, *FiE* 14, 1 (Wien 2008) 97–186.
- Ladstätter 2010a S. Ladstätter, Überlegungen zur Datierung der Steinsäge in WT 2 des Hanghauses 2, in: F. Mangartz (ed.), *Die byzantinische Steinsäge von Ephesos. Baubefund, Rekonstruktion, Architekturteile*, *Monographien des RGZM* 86 (Mainz 2010) 53–58.
- Ladstätter 2010b S. Ladstätter, *Keramikauswertung, 11.3 Süd- und Westportikus*, in: A. Pülz (ed.) *Das sog. Lukasgrab in Ephesos. Eine Fallstudie zur Adaption antiker Monumente in byzantinischer Zeit*, *FiE* 4, 4 (Wien 2010) 250–344.
- Ladstätter 2010c S. Ladstätter, *Keramik*, in: F. Krinzinger (Hrsg.) *Hanghaus 2 in Ephesos. Die Wohneinheiten 1 und 2. Baubefund, Ausstattung, Funde*, *FiE* 8, 8 (Wien 2010) 172–279 and 530–579.
- Ladstätter – Lang-Auinger 2001 S. Ladstätter – C. Lang-Auinger, Zur Datierung und kunsthistorischen Einordnung einer Apollon–Kitharodos–Statuette, in: F. Krinzinger (Hrsg.), *Studien zur hellenistische Keramik in Ephesos*, *ÖJh Erg.* 2 (Wien 2001) 71–81.
- Ladstätter – Pülz 2007 S. Ladstätter – A. Pülz, *Ephesus in the Late Roman and early Byzantine Period. Changes in its Urban Charakter from the Third to the Seventh Century AD*, in: G. Poulter (ed.), *The Transition to Late Antiquity on the Danube and Beyond. Acts of a symposium at the British Academy 2003. Proceedings of the British Academy* 141 (Oxford 2007) 391–433.
- Ladstätter – Sauer 2002 S. Ladstätter – R. Sauer, *Late Roman C Ware in Ephesos. The significance of imported and local production by petrological and mineralogical methods*, in: V. Kilikoglou – A. Hein – Y. Maniatis, *Modern trends in scientific studies on ancient ceramics*, *BARIntSer* 1011 (Oxford 2002) 323–333.
- Ladstätter – Sauer 2005 S. Ladstätter – R. Sauer, *Late Roman C–Ware und lokale spätantike Feinware aus Ephesos (mit einem Beitrag von G. Schneider – M. Daszkiewicz)*, in: F. Krinzinger (eds.) *Spätantike und mittelalterliche Keramik aus Ephesos*, *AF* 13, *DenkschrWien* 332 (Wien 2005) 143–201.
- Ladstätter – Steskal 2009 S. Ladstätter – M. Steskal, *Die Grabungen 1999 im Bereich der Alytarchenstoa*, in: S. Ladstätter – J. Auinger – I. Kowalleck – H. Thür (eds.), *Neue Forschungen zur Kuretenstraße von Ephesos. Akten des Symposiums für Hilke Thür vom 13. Dezember 2006 an der Österreichischen Akademie der Wissenschaften*, *AF* 15, *DenkschrWien* 382 (Wien 2009) 89–100.
- Lagóstena 1996 L. B. Lagóstena, *Alfarería romana en la Bahía de Cádiz* (Cádiz 1996).
- Lagóstena 2001 L. B. Lagóstena, *La producción de salsas y conservas de pescado en la Hispana romana (II a.C.–VI d.C.)* *Col.lecció Instrumenta* 11 (Barcelona 2001).
- Lagóstena – Bernal 2004 L. Lagóstena Barrios – D. Bernal Casasola, *Alfares y producciones cerámicas en la Provincia de Cádiz. Balance y perspectivas*, in: D. Bernal – L. Lagóstena (eds.), *Figlinae Baeticae. Talleres alfareros y producciones cerámicas en la Bética romana (ss. II a.C. – VII d.C.)*, *Actas del Congreso International (Cádiz, 12–14 de noviembre de 2003)*, *BARIntSer* 1266 (Oxford 2004) 39–123.
- Lagóstena 2005 L. B. Lagóstena = Lazaro Lagóstena: *Beltrán 2A, Beltrán 2B, Beltrán 4B, Beltrán 72, Dressel 7, 8, 9 and 10*, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Lamboglia 1952 N. Lamboglia, *La nave romana Albenga*, *RStLig* 18, 1952, 131–236.
- Lamboglia 1955 N. Lamboglia, *Sulla cronologia delle anfore romane de età repubblicana*, *RStLig*, 1955, 252–260.
- Lang 1984 G. Lang, *Ein Zwischenbericht zur Anastylose des Südtores der Agora von Ephesos*, *AW* 15/4, 1984, 23–30.
- Lang 1955 M. Lang, *Dated Jars of Early Imperial Times*, *Hesperia* 24, 1955, 277–285.

- Lang 1976
Lang-Auinger 1994
Lang-Auinger 2007
- Lang-Auinger – Outschar 1992
Lang-Auinger – Outschar 1994
- Laubenheimer 1985
Laubenheimer 1989
- Laubenheimer 2005
- Laubenheimer *et al.* 2007
- Laubenheimer – Marlière 2010
- Lawall 2003
Lawall 2004
Lawall 2006
Lawall 2007
Lawall *et al.* 2010
- Lemaître 1997
Lemaître 2000
Lemaître 2002
- Le Roy 1984
Liko 2001
Liko 2010
- Licordari 1982
- Lindhagen 2009
- M. Lang, *The Athenian Agora 21. Graffiti and dipinti* (Athen 1976).
- C. Lang-Auinger, *Nachgrabungen in Hanghaus 1 und 2*, *ÖJh* 63, 1994, Beibl., Ausland 20 f.
- C. Lang-Auinger, *Zum Grabungsbefund*, in: V. Mitsopoulos-Leon – C. Lang-Auinger (eds.), *Die Basilica am Staatsmarkt in Ephesos 2. Teil. Funde klassischer bis römischer Zeit*, *FiE* 9, 2, 3 (Wien 2007) 4–8.
- C. Lang-Auinger – U. Outschar, *Ephesos/Hanghaus 1 vorläufiger Grabungsbericht 1990/1991*, *AnzWien* 128, 1991 (1992) 147–154.
- C. Lang-Auinger – U. Outschar, *Ephesos/Hanghaus 1 vorläufiger Grabungsbericht 1992*, *AnzWien* 130, 1993 (1994) 1–24.
- F. Laubenheimer, *La production des amphores en Gaule Narbonnaise* (Paris 1985).
- F. Laubenheimer, *Les amphores gauloises sous l'Empire. Recherches nouvelles sur leur production et leur chronologie*, in: *Amphores romaines et histoire économique. Dix ans de recherches, actes du colloque de Sienne (22–24 mai 1986), organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome*, *CEFR* 114 (Rome 1989) 105–138.
- F. Laubenheimer, *Gauloise 4*, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- F. Laubenheimer – Kh. Al-As'ad – A. Schmidt-Colinet, *Des amphores à Palmyre. Le matériel des fouilles récentes de la mission syro-allemande*, in: M. Satre (ed.) *Productions et échanges dans la Syrie Grecue et romaine. Coll. Tours 2003, Topoi Suppl. 8, 2007*, 329–355.
- F. Laubenheimer – É. Marlière, *Échanges et vie économique dans le Nord-Ouest des Gaules. Le témoignage des amphores du IIe siècle avant J.-C. au IVe siècle après J.-C. vol. I–II*. Presses universitaires de Franche-Comté (Besançon 2010).
- M. L. Lawall, *Egyptian and Imported Amphoras*, in: S. C. Herbert – A. Berlin (eds.), *Excavations at Coptos (Qift) in Upper Egypt, 1987–1992*, *JRA Suppl.* 53, 2003, 157–191.
- M. L. Lawall, *Archaeological context and Aegean amphora chronologies. A case study of Hellenistic Ephesos*, in: J. Eiring – J. Lund (eds.), *Transport amphorae and trade in the eastern Mediterranean, Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002, Monographs of the Danish Institute at Athens 5* (Aarhus 2004) 171–188.
- M. L. Lawall, *Consuming the West in the East. Amphoras of the western Mediterranean in the Aegean before 86 BC*, in: D. Malfitana – J. Poblome – J. Lund (eds.), *Old pottery in a new century. Innovating perspectives on Roman pottery studies, Atti del Convegno Internazionale di Studi Catania, 22–24 Aprile 2004* (Catania 2006) 265–286.
- M. L. Lawall, *Hellenistic stamped Amphora handles*, in: V. Mitsopoulos-Leon – C. Lang-Auinger (eds.), *Die Basilika am Staatsmarkt in Ephesos, 2. Teil: Funde klassischer bis römischer Zeit*, *FiE* 9 (Wien 2007) 28–60.
- M. L. Lawall – N. A. Lejpunskaja – P. D. Diatropov – T. L. Samojlova, *Transport amphoras*, in: N. A. Lejpunskaja *et al.* (eds.) *The Lower City of Olbia (Sector NGS) in the 6th century BC to the 4th century AD*, *Black Sea Studies* 13. (Aarhus 2010) 355–405.
- S. Lemaître, *L'amphore de type Agora F65/66, dite "monoansée". Essai de synthèse à partir d'exemplaires lyonnais*, in: *Actes du Congrès du Mans, 8–11 mai 1997, Ensembles céramiques précoces dans l'ouest de la Gaule, quelques ensembles céramiques des pays de la Loire, Actualité des recherches céramiques, SFECAG* (Marseille 1997) 311–319.
- S. Lemaître, *Les importations d'amphores de Méditerranée orientale à Lyon au IIIe siècle ap. J.-C.*, *ReiCretActa* 36, 2000, 467–476.
- S. Lemaître, *Recherche sur la diffusion en Gaule des amphores produites dans le sud-ouest de l'Anatolie à l'époque impériale*, in: F. Blondé – P. Ballet – J.-F. Salles (eds.), *Céramiques hellénistiques et romaines. Productions et diffusion en Méditerranée orientale (Chypre, Égypte et côte syro-palestinienne)*, *TMO* 35 (Lyon 2002) 213–226.
- C. Le Roy, *Timbres amphoriques provenant de Tanis*, *BIFAO*, 84 1984, 307–316.
- H. Liko, *Hellenistische Keramik aus der Grabung beim sogenannten Lukasgrab*, in: F. Krinzinger (ed.), *Studien zur hellenistischen Keramik in Ephesos*, *ÖJh Ergh.* 2 (Wien 2001) 83–97.
- H. Liko, *Keramikauswertung 11.1 Rundbau*, in: A. Pülz (ed.), *Das sog. Lukasgrab in Ephesos. Eine Fallstudie zur Adaption antiker Monumente in byzantinischer Zeit*, *FiE* 4, 4 (Wien 2010) 186–249.
- A. Licordari, *Ascesa al Senato e rapporti con i territori d'origine. Italia: Regio I (Latium)*, in: S. Panciera (ed.), *Epigrafia e ordine senatorio. Atti del Colloquio Internazionale AIEGL. Roma, 14–20 maggio 1981, Tituli* 5, II (Roma 1982) 9–57.
- A. Lindhagen, *The transport amphoras Lamboglia 2 and Dressel 6A. A central Dalmatian origin?*, *JRA* 22, 1, 2009, 83–108.

- Liou 1987a B. Liou, Inscriptions peintes sur amphores. Fos (suite), Marseille, Toulon, Port-la-Nautique, Arles, Saint-Blaise, Saint-Martin-de-Crau, Mâcon, Calvi, *Archaeonautica* 7, 1987, 55–139.
- Liou 1987b B. Liou, L'Exporation du vin de Tarraconaise d'après les épaves (Badalona 1987) 271–284.
- Liou 1993 B. Liou, Inscriptions peintes sur amphores de Narbonne (Port de la Nautique), *Archaeonautica* 11, 1993, 131–148.
- Liou – Marichal 1978 B. Liou – R. Marichal, Les inscriptions peintes sur amphores de l'anse Saint-Gervais a Fos-sur-mer, *Archaeonautica* 2, 1978, 109–182.
- Loeschcke 1909 S. Loeschcke, Ausgrabungen bei Haltern. Die keramischen Funde, *Mitteilungen der Altertums-Kommission für Westfalen* 5, 1909.
- Loeschcke 1942 S. Loeschcke, Die römische und belgische Keramik aus Oberaden, in: Ch. Albrecht, *Das Römerlager in Oberaden 2* (Dortmund 1942) 76–114.
- Lopreato 1993 P. Lopreato, Iulia Felix. La nave romana di Grado, relazione preliminare, in: *Antichità Alto-adriatiche* 40, 1993, 271–277.
- Love 1972 I. Love, A preliminary report of the excavations at Cnidus, *AJA* 86, 1972, 61–76.
- Lund 1993a J. Lund, Pottery of the Classical, Hellenistic and Roman Periods, in: L. W. Sørensen – D. W. Rupp (eds.), *The Land of the Paphian Aphrodite 2. The Canadian Palaiaphos Survey Project Artifact and Ecofactual Studies*, SIMA 104, 2 (Gothenburg 1993) 79–155.
- Lund 1993b J. Lund, Rhodian Amphorae as Evidence for the Relations between Late Punic Carthage and Rhodes, *ActaHyp* 5, 1993, 359–375.
- Lund 1999 J. Lund, Trade Patterns in the Levante from ca. 100 BC to AD 200 as reflected by the Distribution of Ceramic Fine Wares in Cyprus, *MünstBeitr* 18, 1999, 1, 1–22.
- Lund 2000a J. Lund, Transport Amphorae as Evidence of Exportation of Italian Wine and Oil to the Eastern Mediterranean in the Hellenistic Period, in: J. Lund – P. Pentz (eds.), *Between Orient and Occident. Studies in Honour of P. J. Riis* (Copenhagen 2000) 77–99.
- Lund 2000b J. Lund, The “Pinched-handle” Transport Amphorae as Evidence of the Wine Trade of Roman Cyprus, in: Γ. Κ. Ιωαννίδη – Σ. Α. Χατζηστόλη (eds.), *Πρακτικά του τρίτου διεθνούς κυπριολογικού συνεδρίου (Λευκωσία, 16–20 Απριλίου 1996), Τόμος Α' (Λευκωσία 2000)* 565–578.
- Lund 2002 J. Lund, Review of Finkielstejn *Chronologie détaillée et révisée des éponymes amphoriques rhodiens, de 270 à 108 av. J.–C. environ. Premier bilan. BAR International Series 990*, Oxford 2001, in: *Bryn Mawr Classical Review* on line: <http://ccat.sas.upenn.edu/bmcr/2002/2002–11–23.html>
- Lund 2005 J. Lund, Agora G 199, Agora M 54, Amphore de Pamphylie, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Lund 2007 J. Lund, The circulation of ceramic fine wares and transport amphorae from the Black Sea region in the Mediterranean, c. 400 BC – AD 200, in: V. Gabrielsen – J. Lund (eds.), *The Black Sea in Antiquity. Regional and interregional economic exchanges* (Aarhus 2007) 183–194.
- Lusuardi Siena 1973 S. Lusuardi Siena, Anfore, in: A. Frova (ed.) *Scavi di Luni, Relazione preliminare delle campagne di scavo 1970–1971* (Roma 1973) 425–456.
- Lusuardi Siena 1977 S. Lusuardi Siena, Anfore, in: A. Frova (ed.) *Scavi di Luni II, Relazione delle campagne di scavo 1972–1973–1974* (Roma 1977) 218–270.
- Mackensen 1987 M. Mackensen, *Mediterrane Sigillata, Lampen und Amphoren*, in: V. Bierbrauer (ed.), *Invillino–Ibligo in Friaul I. Die Römische Siedlung und das spätantik–frühmittelalterliche Castrum*, *MünchBeitrVfG* 33, 1987, 229–265.
- Magie 1950 D. Magie, *Roman rule in Asia Minor*, Princeton, 1950.
- Maier-Maidl 1992 V. Maier-Maidl, *Stempel und Inschriften auf Amphoren vom Magdalensberg. Archäologische Forschungen zu den Grabungen auf dem Magdalensberg* 11 (Klagenfurt 1992).
- Maiuri 1924 A. Maiuri, Una Fabbrica di Anfore Rhodie, *Annuario della Scuola Archeologica di Athene* 4–5, 1924, 249–269.
- Maiuri 1933 A. Maiuri, *La Casa del Menandro e il suo tesoro di argenteria* (Roma 1933).
- Majcherek 1990 G. Majcherek, Amphorae, in: W. A. Daszewski, *Excavations at Marina el-Alamein 1987–1988*, *MDAIK* 46, 1990, 46–51.
- Majcherek 1993 G. Majcherek, Roman Amphorae from Marina el-Alamein, *MDAIK* 49, 1993, 215–220.
- Majcherek 1995 G. Majcherek, Gazan amphorae. Typological Reconsidered, in: H. Meyza – J. Mlynarczyk (eds.), *Hellenistic and Roman Pottery in the Eastern Mediterranean. Advances in Scientific Studies, Acts of the II Nieborów Pottery Workshop* (Warsaw 1995) 163–178.
- Majcherek 2007 G. Majcherek, Aegean and Asia Minor Amphorae from Marina el-Alamein, in: S. Marchand – A. Marangou (eds.), *Amphores d'Égypte de la Basse Époque à l'époque arabe*, *IFAO* 8, 2007, 9–31.
- Manacorda 1975 D. Manacorda, Proposta per una identificazione dell'anfora Dressel 24, *Archeologia Classica* 27, 2, 1975, 378–383.

- Manacorda 1976–77 D. Manacorda, Testimonianze sulla produzione e il consumo dell'olio tripolitano nel secolo III, *DialArch* 9–10, 1976–77, 542–601.
- Manacorda 1977 D. Manacorda, Ambiente XVI. Le anfore, Ostia IV, *Studi Miscellanei* 23 (Roma 1977) 116–266, 277–283.
- Manacorda 1986 D. Manacorda, A proposito della anfore cosidette greco-italiche, una breve nota. in: J.-Y. Empeur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, BCH Suppl. 13, 1986, 581–582.
- Manacorda 1988 D. Manacorda, Per uno studio dei centri produttori delle anfore brindisine. La Puglia in età repubblicana, Atti del I Convegno di studi sulla Puglia romana, Mesagne 20–22 marzo 1986, *Testi e Monumenti VI* (Galatina 1988) 91–108.
- Manacorda 1989 D. Manacorda, Le Anfore dell'Italia Repubblicana. Aspetti Economici e Sociali, in: *Amphores romaines et histoire économique. Dix ans de recherches, actes du colloque de Sienne (22–24 mai 1986)*, organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'École française de Rome, CEFR 114 (Rome 1989) 443–467.
- Manacorda 1990 D. Manacorda, Le fornaci di Visellio a Brindisi. Primi risultati dello scavo, *VeteraChr* 27, 1990, 375–415.
- Manacorda 1994 D. Manacorda, Produzione agricola, produzione ceramica e proprietà della terra nella Calabria romana tra Repubblica e Impero, in: *Epigrafia della produzione e della distribuzione*, CEFR 193 (Rome 1994) 3–59.
- Manacorda 1995 D. Manacorda, A proposito delle anfore della Pannonia romana. Appunti e riflessioni, in: G. Hajnóczy (ed.), *La Pannonia e l'Impero Romano. Atti del convegno internazionale*, Accademia d'Ungheria e l'Istituto austriaco di cultura, Roma 13–16 gennaio 1994 (Milano 1995) 177–191.
- Manacorda 1998 D. Manacorda, Il vino del Salento e le sue anfore, in: *El Vi a l'antiguitat. Economia, producció i comerç al Mediterrani Occidental, Actes* (Badalona 6–9 de Maig de 1998), *Monografies Badalonines* 14 (Badalona 1998) 319–331.
- Manacorda 2001 D. Manacorda, Le fornaci di Giancola (Brindisi). *Archeologia, epigrafia, archeometria*, in: F. Laubenheimer (ed.), *20 ans de recherches à Sallèles d'Aude* (Besançon 2001) 229–240.
- Mañá 1974 J. M. Mañá, Sobre tipología de las ánforas púnicas, *Información Arqueológica* 14, 1974, 38–46.
- Mange – Bezeczky 2006 M. A. Mange – T. Bezeczky, Petrography and provenance of Laecanius amphorae from Istria, northern Adriatic region, Croatia, *Geoarchaeology, an International Journal* 21, 2006, 427–458.
- Marangou-Lerat 1996 A. Marangou-Lerat, Le vin et les amphores de Crète. De l'époque classique à l'époque impériale, *Études Crétoises* 30 (Athènes–Paris 1996).
- Marangou – Marchand 2007 A. Marangou – S. Marchand, Conteneurs importés et égyptiens de Tebtynis (Fayoum) de la deuxième moitié du IV^e siècle av. J.-C. au Xe siècle apr. J.-C. (1994–2002), in: S. Marchand – A. Marangou (eds.), *Amphores d'Égypte, de la Basse Époque à l'époque arabe. Cahiers de la Céramique Égyptienne*, IFAO 8, 2007, 239–295.
- Marimon – Carreras 2004 P. Marimon – C. Carreras, Imitacions d'Haltern 70 en Gallia Romana, in: *Culip VIII i les àmfores Haltern 70*, *Monografies del CASC* 5 (Girona 2004) 41–49.
- Marikoulaki *et al.* 1989 S. Marikoulaki – J.-Y. Empeur – A. Marangou, Recherches sur les centres de fabrication d'amphores de Crète occidentale, *BCH* 113, 1989, 551–580.
- Martin 1999 A. Martin, Amphorae, in: D. Soren – N. Soren, A Roman villa and a late Roman infant cemetery. Excavation at Poggio Gramignano, Lugnano in Teverina (Roma 1999) 329–361.
- Martin 2000 A. Martin, Amphorae at Olympia, *ReiCretActa* 36, 2000, 427–433.
- Martin 2005 A. Martin, Pottery at Ostia (4th to 8th centuries). The evidence from the AAR–DAI excavations, *ReiCretActa* 39, 2005, 127–132.
- Martin-Kilcher 1987 S. Martin-Kilcher, Die römischen Amphoren aus Augst und Kaiseraugst. Ein Beitrag zur römischen Handels- und Kulturgeschichte, *FiA* 7, 1 (Augst 1987).
- Martin-Kilcher 1991 S. Martin-Kilcher, Die Amphoren, in: A. Hochuli-Gysel – A. Siegfried-Weiss – E. Ruoff – V. Schaltenbrand Obrecht (eds.), *Chur in römischer Zeit II*. Basel, *Antiqua* 19, 1991, 119–127.
- Martin-Kilcher 1993 S. Martin-Kilcher, Amphoren der späten Republik und der frühen Kaiserzeit in Karthago. Zu den Lebensmittelimporten der Colonia Iulia Concordia, *RM* 100, 1993, 269–320.
- Martin-Kilcher 1994 S. Martin-Kilcher, Die römischen Amphoren aus Augst und Kaiseraugst. Die Amphoren für Wein, Fischsauce, Südfrüchte (Gruppen 2–24) und Gesamtauswertung, *FiA* 7/2–3 (Augst 1994).
- Martin-Kilcher 1999 S. Martin-Kilcher, Karthago 1993. Die Füllung eines frühkaiserzeitlichen Pozzo, in: F. Rakob – A. von den Driesch (Hrsg.), *Karthago III. Die deutschen Ausgrabungen in Karthago* (Mainz 1999) 404–434.
- Martin-Kilcher 2000 S. Martin-Kilcher, Les Laecanii et les amphores à huile d'Istrie, *JRA* 13,2, 2000, 506–509.
- Martin-Kilcher 2003 S. Martin-Kilcher, Fish-sauce amphorae from the Iberian peninsula. The forms and observations on trade with the north-west provinces, *JRomPotSt* 10, 2003, 69–84.

- Martin-Kilcher 2005 S. Martin-Kilcher, Carthage. Imported eastern amphorae in the Roman Colonia Iulia, 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*, *Halicarnassian Studies 7* (Odense 2005) 202–220.
- Martínez – Revilla 2008 V. Martínez – V. Revilla, El Vilarenc (Calafell). Quelques observations sur la production amphorique d'un fundus du territoire de *Tarraco* à la période augustéenne, in: SFECAG Actes du Congrès de L'Escala–Empúries (Marseille 2008) 295–304.
- Maselli Scotti 1983 F. Maselli Scotti, Problemi suscitati dai recenti scavi di Duino (Trieste). *Atti dei Civici Musei di Storia ed Arte di Trieste, Quaderno 13, 1*, 1983, 45–64.
- Mariotti *et al.* 2009 V. Mariotti – W. Basile – P. Bordigone – A. Marensi – M. Sannazaro – G. L. Gregori, Chiavenna (Clavenna, Italia settentrionale). Un *vicus* tra il Mediterraneo e l'Europa centrale, le ceramiche locali e di importazione de un recente scavo urbano, SFECAG, Actes du Colmar (Marseille 2009) 563–588.
- Matijašić 1982 R. Matijašić, Roman Rural Architecture in the Territory of Colonia Iulia Pola, *AJA* 86, 1982, 53–64.
- Mattingly 1988 D. J. Mattingly, Oil for export? A comparison of Libyan, Spanish and Tunisian olive oil production in the Roman empire, *JRA* 1, 1988, 33–56.
- Mayet 1977 F. Mayet, Deux amphores Haltern 70 estampillées du musée de Séville, in: D. Coll – R. Étienne – R. Lequément – B. Liou – F. Mayet, *L'épave Port Venders II et le commerce de la Bétique à l'époque de Claude*, *Archaeonautica* 1, 1977, 141–143.
- Mazzocchin – Pastore 1995 S. Mazzocchin – P. Pastore, Le fosse con anfore, in: S. Pensavento Mattioli – A. Ruta Serafini (eds.), *Via Beato Pellegrino, Scavo 1994, Necropoli romana e depositi di anfore*, *Quad-AVen* 11, 1995, 104–108.
- Mc Fadden 1946 G. H. Mc Fadden, A tomb of the necropolis of Ayios Ermoyenis at Kourion. *AJA* 50, 1946, 449–489.
- Mercando 1974 L. Mercando, La necropoli romana di Portorecanati, *NSc* 28, 1974, 142–445.
- Mercando 1979 L. Mercando, Marche. Rinvenimenti di insediamenti rurali, *NSc* 33, 1979, 89–296.
- Meriç 2002 R. Meriç, Späthellenistisch-römische Keramik und Kleinfunde aus einem Schachtbrunnen am Staatsmarkt in Ephesos, *FiE* 9, 3 (Wien 2002).
- Meriç 2009 R. Meriç, Das Hinterland von Ephesos. Archäologisch-topographische Forschungen im Kaystros-Tal, *ÖJh Ergh.* 12 (Wien 2009).
- Milne 1905 J. G. Milne, Greek Inscriptions, *Catalogue général des Antiquités Égyptiennes des Musées du Caire* 18 (Oxford 1905).
- Miltner 1956–1958 F. Miltner, Vorläufiger Bericht über die Ausgrabungen in Ephesus, *ÖJh* 43, 1956–1958, Beibl. 2–63.
- Miltner 1959 F. Miltner, XXII Vorläufiger Bericht über die Ausgrabungen in Ephesus, *ÖJh* 44, 1959, 289–312.
- Miró 1988 J. Miró, La producción de ánforas romanas en Catalunya, *BARIntSer* 473 (Oxford 1988).
- Mitchell 2005 S. Mitchell, Olive cultivation in the economy of Roman Asia Minor, in: S. Mitchell – C. Katsari (eds.), *Patterns in the economy of Roman Asia Minor*, (Wales 2005) 83–113.
- Molina Vidal 2000 J. Molina Vidal, Las primeras exportaciones Béticas en el Mediterráneo occidental, in: *Congreso Internacional Ex Baetica Amphorae. Conservas, aceite y vino de la Bética en el Impero Romano*, Sevilla – Écija, 17 al 20 de diciembre de 1998 (Écija 2000) 637–645.
- Mollo 2001 F. Mollo, Archeologia per Tortara. Frammenti del passato, Guida alla mostra dei palazzo Casapesenna (Potenza 2001).
- Monsieur 2001 P. Monsieur, Note préliminaire sur les amphores découvertes à Pessinonte. Annexe, I, *Anatolia Antiqua* 9, 2001, 73–84.
- Monsieur – De Paepe 2002 P. Monsieur – P. De Paepe, Amphores de Cos et amphores Italiques a Pessinonte. Croiser les données archéologiques et pétrographiques, *Anatolia Antiqua* 10, 2002, 155–175.
- Morais – Carreras 2004 R. Morais – C. Carreras, Geografia del consum de les Haltern 70, in: C. Carreras, *Culip VIII i les ànfores Haltern 70*, *Monografies del CASC* 5 (Girona 2004) 93–112.
- Muffanti Musselli 1987 G. Muffanti Musselli, Diffusione dell'anfora tronco-conica da olive nel I sec. D.C., *Rivista archeologica dell'antica provincia e diocesi di Como* 168, 1987, 187–215.
- Nicolaou – Empereur 1986 I. Nicolaou – J.-Y. Empereur, Amphores rhodiennes du musée de Nicosie, in: J.-Y. Empereur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, *BCH Suppl.* 13, 1986, 516.
- Nilsson 1909 M. P. Nilsson, Timbres amphoriques de Lindos publiés avec une étude sur les timbres amphoriques rhodiens (Copenhague 1909) 37–180. 349–539.
- Nonnis 2001 D. Nonnis, Appunti sulle anfore adriatiche d'età repubblicana. Aree di produzione e commercializzazione, in: C. Zaccaria (ed.), *Strutture portuali e rotte marittime nell'Adriatico di età romana*, *Atti della 29 settimana di studi aquileiesi*, 20–23 maggio 1998, *Antichità Altoadriatiche* 46, *CEFR* 280 (Trieste 2001) 467–500.
- Oelmann 1914 F. Oelmann, *Die Keramik des Kastells Niederbieber* (Frankfurt 1914).

- Olcese 2005–2006 G. Olcese, The production and circulation of Greco-Italic amphorae of Campania (Ischia/Bay of Naples). The data of archaeological and archaeometric research, *Skyllis*, 7, 2005–2006, 60–75.
- Olcese 2010 G. Olcese, *Le anfore greco italiche di Ischia: archeologia e archeometria. Artigianato ed economia nel Golfo di Napoli* (Roma 2010).
- Olcese – Thierrin-Michael 2009 G. Olcese – G. Thierrin-Michael, Greco-Italic amphorae in the region of Ostia. Archaeology and archaeometry, in: T. K. Biró – V. Szilágyi – A. Kreiter, *Vessels. Inside and outside*, Proceedings of the conference EMAC 07 (Budapest 2009) 159–164.
- Oleson 1994 J. P. Oleson, Amphoras, in: J. P. Oleson (ed.), *The Harbours of Caesarea Maritima. Result of the Caesarea Ancient Harbour Excavation Project 1980–1985, Vol II, The Finds and the Ship*, BARIntSer 594 (Oxford 1994) 3–24.
- Opaiț 1980 A. Opaiț, Considerații preliminare asupra amforelor romane și romano-bizantine din Dobrogea, *Peuce* 8, 1980, 291–327.
- Opaiț 1996 A. Opaiț, Aspecte ale vieții economice din Provincia Scythia (secolele 4–6 p. ch.). Producția ceramicii locale și de import – Economical life's aspects in the Scythia Minor province (4th–6th c. A.D.). The local and import ceramics production, *Bibliotheca Thracologica* 16 (București 1996).
- Opaiț 2004a A. Opaiț, Local and Imported Ceramics in the Roman Province of Scythia (4th – 6th centuries AD), BARIntSer 1274 (Oxford 2004).
- Opaiț 2004b A. Opaiț, The Eastern Mediterranean Amphorae in the Province of Scythia. in: J. Eiring – J. Lund (eds.), *Transport Amphorae and the Trade in the Eastern Mediterranean, Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002, Monographs of the Danish Institute at Athens* 5 (Aarhus 2004) 293–308.
- Opaiț 2007a A. Opaiț, From 24 to LR 2?, in: M. Bonifay – J.-C. Tréglia (eds.), *LRCW 2*, BARIntSer 1662 (Oxford 2007), 627–643.
- Opaiț 2007b A. Opaiț, A Weighty Matter. Pontic Fish Amphorae, in: V. Gabrielsen – J. Lund (eds.), *The Black Sea in Antiquity. Regional and Interregional Economic Exchanges*, 2007, 101–121.
- Opaiț – Tsaravopoulos 2010 A. Opaiț – A. Tsaravopoulos, A Chiote pottery workshop of the Roman period, *ReiCretActa* 41, 2010, 23–28.
- Outschar 1993 U. Outschar, Produkte aus Ephesos in alle Welt?, *ÖAI BerMat* 5, 2 (Wien 1993) 46–52.
- Outschar 1996 U. Outschar, Dokumentation exemplarisch ausgewählter keramischer Fundkomplexe, in: C. Lang-Auinger, *Hanghaus 1 in Ephesos. Der Baubefund*, FiE 8, 3 (Wien 1996) 27–85.
- Outschar 2000 U. Outschar, Keramik macht Baugeschichte. Die Begrenzung der Insula Hanghaus 2 in Ephesos, die Evidenz des keramischen Fundmaterials unter dem Pflaster der sog. Hanghausstrasse, *Römisch-Historische Mitteilungen* 42, 2000, 107–169.
- Özyiğit 1990 Ö. Özyiğit, 1988 Yılı Erythrai sondaj çalışmaları, *Kazı Sonuçları Toplantısı* XI, 1, 1990, 125–150.
- Palazzo 1988 P. Palazzo, Aspetti tipologici della produzione di anfore brindisine, in: C. Matangio, *La Puglia in età repubblicana. Atti del I Convegno di Studi sulla Puglia Romana, Mesagne, 20–22 marzo 1986* (1988) 107–117.
- Palazzo 1989 P. Palazzo, Le anfore di Apani (Brindisi), in: *Amphores romaines et histoire économique. Dix ans de recherche, actes du colloque de Sienne (22–24 mai 1986), organisé par l'Université degli studi di Siena, l'Università degli studi di Roma-La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome, CEFR 114* (Rome 1989) 548–553.
- Palazzo 1990 P. Palazzo, Brindisi. Località “La Rosa”, I reperti anforari, *Taras* 10, 1, 1990, 141–156.
- Palazzo 1992 P. Palazzo, Nuovi rinvenimenti in località La Rosa, Brindisi, *Taras* 12, 1992, 115–130.
- Palazzo 1993 P. Palazzo, Anse con bollo rivenute in località La Rosa (Brindisi), *Taras* 1993, 227–236.
- Palazzo 1994 P. Palazzo, Brindisi. Località Marmorelle, le fornaci e i reperti anforari, in: M. Pani (ed.), *Epigrafia e territorio. Politica e società, Terni di antichità romane III* (Bari 1994) 201–225.
- Palazzo 1996 P. Palazzo, Bolli anforari dal sito di Apani, in: M. Cébeillac-Gervasoni (ed.), *Les élites municipales de l'Italie péninsulaire des Gracques à Néron. Actes de la table ronde de Clermont-Ferrand, 28–30 novembre 1991, CEFR 215* (Roma 1996) 47–53.
- Palazzo – Silvestrini 2001 P. Palazzo – M. Silvestrini, Apani. Anfore brindisine di produzione “aniniana”, *Daidalos* 3, 2001, 57–107.
- Panella 1970 C. Panella, *Le Anfore. Studi Miscellanei* 16, Ostia II (Roma 2001) 102–156.
- Panella 1972 C. Panella, Annotazioni in margine alle stitografie delle terme Ostiensi del nuotatore. *Recherches sur les Amphores Romaines, CEFR 10* (Rome 1972) 69–106.
- Panella 1973 C. Panella, Appunti su un gruppo di anfore della prima, media e tarda età Imperiale, *Studi Miscellanei* 21, Ostia III (Roma 1973) 460–633.
- Panella 1976 C. Panella, Per uno studio delle anfore di Pompei. Le forme VIII e X della tipologia di R. Schoene, *StMiscRo*, 22, 1976, 149–162.

- Panella 1980 C. Panella, *Retroterra. Porti e mercati. L'esempio dell'Ager Falernus*, in: J. H. D'Arms – E. C. Kopff (eds.), *The Seaborne Commerce of Ancient Rome. Studies in Archaeology and History*, MemAmAc 36, 1980, 251–259.
- Panella 1981 C. Panella, *La distribuzione e i mercati*, in: A. Giardina – A. Schiavone (eds.), *Società romana e produzione schiavistica*, Vol. II. *Merci, mercati e scambi nel Mediterraneo (Rome–Bari 1981)* 55–80.
- Panella 1982 C. Panella, *Le anfore africane della prima, media e tarda età imperiale. Tipologia e problemi*, in: *Actes du colloque sur la céramique antique, Carthage, 23–24 juin 1980, CEDAC Dossiers 1 (Carthage 1982)* 171–186.
- Panella 1986 C. Panella, *Oriente ed Occidente. Considerazioni su alcune anfore "egee" di età imperiale a Ostia*, in: J.-Y. Empereur – Y. Garlan (eds.), *Recherches sur les amphores grecques*, BCH Suppl. 13, 1986, 609–636.
- Panella 1993 C. Panella, *Merci e scambi nel Mediterraneo tardoantico*, in: A. Schiavone (ed.) *Storia di Roma 3/2. L'età tardoantica II. I luoghi e le culture (Torino 1993)* 613–697.
- Panella 2001 C. Panella, *Le anfore di età imperiale nel Mediterraneo occidentale*, in: E. Geny (ed.), *Céramiques hellénistiques et romaines 3 (Paris 2001)* 177–275.
- Panella – Fano 1977 C. Panella – M. Fano, *Le anfore con anse bifide conservate a Pompei. Contributo ad una loro classificazione*, *Méthodes classiques et méthodes formelles dans l'étude des amphores*, CEFR 32 (Rome 1977) 133–177.
- Panella – Morizio forthcoming C. Panella – V. Morizio (eds.), *Corpus dei bolli sulle anfore romane I. I bolli sulle anfore italiane (Roma, forthcoming)*.
- Parker 1977 A. J. Parker, *Lusitanian amphoras. Méthodes classiques et méthodes formelles dans l'étude des amphores*, CEFR 32, (Rome 1977) 35–40.
- Parker 1989 A. J. Parker, *Amphores Almagro 50 de l'épave de Randello (Sicile)*, in: *Amphores romaines et histoire économique. Dix ans de recherche, actes du colloque de Sienne (22–24 mai 1986)*, organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'École française de Rome, CEFR 114 (Rome 1989) Poster 36, 650–653.
- Parker 1992 A. J. Parker, *Ancient shipwrecks of the Mediterranean and the Roman provinces*, BARIntSer 580 (Oxford 1992).
- Pascual Guasch 1962 R. Pascual Guasch, *Centros de producción y difusión geográfica de un tipo de anfora*, in: *Congreso Nacional de Arqueología 7, Barcelona 1960 (Saragossa 1962)* 334–345.
- Pasquinucci *et al.* 2005 M. Pasquinucci – A. Del Rio – S. Menchelli – G. Picchi, *Dinamiche commerciali nel Tirreno settentrionale nell'età tardoantica*, *ReiCretActa* 39, 2005, 119–125.
- Paton – Hicks 1891 W. R. Paton – E. L. Hicks, *The Inscriptions of Cos (Oxford 1891)*.
- Peacock 1971 D. P. S. Peacock, *Roman Amphorae in Pre-Roman Britain*, in: M. Jesson – D. Hill (eds.), *The Iron Age and its Hill Forts (Southampton 1971)* 161–188.
- Peacock 1974 D. P. S. Peacock, *Amphorae and the Baetican fish industry*, *AntJ* 54, 1974, 232–243.
- Peacock 1977a D. P. S. Peacock, *Roman amphorae. Typology, fabric and origins*, in: *Méthodes classiques et méthodes formelles dans l'étude des amphores*, CEFR 32 (Rome 1977) 261–278.
- Peacock 1977b D. P. S. Peacock, *Recent discoveries of Roman amphora kilns in Italy*, *AntJ* 57, 1977, 262–269.
- Peacock 1977c D. P. S. Peacock, *Late Roman Amphorae from Chalk, near Gravesend, Kent*, in: J. Dore – K. Greene (eds.), *Roman Pottery Studies in Britain and beyond*, BAR Suppl 30, 1977, 295–300.
- Peacock 1984 *Petrology and origins; The amphorae: typology and chronology*, in: M. G. Fulford – D. P. S. Peacock, *Excavation at Carthage. The Avenue du Président Bourguiba: Pottery and Other Ceramic Objects. The British Mission, Vol. I, 2 (Sheffield 1984)* 6–28; 116–140.
- Peacock – Williams 1986 D. P. S. Peacock – D. F. Williams, *Amphorae and the Roman Economy (London 1986)*.
- Peacock *et al.* 1989 D. P. S. Peacock – F. Bejaoui – N. Ben Lazreg, *Roman amphora production in the Sahel region of Tunisia*, in: *Amphores romaines et histoire économique. Dix ans de recherches, Actes du colloque de Sienne (22–24 mai 1986)*, organisé par l'Università degli studi di Siena, l'Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'École française de Rome, CEFR 114 (Rome 1989) 179–222.
- Peirce 2001 S. Peirce, *The Greek transport amphorae*, in: A. Cambitoglou – J. K. Papadopoulos – O. Tudor Jones (eds.), *Torone I. The Excavations of 1975, 1976, and 1978 (Athens 2001)* 495–513.
- Pensabene 1981 P. Pensabene, *Nuove acquisizioni nella zona sud-occidentale del Palatino*, *Archeologia laziale* 4, *Quaderni del Centro di studio per l'archeologia etrusco-italica* 5, 1981, 101–118.
- Pesavento Mattioli *et al.* 1992 S. Pesavento Mattioli – S. Cipriano – P. Pastore – S. Mazzocchin, *Anfore romane a Padova. Ritrovamenti dalla città. Materiali d'archeologia* 1, (Modena 1992).
- Pesavento Mattioli – Zanini 1993 S. Pesavento Mattioli – S. Zanini, *Per un Aggiornamento dell'Epigrafia Anforaria Pataviana. Le Lamboglia 2 e le Dressel 6A del Museo Civico Archeologico*, *Bollettino del Museo Civico di Padova* 83, 1993, 47 Fig. 49–51.

- Piccottini 1997 G. Piccottini, Amphorae litteratae vom Magdalensberg, in: G. Erath – M. Lehner – G. Schwarz (Hrsg.), Komos. Festschrift für Thuri Lorenz zum 65. Geburtstag (Wien 1997) 203–206.
- Piccottini 2000–2001 G. Piccottini, Neues zum Wein- und Lebensmittelimport in die Stadt auf den Magdalensberg, Kärnten. Festschrift für E. Reuer, *Archaeologia Austriaca* 84–85, 2000–2001, 373–385.
- Pieri 2005 D. Pieri, Le commerce du vin oriental à l'époque byzantine (Ve–VIIe siècles). Le témoignage des amphores en Gaul, *Bibliothèque archéologique et historique* 174 (Beyrouth 2005).
- Pichlerová 1996 M. Pichlerová, Eine Olivenamphore aus Gerulata, in: Römerzeit – Mittelalter. Archäologische und kulturwissenschaftliche Beiträge, Festschrift Herma Stiglitz (Petronell–Carnuntum 1996) 73–77.
- Pimenta 2003 J. Pimenta, Contribuiçã para o estudo das ânforas do Castelo de São Jorge (Lisboa), *Revista Portuguesa de Arqueologia* 6/2, 2003, 341–362.
- Plesničar–Gec 1983 L. Plesničar–Gec, Starokrščanski Center v Emonu (Old Christian center in Emona), *Katalogi in Monografije* 21 (Ljubljana 1983).
- Poblome *et al.* 2005 J. Poblome – P. Bes – P. Degryse, The decline and fall of Sagalassos. A ceramic perspective, *ReiCretActa* 39, 2005, 225–230.
- Ponsich 1979 M. Ponsich, Implantation rurale antique sur le bas–Guadalquivir, Tome 2 (Paris 1979).
- Ponsich 1998 M. Ponsich, Aceite de oliva y salazones de pescado. Factores geo–economicos de Betica y Tingitania (Madrid 1998).
- Portale – Romeo 2000 E. C. Portale – I. Romeo, Le anfore locali di Gortina ellenistica e romana, *ReiCretActa* 36, 2000, 417–426.
- Praschiv 2006 D. Praschiv, Amfore romane și romano–bizantine în zona Dunării de Jos, sec. I – VII p. Chr. (Iași 2006).
- Puig 2004 A. Puig, Evolució de les Haltern 70 in: C. Carreras, Culip VIII i les àmfores Haltern 70, *Monografies del CASC* 5 (Girona 2004) 23–32.
- Pülz 1985 S. Pülz, Milet 1983–1984. Kaiserzeitliche Keramik aus dem Heroon III, *IstMitt* 35, 1985, 77–115.
- Pülz 2008 A. Pülz, Von der Göttin zur Gottesmutter? Artemis und Maria, in: U. Muss (Hrsg.), *Die Archäologie der ephesischen Artemis. Gestalt und Ritual eines Heiligtums* (Wien 2008) 67–75.
- Quatember *et al.* 2008 U. Quatember – A. Waldner – M. Pfisterer – M. Aurenhammer, Die Grabung des Jahres 2005 beim Nymphaeum Traiani Ephesus, *ÖJh* 77, 2008, 265–334.
- Radić – Jurišić 1993 I. Radić – M. Jurišić, Das antike Schiffswrack von Mljet, *Germania* 71, 1993, 113–138.
- Radulescu 1973 A. Radulescu, Amfore cu inscripții de la edificiul roman cu mozaic din Tomis, *Pontica* 6, 1973, 193–208.
- Radulescu 1976 A. Radulescu, Amfore romane și romano–bizantine din Scythia Minor, *Pontica* 9, 1976, 99–114.
- Rathmayr 2005 E. Rathmayr, Skulpturen, in: H. Thür (ed.), *Hanghaus 2 in Ephesus. Die Wohneinheit 4*, *FiE* 8, 6 (Wien 2005) 207–229.
- Rathmayr 2009 E. Rathmayr, Das Haus des Ritters C. Flavius Furius Aptus. Beobachtungen zur Einflussnahme von Hausbesitzern an Architektur und Ausstattung in der Wohneinheit 6 des Hanghauses 2 in Ephesos, *IstMitt* 59, 2009, 307–336.
- Rauh 2003 N. K. Rauh, Merchants, sailors and pirates in the Roman world (Charleston 2003).
- Rauh 2004 N. K. Rauh, Pirated Knock–offs. Cilician Imitations of Internationally Traded Amphoras, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens*, *Monographs of the Danish Institute at Athens* 5 (Aarhus 2004) 329–336.
- Rauh – Slane 2000 N. K. Rauh – K. W. Slane, Possible Amphora Kilns in West Rough Cilicia, *JRA* 13, 2000, 319–330.
- Rautman 1995 M. L. Rautman, Two Late Roman Wells at Sardis, *AASOR* 53, 1995, 37–84.
- Remesal Rodríguez 1982 J. Remesal Rodríguez, Die Ölwirtschaft in der Provinz Baetica: Neue Formen der Analyse, *Saalburg Jb* 38 1982, 30–71.
- Remesal Rodríguez 1986 J. Remesal Rodríguez, La annona militaris y la exportacion de aceite bético a Germania (Madrid 1986).
- Remesal Rodríguez 1997 J. Remesal Rodríguez, Heeresversorgung und die wirtschaftlichen Beziehungen zwischen der Baetica und Germanien, *Materialhefte zur Archäologie in Baden–Württemberg* 42 (Stuttgart 1997).
- Remolà Vallverdú 2000 J. A. Remolà Vallverdú, Las ánforas tardo–antiguas en Tarraco (Hispania tarraconensis) Siglos IV–VII d.C. *Collecció Instrumenta* 7 (Barcelona 2000).
- Reynolds 1995 P. Reynolds, Trade in the Western Mediterranean, AD 400–700. The ceramic evidence, *BAR–IntSer* 604 (Oxford 1995).
- Reynolds 2000 P. Reynolds, The Beirut amphora type, 1st century BC – 7th century AD. An outline of its formal development and some preliminary observations of regional economy trends, *ReiCretActa* 36, 2000, 387–395.

- Reynolds 2004 P. Reynolds, The Roman pottery from the Triconch Palace, in: R. Hodges – W. Bowden – K. Lako (eds.), *Byzantine Butrint. Excavations and Surveys 1994–99* (Oxford 2004) 224–269.
- Reynolds 2005 P. Reynolds, Almagro 54. Late Roman Amphora 1, Late Roman Amphora 5 and 6, Peacock and Williams Class 65 and 66, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Reynolds 2005a P. Reynolds, Levantine amphorae from Cilicia to Gaza. A Typology and Analysis of Regional Production Trends from the 1st to 7th Centuries, in: J. M. Gurt i Esparraguera – J. Buxeda Garrigós – M. A. Cau Ontiveros (eds.), *LRCW I. Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean, Archaeology and Archaeometry, BARIntSer 1340* (Oxford 2005) 63–612.
- Reynolds 2010 P. Reynolds, *Hispania and the Roman Mediterranean, AD 100–700. Ceramics and Trade* (London 2010).
- Riley 1975 J. A. Riley, The pottery from the first session of excavation in the Caesarea Hippodrome, *BA-SOR* 218, 1975, 25–63.
- Riley 1979 J. A. Riley, The Coarse Pottery from Berenice, in: J. A. Lloyd (ed.), *Excavations at Sidi Khrebish Benghazi (Berenice) II, Libya Antiqua Suppl. 5, 2* (Tripoli 1979) 91–467.
- Riley 1981 J. A. Riley, The pottery from the cisterns 1977.1, 1977.2 and 1977.3, in: J. H. Humphrey (ed.), *Excavations at Carthage conducted by the University of Michigan, vol. VI* (Ann Arbor 1981) 85–124.
- Rizzo 2003 G. Rizzo, *Instrumenta Urbis I. Ceramiche fini da mensa, lucerne ed anfore a Roma nei primi due secoli dell'impero, CEFR 307* (Rome 2003).
- Robinson 1959 H. S. Robinson, *The Athenian Agora V. Pottery of the Roman Period, Chronology* (Princeton 1959).
- Rodríguez Almeida 1977 E. Rodríguez Almeida, Bolli anforari di Monte Testaccio 1, *BCom* 86 (1974–1975) 1977, 199–248.
- Rodríguez Almeida 1981 E. Rodríguez Almeida, Bolli anforari di Monte Testaccio 2, *BCom* 86 (1978–1979) 1981, 109–135.
- Rodríguez Almeida 1984 E. Rodríguez Almeida, *Il Monte Testaccio* (Roma 1984).
- Rodríguez Almeida 1989 E. Rodríguez Almeida, *Los tituli picti de las ánforas olearias de la Bética* (Madrid 1989).
- Rogl 2003a Ch. Rogl, Späthellenistische Applikenkeramik und Verwandtes aus Ephesos, *ÖJh* 72, 2003, 187–207.
- Rogl 2003b Ch. Rogl, Hellenistische Keramik aus den Grabungen auf der Tetragonos-Agora in Ephesos. Ein mittelhellenistischer Fundkomplex, in: B. Asamer – W. Wohlmayr (eds.), *Actes des 9. Österreichischen Archäologentages am Institut für Klassische Archäologie der Paris-Lodron-Universität Salzburg vom 6. bis 8. Dezember 2001* (Wien 2003) 175–182.
- Rogl 2004 Ch. Rogl, Zu dem Produktionsbeginn schwarzer Sigillata in Ephesos. Die Evidenz der Tetragonos Agora, *ÖJh* 73, 2004, 207–219.
- Rostovtzeff 1998 M. Rostovtzeff, *The Social and Economic History of the Hellenistic World* (Oxford 1941, Special edition 1998).
- Rothschild-Boros 1981 M. C. Rothschild-Boros, The Determination of Amphora Contents, in: G. Barker – R. Hodges (eds.), *Archaeology and Italian Society, BARIntSer 102* (Oxford 1981) 79–89.
- Saguì 1998 L. Saguì, Il deposito della Crypta Balbi. Una testimonianza impervidibile sulla Romana del VII secolo?, in: L. Saguì (ed.), *Ceramica in Italia. VI–VII secolo, Atti del Convegno in onore di John W. Hayes, Roma 11–13 maggio 1995* (Firenze 1998) 305–330.
- Sakl-Oberthaler 1994 S. Sakl-Oberthaler, Die römischen Transportamphoren aus der Insula XXII in Flavia Solva, *Schild von Steier* 17, 1994, 8–44.
- Sanginetto 2001 A. B. Sanginetto, Trasformazioni o crisi nei Bruttii fra il II a.C. ed il VII d.C.?, in: E. Lo Cascio – A. Storchi Marino (eds.), *Modalità insediative e strutture agrarie nell'Italia meridionale in età romana, PragmaTeiai 7* (Bari 2001) 203–246.
- Sauer 1995 R. Sauer, Bericht über die archäometrischen Untersuchungen für das FWF-Projekt Nr. 9280. Produktionszentren späthellenistischer und römischer Keramik an der W-Küste Kleinasien (mit einem Anhang von U. Outschar (unpubl. Manuskript, 1995).
- Sauer 2005 R. Sauer, Ergebnisse der mineralogisch-petrographischen Analysen von ausgewählten römischen Amphorenproben aus Wien, in: F. Krinzinger (Hrsg.), *Vindobona. Beiträge zu ausgewählten Keramikgattungen in ihrem topographischen Kontext, AF 12, DenkschrWien 328* (Wien 2005) 109–142.
- Sazanov 1999 A. Sazanov, Les amphores "LA 1 Carthage" dans la région de la Mer Noire, in: Y. Garlan (ed.), *Production et commerce des amphores anciennes en Mer Noire. Colloque International à Istanbul, 25–28 mai 1994* (Aix-en-Provence 1999) 265–279.
- Sazanov 2007 A. Sazanov, Les amphores orientales d'époque protobyzantine au nord de la Mer Noire : chronologie et typologie, in: M. Bonifay – J.-C. Trégliat (eds.) *LRCW 2, BARIntSer 1662* (Oxford 2007) 803–815.

- Schallmayer 1992 E. Schallmayer, Production d'amphores en Germanie Supérieure?, in: F. Laubenheimer (ed.) *Les Amphores en Gaule. Production et circulation* (Paris 1992) 71–74.
- Scheibelreiter-Gail 2011 V. Scheibelreiter-Gail, Die Mosaiken Westkleinasiens. Tessellate des 2. Jahrhunderts v. Chr. bis Anfang des 7. Jahrhunderts n. Chr., *SoSchr ÖAI* 46 (Wien 2011).
- Scherrer 1990 P. Scherrer, Augustus, die Mission des Vedius Pollio und die Artemis Ephesia, *ÖJh* 60, 1990, 87–101.
- Scherrer 2000 P. Scherrer (ed.), *Ephesus – The New Guide*. Revised edition (Istanbul 2000).
- Scherrer 2001 P. Scherrer, The Historical Topography of Ephesos, in: D. Parrish (Hrsg.), *Urbanism in Western Asia Minor. New Studies on Aphrodisias, Ephesos, Hierapolis, Pergamon, Perge and Xanthos*, *JRA Suppl.* 45, 2001, 57–93.
- Scherrer 2005 P. Scherrer, Das sogenannte Serapeion in Ephesos. Ein Mouseion?, in: A. Hoffmann (ed.), *Ägyptische Kulte und Heiligtümer im Osten des Römischen Reiches*, *Byzas* 1, 2005, 109–138.
- Scherrer 2006 P. Scherrer, Die Tetragonos Agora, in: P. Scherrer – E. Trinkl (eds.), *Die Tetragonos Agora in Ephesos. Grabungsergebnisse von archaischer bis in byzantinische Zeit – ein Überblick. Befunde und Funde klassischer Zeit*, *FiE* 13, 2 (Wien 2006).
- Scherrer 2007 P. Scherrer, Der *conventus civium Romanorum* und kaiserliche Freigelassene als Bauherren in Ephesos in augusteischer Zeit, in: M. Meyer (ed.), *Neue Zeiten – Neue Sitten. Zu Rezeption und Integration römischen und italischen Kulturguts in Kleinasien*, *Wiener Forschungen zur Archäologie* 12 (Wien 2007) 63–75.
- Scherrer – Trinkl 2006 P. Scherrer – E. Trinkl, Die Tetragonos Agora in Ephesos. Grabungsergebnisse von archaischer bis in byzantinische Zeit, ein Überblick, *Befunde und Funde klassischer Zeit*, *FiE* 13, 2 (Wien 2006).
- Schimmer 2009 F. Schimmer, Amphoren aus Cambodonum/Kempton. Ein Beitrag zur Handelsgeschichte der römischen Provinz Raetia (Wiesbaden 2009).
- Schmidt-Colinet 2001 A. Schmidt-Colinet, Short preliminary Report of the Syro-German Archaeological Mission at Palmyra in 2001 (manuscript 2001).
- Schörgendorfer 1942 A. Schörgendorfer, Die römische Keramik der Ostalpenländer (Wien 1942).
- Schulten 1906 A. Schulten, Zwei Erlasse des Kaisers Valens über die Provinz Asia, *ÖJh* 9, 1906, 40–70.
- Schulze 1904 W. Schulze, Zur Geschichte lateinischer Eigennamen (Berlin 1904).
- Sciallano – Sibella 1994 M. Sciallano – P. Sibella, Amphores. Comment les identifier? (Aix-en-Provence 1994).
- Sciarra 1970 B. Sciarra, Bolli anforari Brindisini, *Studi Salentini* 37–38, 1970, 143–155.
- Scorpan 1976 C. Scorpan, Origini și linii evolutive in Ceramica Romano-Byzantina (sec. IV–VII) din spațiul Mediteranean și Pontic, *Pontica* 9, 1976, 155–185.
- Scorpan 1977 C. Scorpan, Contribution à la connaissance de certains types céramiques romano-byzantins (IV–VII siècles), dans *l'espace Istro-Pontique*, *Dacia* 7, 1977, 269–297.
- Scotti 1994 C. Scotti, Anfore romane al museo di Legnano. Catalogo (Legnano 1994).
- Sealey 1985 P. R. Sealey, Amphoras from the 1970 Excavations at Colchester Sheepen, *BARIntSer* 142 (Oxford 1985).
- Sealey 2003 P. R. Sealey, Ver 1908 amphoras introduced. *Amphorae in Britain and the western Empire*, *JRomPotSt* 10, 2003, 92–95.
- ШЕЛОВ 1975 Д. Б. ШЕЛОВ, КЕРАМИЧЕСКИЕ КЛЕЙМА ИЗ ТАНАЙСА III–I ВЕКОВ ДО Н.Э. (МОСКВА 1975).
- Şenol 2003 A. K. Şenol, Marmaris Müzesi Ticarî Amphoraları (Ankara 2003).
- Şenol 2008 A. K. Şenol, Amphores produites en Égypte, in: J.-Y. Empereur (dir.), Ahmet Kaan Şenol, *Le Centre Alexandrin d'Étude des Amphores*, CNRS 2008 www.amphoralex.org
- Şenol – Kerem 2000 A. K. Şenol – F. Kerem, İçel Müzesinde Bulunan Bir Grup Amphora, *Olba III* (Mersin 2000) 83–114.
- Şenol *et al.* 2004 G. C. Şenol – A. Şenol – E. Doğer, Amphora Production in the Rhodian Peraea in the Hellenistic Period, in: J. Eiring – J. Lund.(eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International colloquium at the Danish Institute at Athens, September 26–29, 2002*, *Monographs of the Danish Institute at Athens* 5 (Aarhus 2004) 353–359.
- SGDI H. Collitz, F. Bechtel, *et al.* (eds.), *Sammlung der griechischen Dialekt-Inschriften*, (Göttingen 1884–1915).
- Sherwin-White 1978 S. Sherwin-White, *Ancient Cos* (Göttingen 1978).
- Siani-Davies 2001 Cicero, *Pro Rabirio Postumo*. Marcus Tullius Cicero, translated with introduction and commentary by M. Siani-Davies, *Clarendon ancient history series* (Oxford 2001).
- Solin 2003 H. Solin, *Die griechischen Personennamen in Rom* (Berlin 2001).
- Sotelazvili – Jakobson 1984 M. K. Sotelazvili – A. L. Jakobson, *Vizantijskij sram v s. Drandra (Absaziya)*, *Vizantijskij Vremennik* 45, 1984, 192–206.

- Sotomayor 1969 M. Sotomayor, Hornos Romanos de ánforan en Algeciras, in: X Congreso nacional de arqueología (Mahón 1969) 389–399.
- Soykal 1993 F. Soykal, Eine spätklassische Terrakottastatue der Kybele aus Ephesos, *ÖAI BerMat* 5 (Wien 1993) 53–56.
- Starac 2009 A. Starac, Nalaz Rimskog svetišta u Četvrti Sv. Teodora u Puli, *Archeološka istraživanja* 2008, *Histria Archeol.* 38–39, 2009, 123–168.
- Steckner 1989 C. Steckner, Les amphores LR 1 et LR 2 en relation avec le pressoir du complexe ecclésiastique des thermes de Samos, *BCH Suppl.* 18, 1989, 57–71.
- Steskal 2010 M. Steskal, Das Prytaneion in Ephesos, *FiE* 9, 4 (Wien 2010).
- Stöckli 1979 W. E. Stöckli, Die Grob- und Importkeramik von Manching (Wiesbaden 1979).
- Swan 2004 V. G. Swan, Dichin (Bulgaria) and the supply of amphorae to the Lower Danube in the late Roman–early Byzantine period. in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International colloquium at the Danish Institute at Athens, September 26–29. 2002, Monographs of the Danish Institute at Athens* 5 (Aarhus 2004) 371–382.
- Sztetyło 1976 Z. Sztetyło, Nea Paphos I. Les timbres céramiques, 1965–1973 (Varsovie 1976).
- Sztetyło 1991 Z. Sztetyło, Nea Paphos IV. Pottery stamps, 1975–1989 (Varsovie 1991).
- Sztetyło 2000 Z. Sztetyło, Pottery stamps. Tell Atrib 1985–1995, I (Varsovie 2000).
- Syme 1961 R. Syme, Who was Vedius Pollio?, *JRS* 51, 1961, 23–30.
- Taeuber 2005 H. Taeuber, Graffiti, in: H. Thür (ed.), *Hanghaus 2 in Ephesus. Die Wohneinheit* 4, *FiE* 8, 6 (Wien 2005) 132–143.
- Taeuber 2011 H. Taeuber, Der Gaius Laecanius Bassus-Brunnen in Ephesos – privat oder öffentlich finanziert?, *NFN Imperium and Officium. Comparative Studies in Ancient Bureaucracy and officialdom, Working Papers (IOWP) Version 01, May 20011*
http://iowp.univie.ac.at/sites/default/files/CLB_Inschr_%20IOWP_03.pdf.
- Tartari 1982 F. Tartari, Anforat e Muzeut arkeologjik ta Durrasit, *Illiria* 2, 1982, 239–279.
- Tassaux 1982 F. Tassaux, Laecanii. Recherches sur une famille sénatoriale d’Istrie, *MEFRA* 94, 1982, 227–269.
- Tchernia 1969 A. Tchernia, Une marque d’amphore au nom de P. Vedius Pollio, *Mélanges F. Benoit III, RSt-Lig* 35, 1969, 145–148.
- Tchernia 1971 A. Tchernia, Les amphores vinaires de Tarraconaise et leur exploitation au début de l’Empire, *Archivo Español de arqueología* 44, 1971, 38–85.
- Tchernia 1983 A. Tchernia, Italian Wine in Gaul at the End of the Republic, in: P. Garnsey – K. Hopkins – D. Whittaker (eds.) *Trade in the Ancient Economy* (London 1983) 87–104.
- Tchernia 1986 A. Tchernia, Le vin de l’Italie romaine, *BEFAR* 261 (Rome 1986).
- Tchernia 1992 A. Tchernia, Le dromadaire des Peticii et la commerce oriental, *MEFRA* 104, 1992, 293–301.
- Tchernia *et al.* 1978 A. Tchernia – P. Pomey – A. Hesnard, L’épave romaine de la Madrague de Gins (Var), *Gallia Suppl.* 34 (Paris 1978).
- Tchernia – Zevi 1972 A. Tchernia – F. Zevi, Amphores vinaires de Campanie et de Tarraconaise à Ostie, *Recherches sur les Amphores Romaines, CEFR* 10 (Rome 1972) 35–67.
- Thomas 1981 C. Thomas, A provisional list of imported pottery in Post-Roman Britain and Ireland. Special report, 7, *Institute of Cornish Studies (Redruth)* 1981.
- Tomber 1988 R. Tomber, Pottery from the 1982–83 Excavations. In: J.H. Humphrey (ed.), *The Circus and a Byzantine Cemetery at Carthage*, vol 1 (Ann Arbor 1988) 437–528.
- Tomber 1998 R. Tomber, The pottery, in: S. E. Sidebotham – W.Z. Wendrich (eds.), *Berenike 1996. Preliminary Report of the 1996 Excavations at Berenike (Egyptian Red Sea Coast) and the Survey of the Eastern Desert* (Leiden 1998) 123–159.
- Tomber 1999 R. Tomber, Pottery from the sediments of the Inner Harbour (area I 14), in: K. G. Holum – A. Raban – J. Patrich (eds.), *Caesarea Papers 2. Herod’s temple, the provincial governor’s praetorium and granaries, the later harbour, a gold coin hoard, and other studies*, *JRA Suppl.* 35, 1999, 295–322.
- Tomber 2005 R. Tomber, Trade relations in the eastern Mediterranean and beyond. The Egyptian–Indian connection, 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, Halicarnassian Studies* 3, (Odense 2005) 221–233.
- Tomber 2006 R. Tomber, The pottery, in: V. A. Maxfield – D. P. S. Peacock (eds.), *Survey and Excavations. Mons Claudianus 1987–1993, Vol III, Ceramic Vessels and Related Objects from Mons Claudianus, FIFAO* 54, 2006, 1–236.
- Tomber 2007 R. Tomber, Pottery from the Excavated Deposits, in: D. Peacock – V. Maxfield (eds.), *The Roman Imperial quarries survey and excavation at Mons Porphyrites 1994–1998* (London 2007) 177–208.

- Tomber 2008 R. Tomber, *Indo–Roman Trade. From pots to pepper* (London 2008).
- Tomber – Williams 1986 R. Tomber – D. Williams, *Late Roman amphorae in Britain and the Western provinces*, *JRomPotSt* 1, 1986, 42–54.
- Tomber – Williams 2000 R. Tomber – D. Williams, *Egyptian Amphorae in Britain and the Western Provinces*, *Britannia* 31, 2000, 41–54.
- Toniolo 1991 A. Toniolo, *Le anfore di Altino* (Padova 2000).
- Toniolo 1994 A. Toniolo, *Anfore commerciali a Corte Cavanella. Alcune precisazioni*, *AquilNost* 65, 1994, 142–148.
- Toniolo 2000 A. Toniolo, *Le anfore di Adria, IV–II a.C.* (Venezia 2000).
- Tóth 1986 H. E. Tóth, *A kunbábonyi lelet amphorája és kapcsolatai*, *Múzeumi Kutatások Bács–Kiskun megyében*, 1986, 1–56.
- Trinkl 2006 E. Trinkl, *Schwarzfirniskeramik klassischer Zeit aus den Agoragrabungen; Gefässkeramik klassischer Zeit aus dem Brunnen S–AB*, in: P. Scherrer – E. Trinkl (eds.), *Die Tetragonos Agora in Ephesos. Grabungsergebnisse von archaischer bis in byzantinische Zeit, ein Überblick, Befunde und Funde klassischer Zeit*, *FiE* 13, 2 (Wien 2006) 86–106 and 177–245.
- Trümper 2009 M. Trümper, *Graeco–Roman Slave Markets. Fact or Fiction?* (Oxford 2009).
- Tsaravopoulos 1986 A. Tsaravopoulos, *The City of Chios. A contribution to the topography of the city from the results of rescue excavations*, *Horos* 4, 1986, 124–144.
- Tuna 2003 N. Tuna, *Datça/Reşadiye Seramik Atölyelerinde Hellenistik Dönem Günlük Seramik Üretimi*, in: C. Abadie–Reynal (ed.), *Varia Anatolica XV, Les Céramiques en Anatolie aux Epoques Hellenistique et Romaine* (İstanbul 2003) 45–54.
- Tuna *et al.* 1987 N. Tuna – J.-Y. Empereur – M. Picon – E. Döger, *Rapport préliminaire de la prospection archéologique turco–française des ateliers d’amphores de Resadiye–Kiliseyeni sur la péninsule de Datça*, *Anatolia Antiqua* 1987, 47–52.
- Turnovsky 1992 P. Turnovsky, *Amphoren*, in: H. Veters – W. Jobst (Hrsg.), *Mosaikenforschung im Kaiserpalast von Konstantinopel. Vorbericht über das Forschungs- und Restaurierungsprojekt am Palastmosaik in den Jahren 1983–1988* (Wien 1992) 43–54.
- Turnovsky 2005 P. Turnovsky, *Late Antique and Byzantine pottery of the church of St. Mary in Ephesus. An introduction*, *ReiCretActa* 39, 2005, 217–224.
- Tusa 1971 V. Tusa, *I rinvenimenti archeologici sottomarini nella Sicilia nordoccidentale tra il II e III Congresso Internazionale*, in: *Atti del III Congresso Internazionale di Archeologia Sottomarina*, Barcelona 1961 (Bordighera 1971) 263–295.
- Vandermersch 1994 C. Vandermersch, *Vins et amphores de Grande Grèce et de Sicile, IVe–IIIe s. avant J.-C.* (Naples 1994).
- Van der Werff 1978 J. H. Van der Werff, *Amphores de tradition punique à Uzita*, *Bulletin antieke beschaving* 52, 1978, 171–200.
- Van der Werff 1984 J. H. Van der Werff, *Roman amphoras at Nijmegen – A preliminary report*, *Bulletin antieke beschaving* 34, 1984, 347–387.
- Van der Werff 1986 J. H. Van der Werff, *The Amphora Wall in the House of the Porch, Ostia. Excavations in the House of the Porch (V.II.4–5) at Ostia*, *Bulletin antieke beschaving* 61, 1986, 96–137.
- Van der Werff 1989 J. H. Van der Werff, L. EVMACHI. *À propos d’une marque d’amphore trouvée à Nimègue*, *BerOudhBod* 39, 1989, 357–376.
- Van der Werff 2002 J. H. Van der Werff, *Greco–Italic amphoras at Valesio (Province of Brindisi)*, *Rei Cretariae Romanae Fautorum, 23rd International Congress*, Sept. 29–Oct. 6 (Roma 2002), abstract.
- Vegas 1973 M. Vegas, *Ceramica comun romana del Mediterráneo occidental*, *Publicaciones Eventuales* 22 (Barcelona 1973).
- Vidrih Perko 1994 V. Vidrih Perko, *Poznoantične amfore v Sloveniji* (PhD thesis, University of Ljubljana 1994).
- Vidrih Perko 1998 V. Vidrih Perko, *The amphorae evidence. The main areas of mercantile exchange in the Roman period in Slovenian territory*, *Novensia* 10, 1998, 99–108.
- Vidrih Perko – Pavletić 2000 V. Vidrih Perko – M. Pavletić, *Report on ceramics from Brijuni*, *ReiCretActa* 36, 2000, 263–269.
- Vidrih Perko – Žbona Trkman 2005 V. Vidrih Perko – B. Žbona Trkman, *Ceramic finds from Ajdovščina–Fluvio Frigido. An early Roman road station and late Roman fortress *Castra**, *ReiCretActa* 39, 2005, 277–286.
- Villa 1994 L. Villa, *Le anfore tra tardoantico e medioevo*, in: S. Lusuardi Siena (ed.), *Ad mensam. Manufatti d’uso da contesti archeologici fra tarda antichità e medioevo* (Udine 1994) 335–431.
- Villa 1998 L. Villa, *Alcuni aspetti della circolazione di prodotti di importazione in Friuli tra VI e VII secolo*, in: L. Sagui (ed.), *Ceramica in Italia. VI–VII secolo*, *Atti del Convegno in onore di John W. Hayes*, Roma 11–13 maggio 1995 (Firenze 1998) 275–288.
- Vilvorder *et al.* 2000 F. Vilvorder – R. P. Symonds – S. Rekk, *Les amphores orientales en Gaule septentrionale et au sud–est de la Grande Bretagne*, *ReiCretActa* 36, 2000, 477–486.
- Viola 1885 L. Viola, *Note sopra nuove scoperte epigrafiche avvenute in Taranto e nel suo territorio*, *NS*, 1885, 258–288.

- Volpe 1988 G. Volpe, Il porto e il litorale, in: G. Andreassi – F. Radina (eds.), *Archeologia di una città. Bari dalle origini al X secolo*, catalogo della mostra (Bari 1988) 385–394.
- Volpe *et al.* 1998 G. Volpe – L. Casavola – F. D’Aloia – L. Pietropaolo, Le ceramiche tardoantiche della villa di Agnuli (Mattinata, FG), in: L. Saguí (ed.), *Ceramica in Italia. VI–VII secolo*, Atti del Convegno in onore di John W. Hayes, Roma 11–13 maggio 1995 (Firenze 1998) 723–734.
- Waldner 2009 A. Waldner, Heroon und Oktogon, in: S. Ladstätter – J. Auinger – I. Kowalleck – H. Thür (Hrsg.), *Neue Forschungen zur Kuretenstraße von Ephesos. Akten des Symposiums für Hilke Thür vom 13. Dezember 2006 an der Österreichischen Akademie der Wissenschaften*, AF 15, *DenkschrWien* 382 (Wien 2009) 283–315.
- Warner Slane 1991 K. Warner Slane, Observations on Mediterranean Amphoras and Tablewares found in India, in: V. Begley – R. D. De Puma (eds.), *Rome and India the Ancient Sea Trade* (London 1991) 204–213.
- Warner Slane 2000 K. Warner Slane, East–West Trade in Fine Wares and Commodities. The View from Corinth, *ReiCretActa* 36, 2000, 299–312.
- Warner Slane 2004 K. Warner Slane, Amphoras – Used and Reused – at Corinth, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean*, Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002, *Monographs of the Danish Institute at Athens* 5 (Aarhus 2004) 361–369.
- Warner Slane 2005 K. Warner Slane, Corinth. Late Roman Horizons, *Hesperia* 74, 2, 2005, 243–297.
- Wendrich *et al.* 2003 W. Z. Wendrich – R. S. Tomber – S. E. Sidebotham – J. A. Harrell – R. T. J. Cappers – R. S. Bagnall, Berenike Crossroads. The integration of information, *Journal of Economic and Social History of the Orient* 46.1, 2003, 46–87.
- Whitbread 1995 I. K. Whitbread, *Greek Transport Amphorae. A Petrological and Archaeological Study*, Fitch Laboratory Occasional Paper 4 (Athens 1995).
- White 1995 P. White, Postumus, Curtius Postumus, and Rabirius Postumus, *Classical Philology* 57, 1995, 151–161.
- Whitehouse *et al.* 1985 D. Whitehouse – L. Constantini – F. Guidobaldi – S. Passi – P. Pensabene – S. Pratt – R. Reece – D. Reece, *The Schola Praeconum II*, *BSR* 53, 1985, 163–210.
- Wilberg 1923 W. Wilberg, *Die Agora*, in: *FiE* 3 (Wien 1923) 1–90.
- Will 1962 E. L. Will, Latin Stamped Amphoras in the Eastern Mediterranean Area, *Yearbook of the American Philosophical Society*, 1962, 649–650.
- Will 1970 E. L. Will, Les Timbres Amphoriques Latins, in: P. Bruneau *et al.*, *L’îlot de la maison des comédiens, Délos* 27 (Paris 1970) 383–386.
- Will 1979 E. L. Will, The Sestius amphorae. A re-appraisal, *JFieldA* 1979, 339–349.
- Will 1982 E. L. Will, Greco–Italic amphoras, *Hesperia* 51, 1982, 338–356.
- Will 1983 E. L. Will, Exportation of Olive Oil from Baetica to the Eastern Mediterranean, in: J. M. Blázquez (ed.), *Producción y Comercio del Aceite en la Antigüedad. Segundo congreso internacional. Sevilla 24–28 febrero 1982* (Madrid 1983) 394–429.
- Will 1987 E. L. Will, The Roman Amphoras, in: A. M. McCain *et al.*, *The Roman Port and Fishery of Cosa* (Princeton 1987) 171–219.
- Will 1989 E. L. Will, Relazioni mutue tra le anfore romane. I ritrovamenti in Oriente alla luce dei dati ottenuti nell’Occidente, in: *Amphores romaines et histoire économique. Dix ans de recherches, Actes du colloque de Sienna (22–24 mai 1986)*, organisé par l’Università degli studi di Siena, l’Università degli studi di Roma–La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l’Ecole française de Rome, *CEFR* 114 (Rome 1989) 297–309.
- Will 1991 E. L. Will, The Mediterranean Shipping Amphoras from Arikamedu, in: V. Begley – R. D. De Puma (eds.), *Rome and India. The Ancient Sea Trade* (Madison 1991) 151–156.
- Will 1996 E. L. Will, Mediterranean shipping amphoras from the 1941–50 Excavations, in: V. Begley *et al.* (eds.), *The Ancient Port of Arikamedu. New Excavations and Researches 1989–92, Mémoires archéologiques* 22 (Paris 1996) 317–349.
- Will 1997 E. L. Will, Shipping Amphoras as Indicators of Economic Romanization in Athens, in: M. C. Hoff – S. I. Rotroff, (eds.), *The Romanization of Athens. Proceedings of an International Conference held at Lincoln, Nebraska, April 1996, Oxbow Monograph* 94 (Oxford 1997) 117–133.
- Williams 1982 D. F. Williams, The petrology of certain Byzantine amphorae. Some suggestions as to origins, *Colloque sur la céramique antique, Carthage 23–24th June 1980, CEDAC Dossier* 1, 1982, 99–110.
- Williams 1985 D. F. Williams, Petrology, in: P. R. Sealey, *Amphoras from the 1970 excavations at Colchester Sheepen. BAR British Series* 142 (Oxford 1985) 153–166.
- Williams 1989 C. Williams, *Anemurium. The Roman and Early Byzantine pottery* (Toronto 1989).
- Williams 1990 D. F. Williams, Note on the petrology of a Samos Cistern Type amphora from excavation at the Castello di Udine, in: *Aquileia Nostra* LXI, 1990, 296.

- Williams 2003 D. F. Williams, Cretan wine in Roman Britain, *Journal of Roman Pottery Studies* 10, 2003, 26–31.
- Williams 2004 D. F. Williams, The Eruption of Vesuvius and its Implications for the Early Roman Amphora Trade with India, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International colloquium at the Danish Institute at Athens, September 26–29, 2002*, Monographs of the Danish Institute at Athens 5 (Aarhus 2004) 441–450.
- Williams 2005 D. F. Williams, Agora F 65–66; Agora M 273; Dressel 2–4 Cilician; Dressel 2–4 Kos; Dressel 2–4 Egyptian; Dressel 2–4 Loire Basin, Dressel 2–4 Lyon 2, Dressel 5; Dresse 12; Dressel 24; Dressel 35; Dressel 43/ Crétoise 4; Crétoise 2; Amphore Égyptienne 2; Kapitän 2; Lomba do Canho 67; Mid Roman Amphora 5; Pompeii 38/Knidian; Pseudo-Koan; Rhodian; Late Roman Amphora 2, Late Roman Amphora 7, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Williams 2005a D. F. Williams, Late Roman Amphora 1. A study of diversification, in: M. Berg Briese – L. E. Vaag (eds.), *Trade Relations In the Eastern Mediterrean from the Late Hellenistic Period to Late Antiquity. The Ceramic Evidence, Halicarnassian Studies 7* (Odense 2005) 157–168.
- Williams *et al.* 2005a D. F. Williams – C. Panella – S. Keay, Greco-Italic; Dressel 2–4 Italian, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Williams *et al.* 2005b D. F. Williams – C. Panella – G. Rizzo, Agora M 254 in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton 2005) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Williams – Panella 2005 D. F. Williams – C. Panella, Dressel 2–4 Flat-based, Dressel 21–22, in: S. Keay – D. F. Williams, *Roman amphorae. A digital resource* (University of Southampton) http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/
- Williams – Zervos 1983 C. K. Williams – O. H. Zervos, *Corinth 1982. East of the Theatre, Hesperia* 52, 1983, 1–47.
- Wilson 1966 A. J. N. Wilson, *Emigration from Italy in the Republican Age of Rome* (Manchester 1966).
- Wintermeyer 2004 U. Wintermeyer, *Die hellenistische und frühkaiserzeitliche Gebrauchskeramik. Auf Grundlage der stratifizierten Fundkeramik aus dem Bereich der Heiligen Strasse, Didyma 3, 2* (Mainz 2004).
- Wiseman 1971 T. P. Wiseman, *New Men in the Roman Senate, 139 B.C. – A.D. 14*, *Oxford classical and philosophical monographs* (Oxford 1971).
- Wolff 2004 S.R. Wolff, Punic Amphoras in the Eastern Mediterranean, in: J. Eiring – J. Lund (eds.), *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens, September 26–29, 2002*, Monographs of the Danish Institute at Athens 5 (Aarhus 2004) 451–457.
- Wood 1877 J. T. Wood, *Discoveries at Ephesus. Including the site and remains of the great temple of Diana, with numerous illustrations from original drawings and photographs* (London 1877).
- Zabehlicky 1995 H. Zabehlicky, Preliminary Views of the Ephesian Harbour, in: H. Koester (ed.), *Ephesos. Metropolis of Asia, an interdisciplinary approach to its archaeology, religion, and culture*, *Harvard Theological Studies* 41 (Valley Forge 1995) 201–215.
- Zabehlicky 1996 H. Zabehlicky, Amphoren – Anker – Aphroditen. Die Grabungen im Hafen von Ephesos 1987–1989, *AÖ* 7, 1, 1996, 64–70.
- Zabehlicky 1999 H. Zabehlicky, Die Grabungen im Hafen von Ephesos 1987–1989, in: H. Friesinger – F. Krinzinger, *100 Jahre österreichische Forschungen in Ephesos. Akten des Symposions Wien 1995*, *AF* 1, *DenkschrWien* 260 (Wien 1999) 479–484.
- Zabehlicky-Scheffenecker 1993 S. Zabehlicky-Scheffenecker, Virunum. Übersicht über das Fundmaterial der Grabung 1992 in Virunum, *Carinthia I* 183, 1993, 257–278.
- Zabehlicky-Scheffenecker 1995 S. Zabehlicky-Scheffenecker, Der Italiener in Ephesos, *ReiCretActa* 34, 1995, 253–271.
- Zabehlicky-Scheffenecker 2004 S. Zabehlicky-Scheffenecker, Italische Sigillata in Ephesos, in: J. Poblome – P. Talloen – R. Brulet – M. Waelkens (eds.), *Early Italian Sigillata. The chronological framework and trade patterns*, *BABesch Suppl.* 10 (Leuven 2004) 73–80.
- Zabehlicky-Scheffenecker *et al.* 1996 S. Zabehlicky-Scheffenecker – R. Sauer – G. Schneider, Graue Platten aus Ephesos und vom Magdalensberg. Vorläufige Typologie, Herstellung und Fundumstände, petrographische und schwermineralogische Untersuchung von Grauen Platten aus Ephesos und vom Magdalensberg, chemische Zusammensetzung der Grauen Platten und anderer Keramik, in: M. Herfort-Koch – U. Mandel – U. Schädler (eds.), *Hellenistische und kaiserzeitliche Keramik des östlichen Mittelmeergebietes, Kolloquium Frankfurt 24.–25. April 1995* (Frankfurt 1996) 41–59.
- Zaccaria 1989 C. Zaccaria, Per una Prosopografia dei Personaggi Menzionati sui Bolli delle Anfore Romane, dell'Italia Nordorientale, in: *Amphores romaines et histoire économique. Dix ans de recherches du colloque de Sienne (22–24 mai 1986), organisé par l'Università degli studi di Siena, l'Università degli studi di Roma-La Sapienza, le Centre national de la recherche scientifique (RCP 403) et l'Ecole française de Rome, CEFR* 114 (Rome 1989) 469–488.

- Zeest 1960 I. B. Zeest = И. Б. Зеест, Керамическая тара Боспора, МИА 83, 1960.
- Zemer 1977 A. Zemer, Storage Jars in Ancient Sea Trade (Haifa 1977).
- Ζερβουδακη 1985 Η. Ζερβουδακη, Εφορεία Κλασικών Αρχαιοτήτων Δωδεκανήσων, ADelt 40, 1985, 396–406.
- Zevi 1966 F. Zevi, Appunti sulle anfore romane, Archeologia Classica 18, 1966, 208–247.
- Zevi – Tchernia 1969 F. Zevi – A. Tchernia, Amphores de Byzacène au Bas-Empire, Antiquités Africaines 3, 1969, 173–214.
- Zupančič *et al.* 1998 N. Zupančič – J. Horvat – M. Dobnikar, The Production of Greco-Italic Amphorae in the Adriatic Region, RMZ Materials and geoenvironment 45, 3–4, 1998, 345–357.

11. ABBREVIATIONS

LCL – Loeb Classical Library

fr. – fragment

D – diameter of the rim

V – thickness of the rim

HD – height of the rim

DN – minimum diameter of the neck

HN – height of the neck

DNB – diameter at the junction of neck and body

DB – diameter of the body

DF – diameter of the foot

H – height of the fragment

HT – height of the amphora

S – section of the handle

SF – surface colour

Colour – Munsell Colour

DS – diameter of the stopper

VS – thickness of the stopper

VM – height of the stopper

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Tetragonos Agora

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
1	Ph 1a	Rhodian	1	51	Ph 2a	Koan	5
2	Ph 11	Rhodian	1	52	Ph 2a	Koan	5
3	Ph 4	Rhodian	1	53	Ph 4	Koan	5
4	Ph 4	Rhodian	1	54	Ph 4	Koan	5
5	Ph 4	Rhodian	1	55	Ph 4	Koan	6
6	Ph 4	Rhodian	1	56	Ph 4	Koan	6
7	Ph 6	Rhodian	1	57	Ph 4	Koan	6
8	Ph 5c	Rhodian	1	58	Ph 4	Koan	6
9	Ph 2a	Rhodian	1	59	Ph 4	Koan	6
10	Ph 4	Rhodian	1	60	Ph 4	Koan	6
11	Ph 3	Rhodian	1	61	Ph 4	Koan	6
12	Ph 4	Rhodian	2	62	Ph 4	Koan	6
13	Ph 4	Rhodian	2	63	Ph 4	Koan	6
14	Ph 4	Rhodian	2	64	Ph 4	Koan	6
15	Ph 4	Rhodian	2	65	Ph 4	Koan	6
16	Ph 11	Rhodian	2	66	Ph 4	Koan	7
17	Ph 4	Rhodian	2	67	Ph 4	Koan	7
18	Ph 4	Rhodian	2	68	Ph 4	Koan	7
19	Ph 5c	Rhodian	2	69	Ph 4	Koan	7
20	Ph 4	Rhodian	2	70	Ph 5b	Koan	7
21	Ph 7–9	Rhodian	3	71	Ph 4	Koan	7
22	Ph 6	Rhodian	3	72	Ph 4	Koan	8
23	Ph 6	Rhodian	3	73	Ph 4	Koan	8
24	Ph 7–9	Rhodian	3	74	Ph 5a	Koan	8
25	Ph 6	Rhodian	3	75	Ph 4	Koan	8
26	Ph 5c	Rhodian	3	76	Ph 5c	Koan	8
27	Ph 4	Rhodian	3	77	Ph 3	Koan	8
28	Ph 5b	Rhodian	3	78	Ph 4	Agora F 65–66	8
29	Ph 5b	Rhodian	3	79	Ph 4	Agora F 65–66	8
30	Ph 5b	Rhodian	3	80	Ph 4	Agora F 65–66	8
31	Ph 5c	Rhodian	4	81	Ph 4	Agora F 65–66	8
32	Ph 5c	Rhodian	4	82	Ph 4	Agora F 65–66	8
33	Ph 4	Chian	4	83	Ph 4	Agora F 65–66	8
34	Ph 5b	Chian	4	84	Ph 4	Agora F 65–66	8
35	Ph 4	Chian	4	85	Ph 4	Agora F 65–66	8
36	Ph 4	Chian	4	86	Ph 4	Agora F 65–66	9
37	Ph 1b	Knidian	4	87	Ph 4	Agora F 65–66	9
38	Ph 4	Knidian	4	88	Ph 4	Agora F 65–66	9
39	Ph 4	Knidian	4	89	Ph 4	Agora F 65–66	9
40	Ph 4	Knidian	4	90	Ph 4	Agora F 65–66	9
41	Ph 4	Knidian	4	91	Ph 5a	Agora F 65–66	9
42	Ph 4	Knidian	5	92	Ph 5c	Agora F 65–66	9
43	Ph 3	Knidian	5	93	Ph 5c	Agora F 65–66	9
44	Ph 4–5	Knidian	5	94	Ph 5c	Agora F 65–66	9
45	Ph 4	Knidian	5	95	Ph 5c	Agora F 65–66	9
46	Ph 5a	Knidian	5	96	Ph 5c	Agora F 65–66	9
47	Ph 7–9	Knidian	5	97	Ph 5c	Agora F 65–66	9
48	Ph 1b	Koan	5	98	Ph 5c	Agora F 65–66	9
49	Ph 1b	Koan	5	99	Ph 5c	Agora F 65–66	9
50	Ph 2a	Koan	5	100	Ph 5c	Agora F 65–66	9

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
101	Ph 6	Agora F 65–66	9	150	Ph 4	Ephesus 1274	13
102	Ph 6–9	Agora F 65–66	9	151	Ph 3	Local Aegean 1	13
103	Ph 7–9	Agora M 45	9	152	Ph 4	Local Aegean 1	13
104	Ph 6	Agora M 125	9	153	Ph 4	Local Aegean 1	13
105	Ph 3	Cup-shaped rim	10	154	Ph 11	Local Aegean 1	14
106	Ph 4	Cup-shaped rim	10	155	Ph 4	Local Aegean 1	14
107	Ph 4	Cup-shaped rim	10	156	Ph 4	Local Aegean 1	14
108	Ph 4	Cup-shaped rim	10	157	Ph 4	Local Aegean 1	14
109	Ph 5c	Cup-shaped rim	10	158	Ph 11	Local Aegean 1	14
110	Ph 4	Cup-shaped rim	10	159	Ph 4	Local Aegean 1	14
111	Ph 4	Cup-shaped rim	10	160	Ph 4	Local Aegean 1	14
112	Ph 4	Cup-shaped rim	10	161	Ph 4	Local Aegean 1	14
113	Ph 4	Cup-shaped rim	10	162	Ph 5c	Local Aegean 1	14
114	Ph 4	Cup-shaped rim	10	163	Ph 4	Local Aegean 1	14
115	Ph 4	Cup-shaped rim	10	164	Ph 4	Local Aegean 1	14
116	Ph 4	Cup-shaped rim	11	165	Ph 7–9	Local Aegean 1	14
117	Ph 4	Cup-shaped rim	11	166	Ph 4	Local Aegean 2	15
118	Ph 4	Cup-shaped rim	11	167	Ph 4	Local Aegean 2	15
119	Ph 4	Cup-shaped rim	11	168	Ph 4	Local Aegean 2	15
120	Ph 4	Cup-shaped rim	11	169	Ph 4	Local Aegean 2	15
121	Ph 4	Cup-shaped rim	11	170	Ph 4	Local Aegean 2	15
122	Ph 4	Cup-shaped rim	11	171	Ph 11	Local Aegean 2	15
123	Ph 4	Cup-shaped rim	11	172	Ph 4	Dressel 25	15
124	Ph 4	Cup-shaped rim	11	173	Ph 4	Dressel 25	15
125	Ph 4	Cup-shaped rim	11	174	Ph 4	Dressel 25	15
126	Ph 4	Cup-shaped rim	11	175	Ph 4	Dressel 25	15
127	Ph 4–5	Cup-shaped rim	11	176	Ph 4	Dressel 25	15
128	Ph 4–5	Cup-shaped rim	11	177	Ph 4	Dressel 25	16
129	Ph 11	Cup-shaped rim	11	178	Ph 4	Dressel 25	16
130	Ph 5a	Dressel 35	12	179	Ph 4	Dressel 25	16
131	Ph 5c	Dressel 35	12	180	Ph 4	Dressel 25	16
132	Ph 6	Dressel 35	12	181	Ph 4	Dressel 25	16
133	Ph 4	Cretan, AC4	12	182	Ph 4	Dressel 25	16
134	Ph 4	Cretan, AC4	12	183	Ph 4	Dressel 25	16
135	Ph 6	Cretan, AC 4	12	184	Ph 5c	Dressel 25	16
136	Ph 5c	Cretan, AC 2	12	185	Ph 5c	Dressel 25	16
137	Ph 4–5	Dressel 5	12	186	Ph 4	Baggy jar	16
138	Ph 6	Dressel 5	12	187	Ph 4	Baggy jar	16
139	Ph 7–9	Dressel 5	12	188	Ph 4	Baggy jar	16
140	Ph 6	Agora M 54	12	189	Ph 4	Baggy jar	17
141	Ph 6	Agora G 198	12	190	Ph 4	Baggy jar	17
142	Ph 6	Agora G 198	13	191	Ph 4	Baggy jar	17
143	Ph 6	Koan type with Pinched Handles	13	192	Ph 4	Baggy jar	17
144	Ph 6	Koan type with Pinched Handles	13	193	Ph 4	Baggy jar	17
145	Ph 6	Koan type with Pinched Handles	13	194	Ph 5b	Baggy jar	17
146	Ph 5a	Agora G199	13	195	Ph 5b	Baggy jar	17
147	Ph 4	Ephesus 29	13	196	Ph 5a	Baggy jar	17
148	Ph 11	Ephesus 29	13	197	Ph 4	Van der Werff 1	17
149	Ph 6–9	Ephesus 373	13	198	Ph 2a	Van der Werff 2	17
				199	Ph 4	Van der Werff 3	17
				200	Ph 4–5	Egyptian AE 2	17
				201	Ph 5c	Egyptian AE 2	17

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
202	Ph 5c	Egyptian AE 2	17	254	Ph 2a	Dressel 1	22
203	Ph 4	Greco-Italic	18	255	Ph 2a	Dressel 1	22
204	Ph 4	Greco-Italic	18	256	Ph 4	Dressel 1	22
205	Ph 4	Greco-Italic	18	257	Ph 1c	Brindisian	23
206	Ph 11	Greco-Italic	18	258	Ph 2b	Brindisian	23
207	Ph 5b	Greco-Italic	18	259	Ph 4	Brindisian	23
208	Ph 3	Dressel 1A	18	260	Ph 4	Brindisian	23
209	Ph 4	Dressel 1A	18	261	Ph 4	Brindisian	23
210	Ph 3	Dressel 1A	18	262	Ph 4	Brindisian	23
211	Ph 4	Dressel 1A	18	263	Ph 4	Brindisian	23
212	Ph 1c	Dressel 1A	18	264	Ph 4	Brindisian	23
213	Ph 4	Dressel 1B	18	265	Ph 11	Brindisian	23
214	Ph 11	Dressel 1B	18	266	Ph 5c	Brindisian	23
215	Ph 4	Dressel 1B	19	267	Ph 11	Brindisian	23
216	Ph 5b	Dressel 1B	19	268	Ph 4	Brindisian	24
217	Ph 7–9	Dressel 1B	19	269	Ph 4	Brindisian	24
218	Ph 1b	Dressel 1C	19	270	Ph 4	Brindisian	24
219	Ph 1b	Dressel 1C	19	271	Ph 4	Brindisian	24
220	Ph 2a	Dressel 1C	19	272	Ph 11	Brindisian	24
221	Ph 2a	Dressel 1C	19	273	Ph 1c	Lamboglia 2	24
222	Ph 11	Dressel 1C	19	274	Ph 2a	Lamboglia 2	24
223	Ph 3	Dressel 1C	19	275	Ph 2a	Lamboglia 2	24
224	Ph 3	Dressel 1C	19	276	Ph 2a	Lamboglia 2	24
225	Ph 3	Dressel 1C	19	277	Ph 2a	Lamboglia 2	24
226	Ph 3	Dressel 1C	20	278	Ph 2b	Lamboglia 2	25
227	Ph 4	Dressel 1C	20	279	Ph 2b	Lamboglia 2	25
228	Ph 4	Dressel 1C	20	280	Ph 3	Lamboglia 2	25
229	Ph 4	Dressel 1C	20	281	Ph 4	Lamboglia 2	25
230	Ph 4	Dressel 1C	20	282	Ph 4	Lamboglia 2	25
231	Ph 4	Dressel 1C	20	283	Ph 4	Lamboglia 2	25
232	Ph 4	Dressel 1C	20	284	Ph 4	Lamboglia 2	25
233	Ph 4	Dressel 1C	20	285	Ph 4	Lamboglia 2	25
234	Ph 4	Dressel 1C	20	286	Ph 4	Lamboglia 2	25
235	Ph 4	Dressel 1C	20	287	Ph 4	Lamboglia 2	25
236	Ph 4	Dressel 1C	20	288	Ph 4	Lamboglia 2	26
237	Ph 4	Dressel 1C	20	289	Ph 5b	Lamboglia 2	26
238	Ph 4	Dressel 1C	21	290	Ph 5c	Lamboglia 2	26
239	Ph 4	Dressel 1C	21	291	Ph 11	Lamboglia 2	26
240	Ph 4	Dressel 1C	21	292	Ph 11	Lamboglia 2	26
241	Ph 4	Dressel 1C	21	293	Ph 4	Dressel 6A	26
242	Ph 5b	Dressel 1C	21	294	Ph 4	Dressel 6A	26
243	Ph 4	Dressel 1C	21	295	Ph 4–5	Dressel 6A	26
244	Ph 4	Dressel 1C	21	296	Ph 5c	Dressel 6A	27
245	Ph 4	Dressel 1C	21	297	Ph 6	Dressel 6A	27
246	Ph 1b	Dressel 1C	21	298	Ph 8	Dressel 6A	27
247	Ph 1b	Dressel 1C	21	299	Ph 4–5	Dressel 6A	27
248	Ph 3	Dressel 1C	21	300	Ph 4	Dressel 21–22	27
249	Ph 3	Dressel 1C	21	301	Ph 4	Dressel 21–22	27
250	Ph 3	Dressel 1C	22	302	Ph 4	Dressel 21–22	27
251	Ph 4	Dressel 1C	22	303	Ph 4	Dressel 21–22	27
252	Ph 4	Dressel 1C	22	304	Ph 4	Dressel 21–22	27
253	Ph 1c	Dressel 1	22	305	Ph 4	Dressel 21–22	27

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
306	Ph 4	Dressel 21–22	28	357	Ph 4	Miscellaneous	31
307	Ph 4	Dressel 21–22	28	358	Ph 1b	Stopper	32
308	Ph 4	Dressel 21–22	28	359	Ph 1b	Stopper	32
309	Ph 4	Dressel 21–22	28	360	Ph 1b	Stopper	32
310	Ph 4	Dressel 21–22	28	361	Ph 3	Stopper	32
311	Ph 4	Dressel 21–22	28	362	Ph 6–9	Stopper	32
312	Ph 4	Dressel 21–22	28	363	Ph 4	Stopper	32
313	Ph 4	Dressel 21–22	28	364	Ph 4	Stopper	32
314	Ph 4	Dressel 21–22	28	365	Ph 4	Stopper	32
315	Ph 4	Dressel 21–22	28	366	Ph 4	Stopper	32
316	Ph 4	Dressel 21–22	29	367	Ph 5c	Stopper	32
317	Ph 4	Dressel 21–22	29	368	Ph 11	Stopper	32
318	Ph 4	Dressel 21–22	29	369	Ph 4	Stopper	32
319	Ph 4	Dressel 21–22	29	370	Ph 7–9	Late Roman Amphora 1	33
320	Ph 11	Dressel 21–22	29	371	Ph 7–9	Late Roman Amphora 1	33
321	Ph 4	Dressel 2–4 Italian	29	372	Ph 7–9	Late Roman Amphora 1	33
322	Ph 5c	Dressel 2–4 Italian	29	373	Ph 7–9	Late Roman Amphora 1	33
323	Ph 4–5	Dressel 2–4 Italian	29	374	Ph 7–9	Late Roman Amphora 1	33
324	Ph 5c	Dressel 2–4 Italian	29	375	Ph 7–9	Late Roman Amphora 2	33
325	Ph 5c	Dressel 2–4 Italian	29	376	Ph 6	Late Roman Amphora 4	33
326	Ph 5a	Dressel 2–4 Italian	29	377	Ph 7–9	Late Roman Amphora 4	33
327	Ph 6	Schörgendorfer 558	30	378	Ph 11	Late Roman Amphora 7	33
328	Ph 6	Schörgendorfer 558	30	379	Ph 10	Agora M 240	34
329	Ph 6	Gauloise 4	30	380	Ph 7–9	Late Roman Amphora 3	34
330	Ph 4	Early Roman Amphora 11B	30	381	Ph 7–9	Late Roman Amphora 3	34
331	Ph 4	Lomba do Canho 67	30	382	Ph 7–9	Late Roman Amphora 3	34
332	Ph 4	Haltern 70	30	383	Ph 7–9	Late Roman Amphora 3	34
333	Ph 4	Haltern 70	30	384	Ph 7–9	Late Roman Amphora 3	34
334	Ph 5c	Haltern 70	30	385	Ph 6	Late Roman Amphora 3	34
335	Ph 5b	Pascual 1	30	386	Ph 6	Late Roman Amphora 3	34
336	Ph 5c	Dressel 20	30	387	Ph 7–9	Late Roman Amphora 3	34
337	Ph 6	Dressel 20	30	388	Ph 7–9	Late Roman Amphora 3	34
338	Ph 6	Dressel 20	30	389	Ph 7–9	Ephesus 56	35
339	Ph 6	Dressel 20	30	390	Ph 7–9	Ephesus 56	35
340	Ph 4	Beltran I / Dressel 7	31	391	Ph 7–9	Ephesus 56	35
341	Ph 5c	Beltran I / Dressel 9	31	392	Ph 7–9	Ephesus 56	35
342	Ph 5c	Beltran I / Dressel 9	31	393	Ph 7–9	Ephesus 56	35
343	Ph 5c	Beltran I / Dressel 9	31	394	Ph 7–9	Ephesus 56	35
344	Ph 5c	Beltran I	31	395	Ph 7–9	Ephesus 56	35
345	Ph 5c	Miscellaneous	31	396	Ph 7–9	Ephesus 56	35
346	Ph 6–9	Miscellaneous	31	397	Ph 7–9	Ephesus 56	35
347	Ph 4	Miscellaneous	31	398	Ph 7–9	Ephesus 56	35
348	Ph 4	Miscellaneous	31	399	Ph 6	Zeest 84B	36
349	Ph 4	Miscellaneous	31	400	Ph 7–9	Samos Cistern Type	36
350	Ph 4	Miscellaneous	31	401	Ph 7–9	Samos Cistern Type	36
351	Ph 4	Miscellaneous	31	402	Ph 7–9	Kuzmanov IX	36
352	Ph 5c	Miscellaneous	31	403	Ph 7–9	Kuzmanov IX	36
353	Ph 4	Miscellaneous	31	404	Ph 7–9	Ephesus 1690	36
354	Ph 4	Miscellaneous	31	405	Ph 7–9	Zeest 84B	36
355	Ph 11	Miscellaneous	31	406	Ph 6	Zeest 84B	36
356	Ph 6	Miscellaneous	31	407	Ph 7–9	Agora M 273	36
				408	Ph 7–9	Sabratha Sub-type 34N	36

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
409	Ph 7–9	Ostia 59 / Bonifay 15	37	416	Ph 6	Almagro 51C	37
410	Ph 7	Africana II	37	417	Ph 6	Égyptienne Bitronconique 3	37
411	Ph 10	Keay 34 / Bonifay 53	37	418	Ph 7–9	Spatheion small 3C	37
412	Ph 6	Tripolitanian I	37	419	Ph 7–9	Spatheion small 3C	37
413	Ph 11	Tripolitanian III	37	420	Ph 7–9	Spatheion 1A	37
414	Ph 6	Almagro 50	37				
415	Ph 10	Mid Roman 1	37				

Terrace House 2

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
501	1	Rhodian	38	539	2	Aegean Local 1	40
502	1	Rhodian	38	540	2a	Aegean Local 1	40
503	2	Rhodian	38	541	2a	Aegean Local 1	40
504	2a–3a	Rhodian	38	542	2a–3a	Aegean Local 1	40
505	4	Rhodian	38	543	1a	Aegean Local 1	40
506	2	Chian	38	544	2a–3a	Aegean Local 1	40
507	11	Knidian	38	545	2	Agora F 65–66	41
508	2a–3a	Knidian	38	546	2	Agora F 65–66	41
509	10	Knidian	38	547	11	Agora F 65–66	41
510	2	Koan	38	548	1b–3	Agora F 65–66	41
511	2	Koan	38	549	1b–3	Agora F 65–66	41
512	2	Koan	39	550	3	Agora F 65–66	41
513	2a–3a	Koan	39	551	11	Cup-shaped rim	41
514	2a–3b	Koan	39	552	5a–6a	Cup-shaped rim	41
515	10	Koan	39	553	3a	Cup-shaped rim	41
516	2	Mushroom rim type	39	554	2a–4	Koan type with Pinched Handles	41
517	2	Mushroom rim type	39	555	10	Miscellaneous	41
518	2	Mushroom rim type	39	556	2	Punic	41
519	2	Mushroom rim type	39	557	2	Dressel 1A	42
520	2	Mushroom rim type	39	558	3a	Dressel 1A	42
521	2	Mushroom rim type	39	559	2	Dressel 1A	42
522	2a–3a	Mushroom rim type	39	560	2	Dressel 1A	42
523	2a–3a	Mushroom rim type	39	561	2	Dressel 1C	42
524	2a–3a	Mushroom rim type	39	562	3a	Dressel 1C	42
525	2a–3a	Mushroom rim type	39	563	10	Brindisian	42
526	11	Mushroom rim type	39	564	3a	Lamboglia 2	42
527	1b	Mushroom rim type	39	565	2a–3a	Lamboglia 2	42
528	2	Mushroom rim type	39	566	2	Lamboglia 2	42
529	2	Mushroom rim type	39	567	2	Lamboglia 2	43
530	11	Mushroom rim type	40	568	2	Lamboglia 2	43
531	2	Mushroom rim type	40	569	2	Lamboglia 2	43
532	1b	Mushroom rim type	40	570	2	Lamboglia 2	43
533	2a–3	Mushroom rim type	40	571	11	Dressel 6A	43
534	11	Mushroom rim type	40	572	1b–3	Dressel 2–4	43
535	1b–3	Mushroom rim type	40	573	2a–3a	Dressel 2–4	43
536	2	Mushroom rim type	40	574	11	Dressel 2–4	43
537	2a–3a	Mushroom rim type	40	575	3	Dressel 2–4	43
538	2	Mushroom rim type	40				

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
576	11	Beltran I / Dressel 8	44	627	6-9	Late Roman Amphora 1	48
577	11	Beltran IIA	44	628	6-9	Late Roman Amphora 1	48
578	11	Dressel 12	44	629	5a	Late Roman Amphora 2	48
579	11	Dressel 12	44	630	5a	Late Roman Amphora 2	48
580	10	Dressel 20	44	631	10	Late Roman Amphora 2	49
581	11	Dressel 20	44	632	6-9	Late Roman Amphora 2	49
582	11	Kapitän II	45	633	7-8	Late Roman Amphora 2	49
583	5a	Kapitän II	45	634	11	LR4/Gaza	49
584	5a	Kapitän II	45	635	5-8	LR4/Gaza	49
585	5a	Kapitän II	45	636	5a	Miscellaneous	49
586	5a	Kapitän II	45	637	5-8	Miscellaneous	49
587	5a	Kapitän II	45	638	5a	Miscellaneous	49
588	5a	Kapitän II	45	639	3-7	Miscellaneous	49
589	5	Kapitän II	45	640	5a	Miscellaneous	49
590	11	Kapitän II	45	641	5a	Miscellaneous	49
591	5a	Kapitän II	45	642	11	Miscellaneous	49
592	2a-4	Agora M 45	46	643	11	Miscellaneous	49
593	2a-4	Agora M 45	46	644	5a	Miscellaneous	49
594	5a	Agora M 125	46	645	5a	Miscellaneous	50
595	11	Agora M 125	46	646	5-8	Miscellaneous	50
596	5a	Agora M 125	46	647		Dressel 6A	50
597	4	Agora M 125	46	648		Dressel 6A	50
598	5a	Agora M 125	46	649		Dressl 2-4	50
599	5a	Agora M 125	46	650		Almagro 50	50
600	5a	Agora M 125	46				
601	11	Agora M 240	46				
602	5-8	Agora M 240	46				
603	11	Agora M 240	46				
604	10	Late Roman Amphora 3	46				
605	11	Late Roman Amphora 3	46				
606	10	Late Roman Amphora 3	47				
607	11	Late Roman Amphora 3	47				
608	11	Late Roman Amphora 3	47				
609	11	Late Roman Amphora 3	47				
610	10	Late Roman Amphora 3	47				
611	11	Ephesus 56	47				
612	11	Ephesus 56	47				
613	10	Ephesus 56	47				
614	11	Ephesus 56	47				
615	6-9	Ephesus 56	47				
616	6-9	Ephesus 56	47				
617	5a	Dressel 30	47				
618	5a-6a	Africana II	47				
619	11	Agora M 273	48				
620	11	Agora M 273	48				
621	11	Miscellaneous	48				
622	5a	Miscellaneous	48				
623	4	Zeest 84	48				
624	5a	Zeest 84	48				
625	5a	Zeest 80	48				
626	11	Kuzmanov IX	48				

Magnesian Gate Survey			
CatNo	Type		Pl.
701	Knidian		51
702	Knidian		51
703	Koan		51
704	Koan		51
705	Rhodian		51
706	Dressel 5		51
707	Agora M 54		51
708	Local Aegean 1		51
709	Cup-shaped rim		51
710	Kapitän II		51
711	Kapitän II		51
712	Agora M 125		52
713	Agora M 125		52
714	Beltran I		52
715	Dressel 20		52
716	Almagro 51C		52
717	Africana II		52
718	Tripolitanian III		52
719	Zeest 75		52
720	Zeest 75		52
721	Zeest 75		52

State Agora, Basilica Stoa

CatNo	Type	Pl.
801	Agora F 65–66	53
802	Lamboglia 2	53
803	Lamboglia 2	53
804	Dressel 6A	53
805	Dressel 2–4	53

State Agora, Well

CatNo	Type	Pl.
810	Dressel 6A	53
811	Dressel 2–4	53

State Agora, Prytaneion

CatNo	Type	Pl.
820	Lamboglia 2	53

Serapeion

CatNo	Type	Pl.
830	Brindisian	53

Arap-Dere Survey

CatNo	Type	Pl.
851	LR3	54
852	LR3	54
853	LR3	54
854	LR3	54
855	LR3	54
856	LR3	54
857	LR3	54
858	LR3	54
859	LR3	54
860	LR3	54
861	Ephesus 56	54
862	Ephesus 56	54
863	Ephesus 56	54
864	Ephesus 56	54
865	Ephesus 56	54
866	Ephesus 56	54
867	Ephesus 56	54
868	Ephesus 56	54
869	Ephesus 56	54
870	Ephesus 56	54
871	Ephesus 56	54

Tetragonos Agora

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
1	Ph 1a	Rhodian	1	6	Ph 4	Rhodian	1
37	Ph 1b	Knidian	4	10	Ph 4	Rhodian	1
48	Ph 1b	Koan	5	12	Ph 4	Rhodian	2
49	Ph 1b	Koan	5	13	Ph 4	Rhodian	2
218	Ph 1b	Dressel 1C	19	14	Ph 4	Rhodian	2
219	Ph 1b	Dressel 1C	19	15	Ph 4	Rhodian	2
246	Ph 1b	Dressel 1C	21	17	Ph 4	Rhodian	2
247	Ph 1b	Dressel 1C	21	18	Ph 4	Rhodian	2
358	Ph 1b	Stopper	32	20	Ph 4	Rhodian	2
359	Ph 1b	Stopper	32	27	Ph 4	Rhodian	3
360	Ph 1b	Stopper	32	33	Ph 4	Chian	4
212	Ph 1c	Dressel 1A	18	35	Ph 4	Chian	4
253	Ph 1c	Dressel 1	22	36	Ph 4	Chian	4
257	Ph 1c	Brindisian	23	38	Ph 4	Knidian	4
273	Ph 1c	Lamboglia 2	24	39	Ph 4	Knidian	4
9	Ph 2a	Rhodian	1	40	Ph 4	Knidian	4
50	Ph 2a	Koan	5	41	Ph 4	Knidian	4
51	Ph 2a	Koan	5	42	Ph 4	Knidian	5
52	Ph 2a	Koan	5	45	Ph 4	Knidian	5
198	Ph 2a	Van der Werff 2	17	53	Ph 4	Koan	5
220	Ph 2a	Dressel 1C	19	54	Ph 4	Koan	5
221	Ph 2a	Dressel 1C	19	55	Ph 4	Koan	6
254	Ph 2a	Dressel 1	22	56	Ph 4	Koan	6
255	Ph 2a	Dressel 1	22	57	Ph 4	Koan	6
274	Ph 2a	Lamboglia 2	24	58	Ph 4	Koan	6
275	Ph 2a	Lamboglia 2	24	59	Ph 4	Koan	6
276	Ph 2a	Lamboglia 2	24	60	Ph 4	Koan	6
277	Ph 2a	Lamboglia 2	24	61	Ph 4	Koan	6
258	Ph 2b	Brindisian	23	62	Ph 4	Koan	6
278	Ph 2b	Lamboglia 2	25	63	Ph 4	Koan	6
279	Ph 2b	Lamboglia 2	25	64	Ph 4	Koan	6
11	Ph 3	Rhodian	1	65	Ph 4	Koan	6
43	Ph 3	Knidian	5	66	Ph 4	Koan	7
77	Ph 3	Koan	8	67	Ph 4	Koan	7
105	Ph 3	Cup-shaped rim	10	68	Ph 4	Koan	7
151	Ph 3	Local Aegean 1	13	69	Ph 4	Koan	7
208	Ph 3	Dressel 1A	18	71	Ph 4	Koan	7
210	Ph 3	Dressel 1A	18	72	Ph 4	Koan	8
223	Ph 3	Dressel 1C	19	73	Ph 4	Koan	8
224	Ph 3	Dressel 1C	19	75	Ph 4	Koan	8
225	Ph 3	Dressel 1C	19	78	Ph 4	Agora F 65-66	8
226	Ph 3	Dressel 1C	20	79	Ph 4	Agora F 65-66	8
248	Ph 3	Dressel 1C	21	80	Ph 4	Agora F 65-66	8
249	Ph 3	Dressel 1C	21	81	Ph 4	Agora F 65-66	8
250	Ph 3	Dressel 1C	22	82	Ph 4	Agora F 65-66	8
280	Ph 3	Lamboglia 2	25	83	Ph 4	Agora F 65-66	8
361	Ph 3	Stopper	32	84	Ph 4	Agora F 65-66	8
3	Ph 4	Rhodian	1	85	Ph 4	Agora F 65-66	8
4	Ph 4	Rhodian	1	86	Ph 4	Agora F 65-66	9
5	Ph 4	Rhodian	1	87	Ph 4	Agora F 65-66	9

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
88	Ph 4	Agora F 65–66	9	182	Ph 4	Dressel 25	16
89	Ph 4	Agora F 65–66	9	183	Ph 4	Dressel 25	16
90	Ph 4	Agora F 65–66	9	186	Ph 4	Baggy jar	16
106	Ph 4	Cup-shaped rim	10	187	Ph 4	Baggy jar	16
107	Ph 4	Cup-shaped rim	10	188	Ph 4	Baggy jar	16
108	Ph 4	Cup-shaped rim	10	189	Ph 4	Baggy jar	17
110	Ph 4	Cup-shaped rim	10	190	Ph 4	Baggy jar	17
111	Ph 4	Cup-shaped rim	10	191	Ph 4	Baggy jar	17
112	Ph 4	Cup-shaped rim	10	192	Ph 4	Baggy jar	17
113	Ph 4	Cup-shaped rim	10	193	Ph 4	Baggy jar	17
114	Ph 4	Cup-shaped rim	10	197	Ph 4	Van der Werff 1	17
115	Ph 4	Cup-shaped rim	10	199	Ph 4	Van der Werff 3	17
116	Ph 4	Cup-shaped rim	11	203	Ph 4	Greco–Italic	18
117	Ph 4	Cup-shaped rim	11	204	Ph 4	Greco–Italic	18
118	Ph 4	Cup-shaped rim	11	205	Ph 4	Greco–Italic	18
119	Ph 4	Cup-shaped rim	11	209	Ph 4	Dressel 1A	18
120	Ph 4	Cup-shaped rim	11	211	Ph 4	Dressel 1A	18
121	Ph 4	Cup-shaped rim	11	213	Ph 4	Dressel 1B	18
122	Ph 4	Cup-shaped rim	11	215	Ph 4	Dressel 1B	19
123	Ph 4	Cup-shaped rim	11	227	Ph 4	Dressel 1C	20
124	Ph 4	Cup-shaped rim	11	228	Ph 4	Dressel 1C	20
125	Ph 4	Cup-shaped rim	11	229	Ph 4	Dressel 1C	20
126	Ph 4	Cup-shaped rim	11	230	Ph 4	Dressel 1C	20
133	Ph 4	Cretan, AC4	12	231	Ph 4	Dressel 1C	20
134	Ph 4	Cretan, AC4	12	232	Ph 4	Dressel 1C	20
147	Ph 4	Ephesus 29	13	233	Ph 4	Dressel 1C	20
150	Ph 4	Ephesus 1274	13	234	Ph 4	Dressel 1C	20
152	Ph 4	Local Aegean 1	13	235	Ph 4	Dressel 1C	20
153	Ph 4	Local Aegean 1	13	236	Ph 4	Dressel 1C	20
155	Ph 4	Local Aegean 1	14	237	Ph 4	Dressel 1C	20
156	Ph 4	Local Aegean 1	14	238	Ph 4	Dressel 1C	21
157	Ph 4	Local Aegean 1	14	239	Ph 4	Dressel 1C	21
159	Ph 4	Local Aegean 1	14	240	Ph 4	Dressel 1C	21
160	Ph 4	Local Aegean 1	14	241	Ph 4	Dressel 1C	21
161	Ph 4	Local Aegean 1	14	243	Ph 4	Dressel 1C	21
163	Ph 4	Local Aegean 1	14	244	Ph 4	Dressel 1C	21
164	Ph 4	Local Aegean 1	14	245	Ph 4	Dressel 1C	21
166	Ph 4	Local Aegean 2	15	251	Ph 4	Dressel 1C	22
167	Ph 4	Local Aegean 2	15	252	Ph 4	Dressel 1C	22
168	Ph 4	Local Aegean 2	15	256	Ph 4	Dressel 1	22
169	Ph 4	Local Aegean 2	15	259	Ph 4	Brindisian	23
170	Ph 4	Local Aegean 2	15	260	Ph 4	Brindisian	23
172	Ph 4	Dressel 25	15	261	Ph 4	Brindisian	23
173	Ph 4	Dressel 25	15	262	Ph 4	Brindisian	23
174	Ph 4	Dressel 25	15	263	Ph 4	Brindisian	23
175	Ph 4	Dressel 25	15	264	Ph 4	Brindisian	23
176	Ph 4	Dressel 25	15	268	Ph 4	Brindisian	24
177	Ph 4	Dressel 25	16	269	Ph 4	Brindisian	24
178	Ph 4	Dressel 25	16	270	Ph 4	Brindisian	24
179	Ph 4	Dressel 25	16	271	Ph 4	Brindisian	24
180	Ph 4	Dressel 25	16	281	Ph 4	Lamboglia 2	25
181	Ph 4	Dressel 25	16	282	Ph 4	Lamboglia 2	25

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
283	Ph 4	Lamboglia 2	25	200	Ph 4-5	Egyptian AE 2	17
284	Ph 4	Lamboglia 2	25	295	Ph 4-5	Dressel 6A	26
285	Ph 4	Lamboglia 2	25	299	Ph 4-5	Dressel 6A	27
286	Ph 4	Lamboglia 2	25	323	Ph 4-5	Dressel 2-4 Italian	29
287	Ph 4	Lamboglia 2	25	46	Ph 5a	Knidian	5
288	Ph 4	Lamboglia 2	26	74	Ph 5a	Koan	8
293	Ph 4	Dressel 6A	26	91	Ph 5a	Agora F 65-66	9
294	Ph 4	Dressel 6A	26	130	Ph 5a	Dressel 35	12
300	Ph 4	Dressel 21-22	27	146	Ph 5a	Agora G199	13
301	Ph 4	Dressel 21-22	27	196	Ph 5a	Baggy jar	17
302	Ph 4	Dressel 21-22	27	326	Ph 5a	Dressel 2-4 Italian	29
303	Ph 4	Dressel 21-22	27	28	Ph 5b	Rhodian	3
304	Ph 4	Dressel 21-22	27	29	Ph 5b	Rhodian	3
305	Ph 4	Dressel 21-22	27	30	Ph 5b	Rhodian	3
306	Ph 4	Dressel 21-22	28	34	Ph 5b	Chian	4
307	Ph 4	Dressel 21-22	28	70	Ph 5b	Koan	7
308	Ph 4	Dressel 21-22	28	194	Ph 5b	Baggy jar	17
309	Ph 4	Dressel 21-22	28	195	Ph 5b	Baggy jar	17
310	Ph 4	Dressel 21-22	28	207	Ph 5b	Greco-Italic	18
311	Ph 4	Dressel 21-22	28	216	Ph 5b	Dressel 1B	19
312	Ph 4	Dressel 21-22	28	242	Ph 5b	Dressel 1C	21
313	Ph 4	Dressel 21-22	28	289	Ph 5b	Lamboglia 2	26
314	Ph 4	Dressel 21-22	28	335	Ph 5b	Pascual 1	30
315	Ph 4	Dressel 21-22	28	8	Ph 5c	Rhodian	1
316	Ph 4	Dressel 21-22	29	19	Ph 5c	Rhodian	2
317	Ph 4	Dressel 21-22	29	26	Ph 5c	Rhodian	3
318	Ph 4	Dressel 21-22	29	31	Ph 5c	Rhodian	4
319	Ph 4	Dressel 21-22	29	32	Ph 5c	Rhodian	4
321	Ph 4	Dressel 2-4 Italian	29	76	Ph 5c	Koan	8
330	Ph 4	Early Roman Amphora 11B	30	92	Ph 5c	Agora F 65-66	9
331	Ph 4	Lomba do Canho 67	30	93	Ph 5c	Agora F 65-66	9
332	Ph 4	Haltern 70	30	94	Ph 5c	Agora F 65-66	9
333	Ph 4	Haltern 70	30	95	Ph 5c	Agora F 65-66	9
340	Ph 4	Beltran I / Dressel 7	31	96	Ph 5c	Agora F 65-66	9
347	Ph 4	Miscellaneous	31	97	Ph 5c	Agora F 65-66	9
348	Ph 4	Miscellaneous	31	98	Ph 5c	Agora F 65-66	9
349	Ph 4	Miscellaneous	31	99	Ph 5c	Agora F 65-66	9
350	Ph 4	Miscellaneous	31	100	Ph 5c	Agora F 65-66	9
351	Ph 4	Miscellaneous	31	109	Ph 5c	Cup-shaped rim	10
353	Ph 4	Miscellaneous	31	131	Ph 5c	Dressel 35	12
354	Ph 4	Miscellaneous	31	136	Ph 5c	Cretan, AC 2	12
357	Ph 4	Miscellaneous	31	162	Ph 5c	Local Aegean 1	14
363	Ph 4	Stopper	32	184	Ph 5c	Dressel 25	16
364	Ph 4	Stopper	32	185	Ph 5c	Dressel 25	16
365	Ph 4	Stopper	32	201	Ph 5c	Egyptian AE 2	17
366	Ph 4	Stopper	32	202	Ph 5c	Egyptian AE 2	17
369	Ph 4	Stopper	32	266	Ph 5c	Brindisian	23
44	Ph 4-5	Knidian	5	290	Ph 5c	Lamboglia 2	26
127	Ph 4-5	Cup-shaped rim	11	296	Ph 5c	Dressel 6A	27
128	Ph 4-5	Cup-shaped rim	11	322	Ph 5c	Dressel 2-4 Italian	29
137	Ph 4-5	Dressel 5	12	324	Ph 5c	Dressel 2-4 Italian	29
				325	Ph 5c	Dressel 2-4 Italian	29

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
334	Ph 5c	Haltern 70	30	103	Ph 7–9	Agora M 45	9
336	Ph 5c	Dressel 20	30	139	Ph 7–9	Dressel 5	12
341	Ph 5c	Beltran I / Dressel 9	31	165	Ph 7–9	Local Aegean 1	14
342	Ph 5c	Beltran I / Dressel 9	31	217	Ph 7–9	Dressel 1B	19
343	Ph 5c	Beltran I / Dressel 9	31	370	Ph 7–9	Late Roman Amphora 1	33
344	Ph 5c	Beltran I	31	371	Ph 7–9	Late Roman Amphora 1	33
345	Ph 5c	Miscellaneous	31	372	Ph 7–9	Late Roman Amphora 1	33
352	Ph 5c	Miscellaneous	31	373	Ph 7–9	Late Roman Amphora 1	33
367	Ph 5c	Stopper	32	374	Ph 7–9	Late Roman Amphora 1	33
7	Ph 6	Rhodian	1	375	Ph 7–9	Late Roman Amphora 2	33
22	Ph 6	Rhodian	3	377	Ph 7–9	Late Roman Amphora 4	33
23	Ph 6	Rhodian	3	380	Ph 7–9	Late Roman Amphora 3	34
25	Ph 6	Rhodian	3	381	Ph 7–9	Late Roman Amphora 3	34
101	Ph 6	Agora F 65–66	9	382	Ph 7–9	Late Roman Amphora 3	34
104	Ph 6	Agora M 125	9	383	Ph 7–9	Late Roman Amphora 3	34
132	Ph 6	Dressel 35	12	384	Ph 7–9	Late Roman Amphora 3	34
135	Ph 6	Cretan, AC 4	12	387	Ph 7–9	Late Roman Amphora 3	34
138	Ph 6	Dressel 5	12	388	Ph 7–9	Late Roman Amphora 3	34
140	Ph 6	Agora M 54	12	389	Ph 7–9	Ephesus 56	35
141	Ph 6	Agora G 198	12	390	Ph 7–9	Ephesus 56	35
142	Ph 6	Agora G 198	13	391	Ph 7–9	Ephesus 56	35
143	Ph 6	Koan type with Pinched Handles	13	392	Ph 7–9	Ephesus 56	35
144	Ph 6	Koan type with Pinched Handles	13	393	Ph 7–9	Ephesus 56	35
145	Ph 6	Koan type with Pinched Handles	13	394	Ph 7–9	Ephesus 56	35
297	Ph 6	Dressel 6A	27	395	Ph 7–9	Ephesus 56	35
327	Ph 6	Schörgendorfer 558	30	396	Ph 7–9	Ephesus 56	35
328	Ph 6	Schörgendorfer 558	30	397	Ph 7–9	Ephesus 56	35
329	Ph 6	Gauloise 4	30	398	Ph 7–9	Ephesus 56	35
337	Ph 6	Dressel 20	30	400	Ph 7–9	Samos Cistern Type	36
338	Ph 6	Dressel 20	30	401	Ph 7–9	Samos Cistern Type	36
339	Ph 6	Dressel 20	30	402	Ph 7–9	Kuzmanov IX	36
356	Ph 6	Miscellaneous	31	403	Ph 7–9	Kuzmanov IX	36
376	Ph 6	Late Roman Amphora 4	33	404	Ph 7–9	Ephesus 1690	36
385	Ph 6	Late Roman Amphora 3	34	405	Ph 7–9	Zeest 84B	36
386	Ph 6	Late Roman Amphora 3	34	407	Ph 7–9	Agora M 273	36
399	Ph 6	Zeest 84B	36	408	Ph 7–9	Sabratha Sub–type 34N	36
406	Ph 6	Zeest 84B	36	409	Ph 7–9	Ostia 59 / Bonifay 15	37
412	Ph 6	Tripolitanian I	37	418	Ph 7–9	Spatheion small 3C	37
414	Ph 6	Almagro 50	37	419	Ph 7–9	Spatheion small 3C	37
416	Ph 6	Almagro 51C	37	420	Ph 7–9	Spatheion 1A	37
417	Ph 6	Égyptienne Bitronco- nique 3	37	298	Ph 8	Dressel 6A	27
102	Ph 6–9	Agora F 65–66	9	379	Ph 10	Agora M 240	34
149	Ph 6–9	Ephesus 373	13	411	Ph 10	Keay 34 / Bonifay 53	37
346	Ph 6–9	Miscellaneous	31	415	Ph 10	Mid Roman 1	37
362	Ph 6–9	Stopper	32	2	Ph 11	Rhodian	1
410	Ph 7	Africana II	37	16	Ph 11	Rhodian	2
21	Ph 7–9	Rhodian	3	129	Ph 11	Cup-shaped rim	11
24	Ph 7–9	Rhodian	3	148	Ph 11	Ephesus 29	13
47	Ph 7–9	Knidian	5	154	Ph 11	Local Aegean 1	14
				158	Ph 11	Local Aegean 1	14
				171	Ph 11	Local Aegean 2	15
				206	Ph 11	Greco–Italic	18

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
214	Ph 11	Dressel 1B	18	292	Ph 11	Lamboglia 2	26
222	Ph 11	Dressel 1C	19	320	Ph 11	Dressel 21–22	29
265	Ph 11	Brindisian	23	355	Ph 11	Miscellaneous	31
267	Ph 11	Brindisian	23	368	Ph 11	Stopper	32
272	Ph 11	Brindisian	24	378	Ph 11	Late Roman Amphora 7	33
291	Ph 11	Lamboglia 2	26	413	Ph 11	Tripolitanian III	37

Terrace House 2

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
501	1	Rhodian	38	540	2a	Aegean Local 1	40
502	1	Rhodian	38	541	2a	Aegean Local 1	40
543	1a	Aegean Local 1	40	533	2a–3	Mushroom rim type	40
527	1b	Mushroom rim type	39	504	2a–3a	Rhodian	38
532	1b	Mushroom rim type	40	508	2a–3a	Knidian	38
535	1b–3	Mushroom rim type	40	513	2a–3a	Koan	39
548	1b–3	Agora F 65–66	41	522	2a–3a	Mushroom rim type	39
549	1b–3	Agora F 65–66	41	523	2a–3a	Mushroom rim type	39
572	1b–3	Dressel 2–4	43	524	2a–3a	Mushroom rim type	39
503	2	Rhodian	38	525	2a–3a	Mushroom rim type	39
506	2	Chian	38	537	2a–3a	Mushroom rim type	40
510	2	Koan	38	542	2a–3a	Aegean Local 1	40
511	2	Koan	38	544	2a–3a	Aegean Local 1	40
512	2	Koan	39	565	2a–3a	Lamboglia 2	42
516	2	Mushroom rim type	39	573	2a–3a	Dressel 2–4	43
517	2	Mushroom rim type	39	514	2a–3b	Koan	39
518	2	Mushroom rim type	39	554	2a–4	Koan type with Pinched Handles	41
519	2	Mushroom rim type	39	592	2a–4	Agora M 45	46
520	2	Mushroom rim type	39	593	2a–4	Agora M 45	46
521	2	Mushroom rim type	39	550	3	Agora F 65–66	41
528	2	Mushroom rim type	39	575	3	Dressel 2–4	43
529	2	Mushroom rim type	39	553	3a	Cup-shaped rim	41
531	2	Mushroom rim type	40	558	3a	Dressel 1A	42
536	2	Mushroom rim type	40	562	3a	Dressel 1C	42
538	2	Mushroom rim type	40	564	3a	Lamboglia 2	42
539	2	Aegean Local 1	40	639	3–7	Miscellaneous	49
545	2	Agora F 65–66	41	505	4	Rhodian	38
546	2	Agora F 65–66	41	597	4	Agora M 125	46
556	2	Punic	41	623	4	Zeest 84	48
557	2	Dressel 1A	42	589	5	Kapitän II	45
559	2	Dressel 1A	42	583	5a	Kapitän II	45
560	2	Dressel 1A	42	584	5a	Kapitän II	45
561	2	Dressel 1C	42	585	5a	Kapitän II	45
566	2	Lamboglia 2	42	586	5a	Kapitän II	45
567	2	Lamboglia 2	43	587	5a	Kapitän II	45
568	2	Lamboglia 2	43	588	5a	Kapitän II	45
569	2	Lamboglia 2	43	591	5a	Kapitän II	45
570	2	Lamboglia 2	43				

CatNo	Layer	Type	Pl.	CatNo	Layer	Type	Pl.
594	5a	Agora M 125	46	631	10	Late Roman Amphora 2	49
596	5a	Agora M 125	46	507	11	Knidian	38
598	5a	Agora M 125	46	526	11	Mushroom rim type	39
599	5a	Agora M 125	46	530	11	Mushroom rim type	40
600	5a	Agora M 125	46	534	11	Mushroom rim type	40
617	5a	Dressel 30	47	547	11	Agora F 65–66	41
622	5a	Miscellaneous	48	551	11	Cup-shaped rim	41
624	5a	Zeest 84	48	571	11	Dressel 6A	43
625	5a	Zeest 80	48	574	11	Dressel 2–4	43
629	5a	Late Roman Amphora 2	48	576	11	Beltran I / Dressel 8	44
630	5a	Late Roman Amphora 2	48	577	11	Beltran IIA	44
636	5a	Miscellaneous	49	578	11	Dressel 12	44
638	5a	Miscellaneous	49	579	11	Dressel 12	44
640	5a	Miscellaneous	49	581	11	Dressel 20	44
641	5a	Miscellaneous	49	582	11	Kapitän II	45
644	5a	Miscellaneous	49	590	11	Kapitän II	45
645	5a	Miscellaneous	50	595	11	Agora M 125	46
552	5a–6a	Cup-shaped rim	41	601	11	Agora M 240	46
618	5a–6a	Africana II	47	603	11	Agora M 240	46
602	5–8	Agora M 240	46	605	11	Late Roman Amphora 3	46
635	5–8	LR4/Gaza	49	607	11	Late Roman Amphora 3	47
637	5–8	Miscellaneous	49	608	11	Late Roman Amphora 3	47
646	5–8	Miscellaneous	50	609	11	Late Roman Amphora 3	47
615	6–9	Ephesus 56	47	611	11	Ephesus 56	47
616	6–9	Ephesus 56	47	612	11	Ephesus 56	47
627	6–9	Late Roman Amphora 1	48	614	11	Ephesus 56	47
628	6–9	Late Roman Amphora 1	48	619	11	Agora M 273	48
632	6–9	Late Roman Amphora 2	49	620	11	Agora M 273	48
633	7–8	Late Roman Amphora 2	49	621	11	Miscellaneous	48
509	10	Knidian	38	626	11	Kuzmanov IX	48
515	10	Koan	39	634	11	LR4/Gaza	49
555	10	Miscellaneous	41	642	11	Miscellaneous	49
563	10	Brindisian	42	643	11	Miscellaneous	49
580	10	Dressel 20	44	647		Dressel 6A	50
604	10	Late Roman Amphora 3	46	648		Dressel 6A	50
606	10	Late Roman Amphora 3	47	649		Dressl 2–4	50
610	10	Late Roman Amphora 3	47	650		Almagro 50	50
613	10	Ephesus 56	47				

Tetragonos Agora

Nos.	Types	Fabrics	Layers
1	Rhodian	Rhodian Peraea, site unknown	Ph 1a
5	Rhodian	Rhodes Island Fabric	Ph 4
7	Rhodian	Koan Fabric A	Ph 6
10	Rhodian	Ephesus Fabric A	Ph 4
11	Rhodian	Rhodian Peraea, site unknown	Ph 3
12	Rhodian	Rhodian Peraea, site unknown	Ph 4
14	Rhodian	Ephesus Fabric A	Ph 4
16	Rhodian	Rhodian Peraea, site unknown	Ph 11
17	Rhodian	Rhodian Peraea, site unknown	Ph 4
22	Rhodian	Rhodian Peraea, site unknown	Ph 6
23	Rhodian	Rhodes Island Fabric	Ph 6
24	Rhodian	Rhodes Island Fabric	Ph 7–9
26	Rhodian	Koan Fabric B	Ph 5c
28	Rhodian	Koan Fabric B1	Ph 5b
34	Chian	Chian Fabric A	Ph 5b
43	Knidian	Knidian Fabric A	Ph 3
47	Knidian	Knidian Fabric A	Ph 7–9
65	Koan	Koan Fabric C	Ph 4
70	Koan	Koan Fabric D	Ph 5b
76	Koan	Koan Fabric B1	Ph 5c
79	Agora F 65–66	Production site unknown	Ph 4
80	Agora F 65–66	Ephesus Fabric A	Ph 4
81	Agora F 65–66	Ephesus Fabric A	Ph 4
89	Agora F 65–66	Ephesus Fabric A	Ph 4
91	Agora F 65–66	Ephesus Fabric A	Ph 5a
105	Cup-shaped rim	Erythrai Fabric A	Ph 3
106	Cup-shaped rim	Erythrai Fabric A	Ph 4
111	Cup-shaped rim	Ephesus and Meander Valley region Fabric A	Ph 4
113	Cup-shaped rim	Erythrai Fabric B	Ph 4
120	Cup-shaped rim	Similar Ephesus Fabric C	Ph 4
124	Cup-shaped rim	Similar Ephesus Fabric C	Ph 4
129	Cup-shaped rim	Erythrai Fabric B	Ph 11
135	Cretan, AC 4	Crete	Ph 6
140	Agora M 54	Cilician Fabric	Ph 6
146	Agora G199	Cilician Fabric	Ph 5a
148	Ephesus 17	Similar no. 12 Rhodian Peraea, site unknown	Ph 11
149	Ephesus 18	Production site unknown, not Ephesian fabric	Ph 6–9
152	Aegean Local 1	Ephesus Fabric C	Ph 4
153	Aegean Local 1	Ephesus Fabric C	Ph 4
157	Aegean Local 1	Ephesus Fabric C	Ph 4
159	Aegean Local 1	Ephesus Fabric C	Ph 4
168	Aegean Local 2	Ephesus Fabric C	Ph 4
172	Dressel 25	Ionian region Fabric A	Ph 4
180	Dressel 25	Ionian region Fabric A	Ph 4
183	Dressel 25	Corinth region, Ionian region Fabric B	Ph 4
184	Dressel 25	Ionian region Fabric A	Ph 5c
192	Baggy jar	Palestinian Fabric A	Ph 4
193	Baggy jar	Palestinian Fabric A1	Ph 4
195	Baggy jar	Palestinian Fabric B	Ph 5b
198	Van der Werff 2	African Fabric	Ph 2a

Nos.	Types	Fabrics	Layers
204	Greco–Italic	Italian Fabric A	Ph 4
209	Dressel 1A	Italian Fabric E	Ph 4
210	Dressel 1A	Italian Fabric I	Ph 3
212	Dressel 1A	Italian Fabric D	Ph 1c
216	Dressel 1B	Italian Fabric F	Ph 5b
219	Dressel 1C	Italian Fabric C	Ph 1b
222	Dressel 1C	Italian Fabric E	Ph 11
223	Dressel 1C	Italian Fabric C	Ph 3
228	Dressel 1C	Italian Fabric G	Ph 4
230	Dressel 1C	Italian Fabric C	Ph 4
240	Dressel 1C	Italian Fabric C	Ph 4
246	Dressel 1C	Spanish Fabric A	Ph 1b
253	Dressel 1	Spanish Fabric B	Ph 1c
254	Dressel 1	Italian Fabric D	Ph 2a
255	Dressel 1	Italian Fabric D	Ph 2a
256	Dressel 1	Italian Fabric B	Ph 4
258	Brindisian	Italian Fabric P	Ph 2b
259	Brindisian	Italian Fabric P1	Ph 4
260	Brindisian	Italian Fabric P	Ph 4
266	Brindisian	Italian Fabric P1	Ph 5c
267	Brindisian	Italian Fabric P?	Ph 11
270	Brindisian	Italian Fabric R?	Ph 4
271	Brindisian	Italian Fabric P	Ph 4
272	Brindisian	Italian Fabric P1	Ph 11
273	Lamboglia 2	Italian Fabric P2	Ph 1c
274	Lamboglia 2	Italian Fabric P2	Ph 2a
276	Lamboglia 2	Italian Fabric P1	Ph 2a
277	Lamboglia 2	Italian Fabric P	Ph 2a
278	Lamboglia 2	Italian Fabric P2	Ph 2b
279	Lamboglia 2	Italian Fabric P2	Ph 2b
281	Lamboglia 2	Italian Fabric O	Ph 4
282	Lamboglia 2	Italian Fabric P	Ph 4
284	Lamboglia 2	Italian Fabric O	Ph 4
291	Lamboglia 2	Italian Fabric P1	Ph 11
296	Dressel 6A	Italian Fabric N	Ph 5c
297	Dressel 6A	Italian Fabric N	Ph 6
301	Dressel 21–22	Italian Fabric J	Ph 4
302	Dressel 21–22	Italian Fabric J	Ph 4
303	Dressel 21–22	Italian Fabric K	Ph 4
304	Dressel 21–22	Italian Fabric J1	Ph 4
306	Dressel 21–22	Italian Fabric C1	Ph 4
308	Dressel 21–22	Italian Fabric J	Ph 4
311	Dressel 21–22	Italian Fabric K	Ph 4
316	Dressel 21–22	Italian Fabric K	Ph 4
318	Dressel 21–22	Italian Fabric K	Ph 4
321	Dressel 2–4	Italian Fabric H	Ph 4
322	Dressel 2–4	Italian Fabric A	Ph 5c
323	Dressel 2–4	Italian Fabric B	Ph 4–5
326	Dressel 2–4	Italian Fabric A1	Ph 5a
327	Schörgendorfer 558	Italian Fabric L	Ph 6
329	Gauloise 4	South France Fabric	Ph 6
331	Lomba do Canho 67	Spanish Fabric C	Ph 4

Nos.	Types	Fabrics	Layers
332	Haltern 70	Spanish Fabric D	Ph 4
341	Dressel 9	Spanish Fabric D	Ph 5c
352	Miscellaneous	Cyprus or Syrian Fabric	Ph 5c
372	Late Roman Amphora 1	Cyprus Fabric	Ph 7–9
375	Late Roman Amphora 2	Production site unknown	Ph 7–9
381	Late Roman Amphora 3	Ephesus Fabric B	Ph 7–9
397	Ephesus 56	Ephesus Fabric B	Ph 7–9
400	Samos Cistern Type	Samos or Meander Valley	Ph 7–9
403	Kuzmanov IX	Sinopean Fabric	Ph 7–9
406	Zeest 84	Production site unknown	Ph 6
410	Africana II D	African Fabric	Ph 7
416	Almagro 51 C	Lusitanian Fabric ?	Ph 6
417	Amphore Égyptienne Bitronconique 3	Egyptian Nile Fabric	Ph 6

Terrace House 2

CatNo	Type	Fabric	Layer
520	Mushroom rim type	Ephesus Fabric C1	2
526	Mushroom rim type	Ephesus Fabric C1	11
527	Mushroom rim type	Ephesus Fabric C1	1b
529	Mushroom rim type	Ephesus Fabric C	2
531	Mushroom rim type	Ephesus Fabric C	2
582	Kapitän II	Production site unknown	11
586	Kapitän II	Production site unknown	5a
589	Kapitän II	Production site unknown	5
601	Agora M 240	Ephesus Fabric A	11
619	Agora M 273	Samos or Meander Valley	11
624	Zeest 84	Production site unknown	5a

Arap-Dere Survey

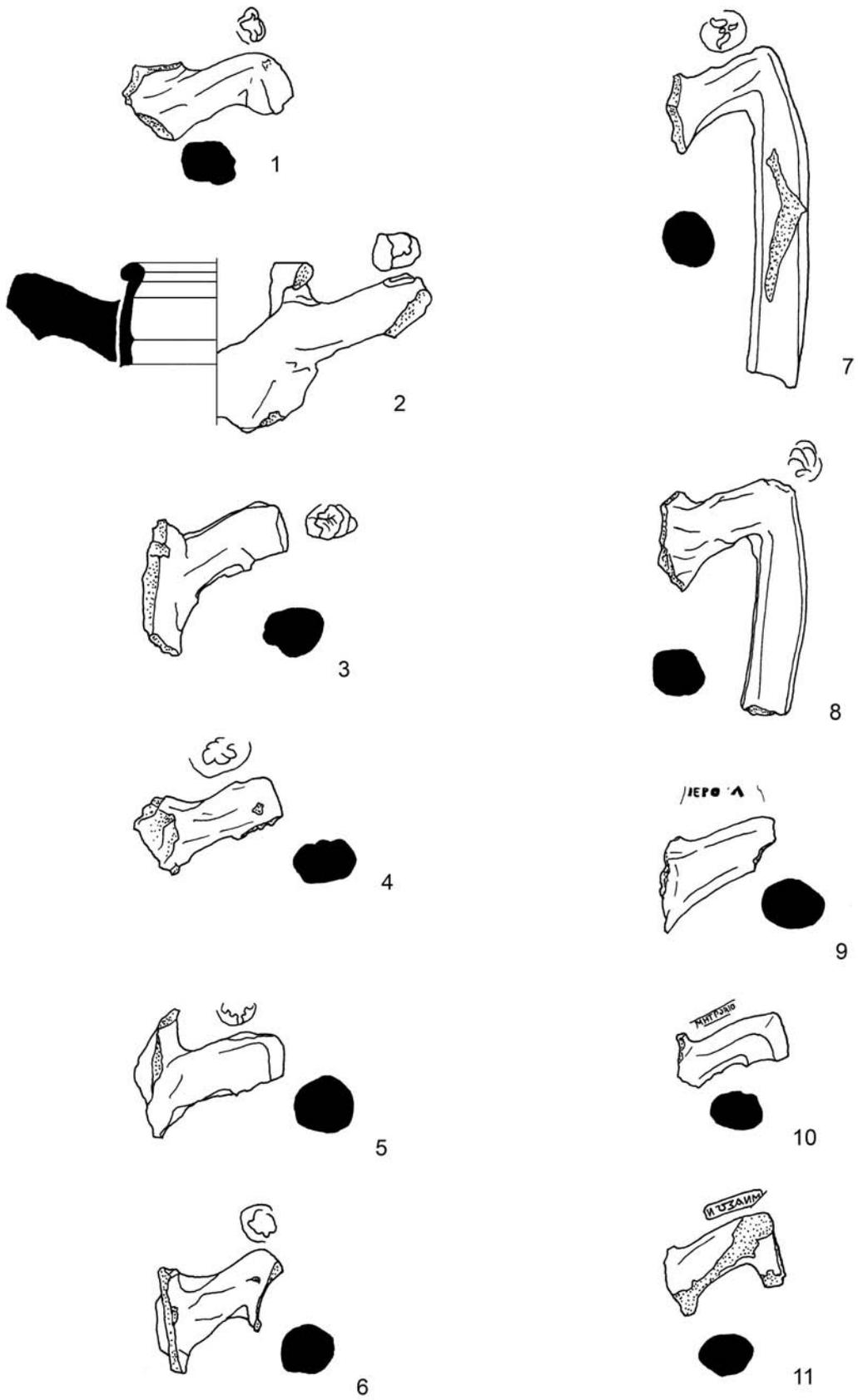
CatNo	Type	Fabric
852	LR3	Ephesus Fabric B
853	LR3	Ephesus Fabric B
856	LR3	Ephesus Fabric B
859	LR3	Ephesus Fabric B
860	LR3	Ephesus Fabric B
861	Ephesus 56	Ephesus Fabric B
865	Ephesus 56	Ephesus Fabric B
869	Ephesus 56	Ephesus Fabric B

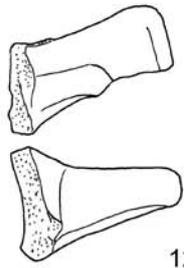
CatNo	Names of Persons	Type	
-	Ἀστυμήδης II	Rhodian	eponym
9	Ἱεροκλῆς	Rhodian	fabricant
10	Μητρόβιος	Rhodian	fabricant
11	Μνάσων	Rhodian	fabricant
33	Ματρ(έας)	Chian	
34	Ματρέ(ας)	Chian	
35	Ματρέ(ας)	Chian	
36	Ἀπελλῆς	Chian	
40	Palm leaf	Knidian	
43	Bull's head	Knidian	
47	Bunch of grapes?	Knidian	
65	Δίων	Koan	
66	Τιμησίων	Koan	
77	Λεωδάμας	Koan	
89	Ελ(...)	Agora F 65–66	
102	Μάσ(...)	Agora F 65–66	
124	Αγα (...)	Cup-shaped rim /Dressel 24	
156	Προμη(...)	Local Aegean 1	
157	Προμη(...)	Local Aegean 1	
158	Προμη(...)	Local Aegean 1	
159	Παχο(...)	Local Aegean 1	
183	Ζοῖλος	Dressel 25	
364	Ψ	Stopper	
368	?ΠΦΔΙΑ?	Stopper	
398	Μ	Ephesus 56	Graffiti
501	Ἀρίσταρχος	Rhodian	fabricant
502	Κλεώνυμος	Rhodian	eponym
508	Exi...	Knidian	eponym
528	Monogram	Mushroom rim / Nikandros group	
529	P T Y...	Mushroom rim / Nikandros group	
530	N(...)	Mushroom rim / Nikandros group	
531	Μηνόφιλος	Mushroom rim / Nikandros group	
532	Μηνόφιλος	Mushroom rim / Nikandros group	
533	Ἀρχέτιμος	Mushroom rim / Nikandros group	
534	.neo..ατ...	Mushroom rim / Nikandros group	
535	Μηνόφαντος	Mushroom rim / Nikandros group	
536	Δι	Mushroom rim / Nikandros group	
537	Monogram	Mushroom rim / Nikandros group	
538	...TE	Mushroom rim / Nikandros group	
801	young head in profile	Agora F 65–66	Gem imprint

Rhodian month

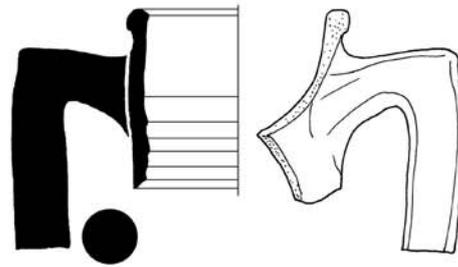
502	Δάλιος
HH2-99/151	Θεσμοφόριος

CatNo	Stamp, Inscription	Type	
149	FVRI...	Ephesus 373	
210	AT..T	Dressel 1A	Dipinto, red ink
216	GAA or CAA	Dressel 1B	
222	M.D...	Dressel 1C	
265	STABVA	Brindisian	
266	PHILIPVS BETIL	Brindisian	
267	MENOPILVS	Brindisian	
269	DEMETRI	Brindisian	
278	ER[...].C	Lamboglia 2	
284	LICIN	Lamboglia 2	
285	C.OPIM	Lamboglia 2	
296	M.HER.PICENT	Dressel 6A	
298	M.HER.PICENT	Dressel 6A	
299	A...	Dressel 6A	Dipinto, red ink
301	POST.CVRT	Dressel 21	
308	[PO]S[T].CVRT	Dressel 21	
311	G	Dressel 21	
316	CET	Dressel 21-22	Dipinto, red ink
318	Anchor or symbol	Dressel 21	
319	Anchor or symbol	Dressel 21	
320	Anchor or symbol	Dressel 21	
336	BA...	Dressel 20	
337	Q() ANT () R ()	Dressel 20	
338	Q.I.M.F	Dressel 20	
361	FELIX	Stopper	
398	M	Ephesus 56	Graffiti, cut after firing
411	B	Keay 34/Bonifay 53	Graffiti, cut after firing
647	D.L.F.PRI	Dressel 6A	
648	.../..NVM...	Dressel 6A	
649	L.EVMAC	Dressel 2-4	
650	[O]LYNT	Almagro 50	
802	LICIN	Lamboglia 2	
803	DAM	Lamboglia 2	
804	S.L.E.[P]	Dressel 6A	
805	[M] LIVI.CAVS / SVR	Dressel 2-4	
810	C.F.G	Dressel 6A	
811	LICCA	Dressel 2-4	
820	CADMVS	Lamboglia 2	
830	[V]ISELLI	Brindisian	

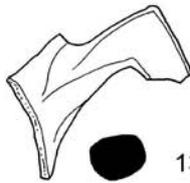




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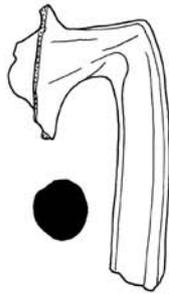
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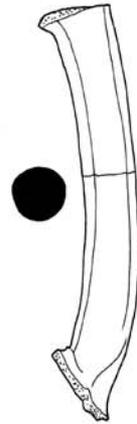
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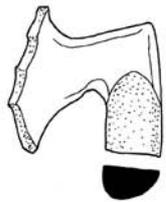
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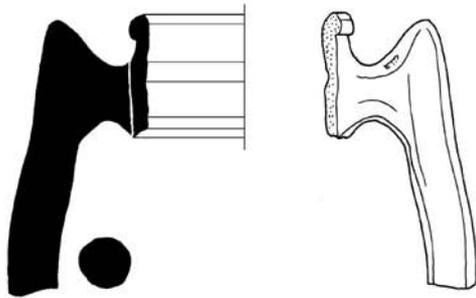
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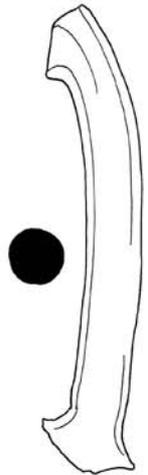
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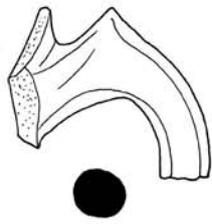
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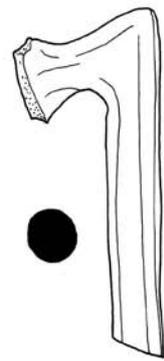
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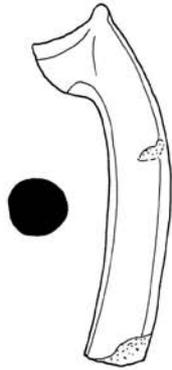
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21



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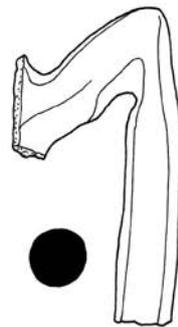
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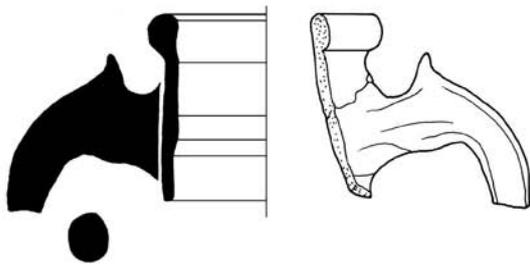
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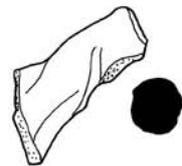
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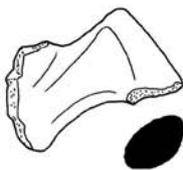
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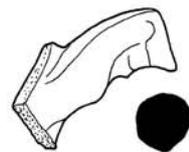
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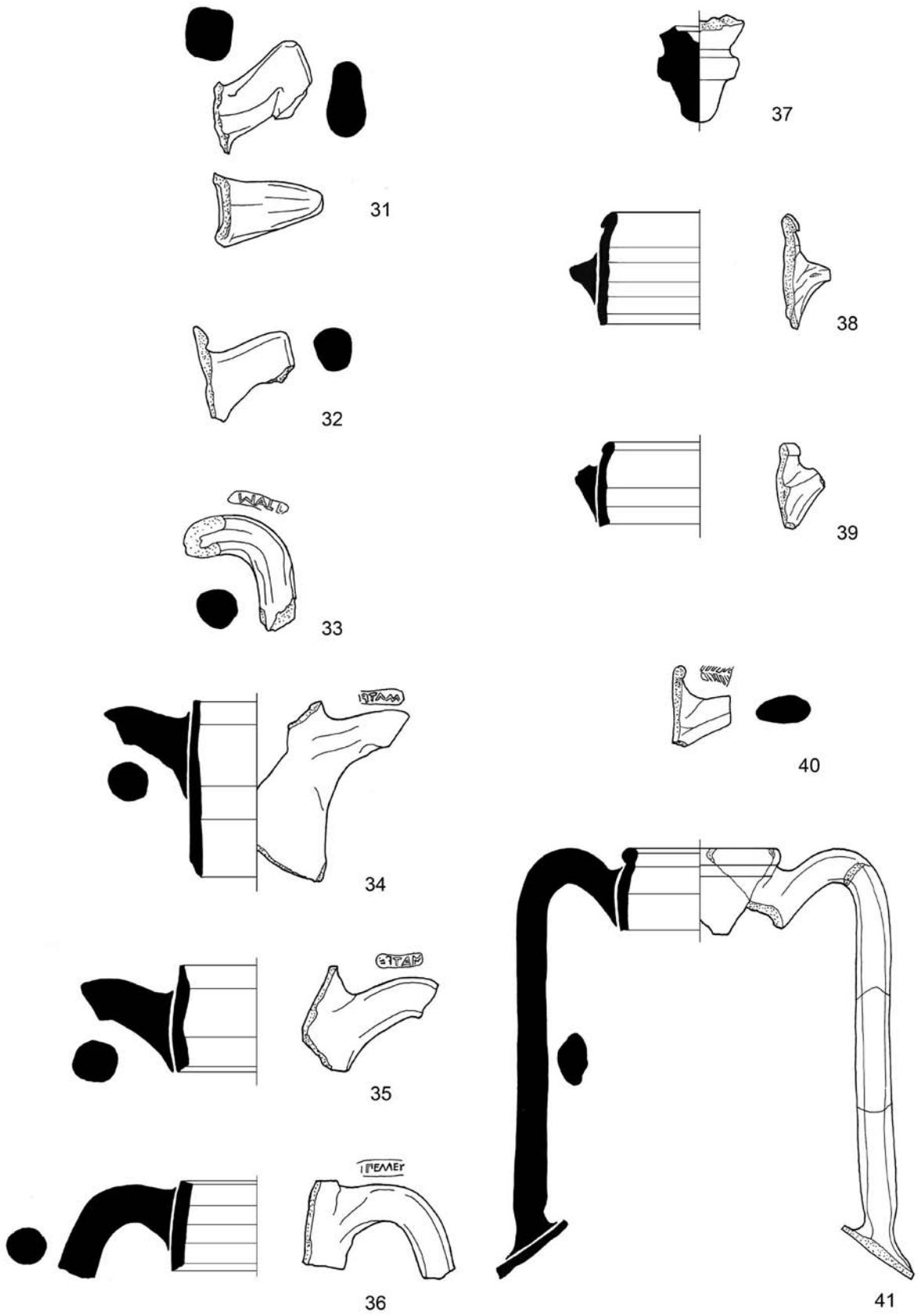
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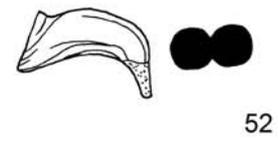
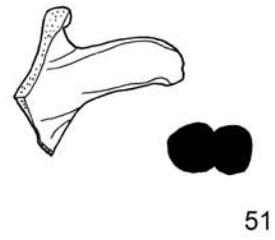
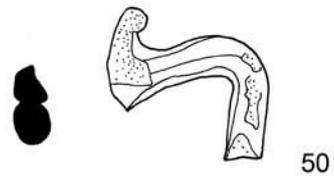
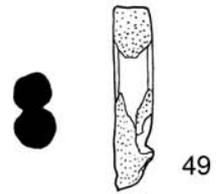
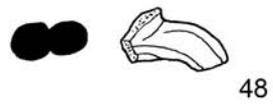
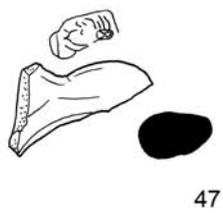
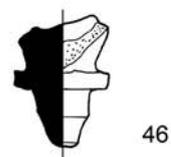
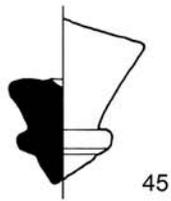
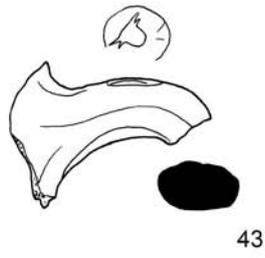
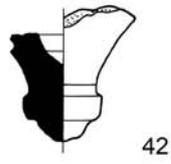
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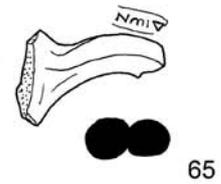
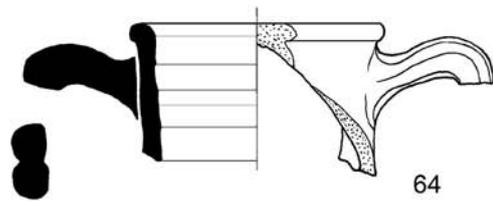
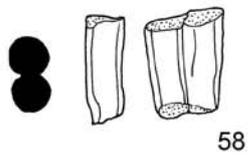
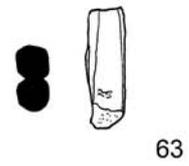
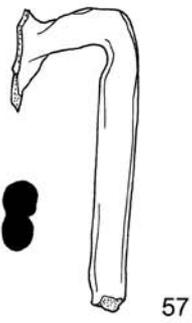
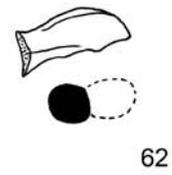
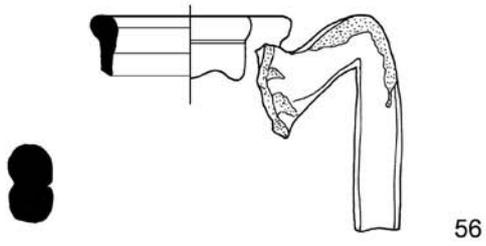
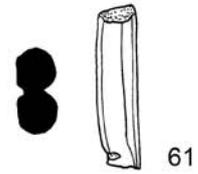
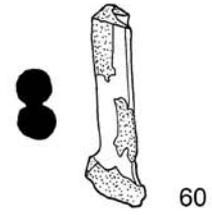
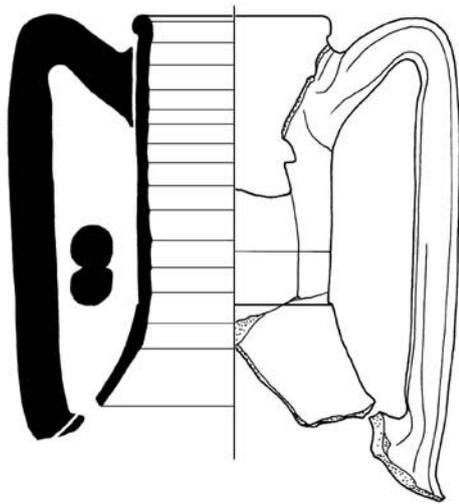


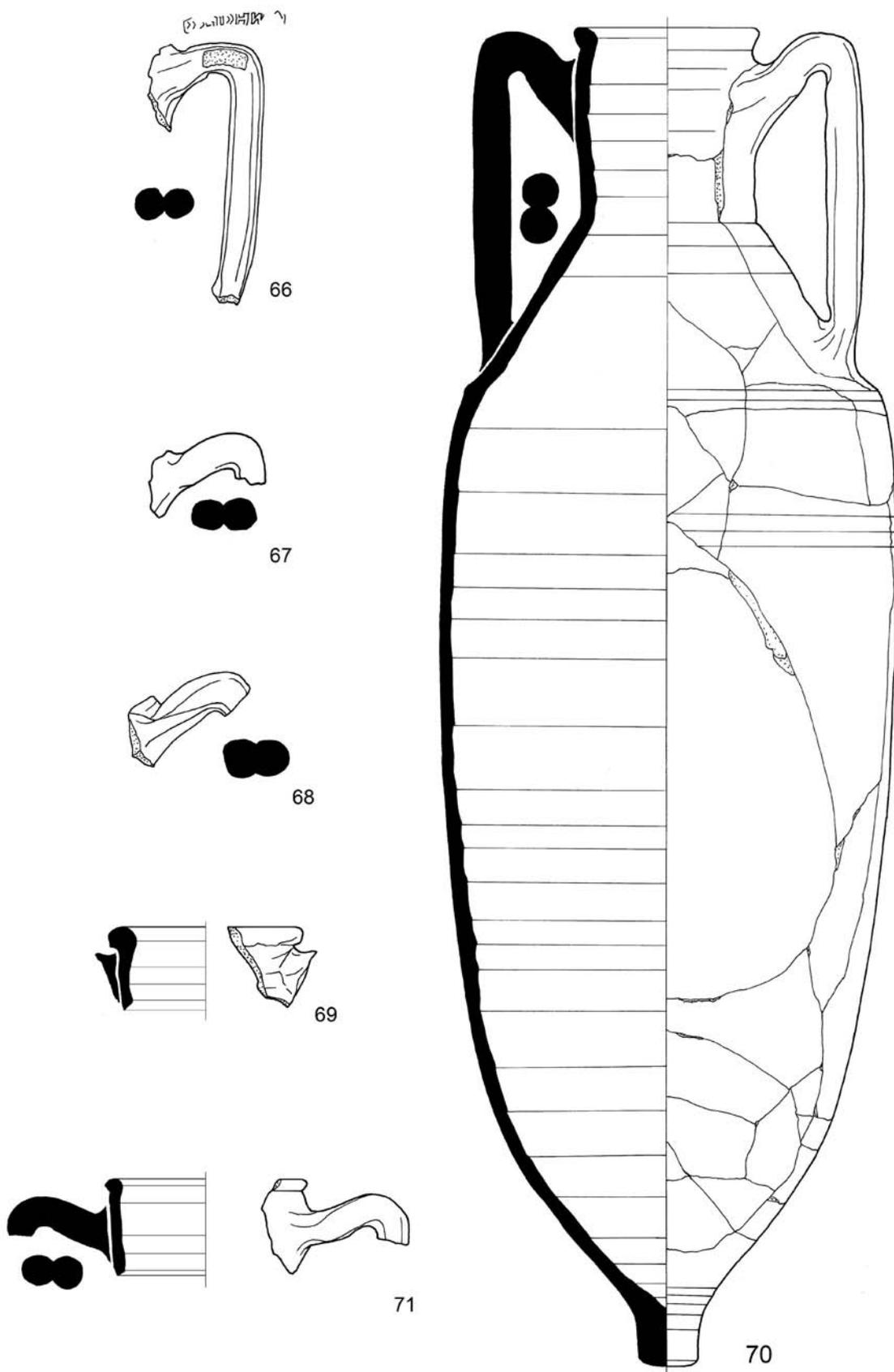
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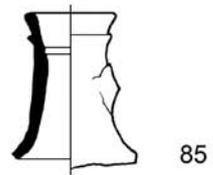
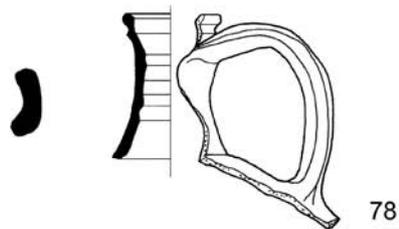
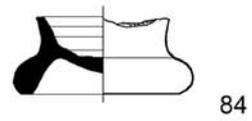
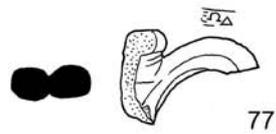
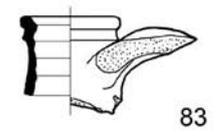
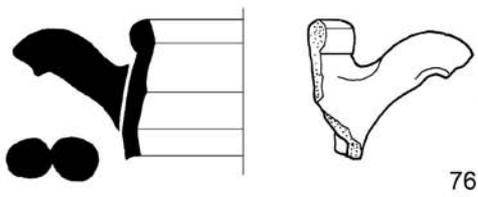
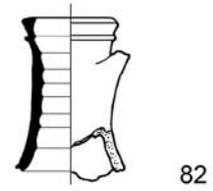
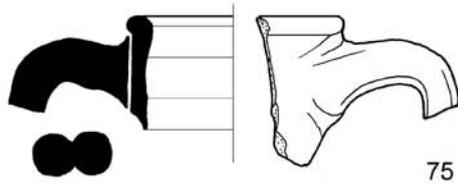
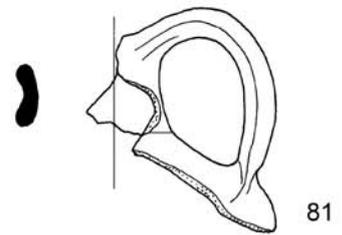
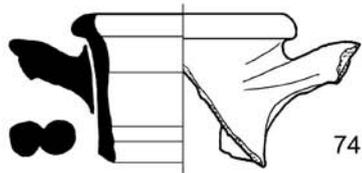
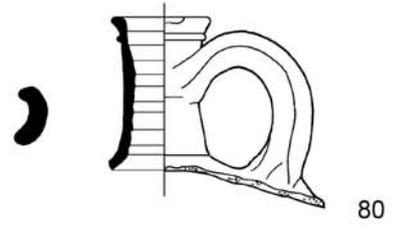
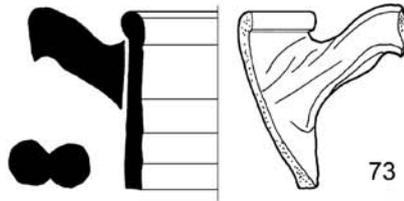
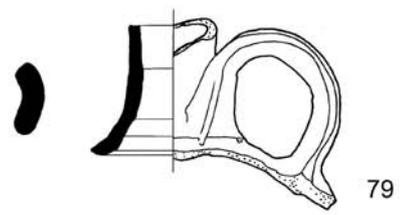
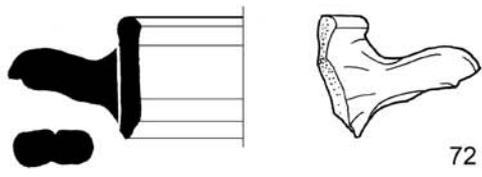
Rhodian Nos. 31-32; Chian Nos. 33-36; Knidian Nos. 37-41

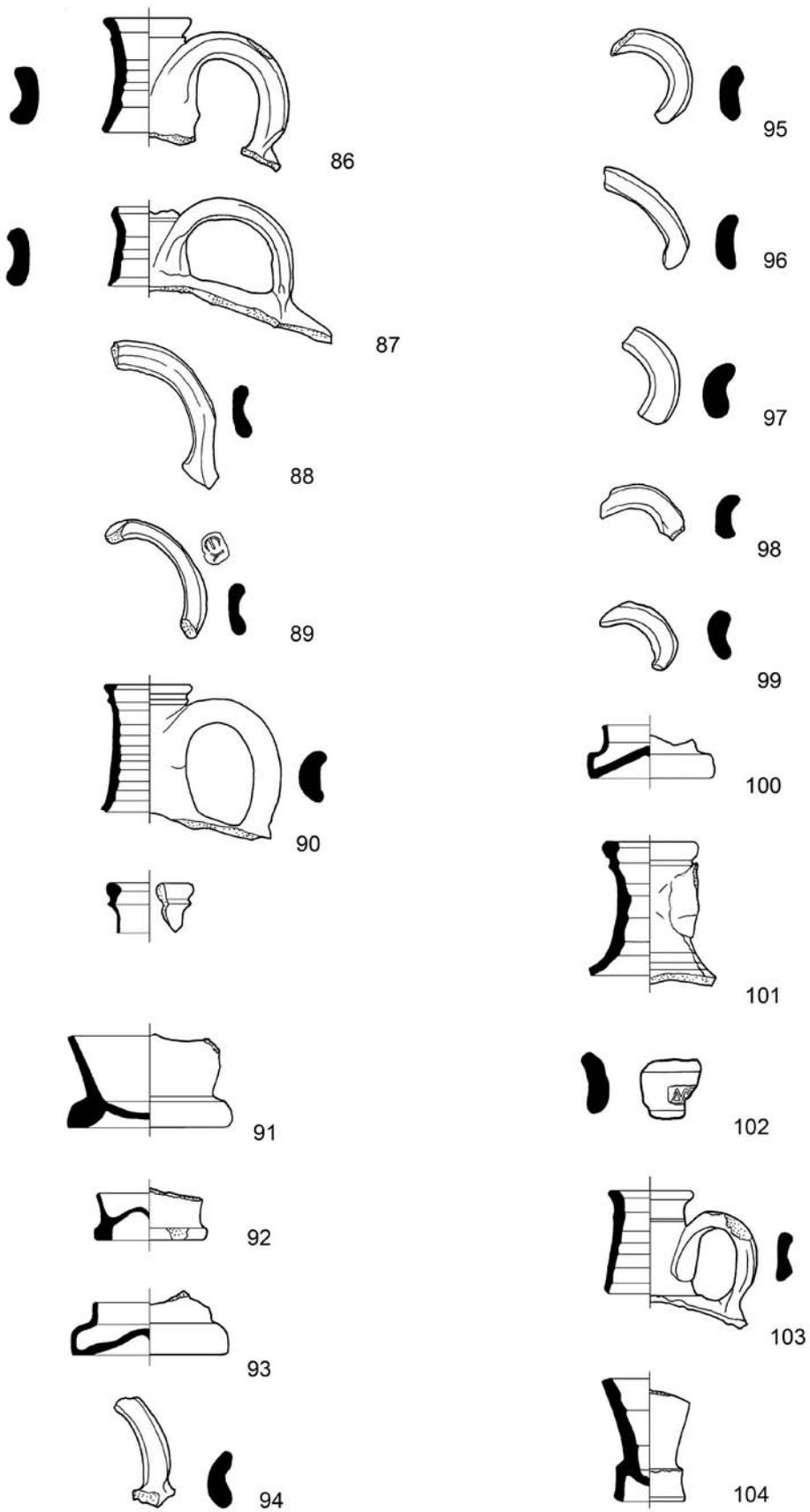




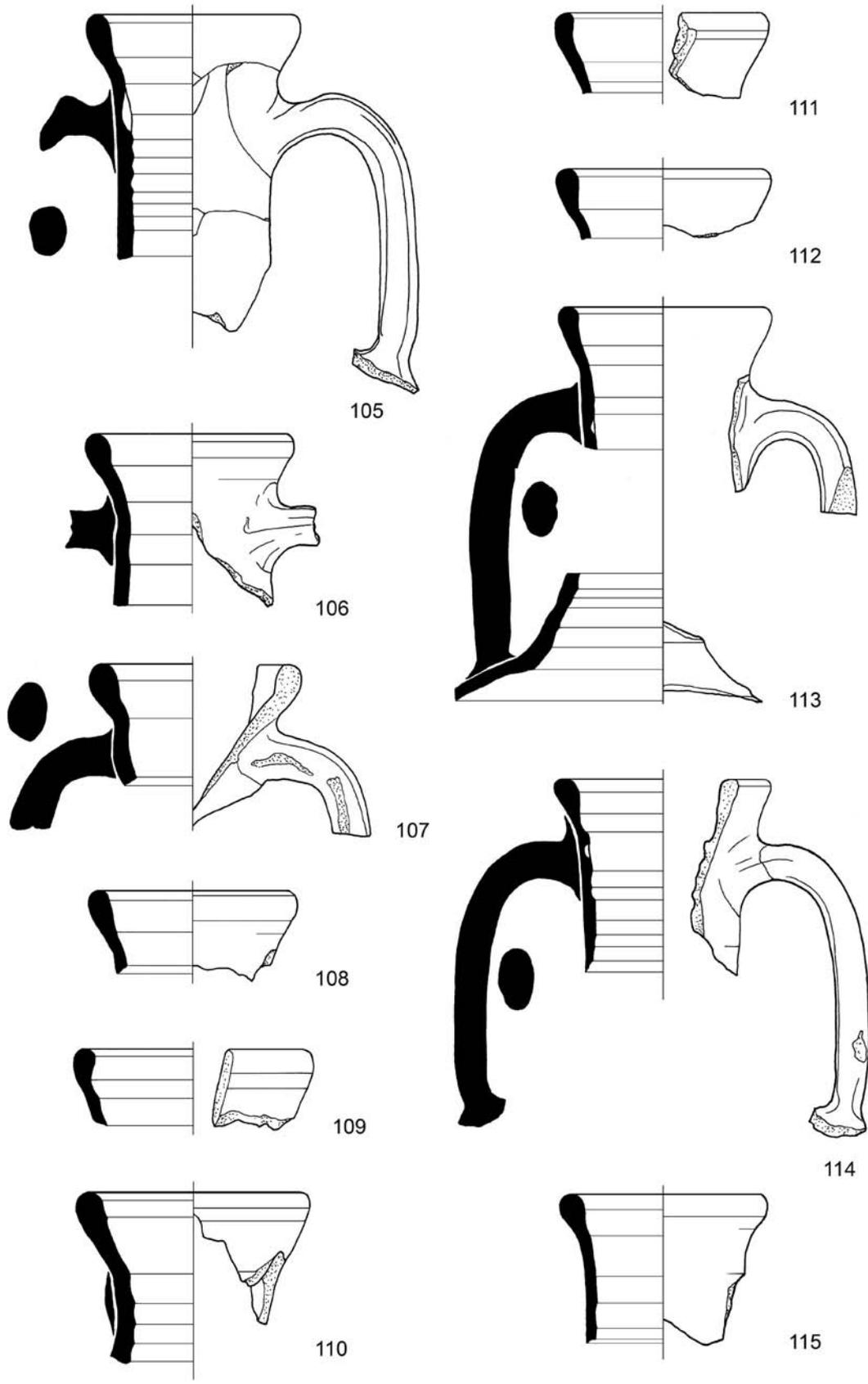


Koan Nos. 66-71

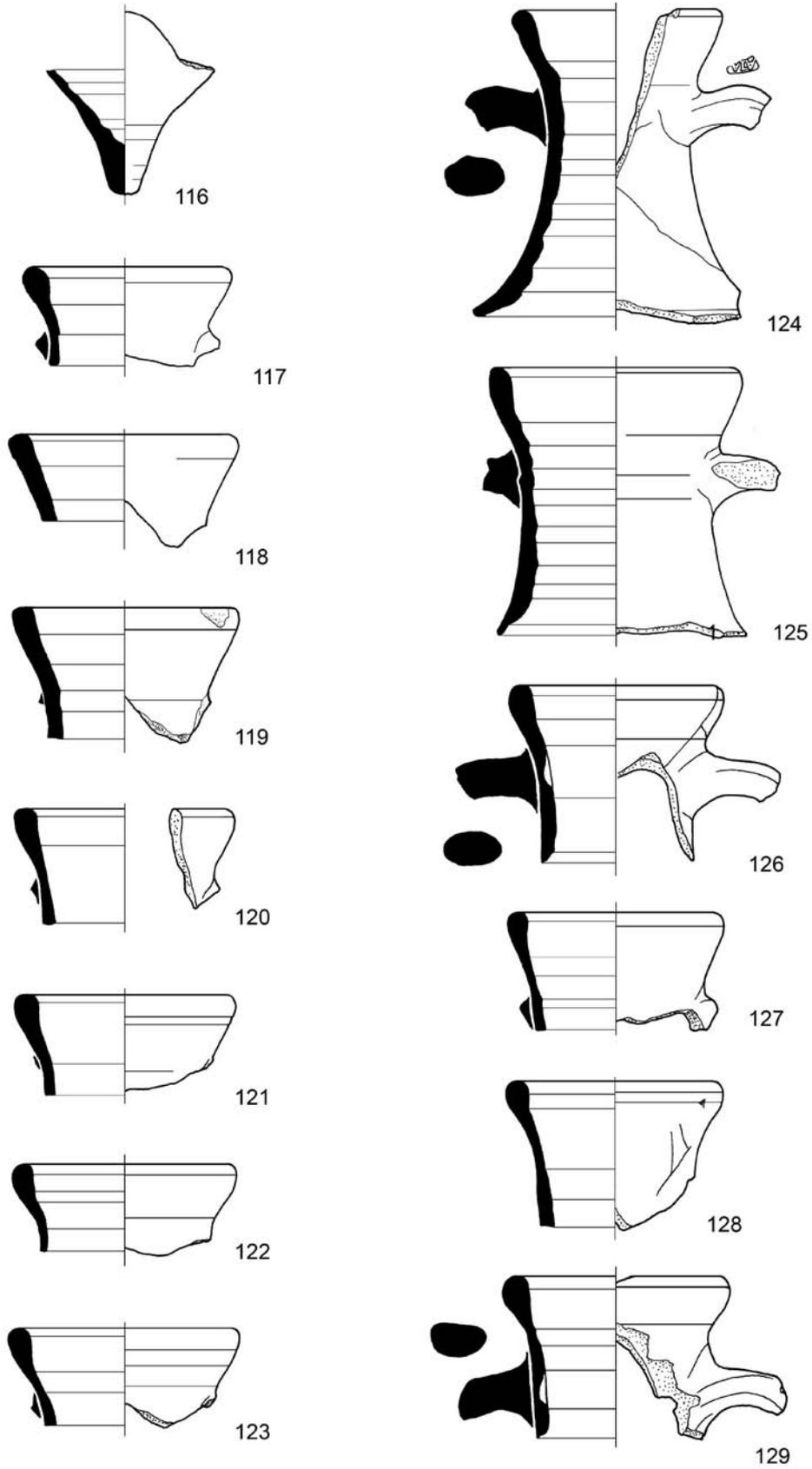




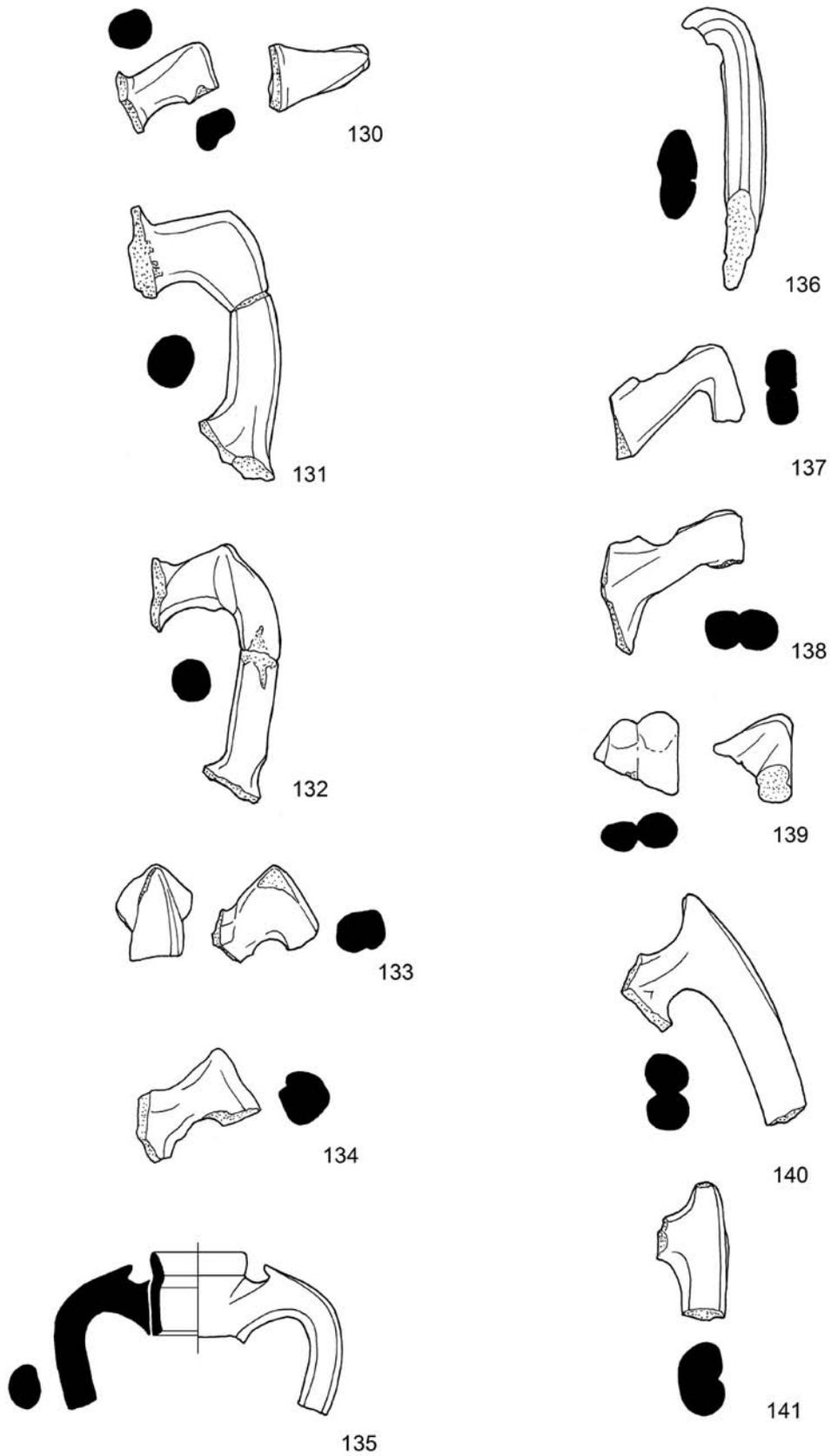
Agora F 65-66 Nos. 86-102; Agora M 45 No. 103; Agora M125 No. 104



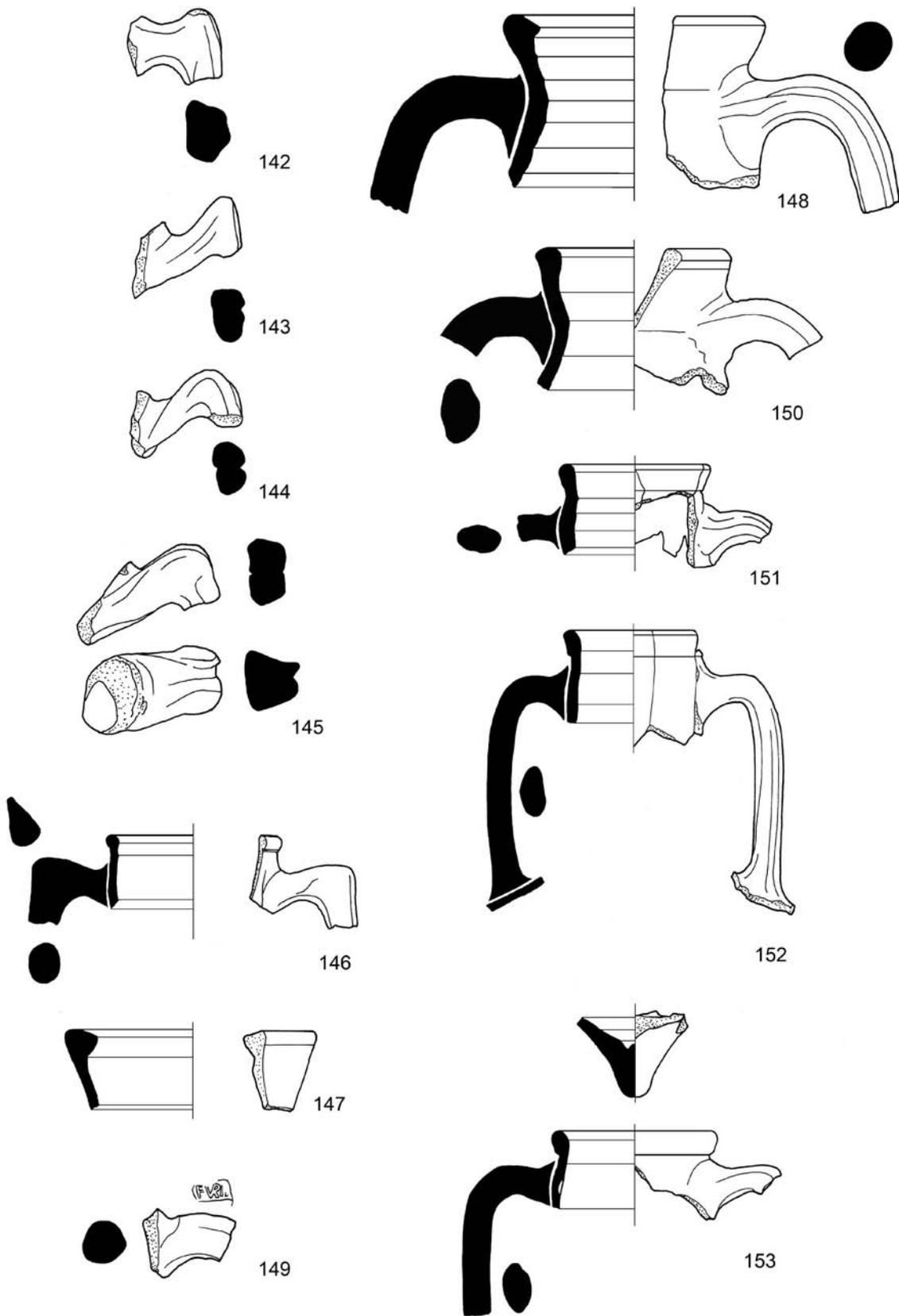
Cup-shaped rim Nos. 105–115



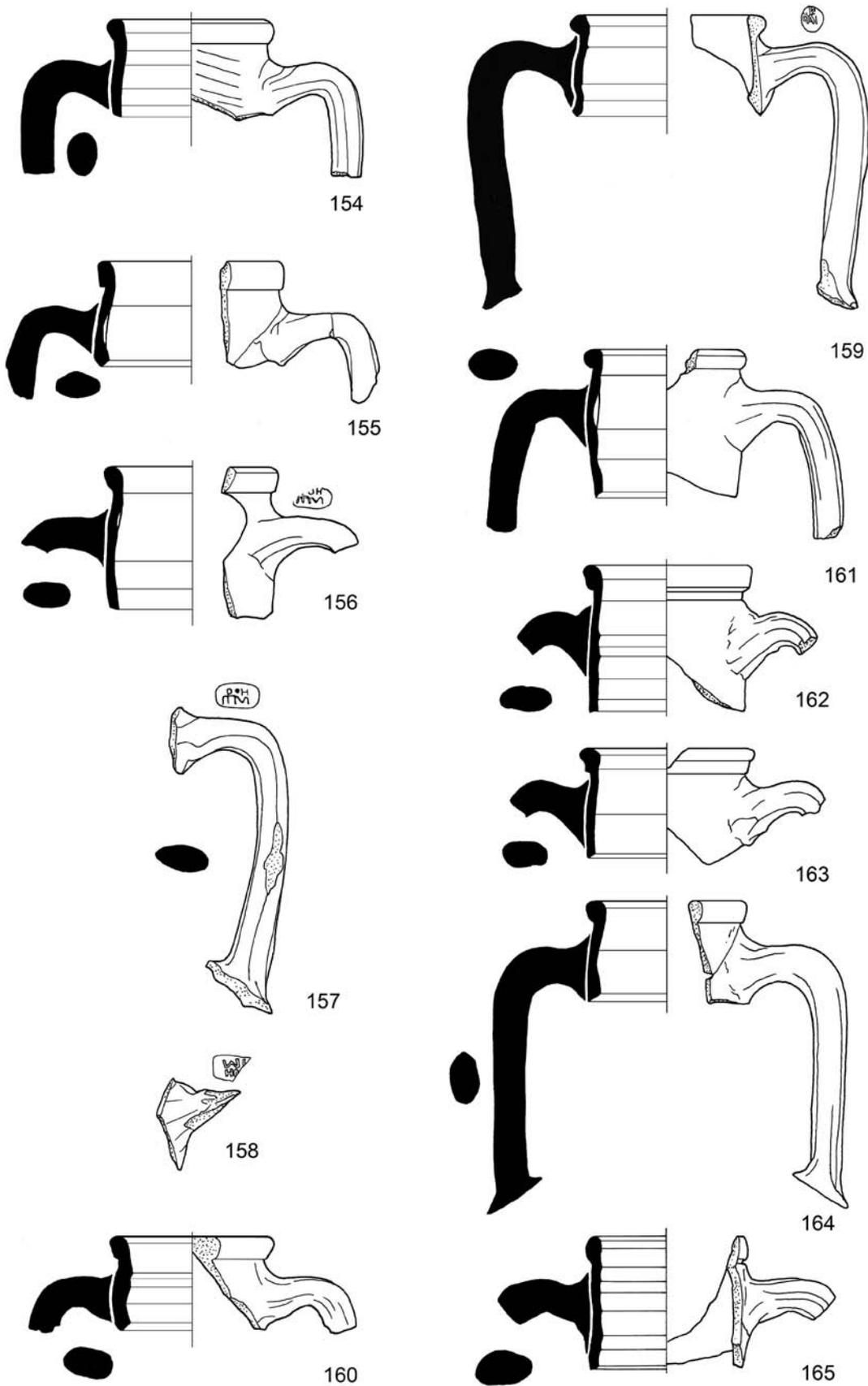
Cup-shaped rim Nos. 116–129



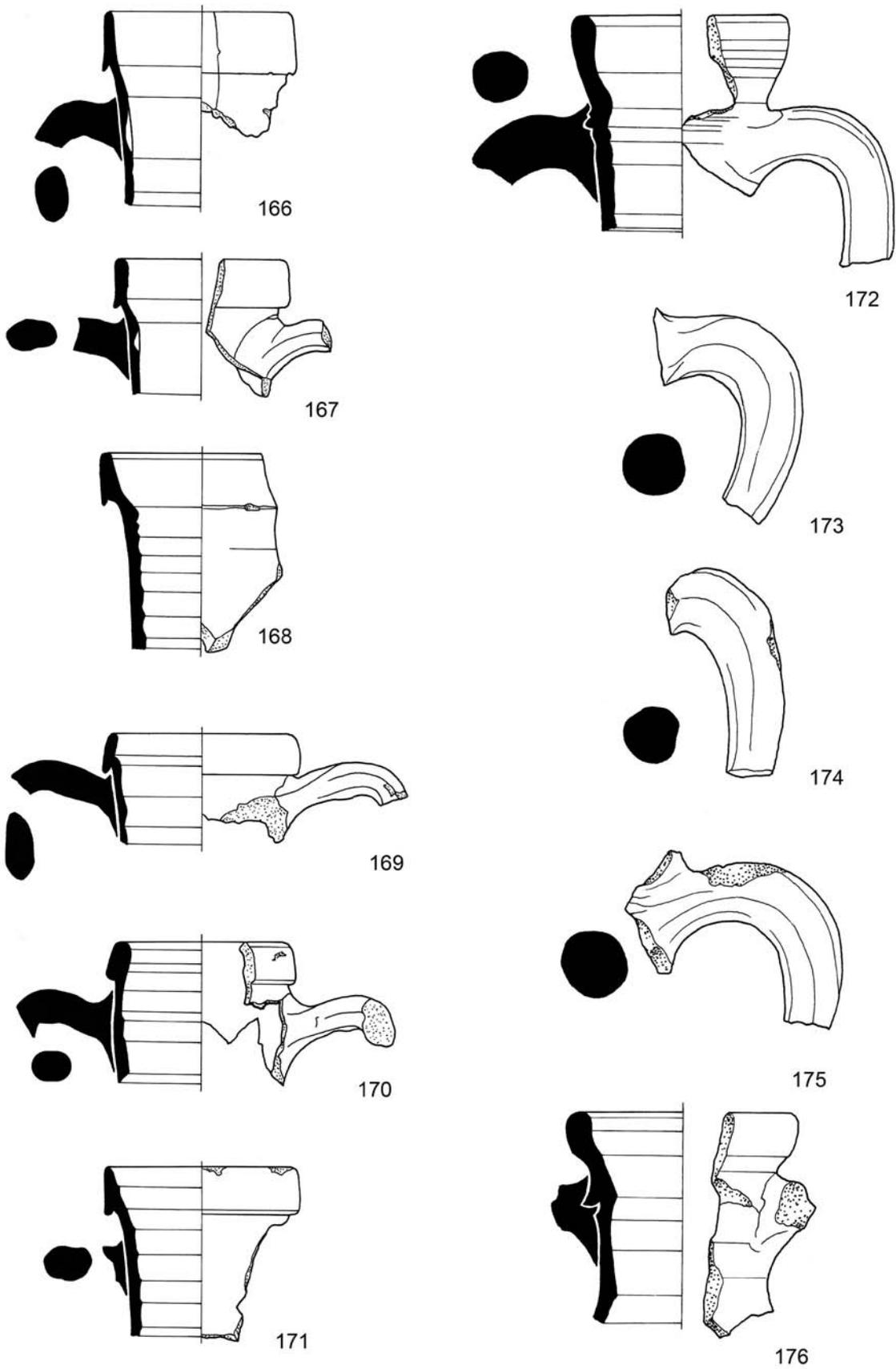
Dressel 35 Nos. 130–132; Cretan AC 4 Nos. 133–135; Cretan AC 2 No. 136;
Dressel 5 Nos. 137–139; Agora M 54 No. 140; Agora G 198 No. 141



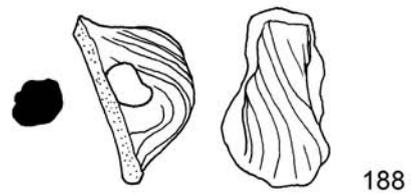
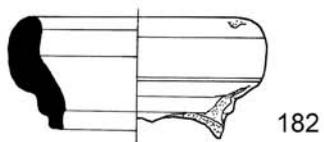
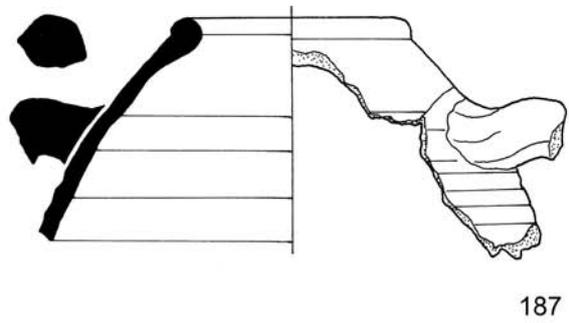
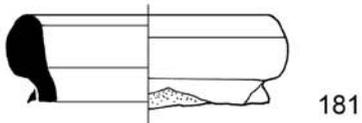
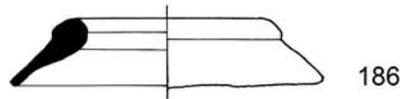
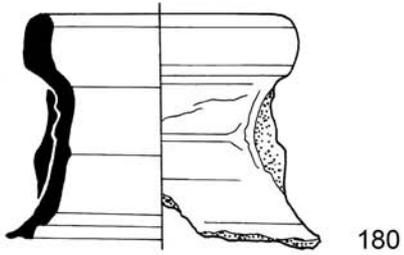
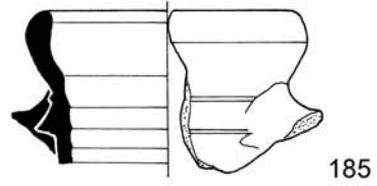
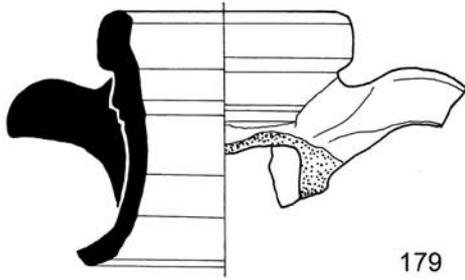
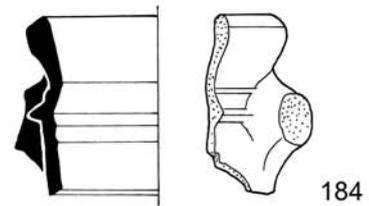
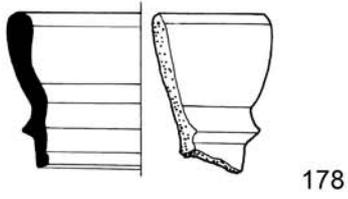
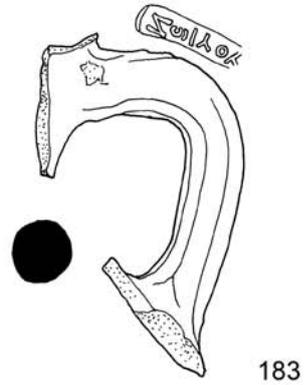
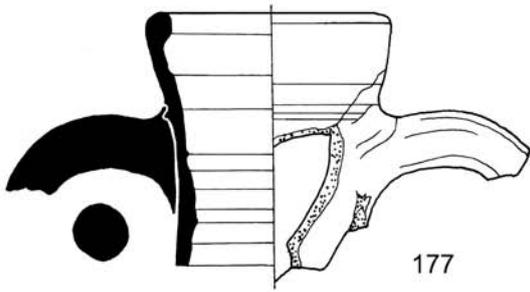
Agora G 198 No. 142; Koan type with Pinched Handles Nos. 143–145; Agora G 199 No. 146; Type 17 Nos. 147–148; Type 18 No. 149; Type 19 No. 150; Local Aegean 1 Nos. 151–153



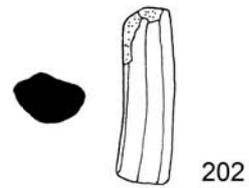
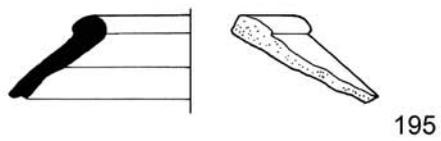
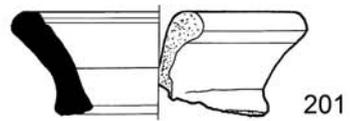
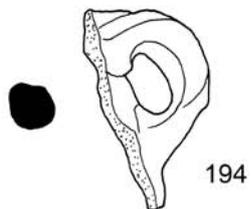
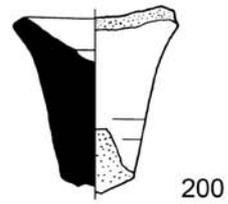
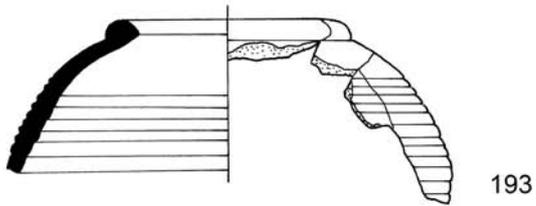
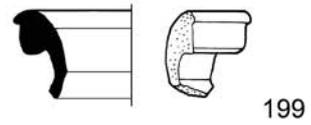
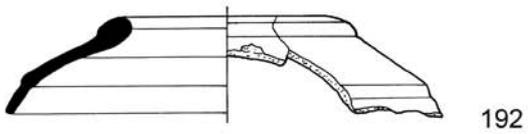
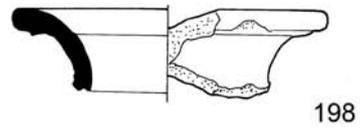
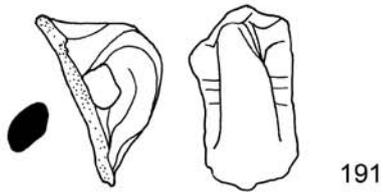
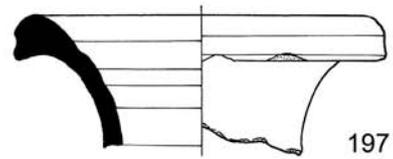
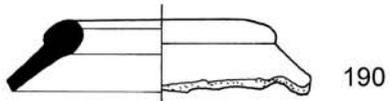
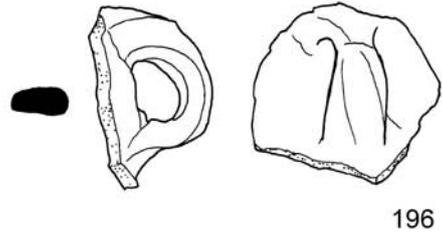
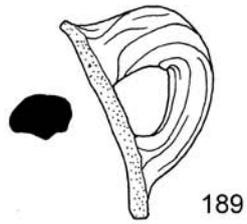
Local Aegean 1 Nos. 154-165



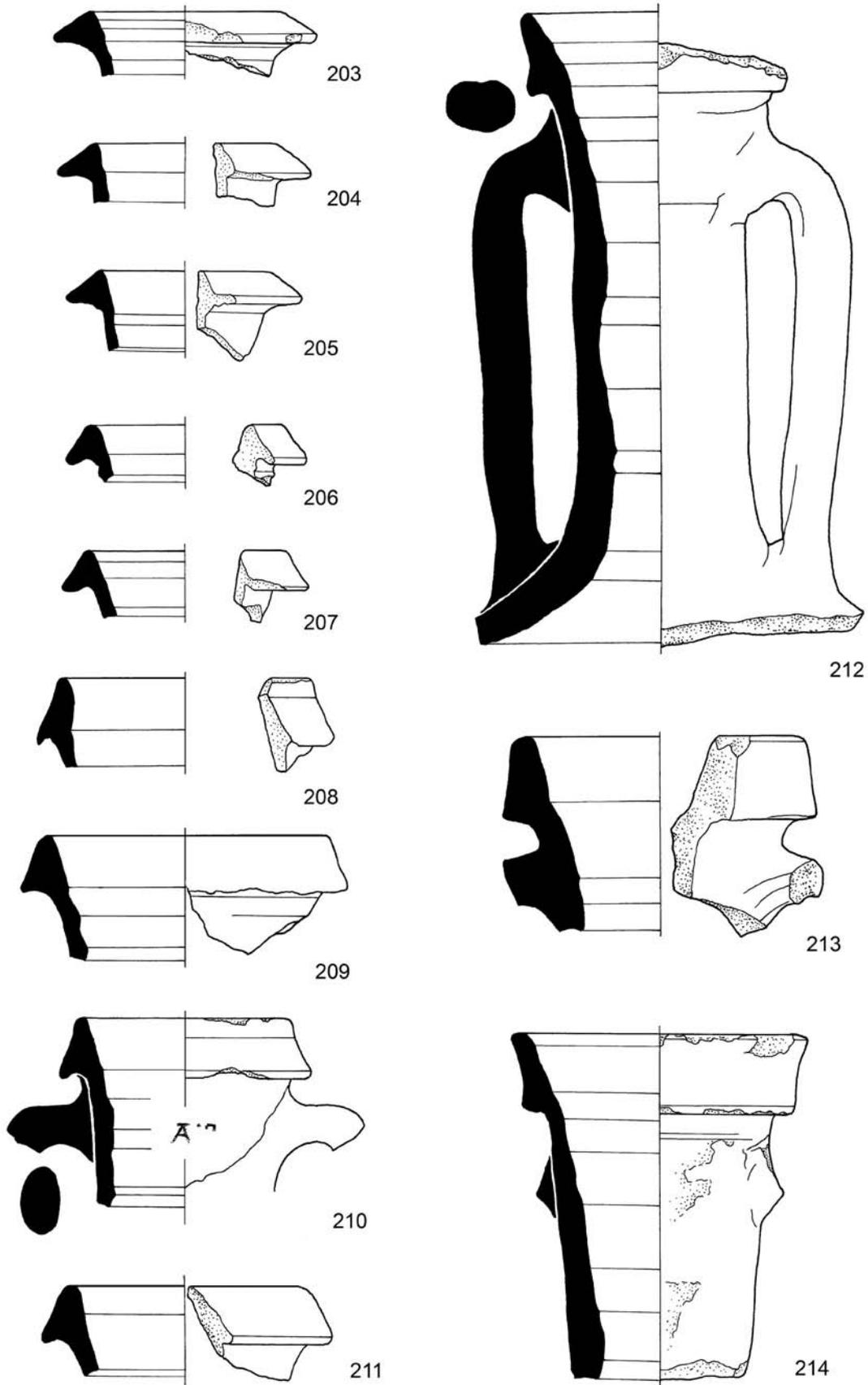
Local Aegean 2 Nos. 166–171; Dressel 25 Nos. 172–176



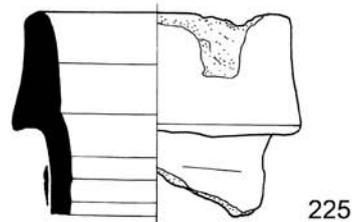
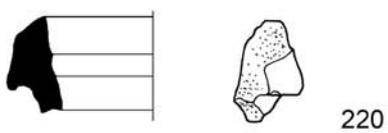
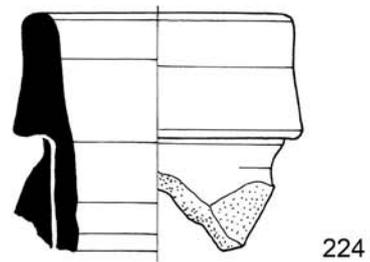
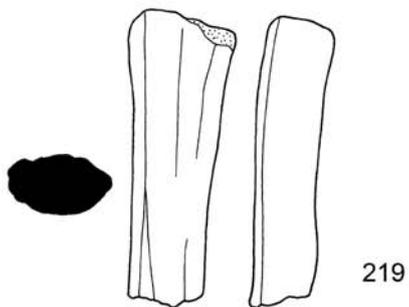
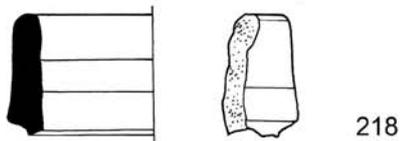
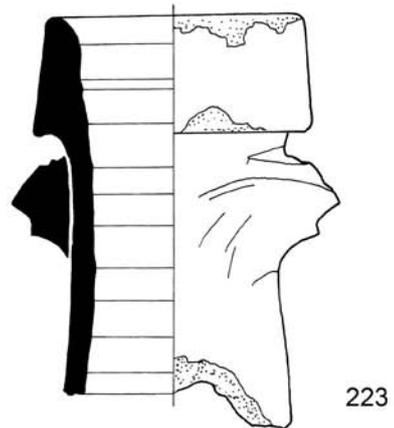
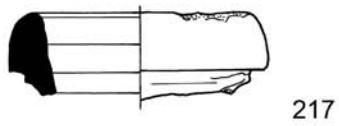
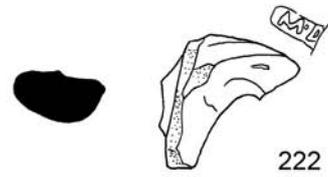
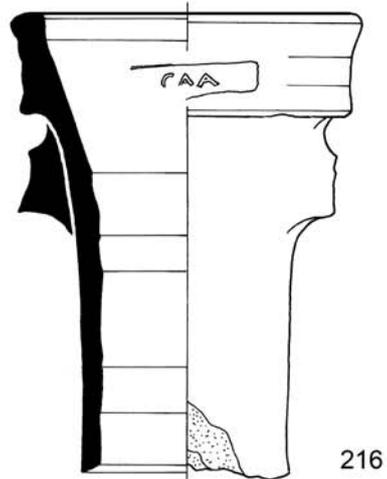
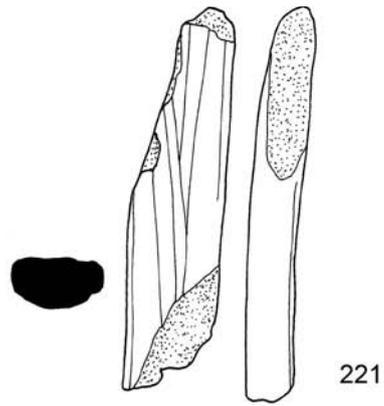
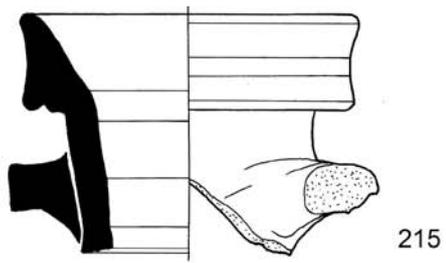
Dressel 25 Nos. 177-185; Baggy jar Nos. 186-188



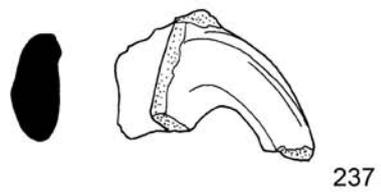
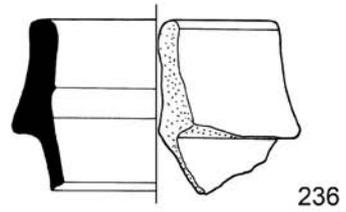
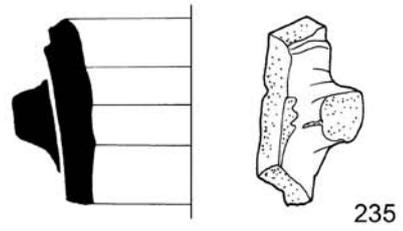
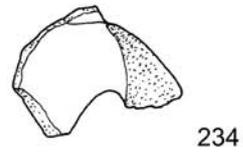
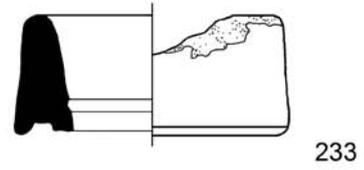
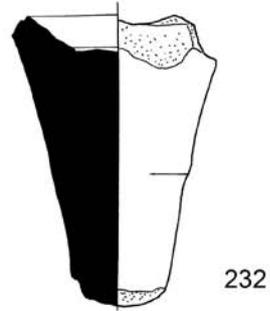
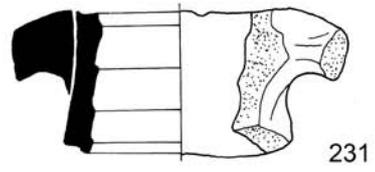
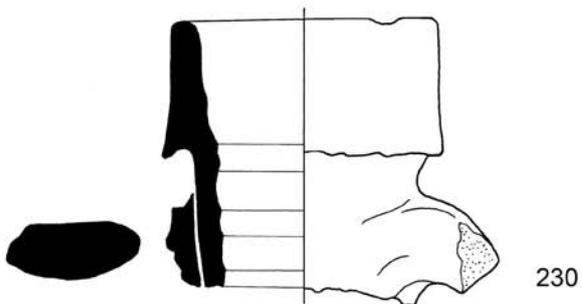
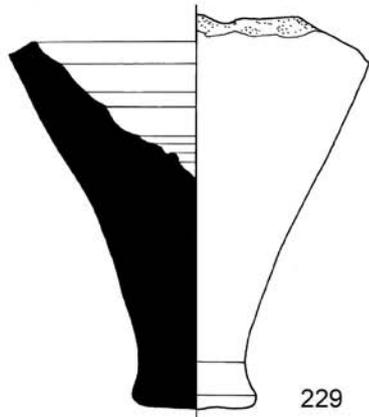
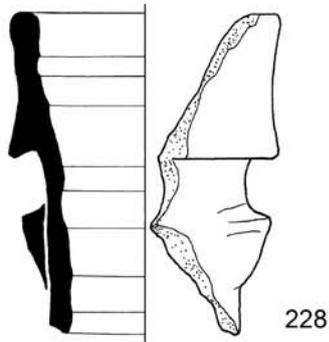
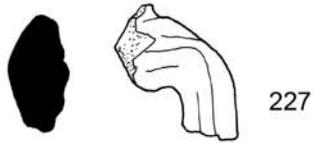
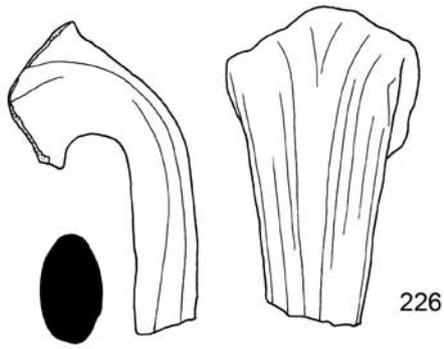
Baggy jar Nos. 189–196; Van der Werff 1–3 Nos. 197–199; Egyptian AE 2 Nos. 200–202

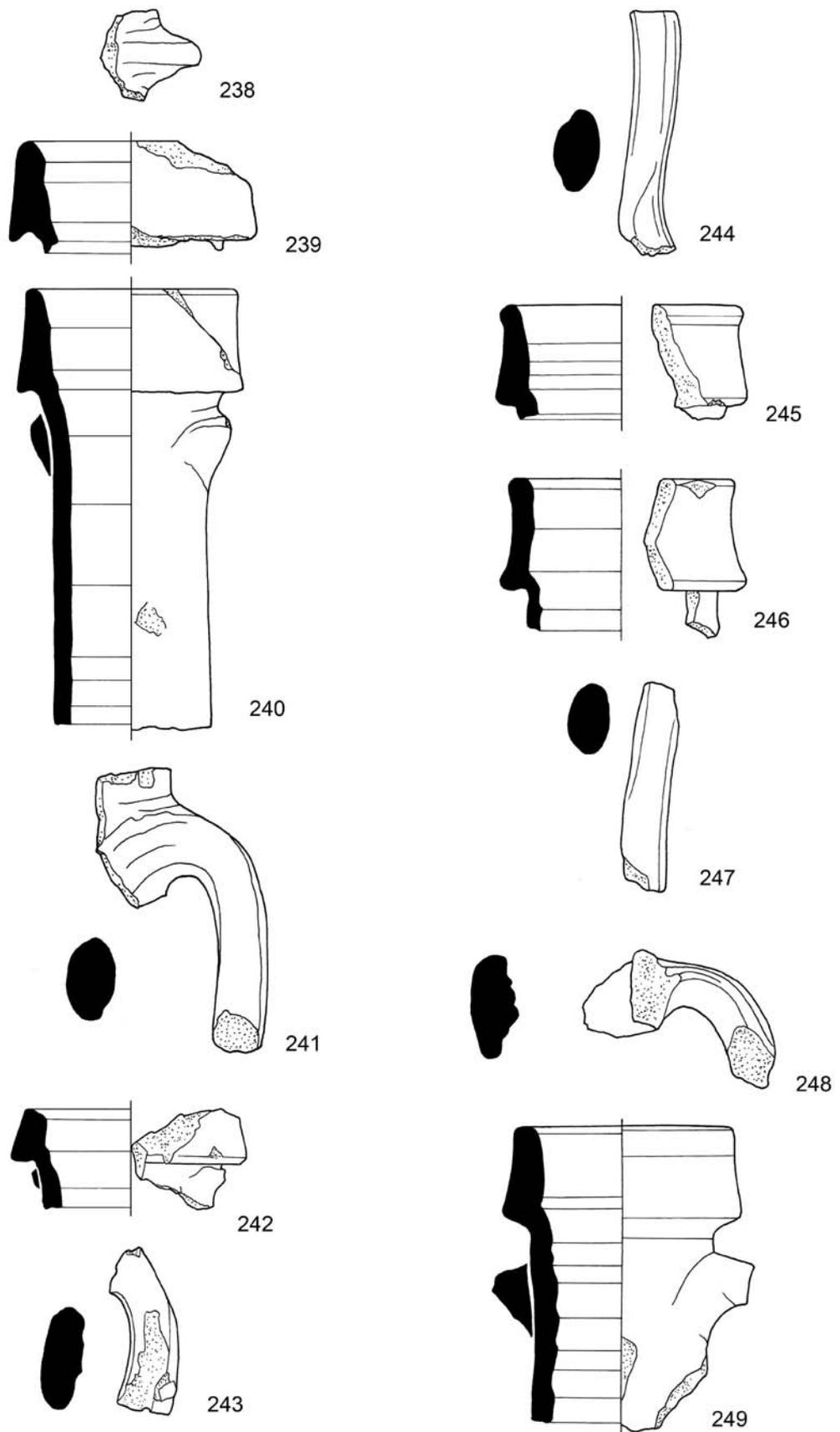


Greco-Italic Nos. 203–207; Dressel 1A Nos. 208–212; Dressel 1B Nos. 213–214

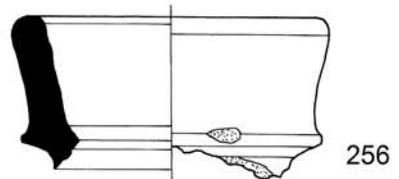
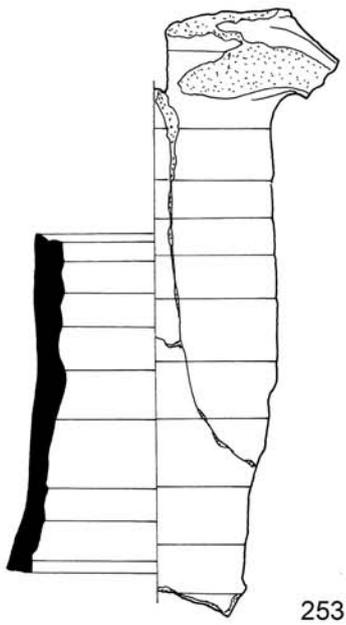
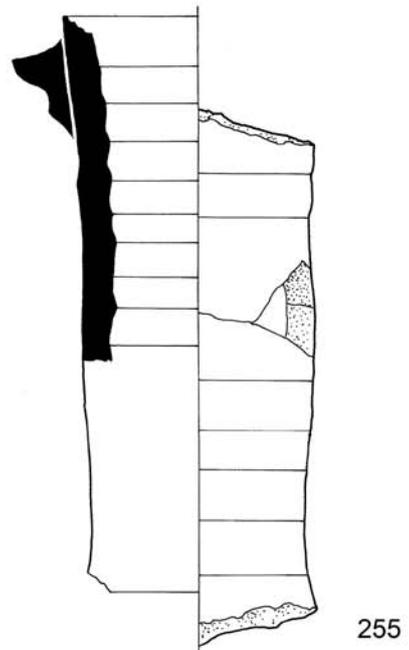
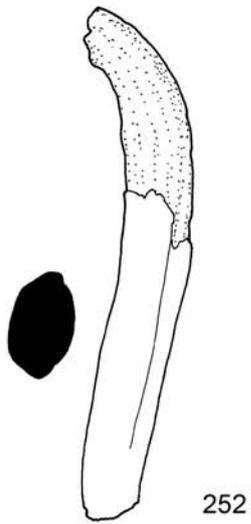
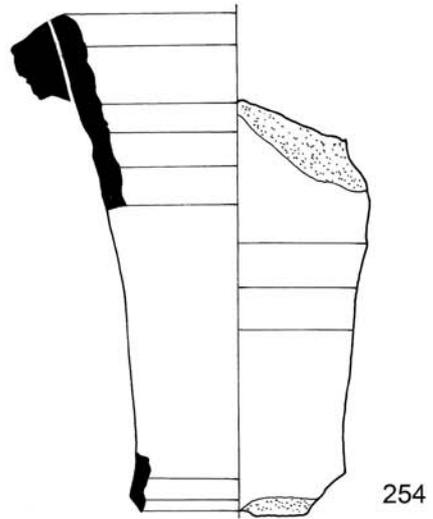
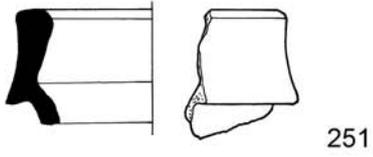
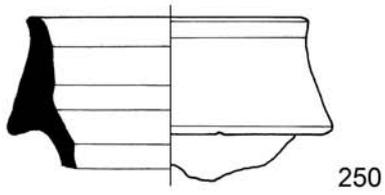


Dressel 1B Nos. 215–217; Dressel 1C Nos. 218–225

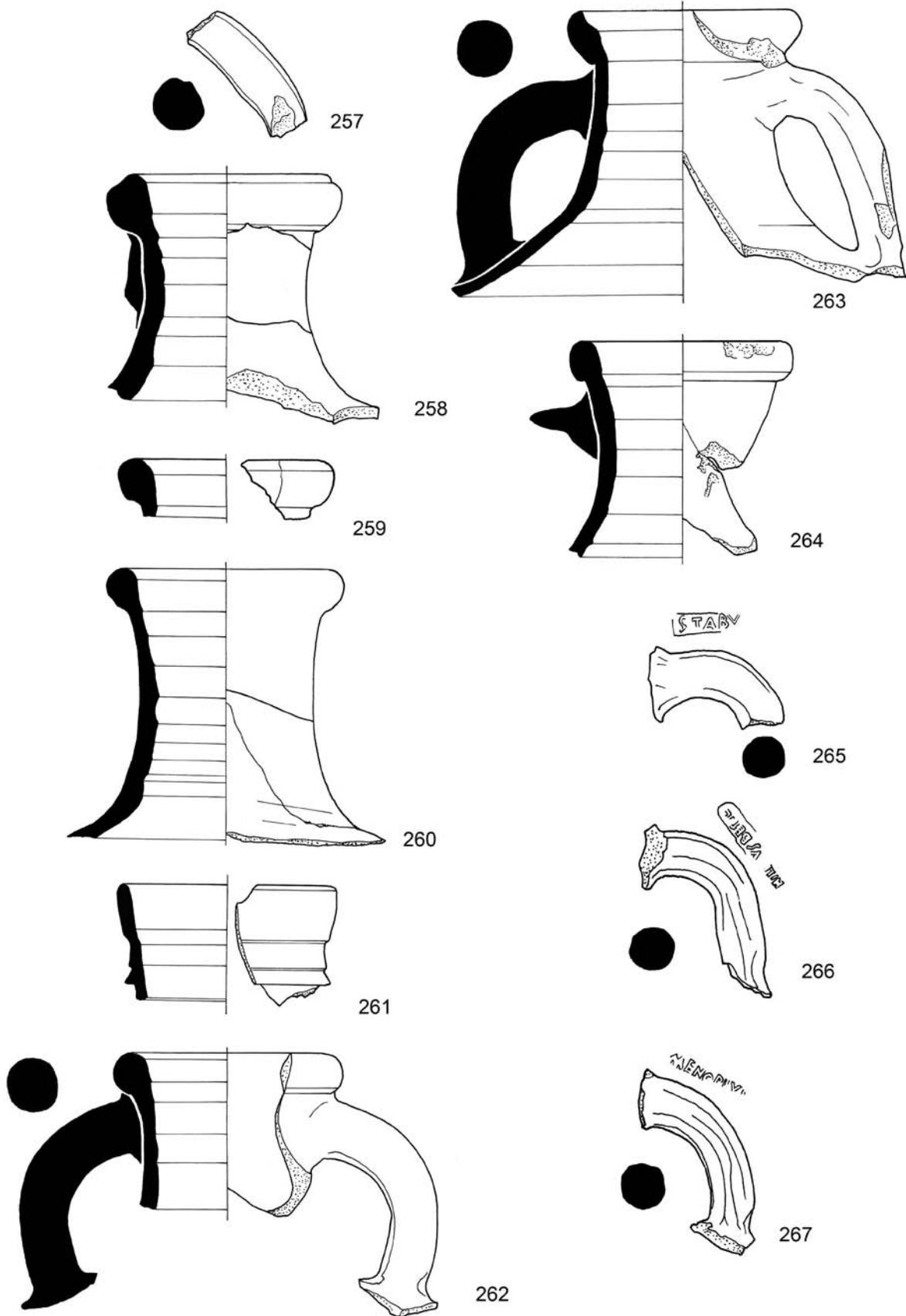




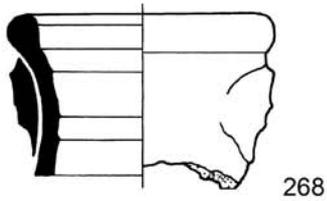
Dressel 1C Nos. 238-249



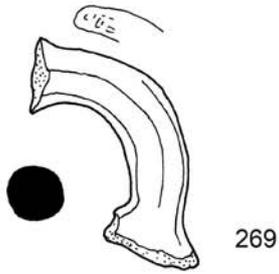
Dressel 1C Nos. 250–252; Dressel 1 Nos. 253–256



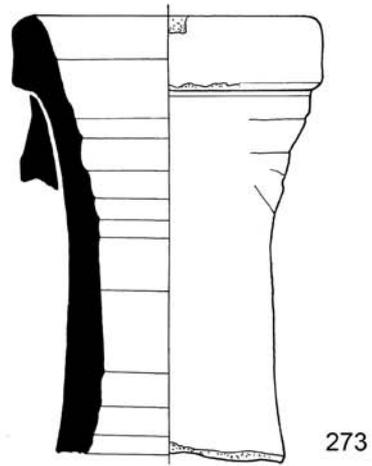
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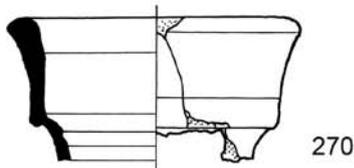
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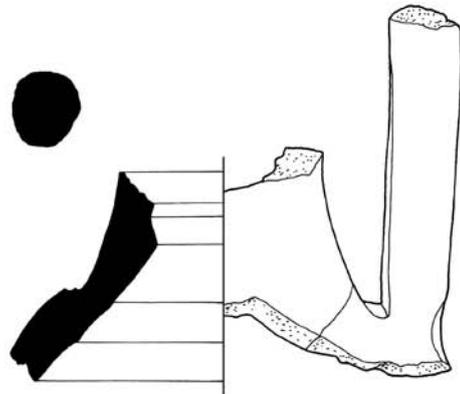
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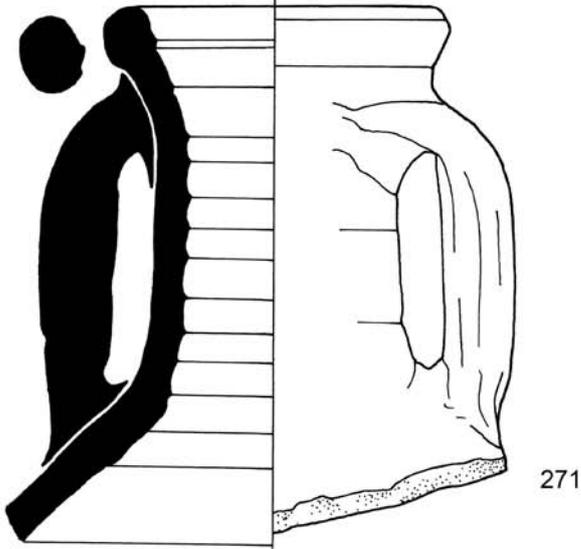
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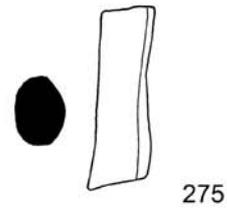
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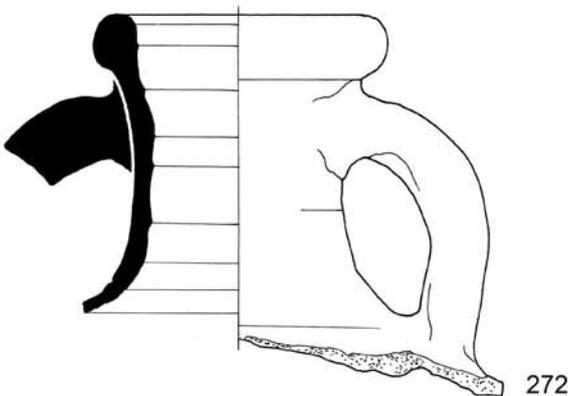
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271



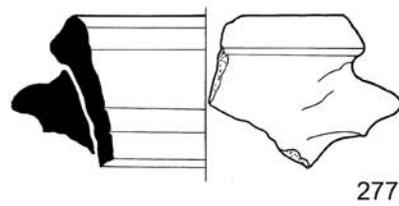
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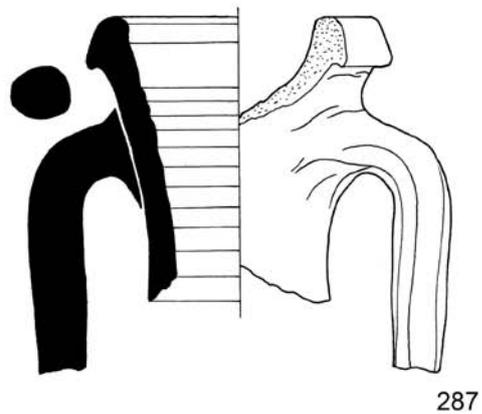
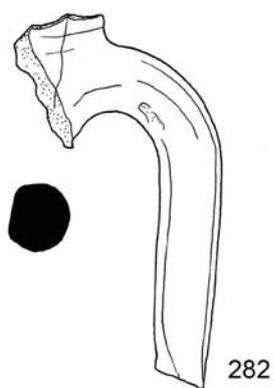
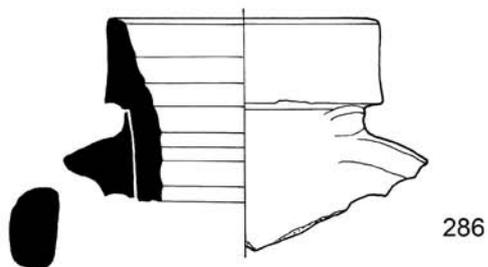
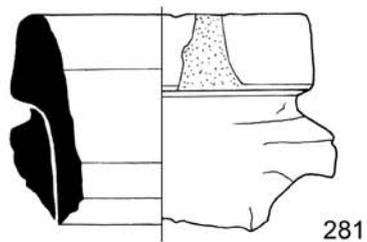
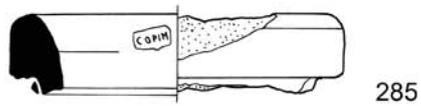
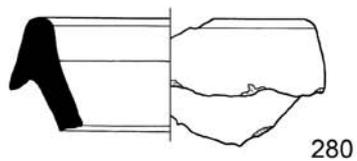
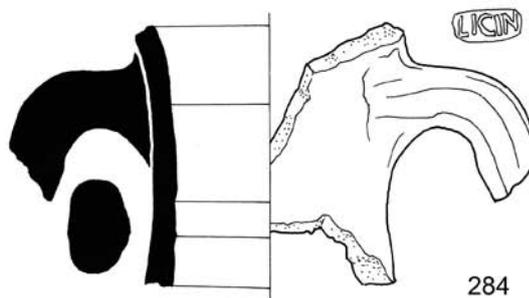
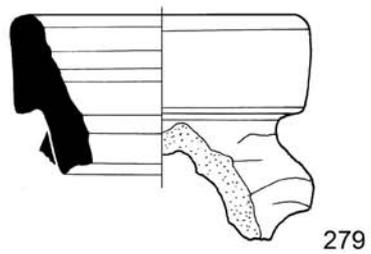
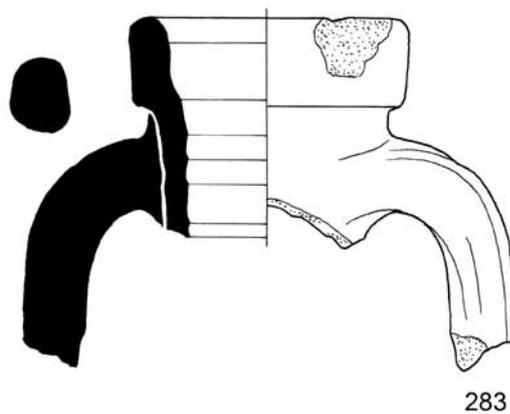
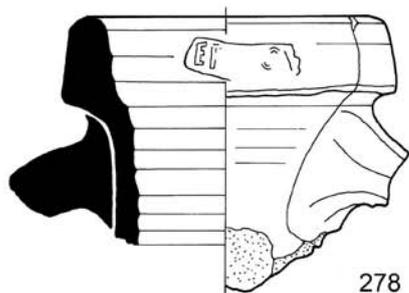
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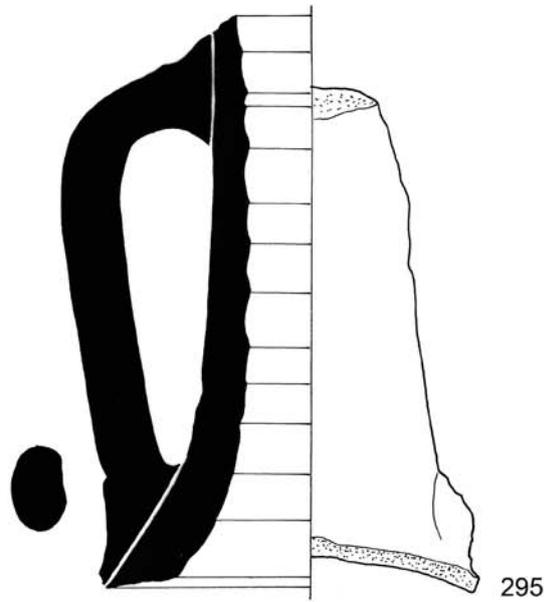
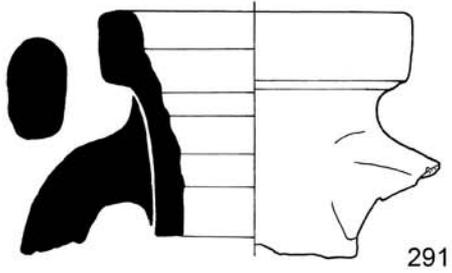
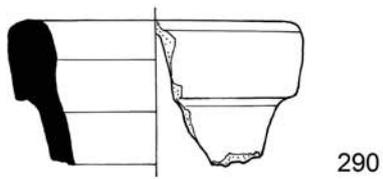
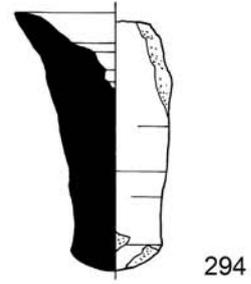
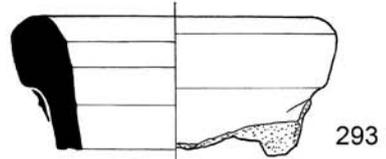
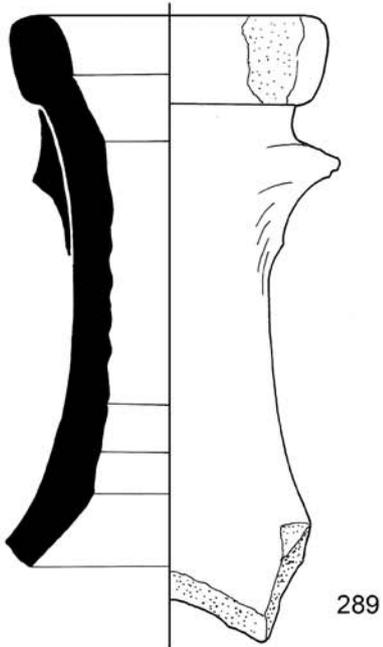
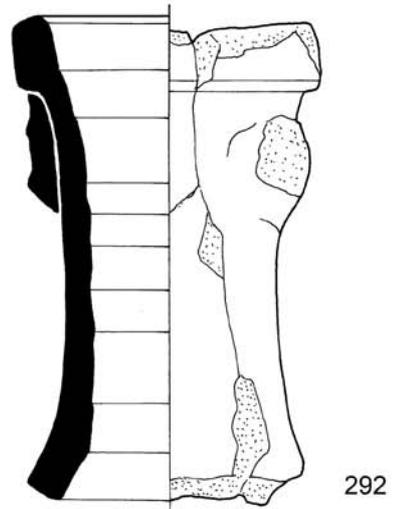
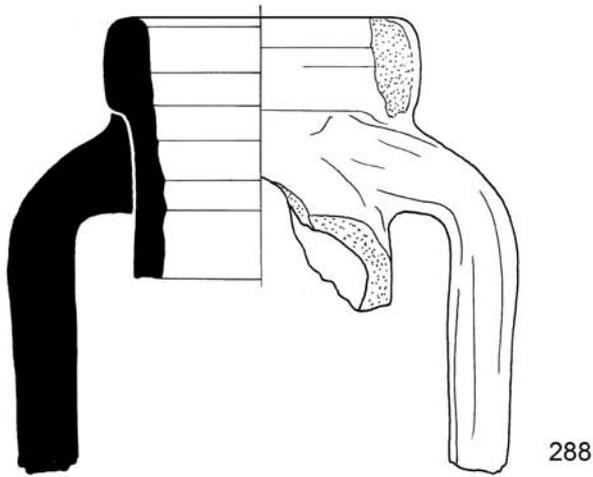


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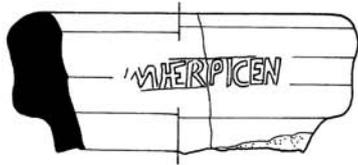


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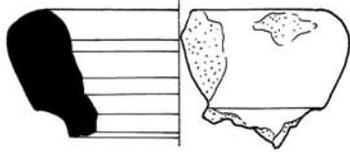




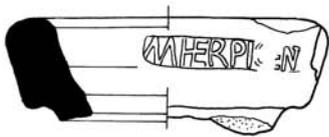
Lamboglia 2 Nos. 288–292; Dressel 6A Nos. 293–295



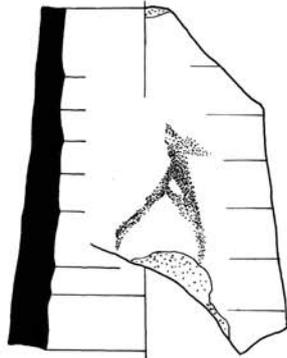
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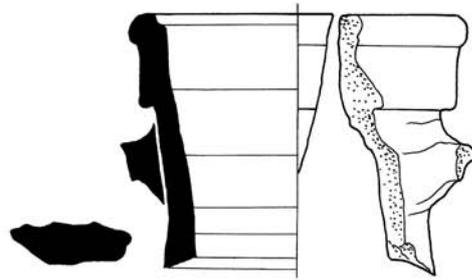
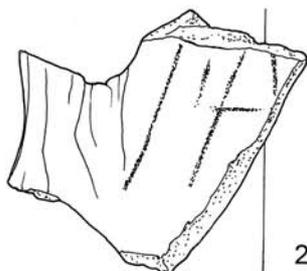
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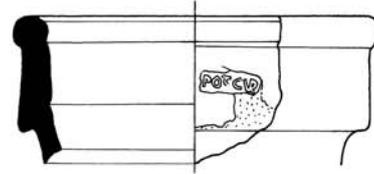
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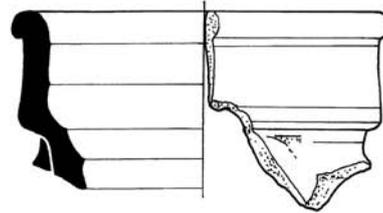
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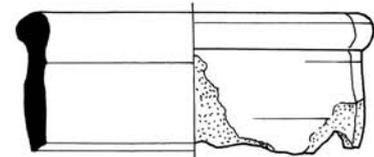
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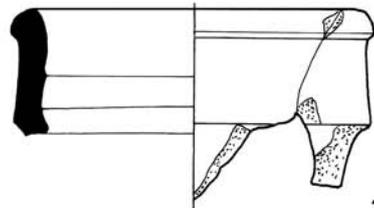
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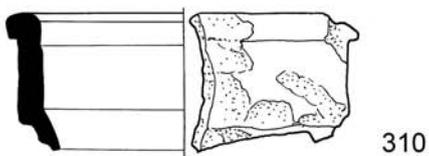
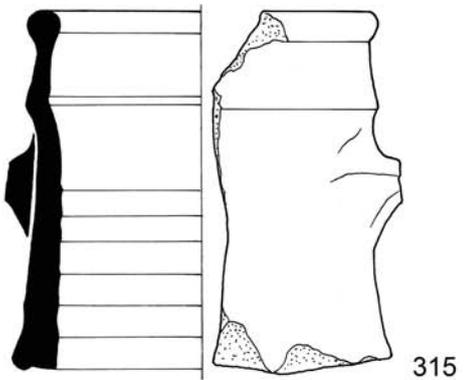
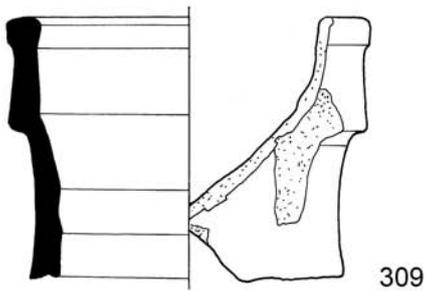
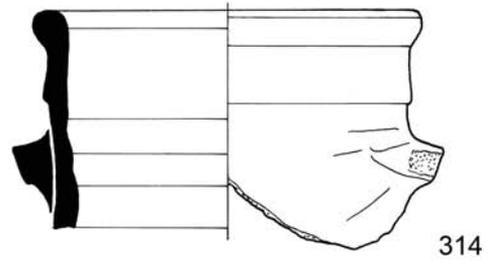
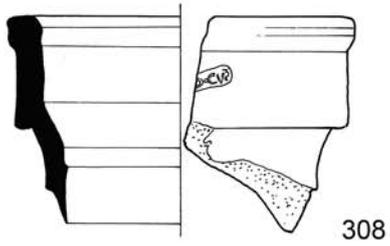
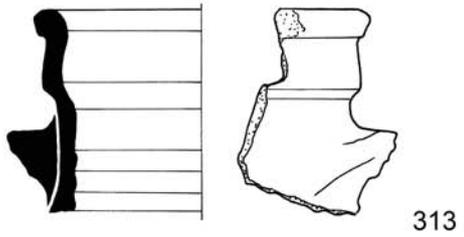
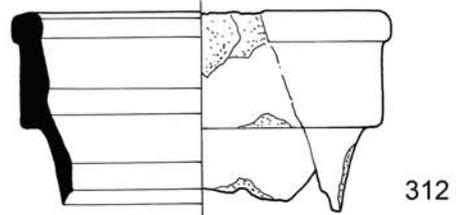
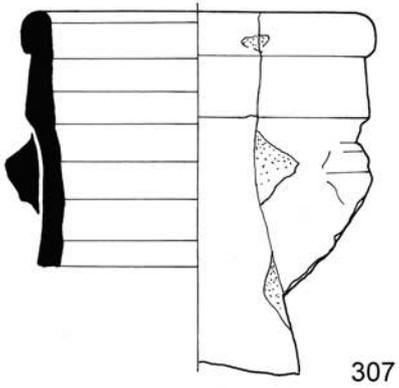
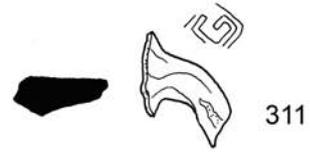
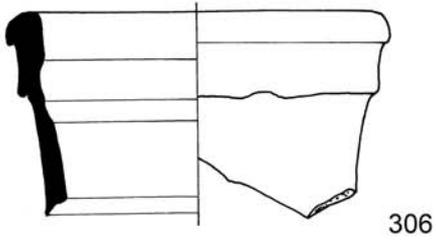
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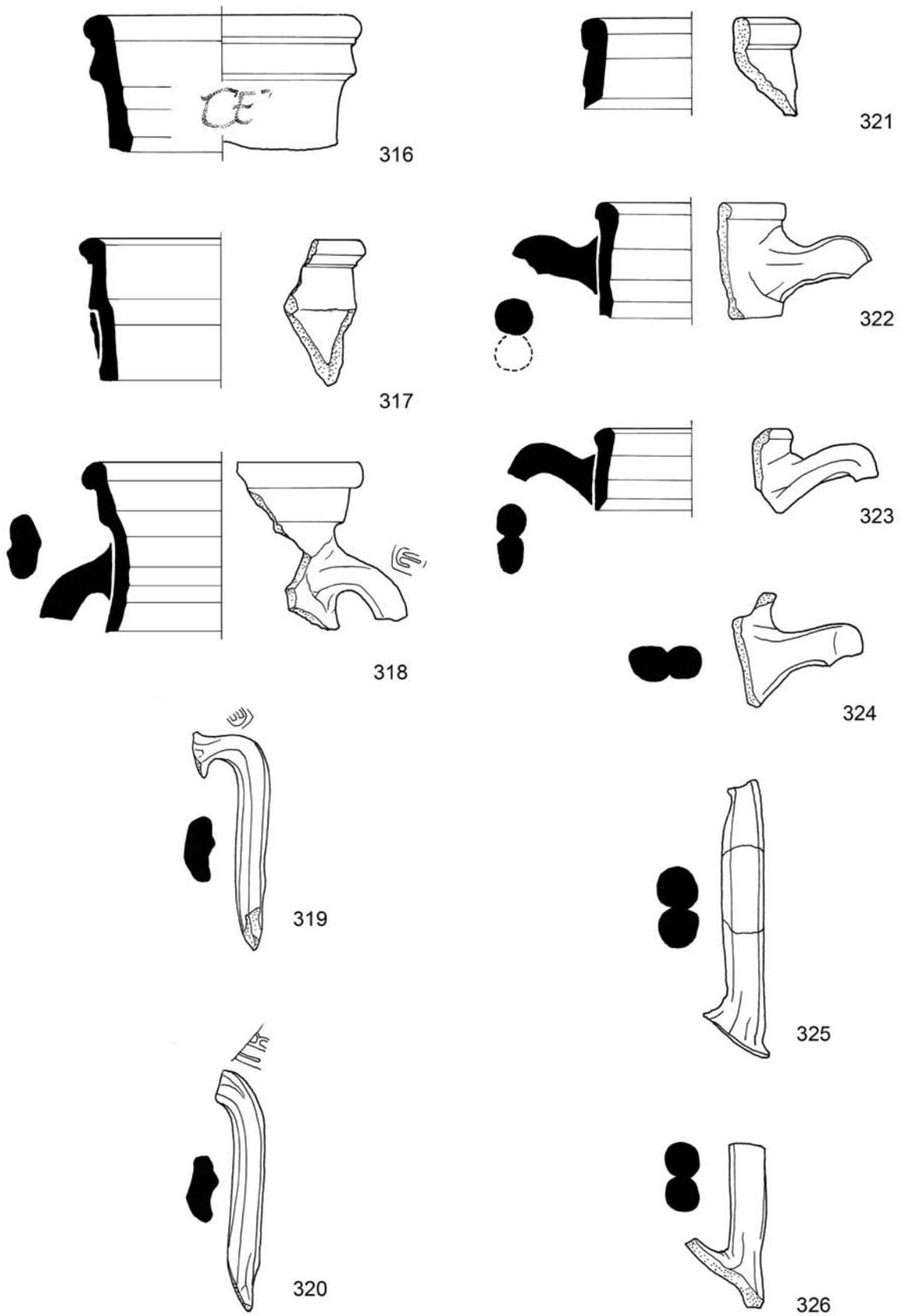


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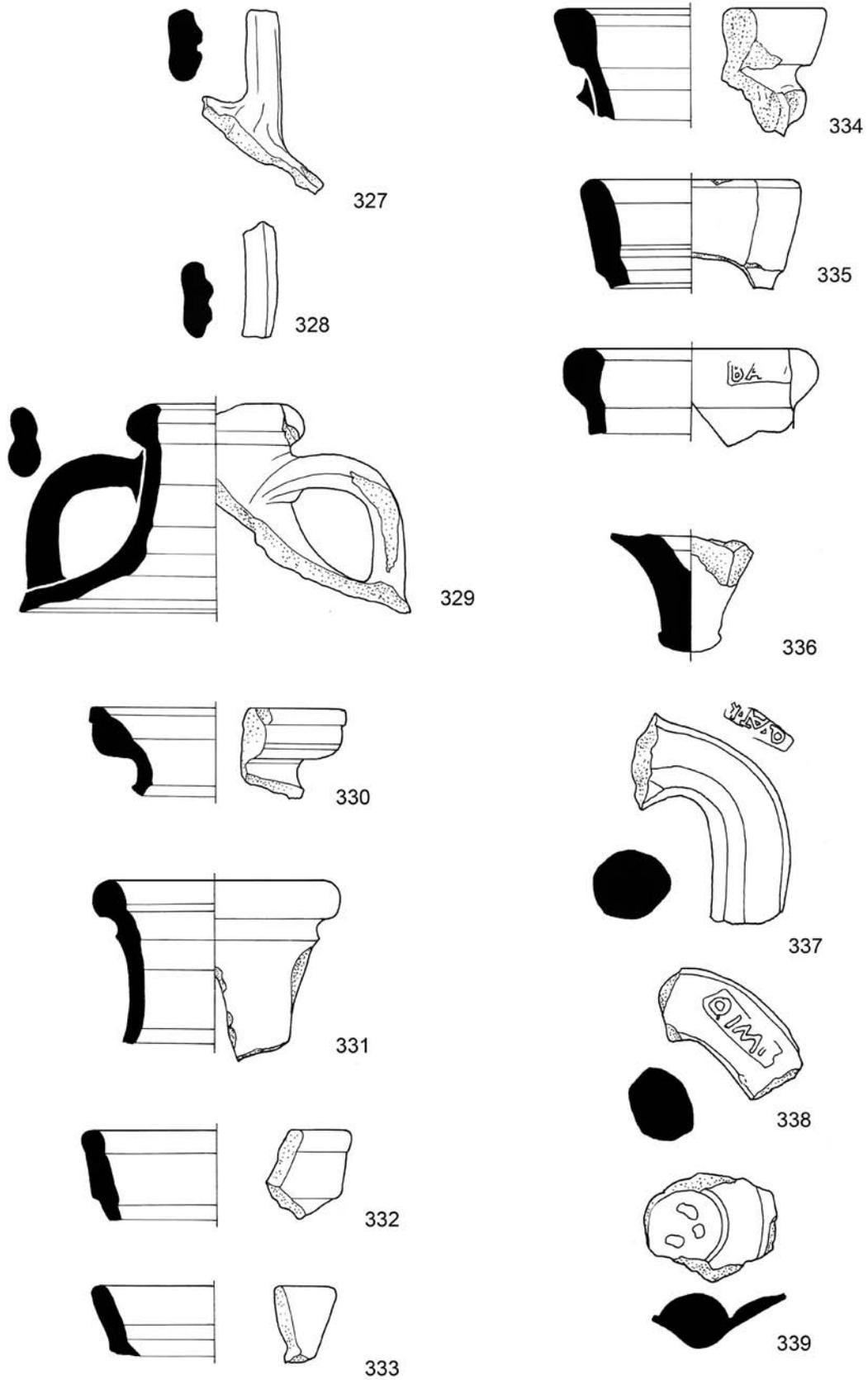


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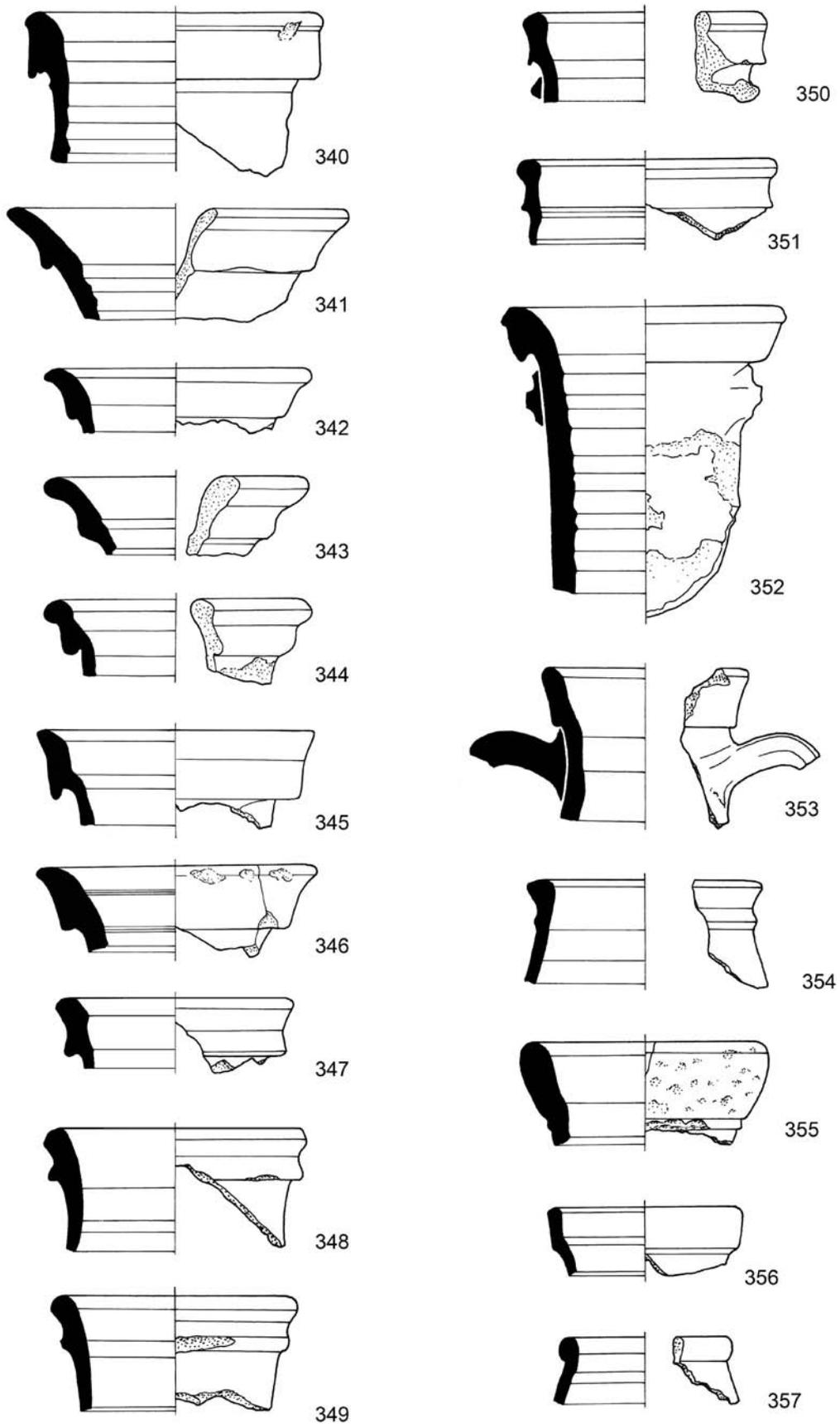




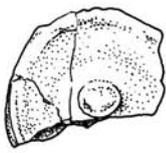
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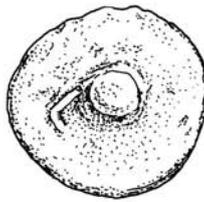
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Beltran I Nos. 340-344; Miscellaneous Nos. 345-357



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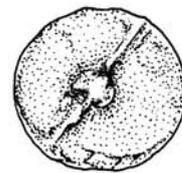
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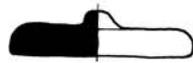
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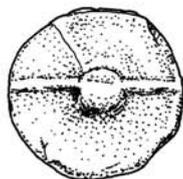
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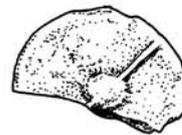
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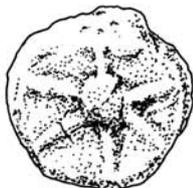
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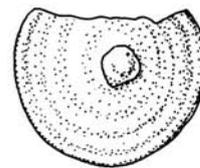
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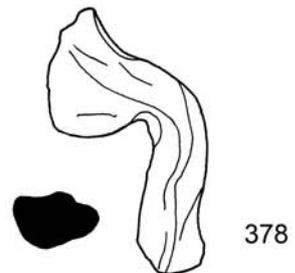
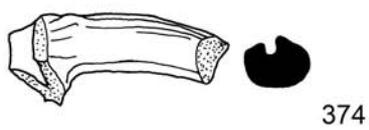
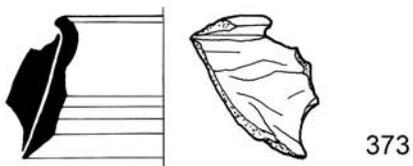
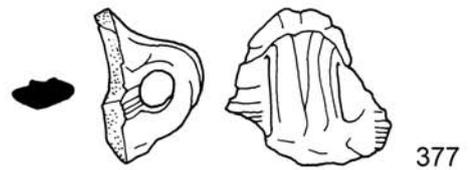
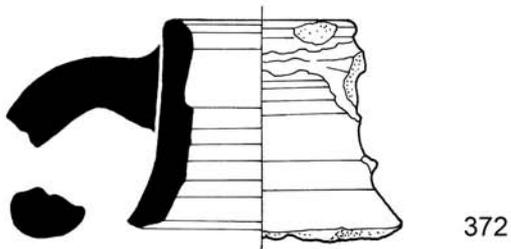
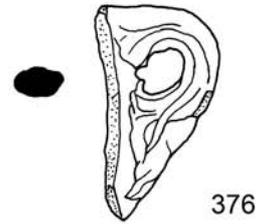
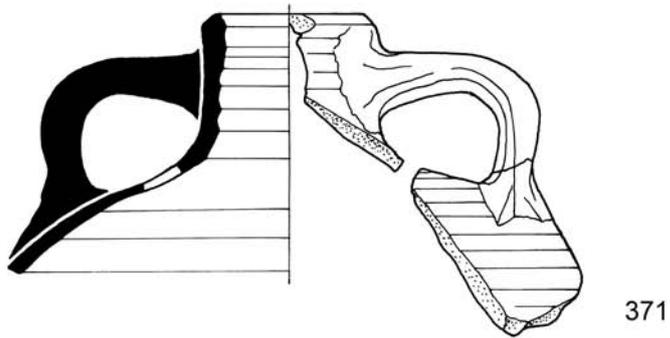
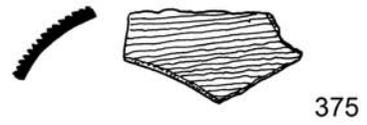
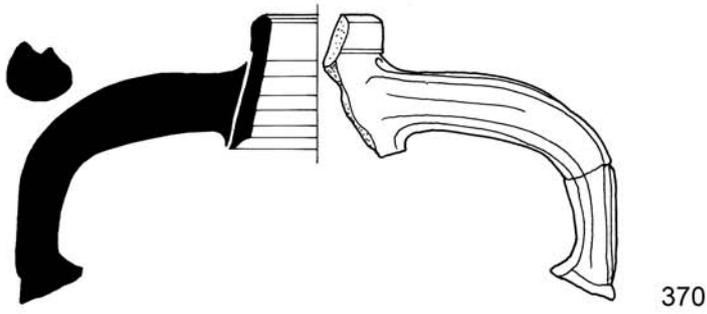
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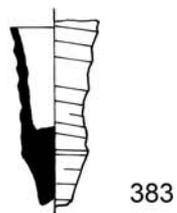
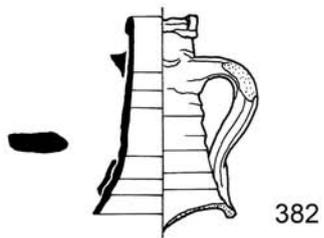
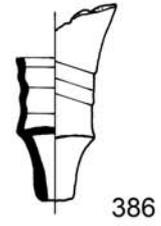
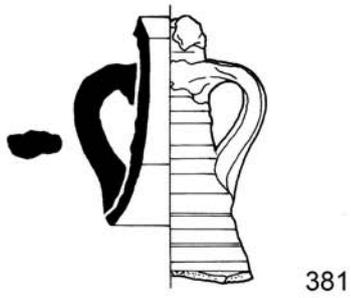
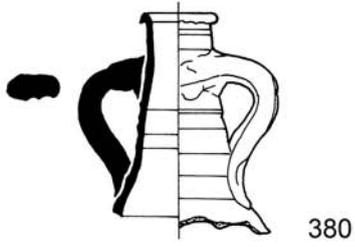
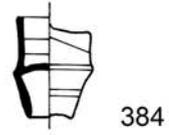
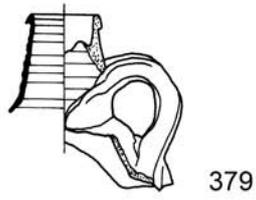


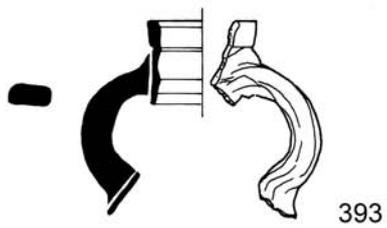
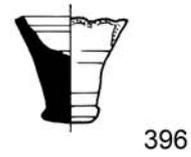
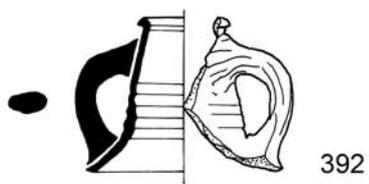
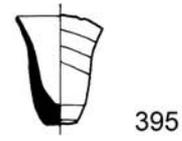
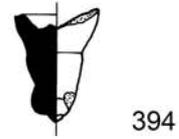
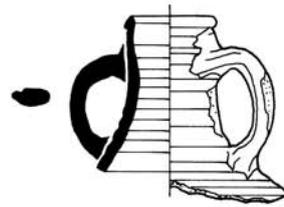
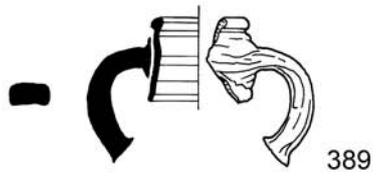
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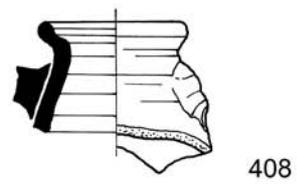
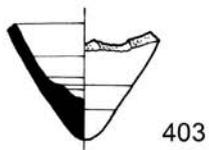
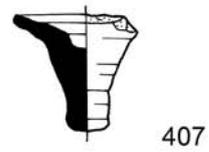
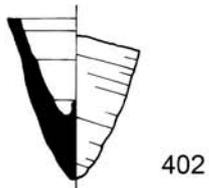
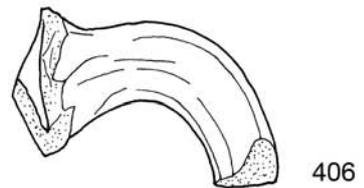
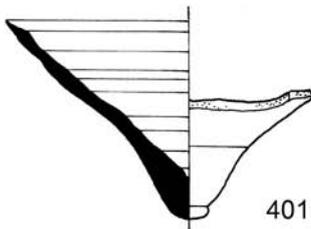
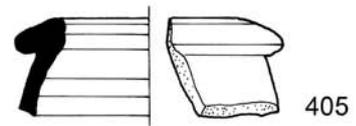
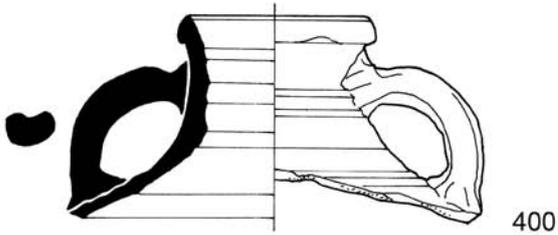
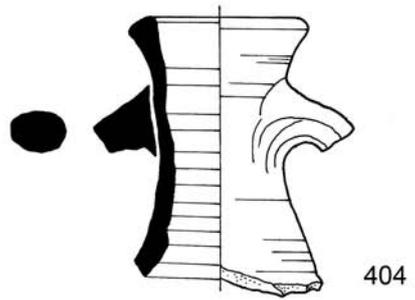
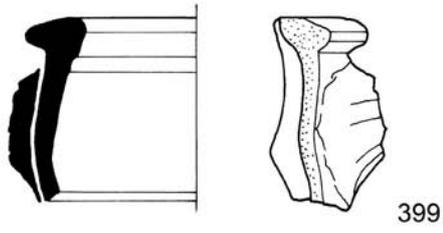


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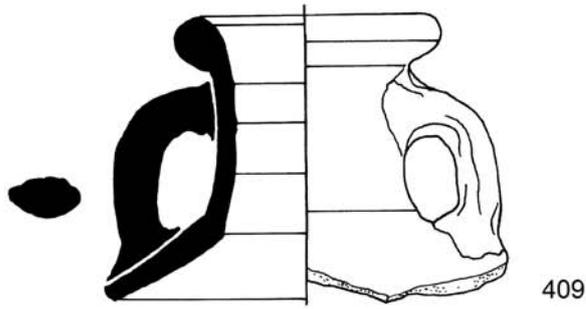




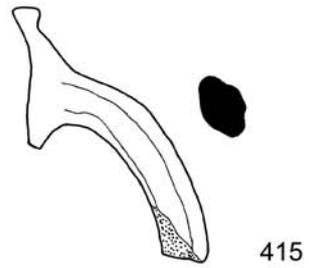




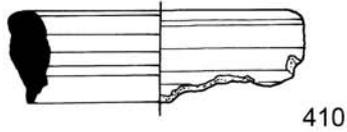
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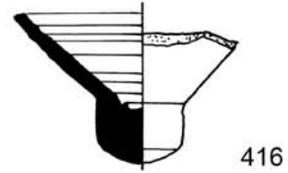
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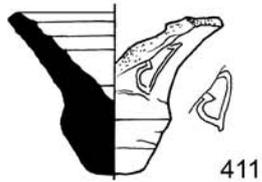
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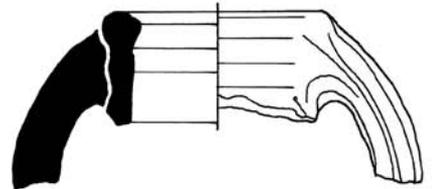
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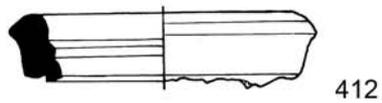
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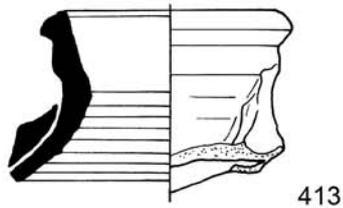
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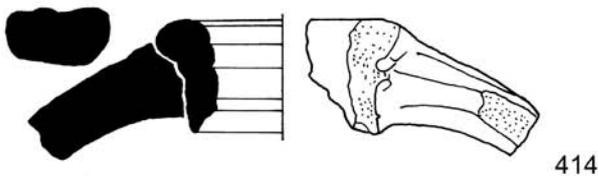
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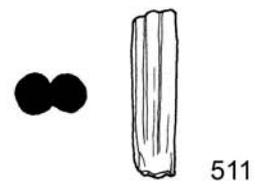
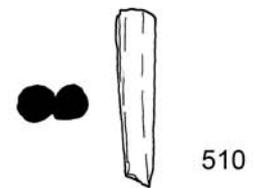
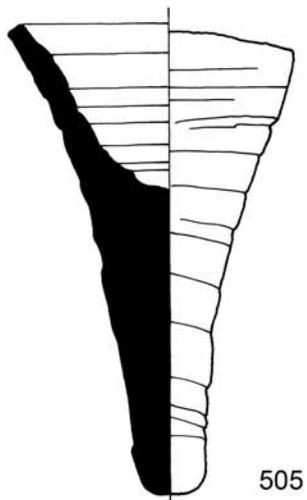
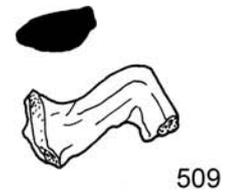
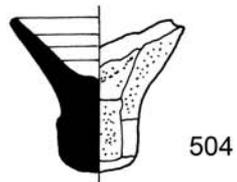
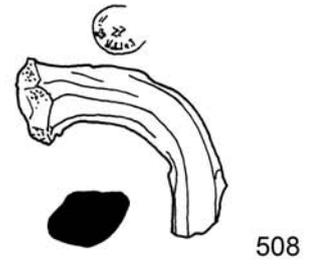
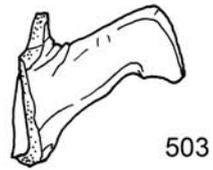
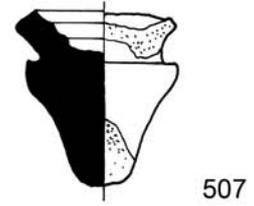
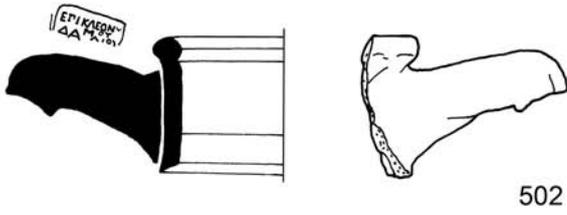
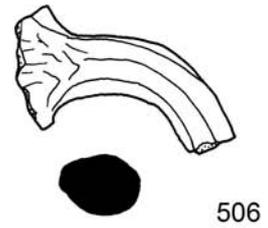
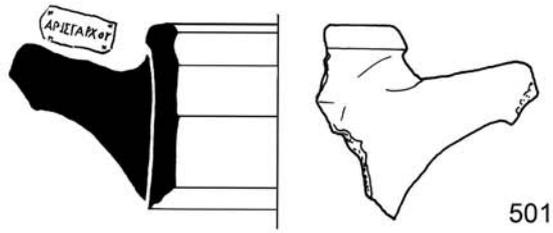


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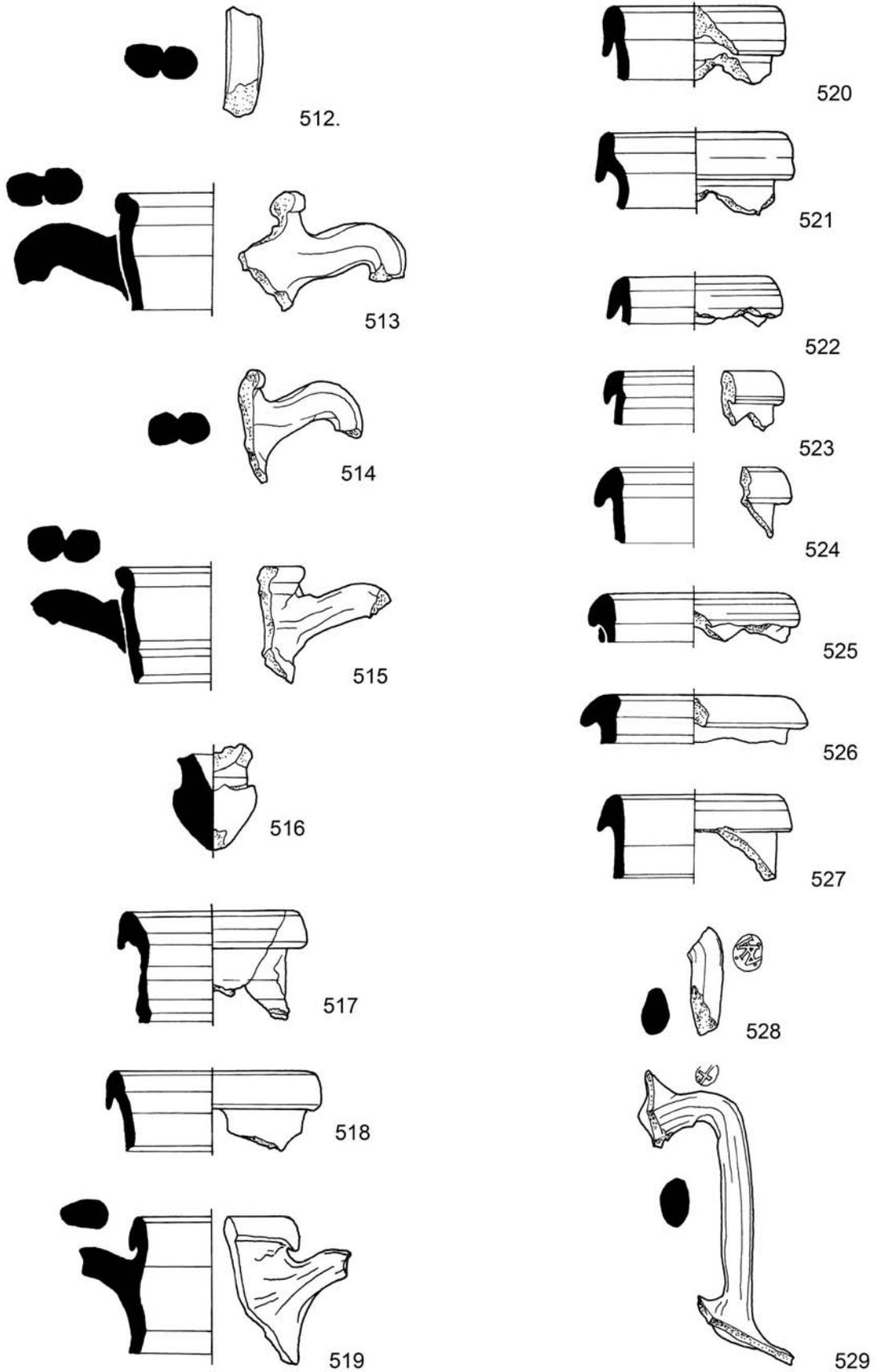


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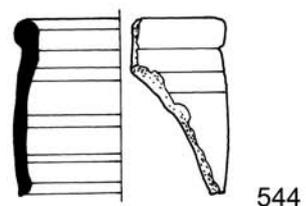
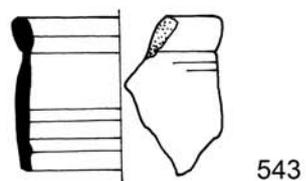
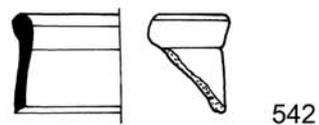
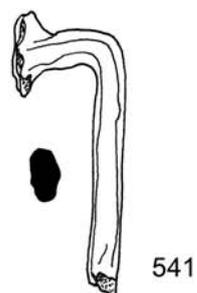
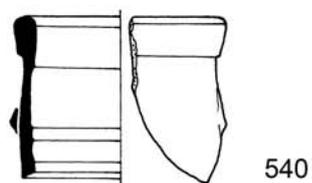
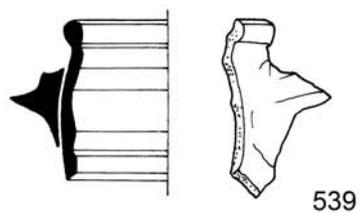
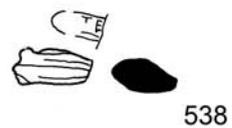
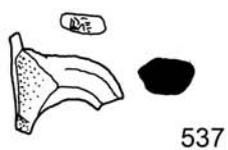
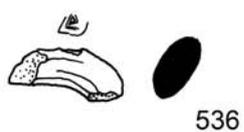
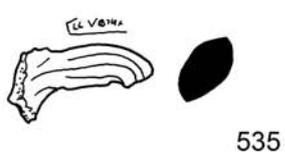
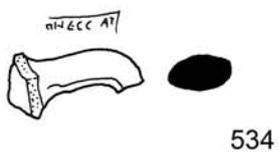
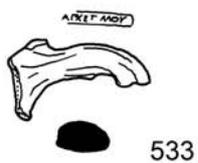
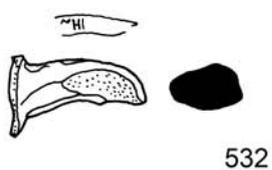
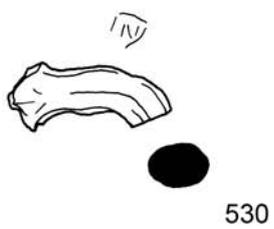
Ostia 59 / Bonifay 15 No. 409; Africana IID No. 410; Keay 34 / Bonifay 53 No. 411; Tripolitanian I No. 412;
 Tripolitanian III No. 413; Almagro 50 No. 414; Almagro 51C No. 416; MR 1 / Agora M 254 No. 415;
 Amphore Égyptienne Bitronconique 3 No. 417; Spatheion Nos. 418–420



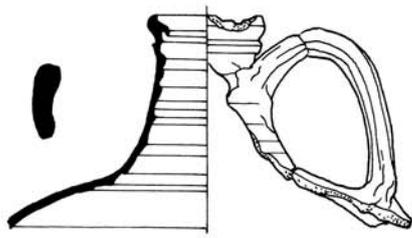
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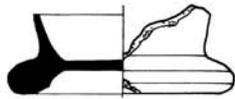
Koan Nos. 512–515; Mushroom rim type Nos. 516–529



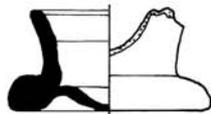
Mushroom rim type Nos. 530–538; Local Aegean 1 Nos. 539–544



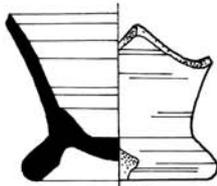
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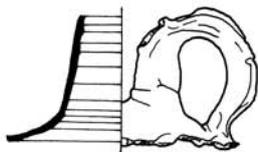
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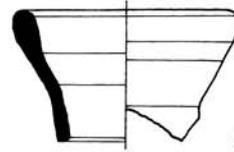
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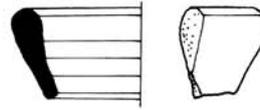
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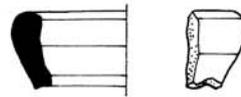
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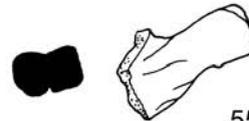
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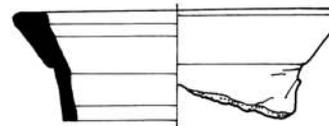
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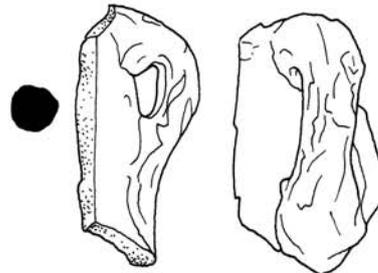
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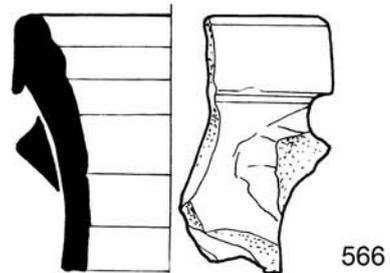
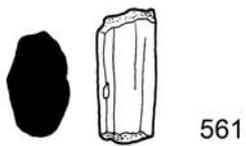
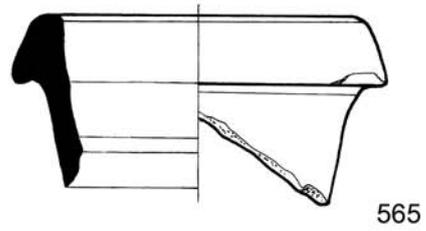
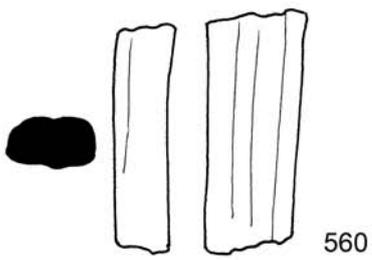
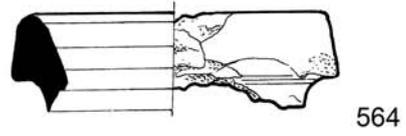
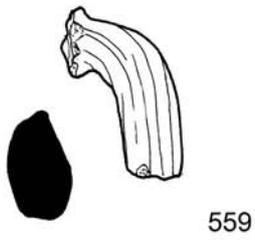
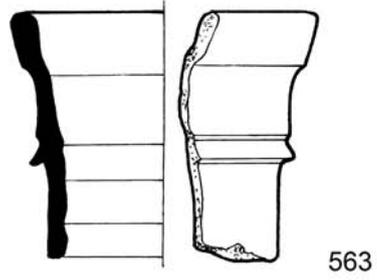
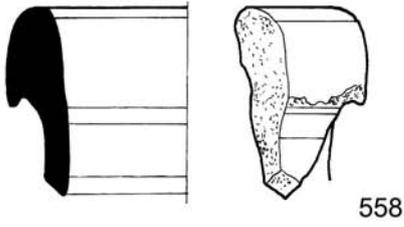
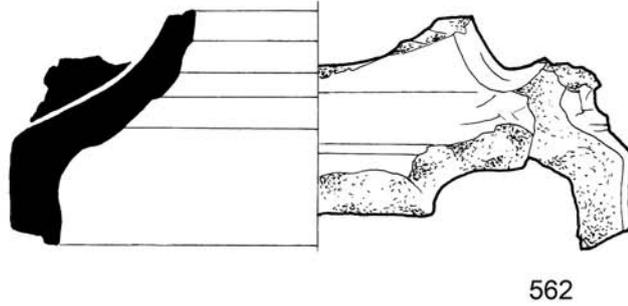
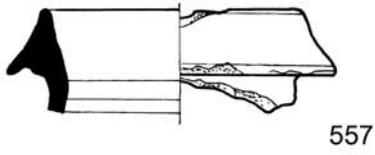


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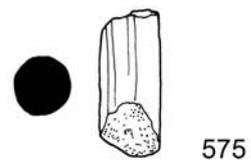
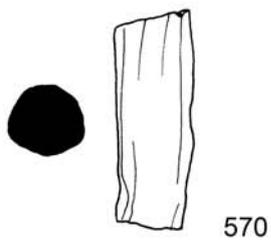
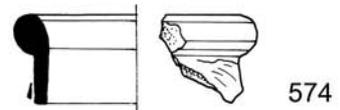
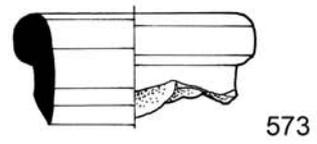
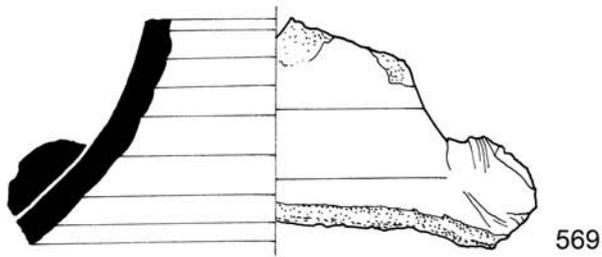
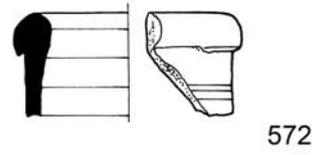
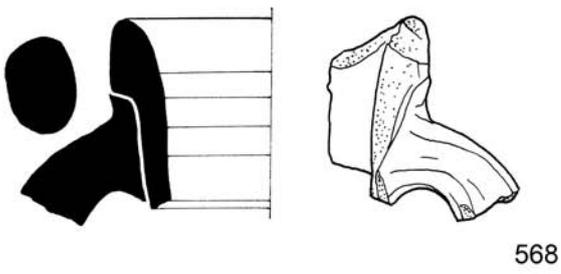
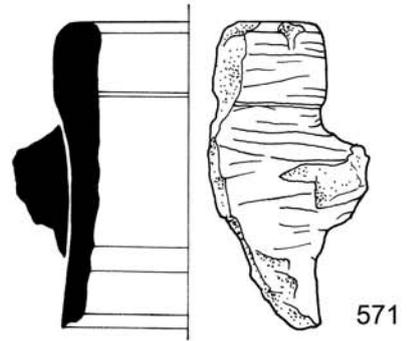
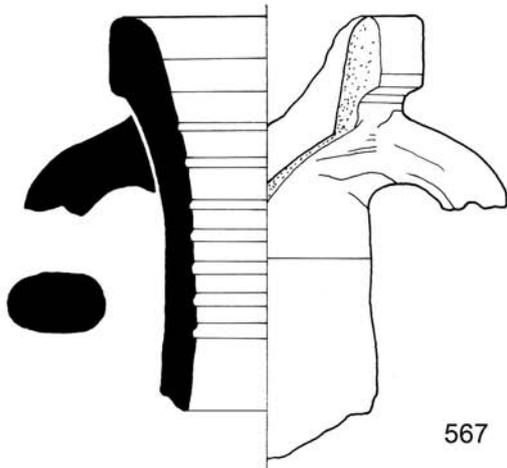


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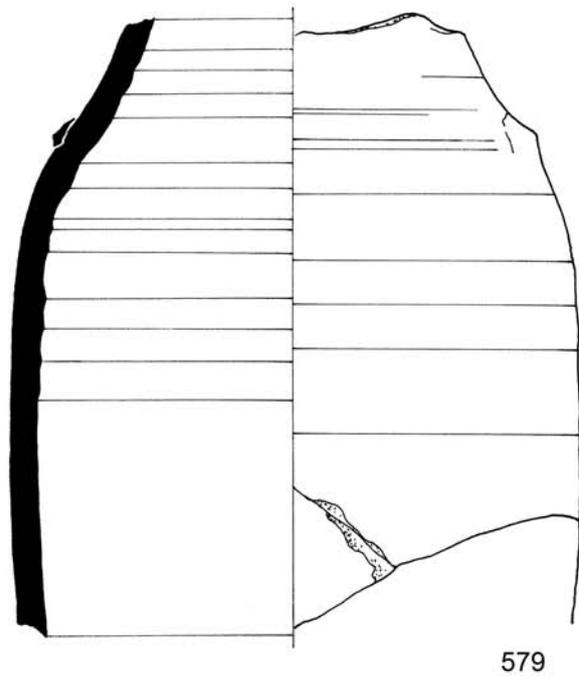
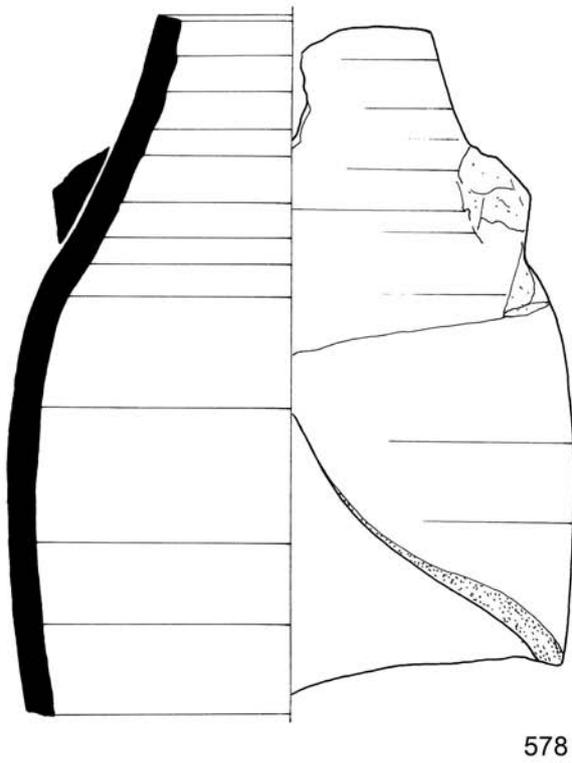
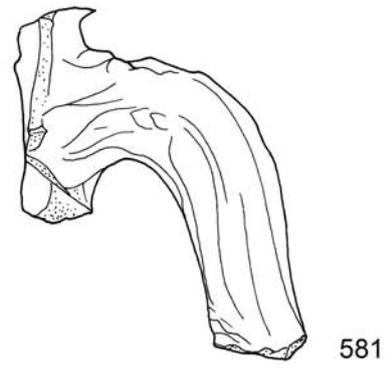
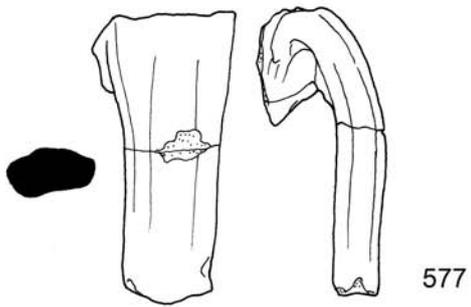
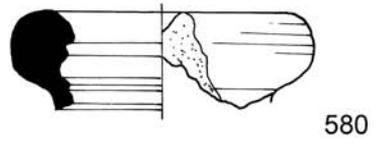
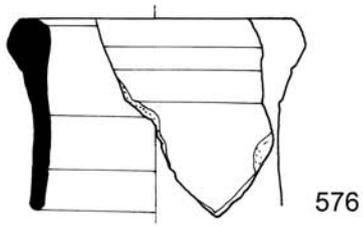
Agora F 65-66 Nos. 545-550; Cup-shaped rim Nos. 551-553;
Koan style with Pinched Handle No. 554; Miscellaneous No. 555; Punic No. 556



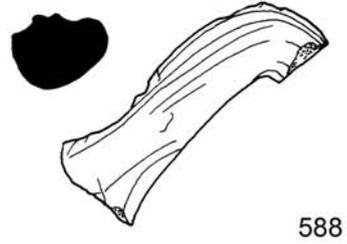
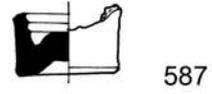
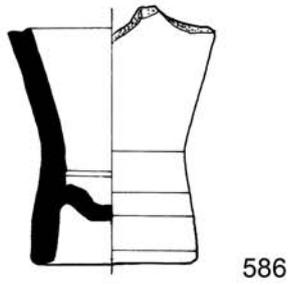
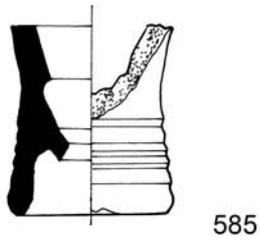
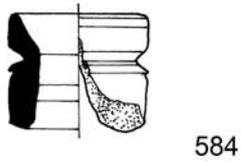
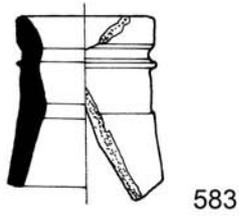
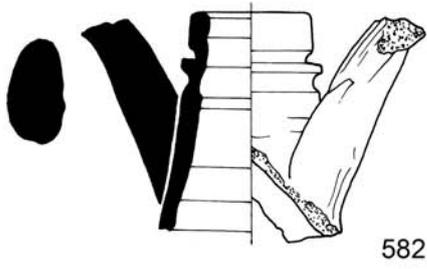
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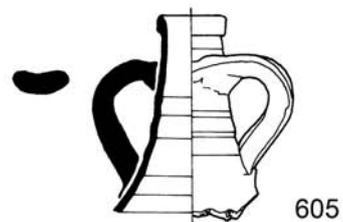
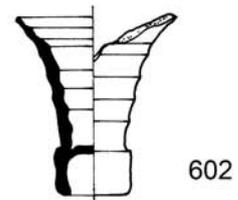
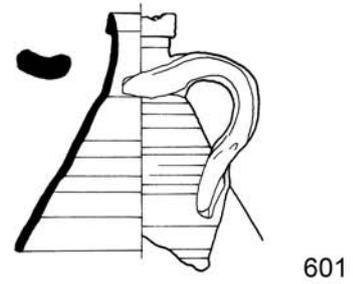
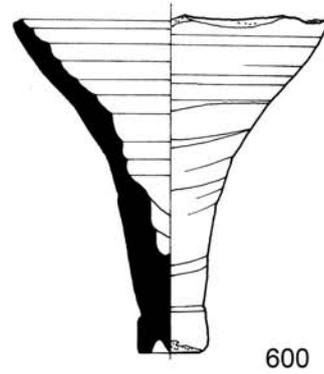
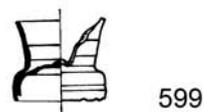
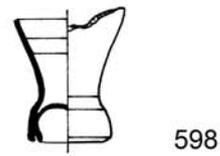
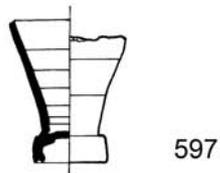
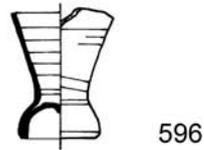
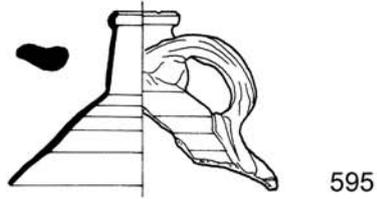
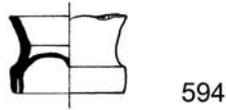
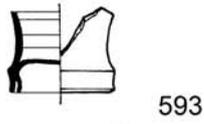
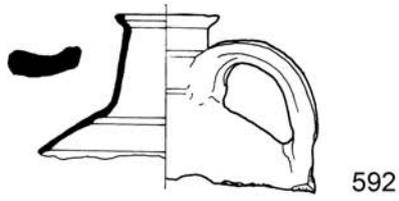


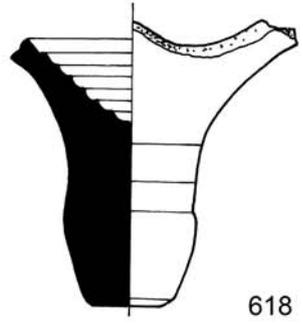
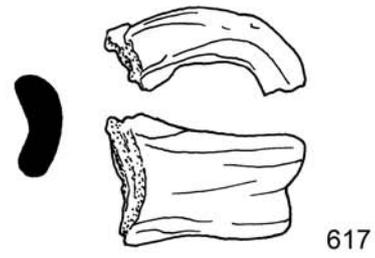
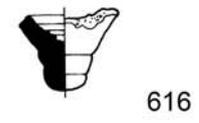
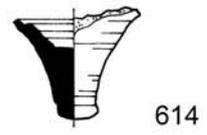
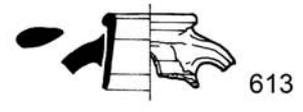
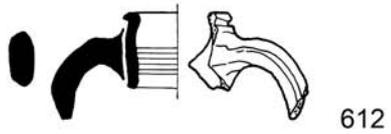
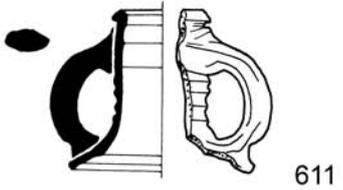
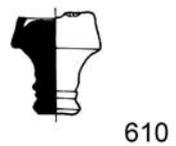
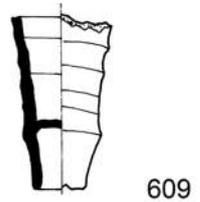
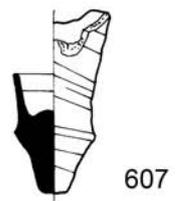
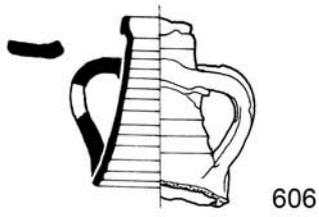
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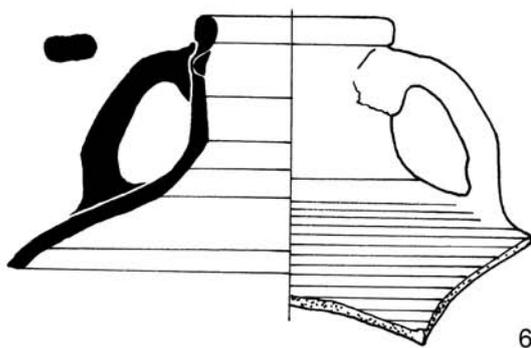
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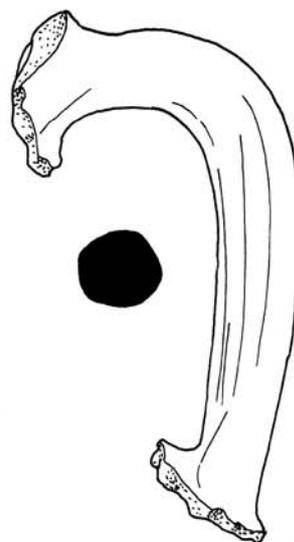




LR 3 Nos. 606–610; Ephesus 56 Nos. 611–616; Dressel 30 No. 617; Africana IID No. 618



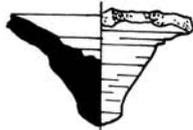
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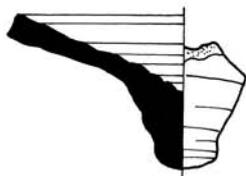
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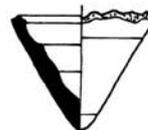
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621



622



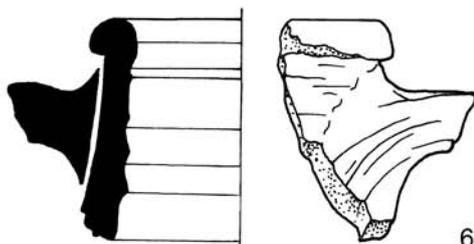
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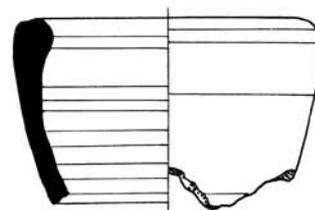
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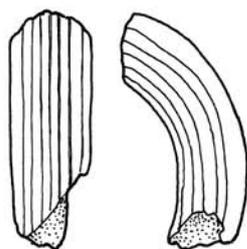
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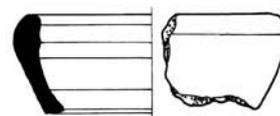
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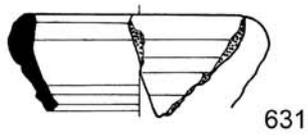


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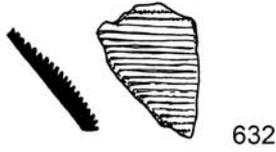


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Agora M 273 Nos. 619–620; Miscellaneous Nos. 621–622; Zeest 84B Nos. 623–624;
Zeest 80 No. 625; Kuzmanov IX No. 626; LR 1 Nos. 627–628; LR 2 Nos. 629–630



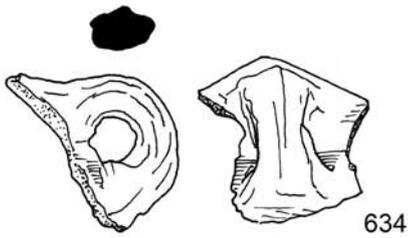
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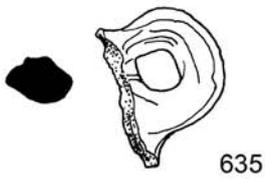
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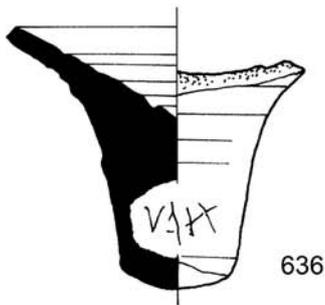
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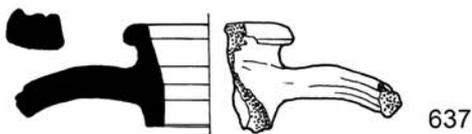
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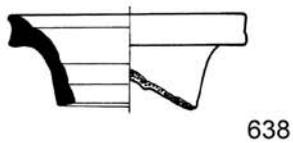
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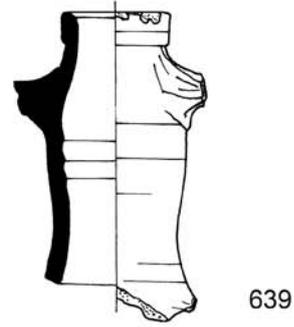
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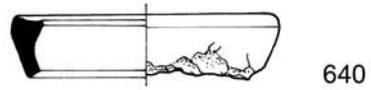
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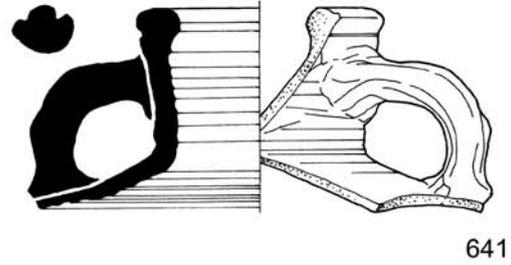
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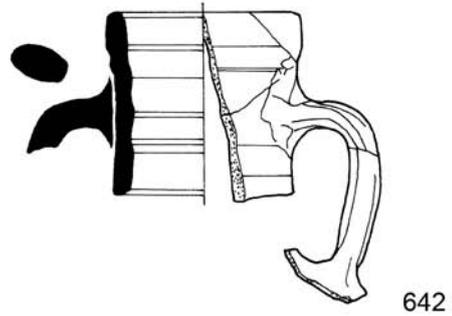
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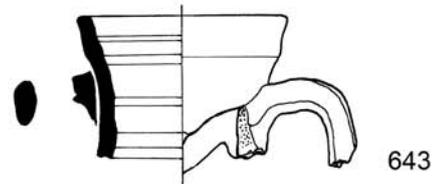
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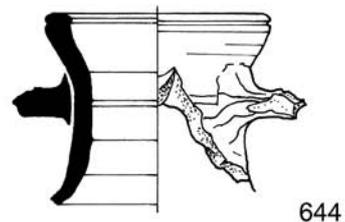
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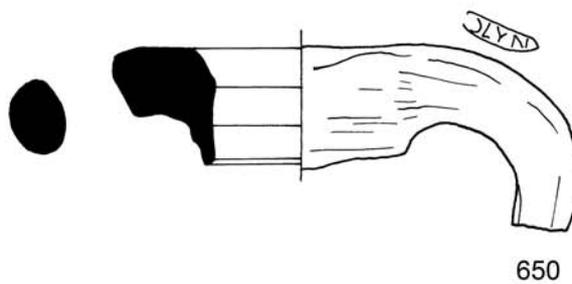
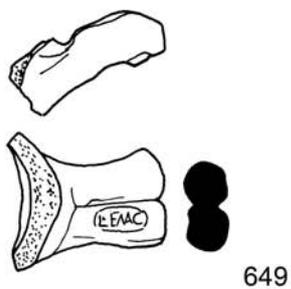
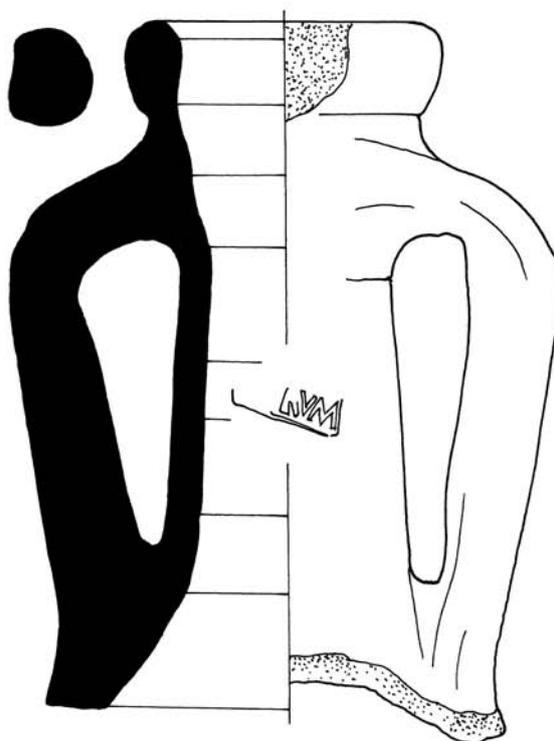
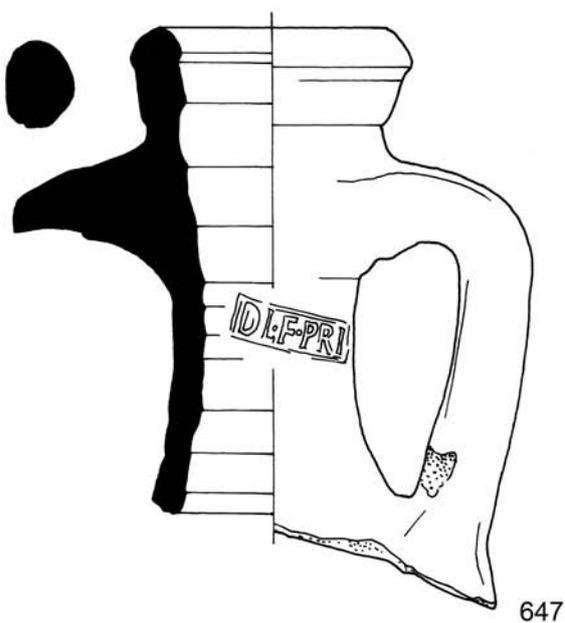
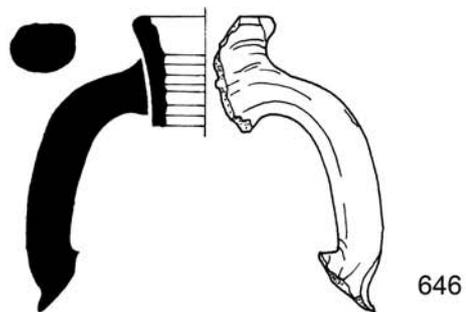
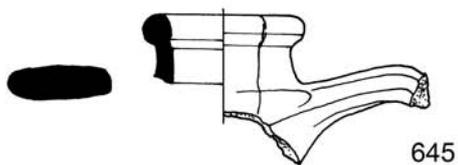
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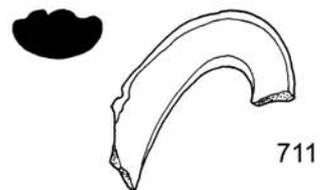
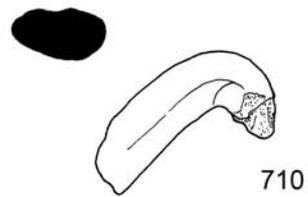
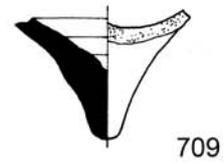
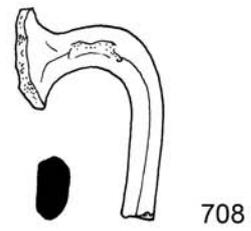
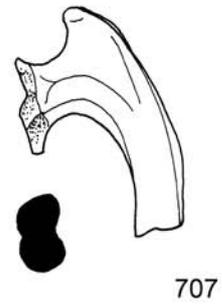
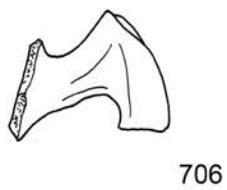
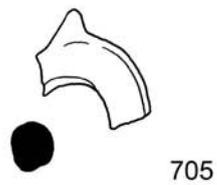
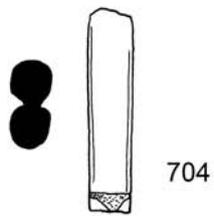
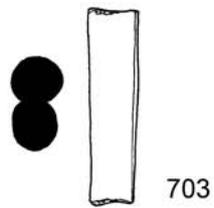
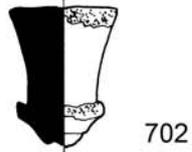
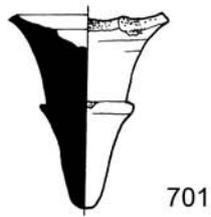


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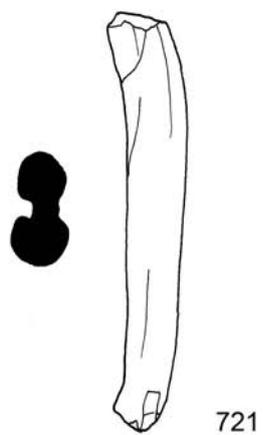
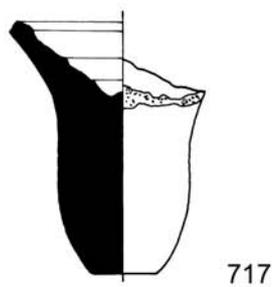
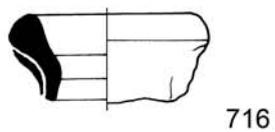
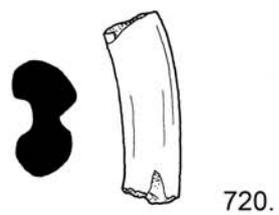
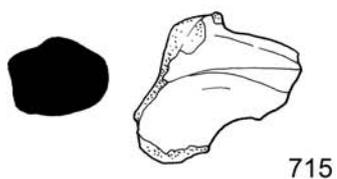
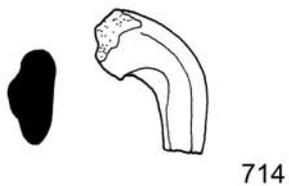
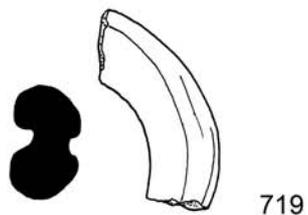
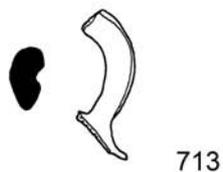
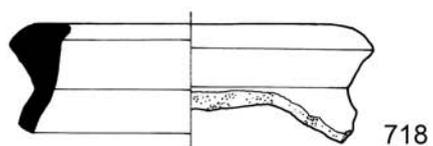


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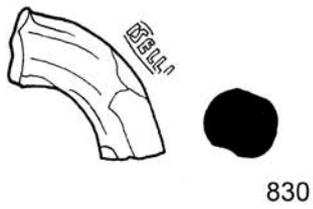
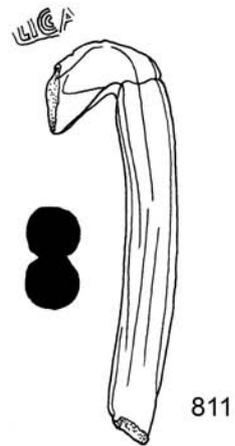
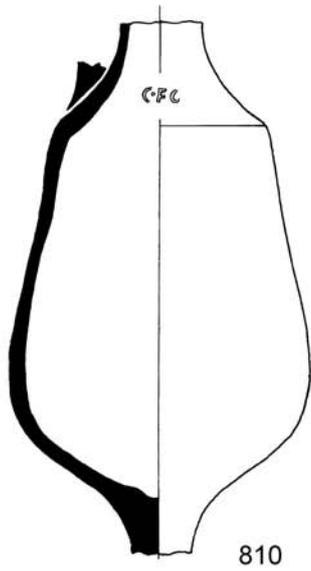
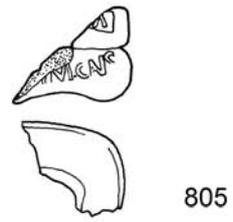
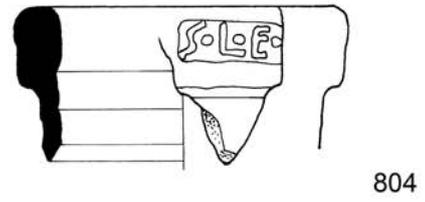
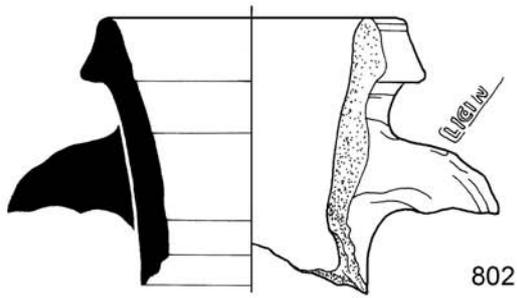
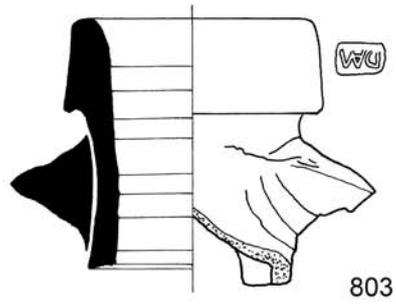
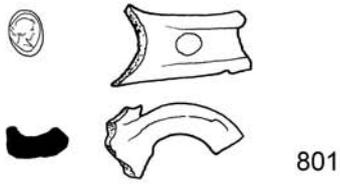




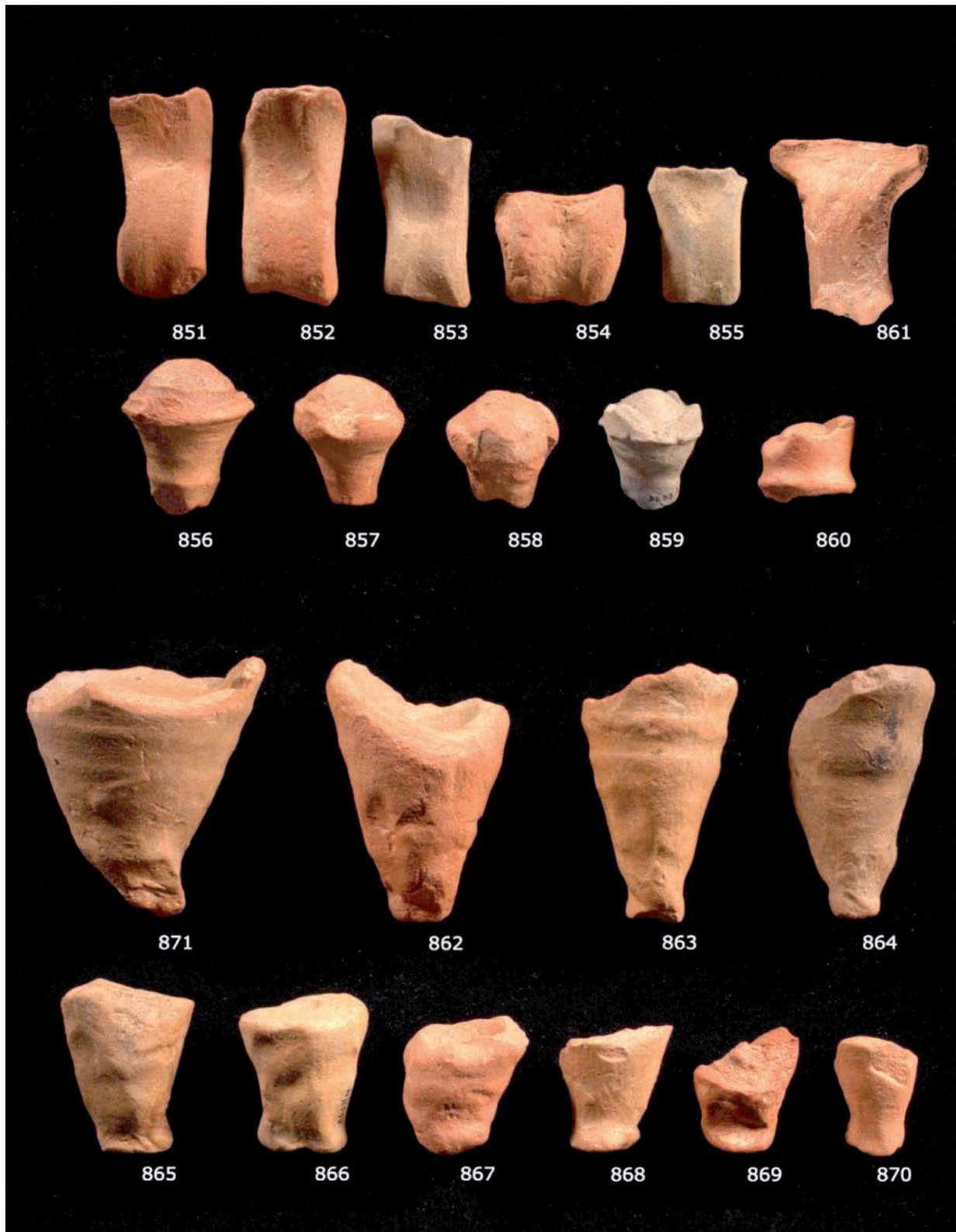
Knidian Nos. 701–702; Koan Nos. 703–704; Rhodian No. 705; Dressel 5 No. 706; Agora M 54 No. 707; Local Aegean 1 No. 708; Cup-shaped rim No. 709; Kapitän II Nos. 710–711



Agora M 125 Nos. 712–713; Dressel 7 No. 714; Dressel 20 No. 715; Almagro 51C No. 716;
Africana IID No. 717; Tripolitanian III No. 718; Zeest 75 Nos. 719–721



Agora F 65–66 No. 801; Lamboglia 2 Nos. 802–803, 820; Dressel 6A Nos. 804 and 810;
Dressel 2–4 Nos. 805 and 811; Bridisian No. 830



LR 3 Nos. 851-860; Ephesus 56 Nos. 861-871



Amphorae produced in the Ephesus region: Mushroom rim type / Nikandros group No. 2;
Local Aegean 1 No. 2; il Agora F 65 No. 3; LR 3 No. 4; Ephesus 56 No. 5



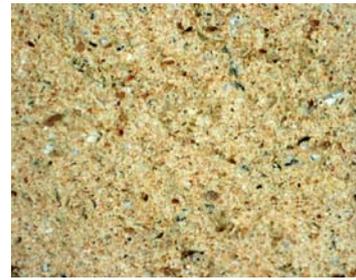
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 Kapitän II No. 7; Agora M 273 No. 8; Kuzmanov IX No. 9



Rhodian 1



Rhodian 2



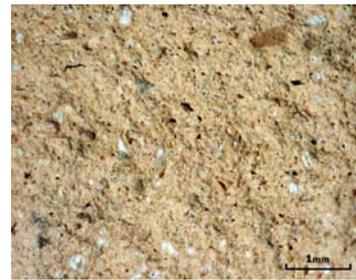
Rhodian 3



Rhodian 4



Rhodian 5



Rhodian 6



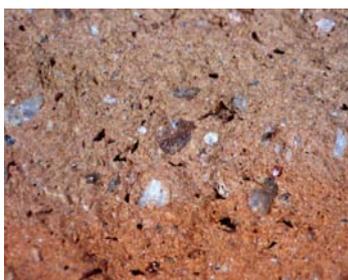
Rhodian 7



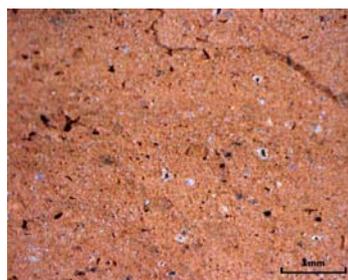
Rhodian 8



Rhodian 9



Rhodian 10



Rhodian 11



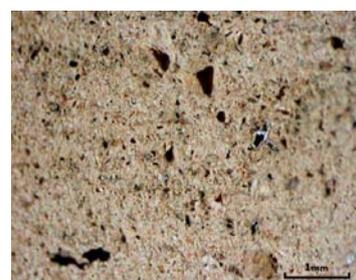
Rhodian 12



Rhodian 13



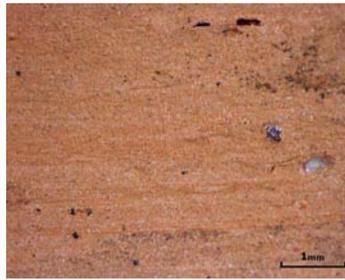
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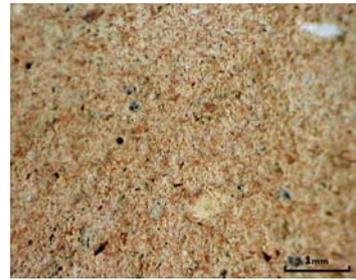
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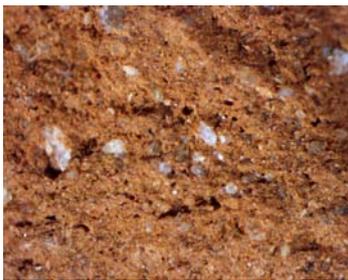
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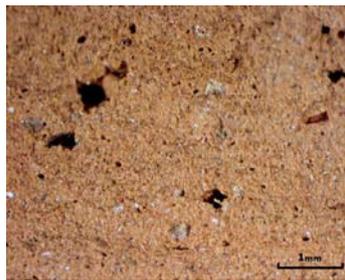
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Rhodian 18



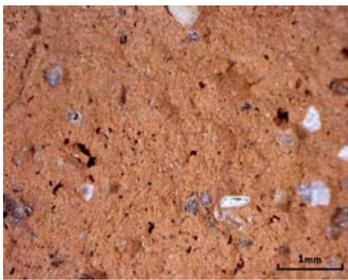
Rhodian 19



Rhodian 20



Rhodian 21



Rhodian 22



Rhodian 23



Rhodian 24



Rhodian 25



Rhodian 26



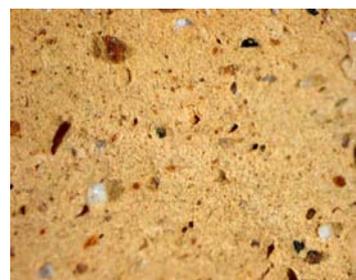
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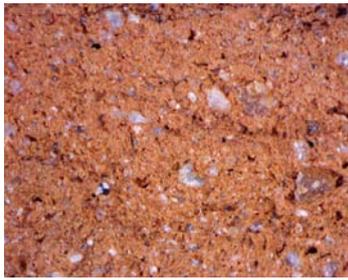
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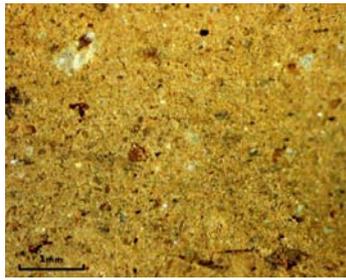
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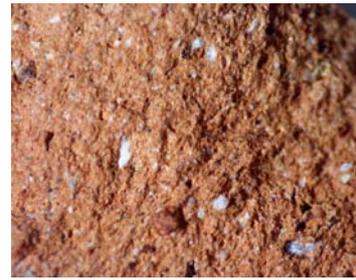
Rhodian 30



Rhodian 31



Rhodian 32



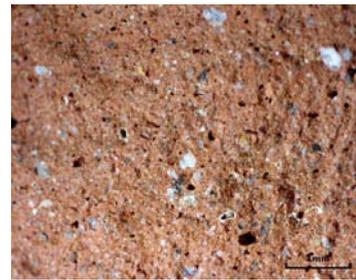
Chian 33



Chian 34



Chian 35



Chian 36



Knidian 37



Knidian 38



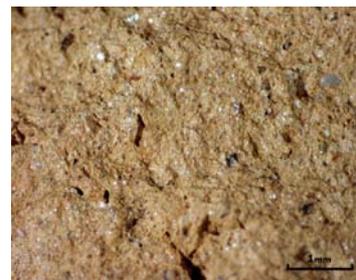
Knidian 39



Knidian 40



Knidian 41



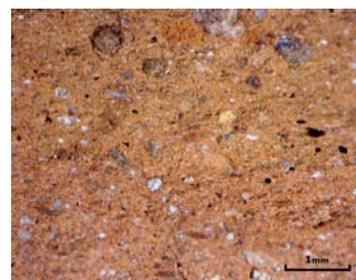
Knidian 42



Knidian 43



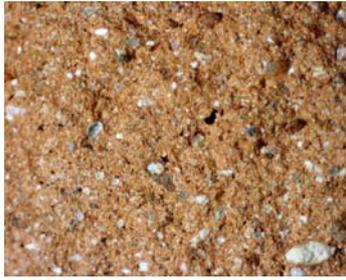
Knidian 44



Knidian 45



Knidian 46



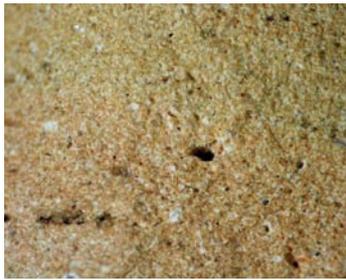
Knidian 47



Koan 48



Koan 49



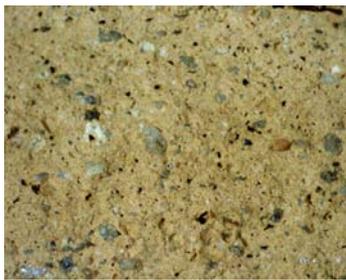
Koan 50



Koan 51



Koan 52



Koan 53



Koan 54



Koan 55



Koan 56



Koan 57



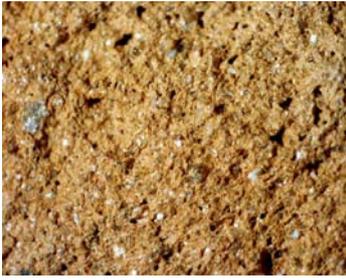
Koan 58



Koan 59



Koan 60



Koan 61



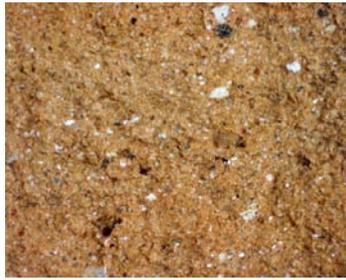
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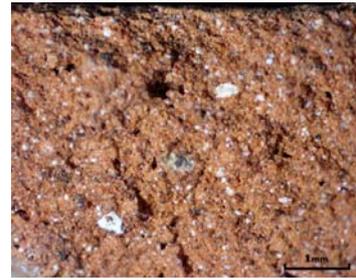
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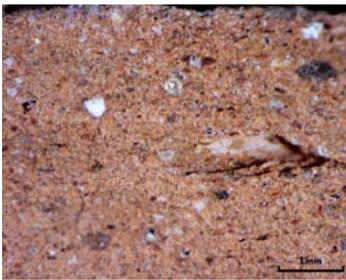
Koan 64



Koan 65



Koan 66



Koan 67



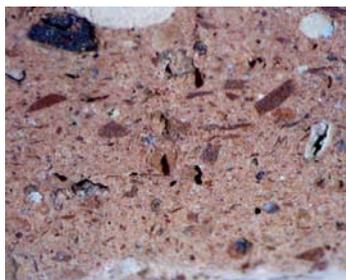
Koan 68



Koan 69



Koan 70



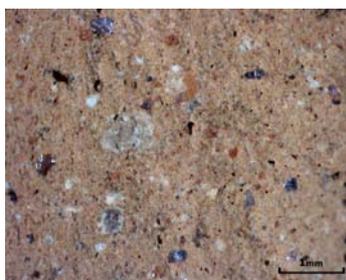
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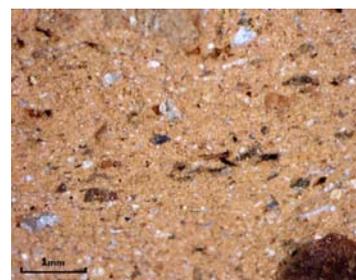
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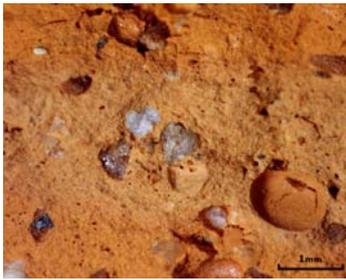
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Koan 74



Koan 75



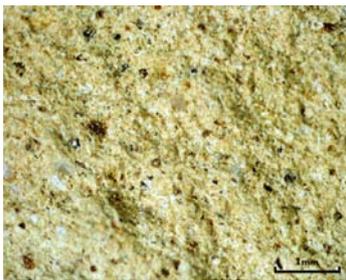
Koan 76



Koan 77



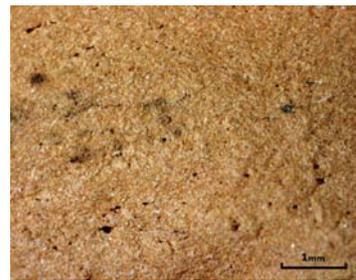
Agora F 65-66 78



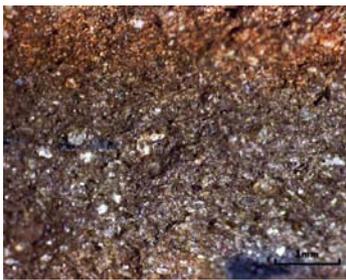
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Agora F 65-66 80



Agora F 65-66 81



Agora F 65-66 82



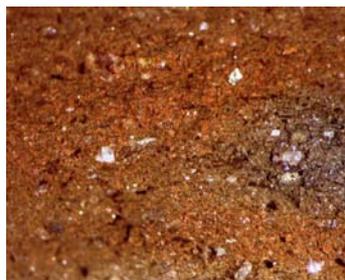
Agora F 65-66 83



Agora F 65-66 84



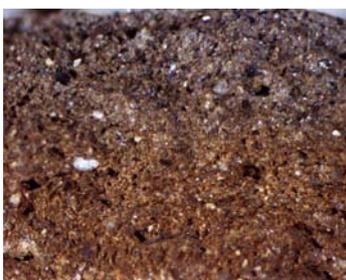
Agora F 65-66 85



Agora F 65-66 86



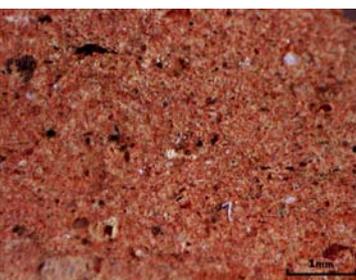
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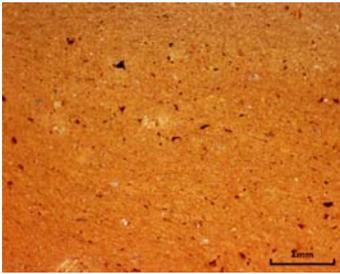
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Agora F 65-66 89



Agora F 65-66 90



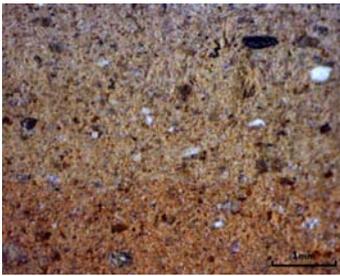
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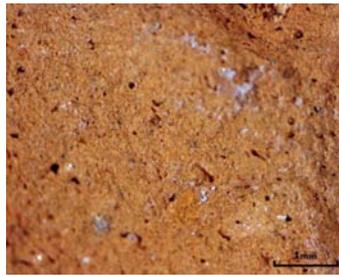
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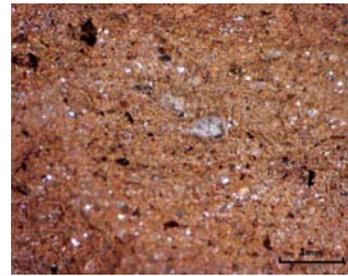
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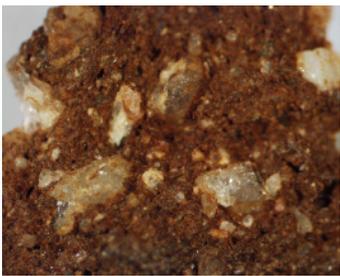
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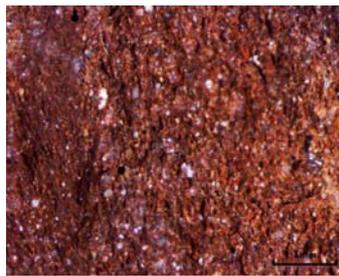
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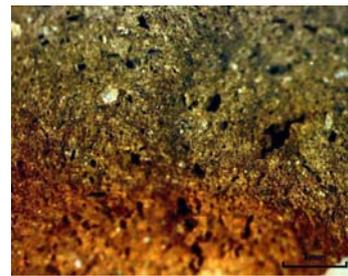
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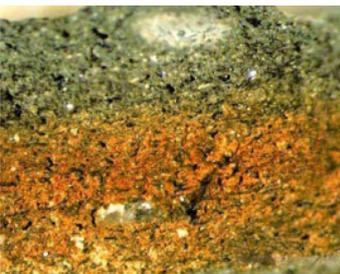
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Agora F65-66 0098



Agora F65-66 0099



Agora F65-66 0100



Agora F65-66 0101



Agora F65-66 0102



Agora M45 0103



Agora M240, 255, 0104



Cup-shaped rim / 0105



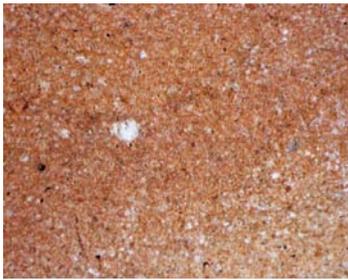
Cup-shaped rim 106



Cup-shaped rim 107



Cup-shaped rim 108



Cup-shaped rim 109



Cup-shaped rim 110



Cup-shaped rim 111



Cup-shaped rim 112



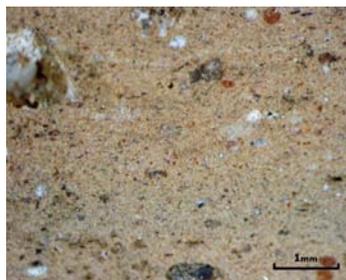
Cup-shaped rim 113



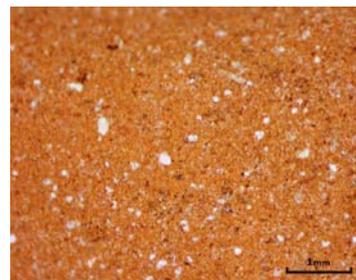
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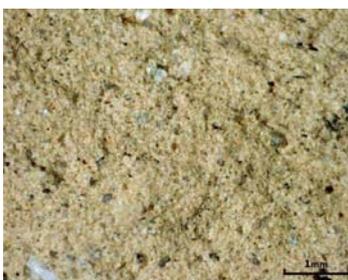
Cup-shaped rim 115



Cup-shaped rim 116



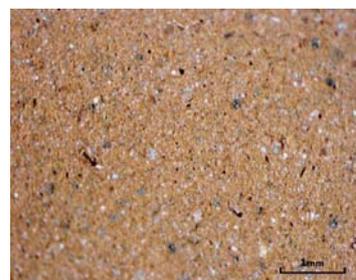
Cup-shaped rim 117



Cup-shaped rim 118



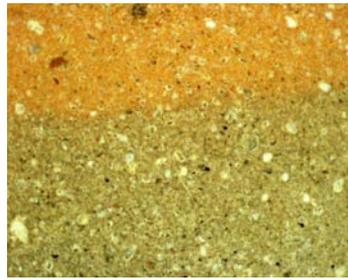
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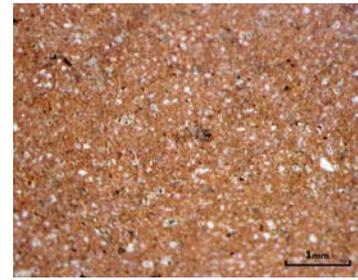
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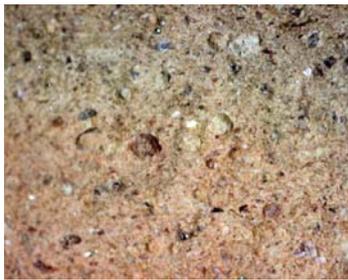
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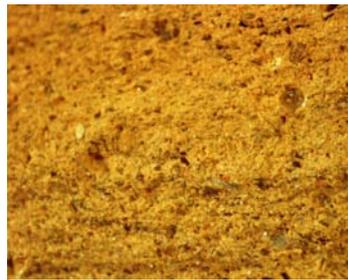
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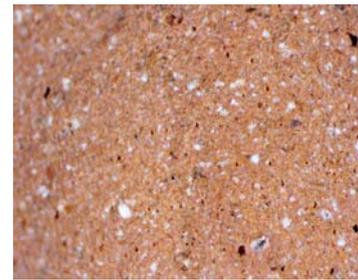
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Cup-shaped rim 124



Cup-shaped rim 125



Cup-shaped rim 126



Cup-shaped rim 127



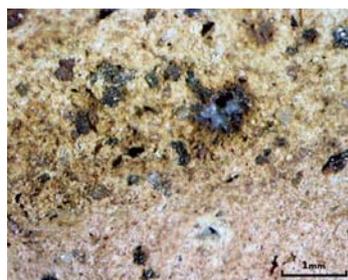
Cup-shaped rim 128



Cup-shaped rim 129



Dressel 35 130



Dressel 35 131



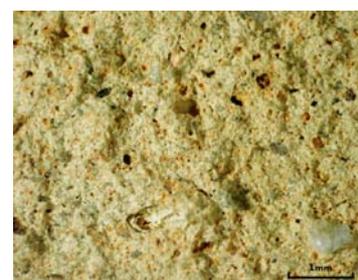
Dressel 35 132



Cretan AC 4 133



Cretan AC 4 134



Cretan AC 4 135



Cretan AC 2 136



Dressel 5 137



Dressel 5 138



Dressel 5 139



Agora M 54 140



Agora G 198 141



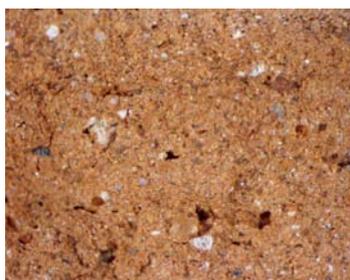
Agora G 198 142



Koan Pinched Handles 143



Koan Pinched Handles 144



Koan Pinched Handles 145



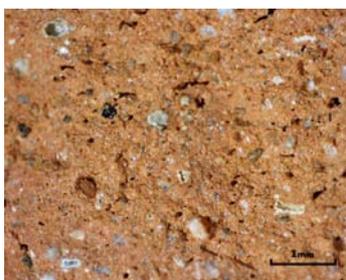
Agora G 199 146



Ephesus 17 147



Ephesus 17 148



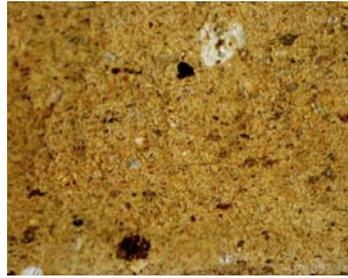
Ephesus 18 149



Ephesus 19 150



Local Aegean 1 151



Local Aegean 1 152



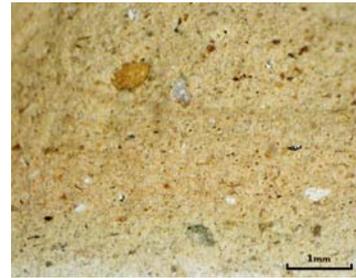
Local Aegean 1 153



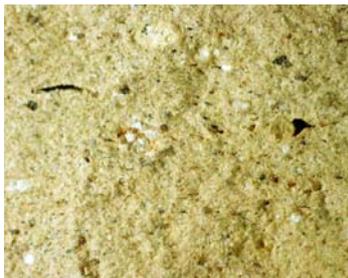
Local Aegean 1 154



Local Aegean 1 155



Local Aegean 1 156



Local Aegean 1 157



Local Aegean 1 158



Local Aegean 1 159



Local Aegean 1 160



Local Aegean 1 161



Local Aegean 1 162



Local Aegean 1 163



Local Aegean 1 164



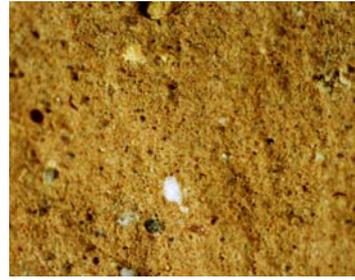
Local Aegean 1 165



Local Aegean 2 166



Local Aegean 2 167



Local Aegean 2 168



Local Aegean 2 169



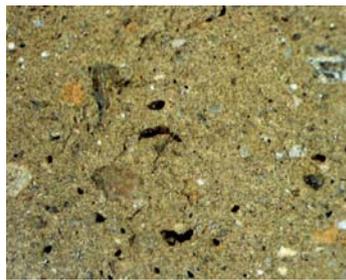
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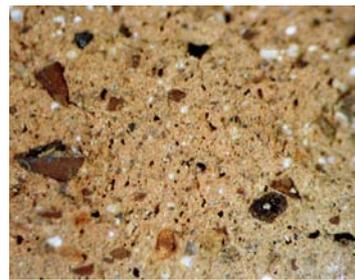
Local Aegean 2 171



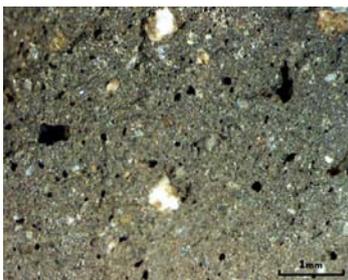
Dressel 25 172



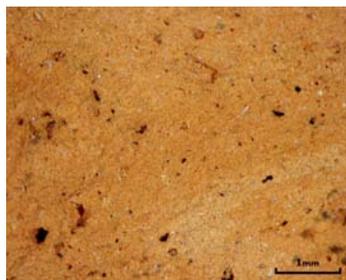
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Dressel 25 174



Dressel 25 175



Dressel 25 176



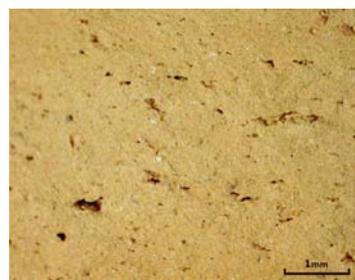
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Dressel 25 178



Dressel 25 179



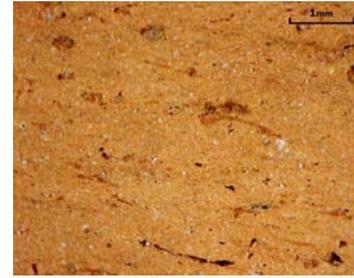
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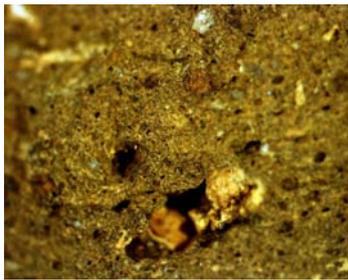
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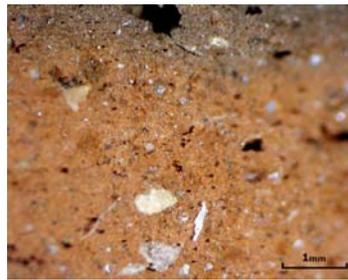
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Dressel 25 183



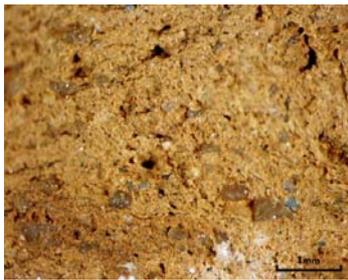
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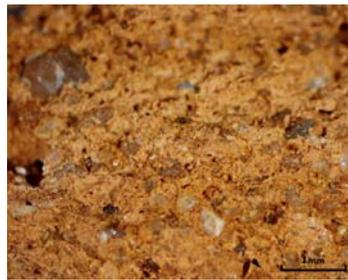
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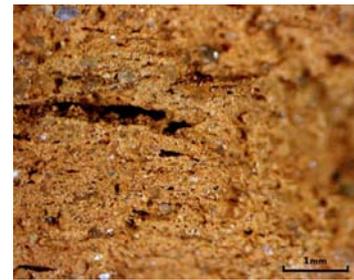
Baggy jar 186



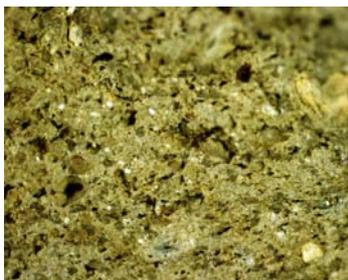
Baggy jar 187



Baggy jar 188



Baggy jar 189



Baggy jar 190



Baggy jar 191



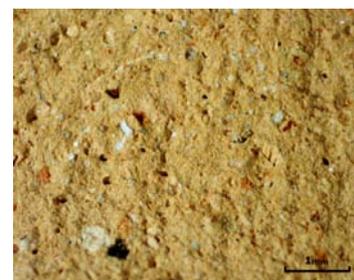
Baggy jar 192



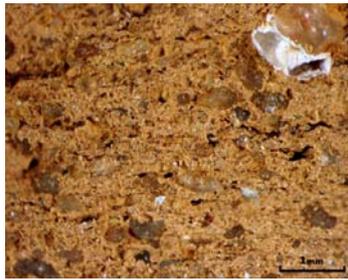
Baggy jar 193



Baggy jar 194



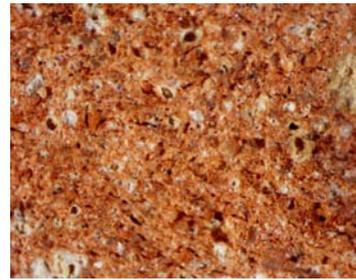
Baggy jar 195



Baggy jar 196



Van der Werff 1 197



Van der Werff 2 198



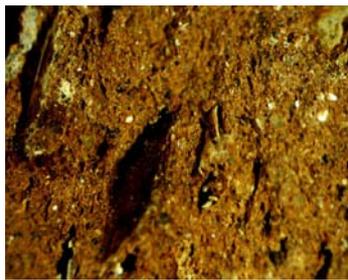
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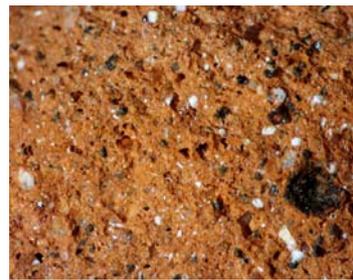
Egyptian AE 2 200



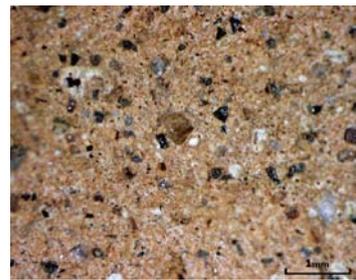
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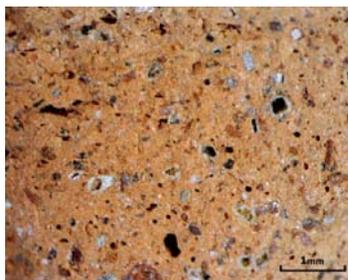
Egyptian AE 2 202



Greco-Italic 203



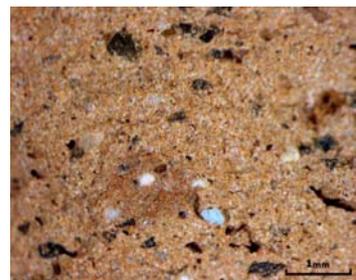
Greco-Italic 204



Greco-Italic 205



Greco-Italic 206



Greco-Italic 207



Dressel 1A 208



Dressel 1A 209



Dressel 1A 210



Dressel 1A 211



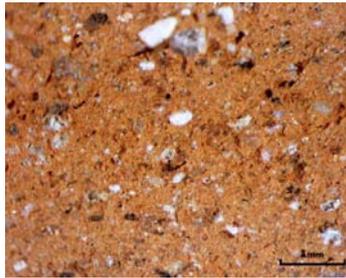
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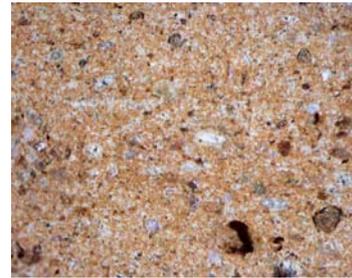
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Dressel 1B 214



Dressel 1B 215



Dressel 1B 216



Dressel 1B 217



Dressel 1C 218



Dressel 1C 219



Dressel 1C 220



Dressel 1C 221



Dressel 1C 222



Dressel 1C 223



Dressel 1C 224



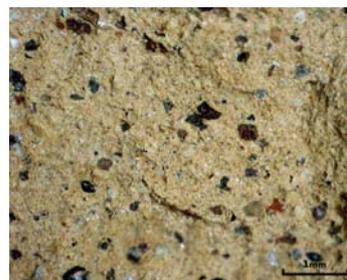
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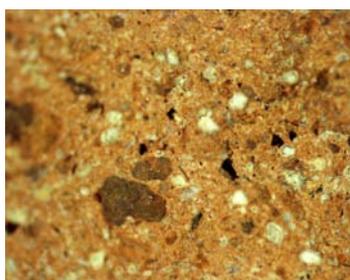
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Dressel 1C 227



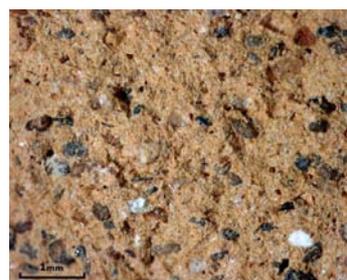
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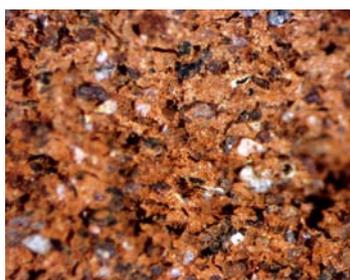
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Dressel 1C 230



Dressel 1C 231



Dressel 1C 232



Dressel 1C 233



Dressel 1C 234



Dressel 1C 235



Dressel 1C 236



Dressel 1C 237



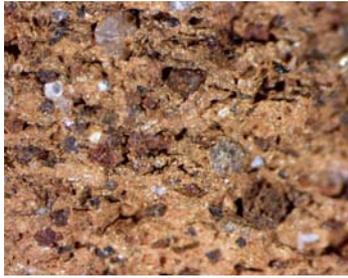
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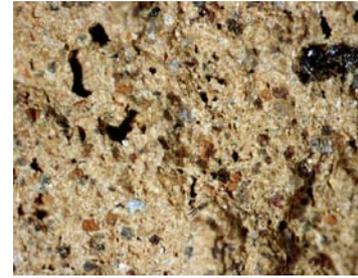
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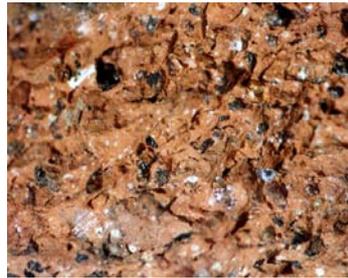
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Dressel 1C 243



Dressel 1C 244



Dressel 1C 245



Dressel 1C 246



Dressel 1C 247



Dressel 1C 248



Dressel 1C 249



Dressel 1C 250



Dressel 1C 251



Dressel 1C 252



Dressel 1 253



Dressel 1 254



Dressel 1 255



Dressel 1 256



Brindisian 257



Brindisian 258



Brindisian 259



Brindisian 260



Brindisian 261



Brindisian 262



Brindisian 263



Brindisian 264



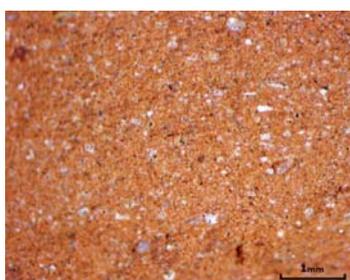
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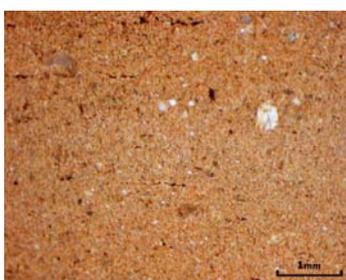
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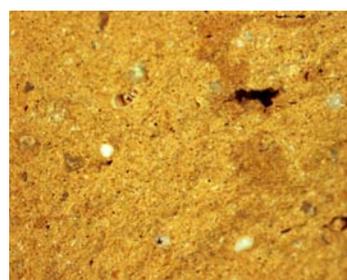
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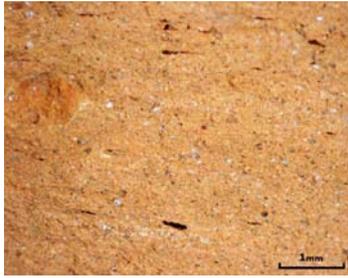
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Brindisian 269



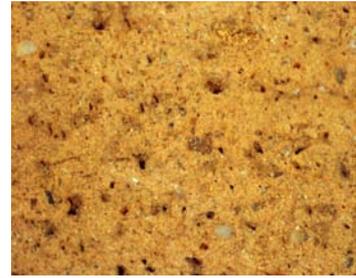
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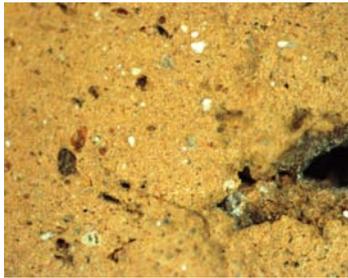
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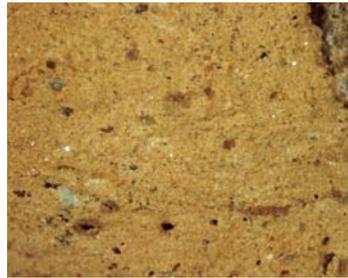
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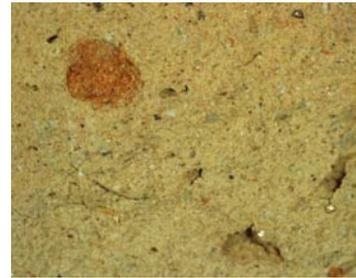
Lamboglia 2 273



Lamboglia 2 274



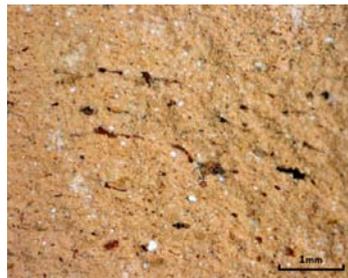
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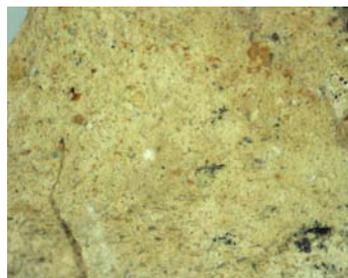
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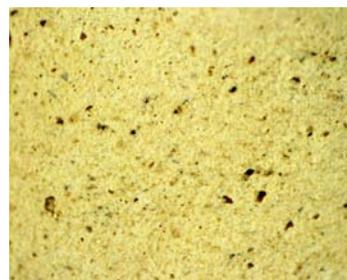
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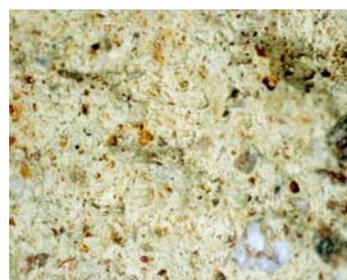
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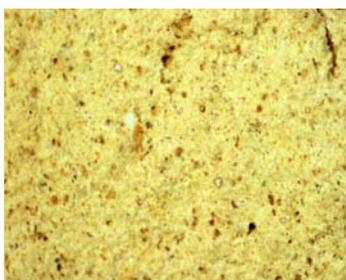
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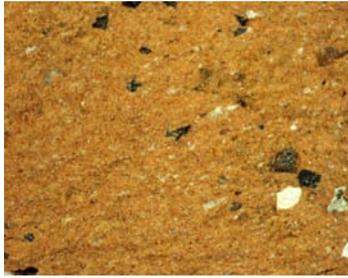
Dressel 6A 298



Dressel 6A 299



Dressel 21-22 300



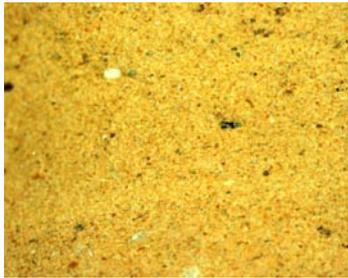
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Dressel 21-22 302



Dressel 21-22 303



Dressel 21-22 304



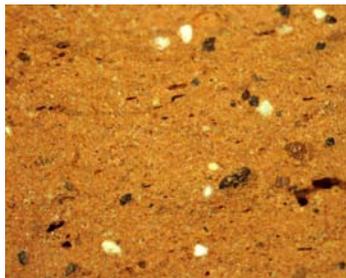
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Dressel 21-22 307



Dressel 21-22 308



Dressel 21-22 309



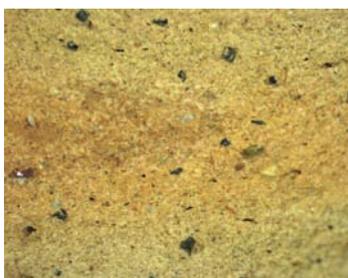
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Dressel 21-22 311



Dressel 21-22 312



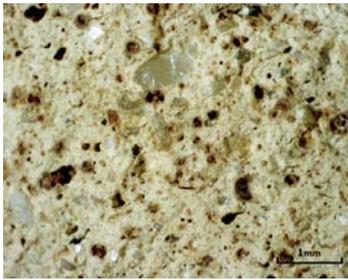
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Dressel 21-22 314



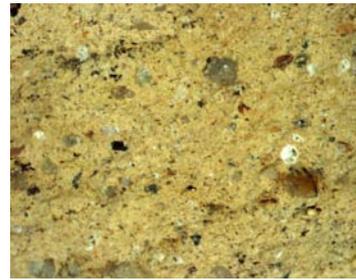
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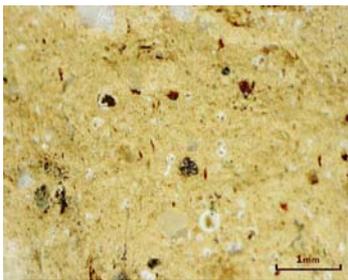
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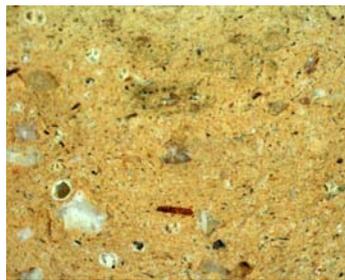
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Dressel 21-22 318



Dressel 21-22 319



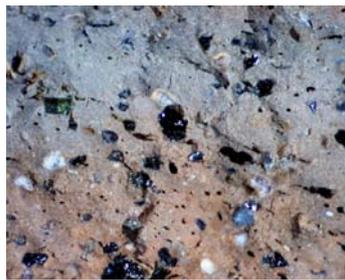
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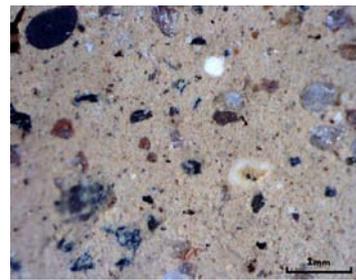
Dressel 2-4 321



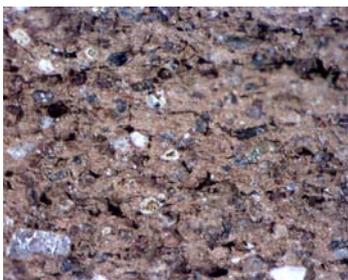
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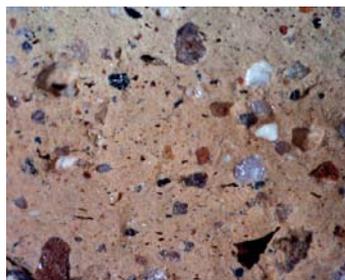
Dressel 2-4 323



Dressel 2-4 324



Dressel 2-4 325



Dressel 2-4 326



Schörgendorfer 558 327



Schörgendorfer 558 328



Gauloise 4 329



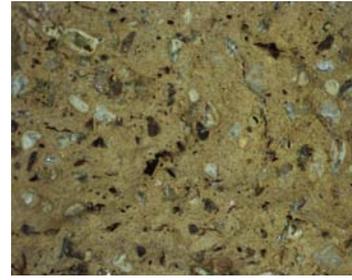
Early Roman 11 B 330



Lomba do Canho 67 331



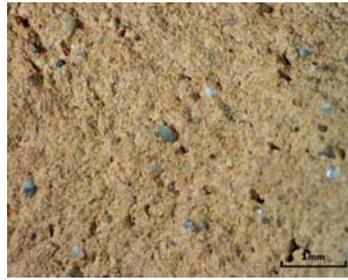
Haltern 70 332



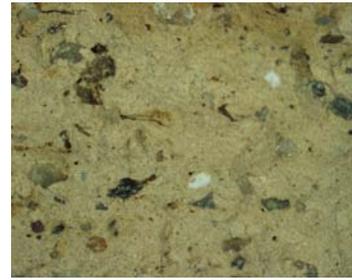
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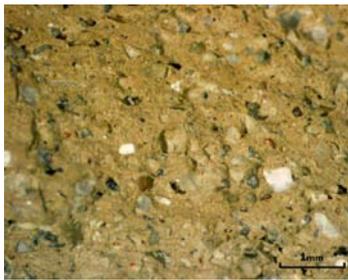
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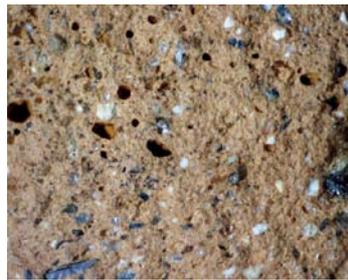
Pascual 1 335



Dressel 20 336



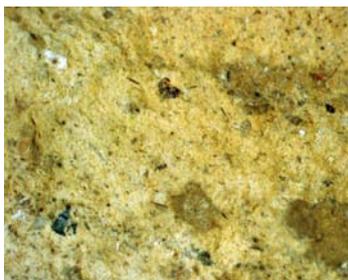
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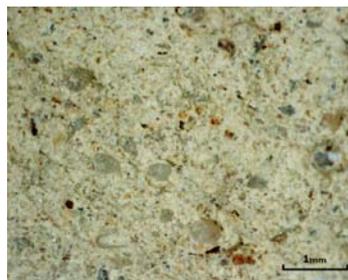
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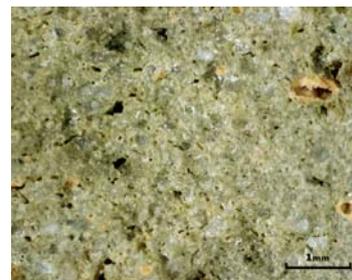
Dressel 20 339



Dressel 7 340



Dressel 9 341



Dressel 9 342



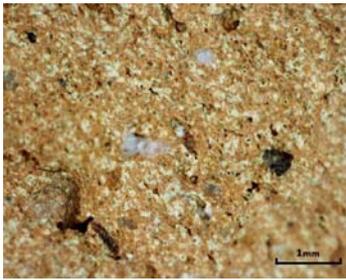
Dressel 9 343



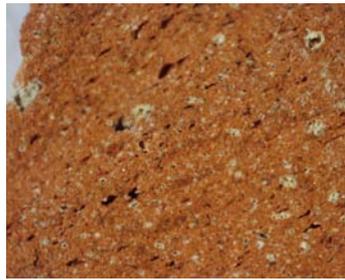
Beltran I 344



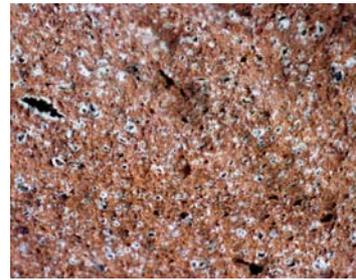
Miscellaneous 345



Miscellaneous 346



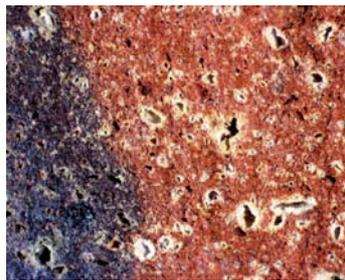
Miscellaneous 347



Miscellaneous 348



Miscellaneous 349



Miscellaneous 350



Miscellaneous 351



Miscellaneous 352



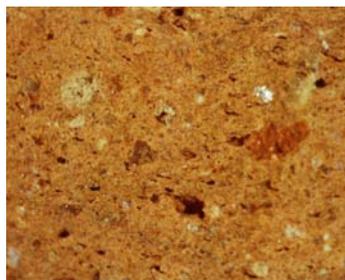
Miscellaneous 353



Miscellaneous 354



Miscellaneous 355



Miscellaneous 356



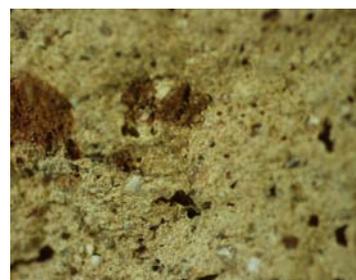
Miscellaneous 357



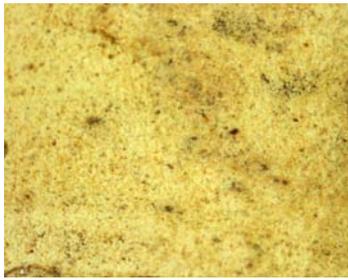
Stopper 358



Stopper 359



Stopper 360



Stopper 361



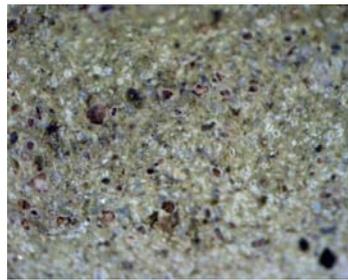
Stopper 362



Stopper 363



Stopper 364



Stopper 365



Stopper 366



Stopper 367



Stopper 368



Stopper 369



LR 1 370



LR 1 371



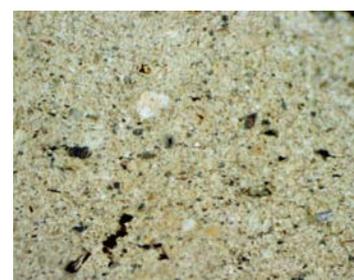
LR 1 372



LR 1 373



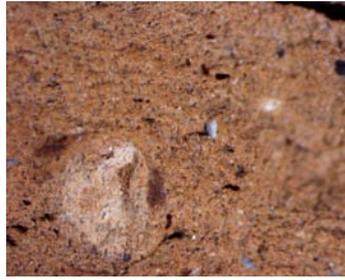
LR 1 374



LR 2 375



LR 4 / Gaza 376



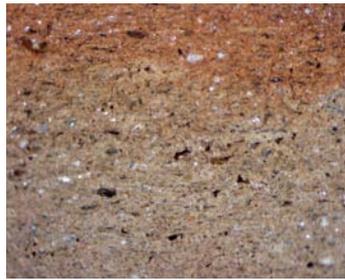
LR 4 / Gaza 377



LR 7 378



Agora M 275-282 379



LR 3 380



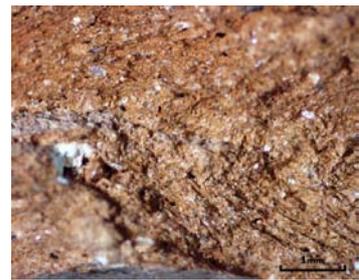
LR 3 381



LR 3 382



LR 3 383



LR 3 384



LR 3 385



LR 3 386



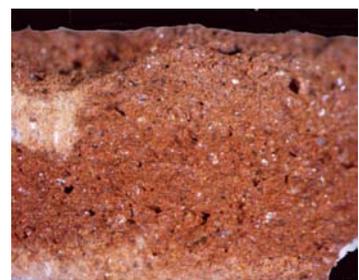
LR 3 387



LR 3 388



Ephesus 56 389



Ephesus 56 390



Ephesus 56 391



Ephesus 56 392



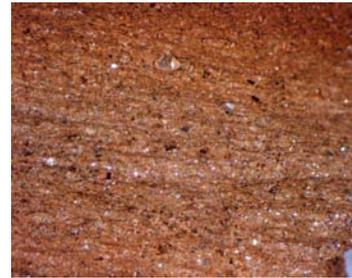
Ephesus 56 393



Ephesus 56 394



Ephesus 56 395



Ephesus 56 396



Ephesus 56 397



Ephesus 56 398



Zeest 84B 399



Samos Cistern Type 400



Samos Cistern Type 401



Kuzmanov IX 402



Kuzmanov IX 403



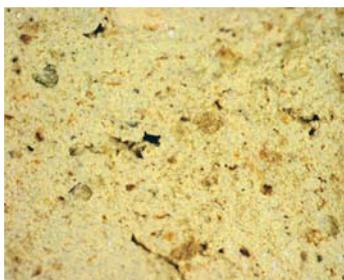
Ephesus 63 404



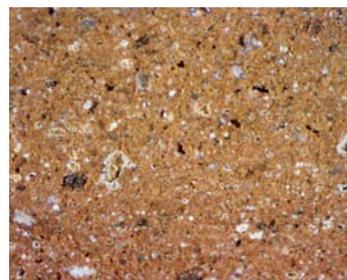
Zeest 84B 405



Zeest 84B 406



Agora M 273 407



Sabratha Sub Type 34N 408



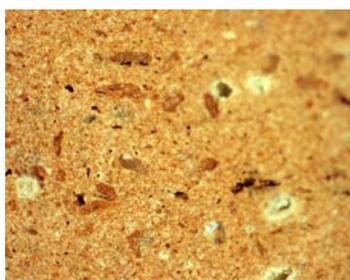
Ostia LIX / Bonifay 15 409



Africana II D 410



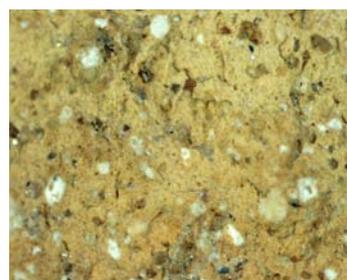
Keya 34 / Bonifay 53 411



Tripolitanian I 412



Tripolitanian III 413



Almagro 50 414



Mid Roman Amphora 1 415



Almagro 51C 416



Égyptienne Bitroconique 417



Spatheion small 418



Spatheion small 419



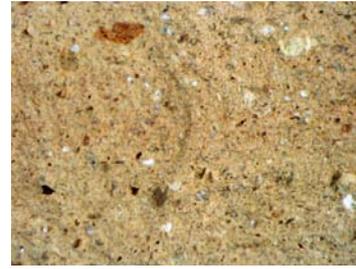
Spatheion 420



Rhodian 501



Rhodian 502



Rhodian 503



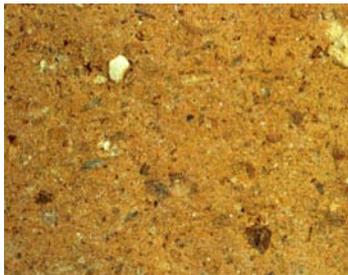
Rhodian 504



Rhodian 505



Chian 506



Knidian 507



Knidian 508



Knidian 509



Koan 510



Koan 511



Koan 512



Koan 513



Koan 514



Koan 515



Mushroom rim type 516



Mushroom rim type 517



Mushroom rim type 518



Mushroom rim type 519



Mushroom rim type 520



Mushroom rim type 521



Mushroom rim type 522



Mushroom rim type 523



Mushroom rim type 524



Mushroom rim type 525



Mushroom rim type 526



Mushroom rim type 527



Mushroom rim type 528



Mushroom rim type 529



Mushroom rim type 530



Mushroom rim type 531



Mushroom rim type 532



Mushroom rim type 533



Mushroom rim type 534



Mushroom rim type 535



Mushroom rim type 536



Mushroom rim type 537



Mushroom rim type 538



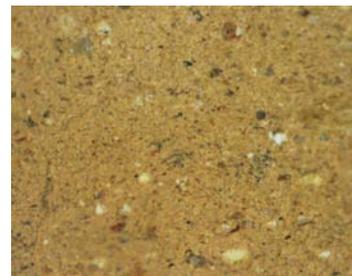
Local Aegean 1 539



Local Aegean 1 540



Local Aegean 1 541



Local Aegean 1 542



Local Aegean 1 543



Local Aegean 1 544



Agora F 65-66 545



Agora F 65-66 546



Agora F 65-66 547



Agora F 65-66 548



Agora F 65-66 549



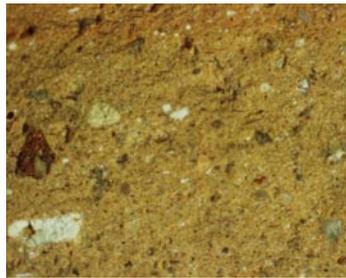
Agora F 65-66 550



Cup-shaped rim 551



Cup-shaped rim 552



Cup-shaped rim 553



Koan Pinched Handles 554



Miscellaneous 555



Punic 556



Dressel 1A 557



Dressel 1A 558



Dressel 1A 559



Dressel 1 560



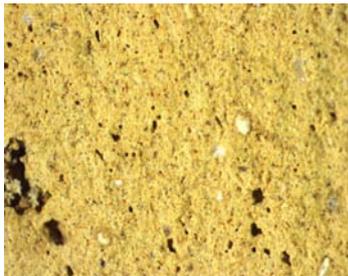
Dressel 1C 561



Dressel 1C 562



Brindisian 563



Lamboglia 2 564



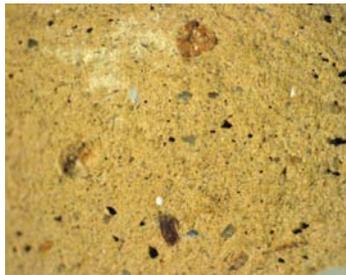
Lamboglia 2 565



Lamboglia 2 566



Lamboglia 2 567



Lamboglia 2 568



Lamboglia 2 569



Lamboglia 2 570



Dressel 6A 571



Dressel 2-4 572



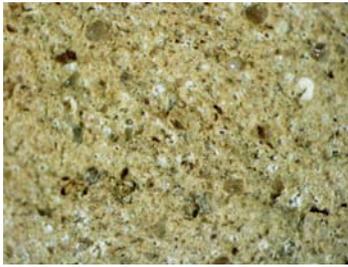
Dressel 2-4 573



Dressel 2-4 574



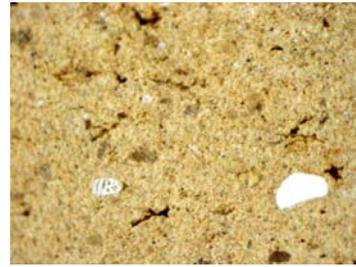
Dressel 2-4 575



Dressel 8 576



Beltran IIA 577



Dressel 12 578



Dressel 12 579



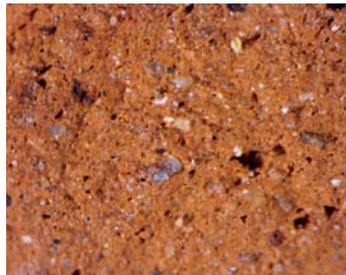
Dressel 20 580



Dressel 20 581



Kapitän II 582



Kapitän II 583



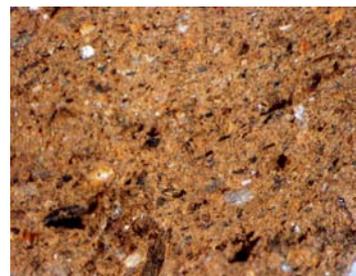
Kapitän II 584



Kapitän II 585



Kapitän II 586



Kapitän II 587



Kapitän II 588



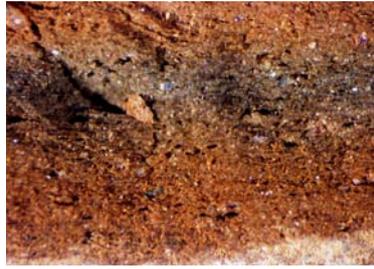
Kapitän II 589



Kapitän II 590



Kapitän II 591



Agora M 125-126 592



Agora M 125-126 593



Agora M 125-126 594



Agora M 125-126 595



Agora M 125-126 596



Agora M 125-126 597



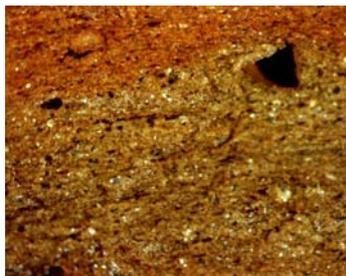
Agora M 125-126 598



Agora M 125-126 599



Agora M 125-126 600



Agora M 240, 255, 256 601



Agora M 240, 255, 256 602



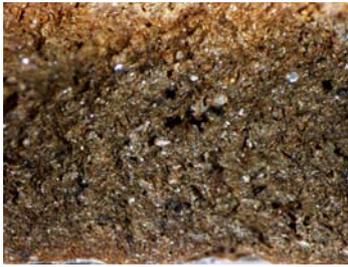
Agora M 240, 255, 256 603



LR 3 604



LR 3 605



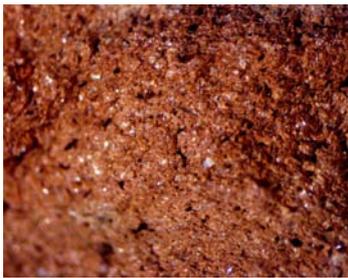
LR 3 606



LR 3 607



LR 3 608



LR 3 609



LR 3 610



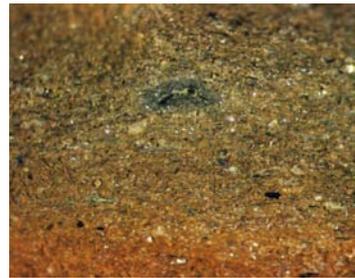
Ephesus 56 611



Ephesus 56 612



Ephesus 56 613



Ephesus 56 614



Ephesus 56 615



Ephesus 56 616



Dressel 30 617



Africana II D 618



Agora M 273 619



Agora M 273 620



Miscellaneous 621



Miscellaneous 622



Zeest 84B 623



Zeest 84B 624



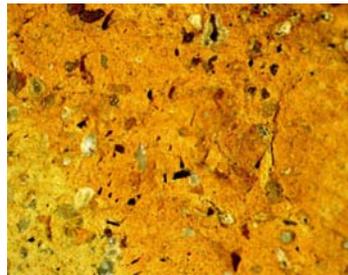
Zeest 80 625



Kuzmanov IX 626



LR 1 627



LR 1 628



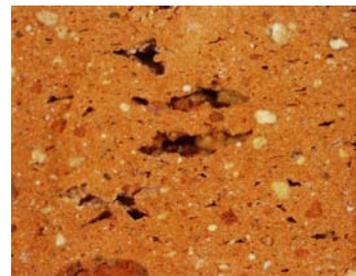
LR 2 629



LR 2 630



LR 2 631



LR 2 632



LR 2 633



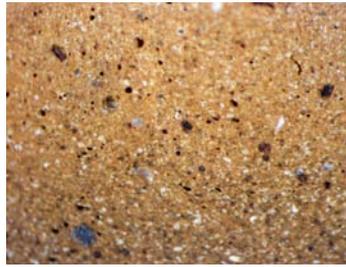
LR 4 / Gaza 634



LR 4 / Gaza 635



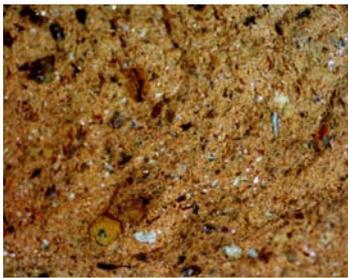
Miscellaneous 636



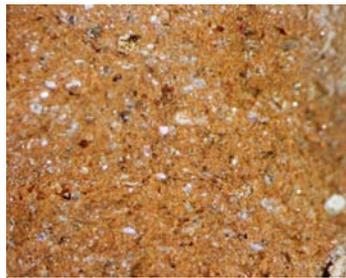
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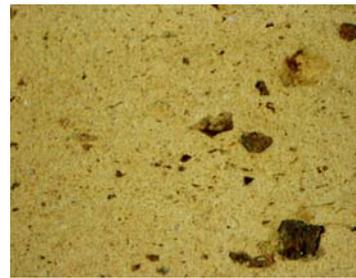
Miscellaneous 638



Miscellaneous 639



Miscellaneous 640



Miscellaneous 641



Miscellaneous 642



Miscellaneous 643



Miscellaneous 644



Miscellaneous 645



Miscellaneous 646



Dressel 6A 647



Dressel 6A 648



Dressel 2-4 649



Almagro 50 650



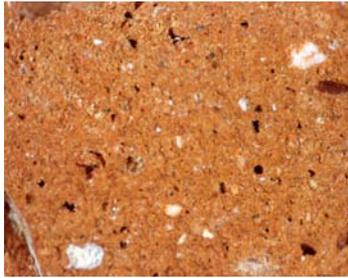
Knidian 701



Knidian 702



Koan 703



Koan 704



Rhodian 705



Dressel 5 706



Agora M 54 707



Aegean Local 1 708



Aegean Local 1 709



Kapitän II 710



Kapitän II 711



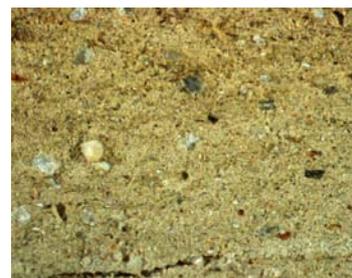
Agora M125-126 712



Agora M125-126 713



Beltran I 714



Dressel 20 715



Almagro 51C 716



Africana II 717



Tripolitana III 718



Zeest 75 719



Zeest 75 720



Zeest 75 721



Agora F65-66 801



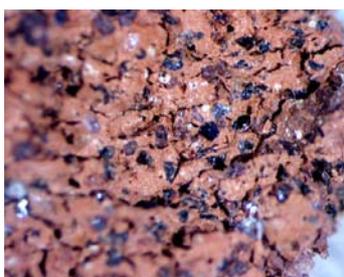
Lamboglia 2 802



Lamboglia 2 803



Dressel 6A 804



Dressel 2-4 805



Dressel 6A 810



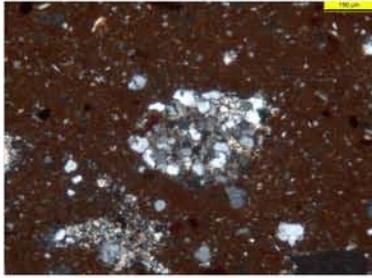
Dressel 2-4 811



Lamboglia 2 820



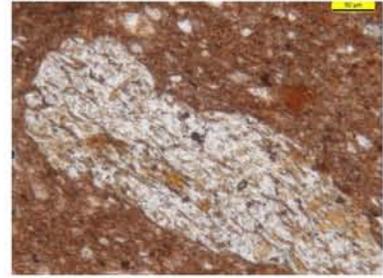
Brindisi type 830



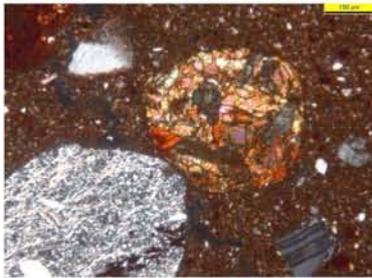
Rhodian 1



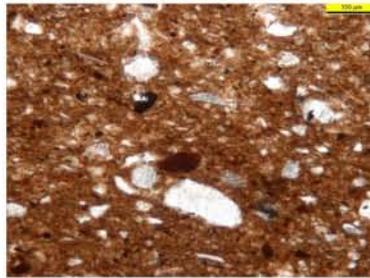
Rhodian 5



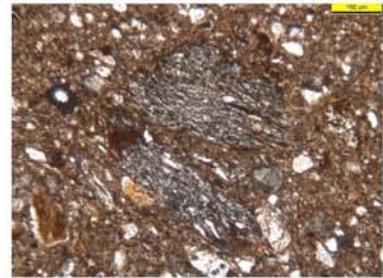
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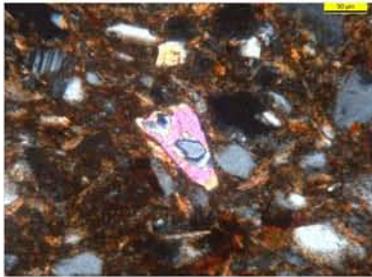
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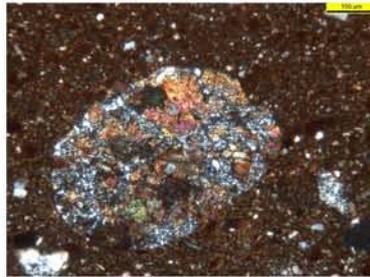
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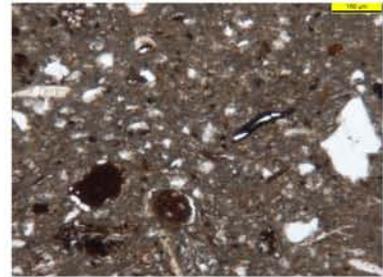
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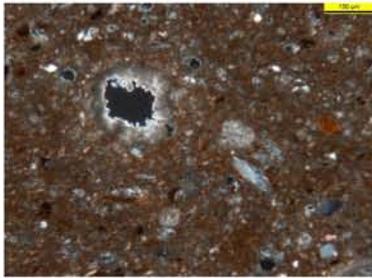
Koan 65



Koan 76



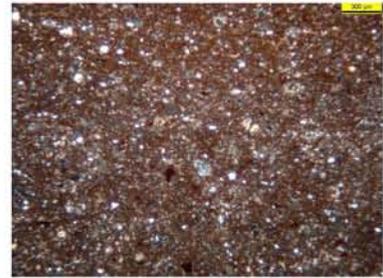
Agora F 65-66 79



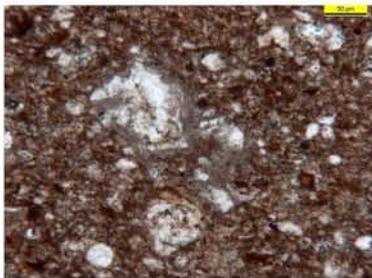
Cup-shaped rim 105



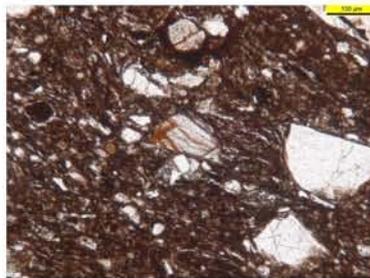
Cup-shaped rim 106



Cup-shaped rim 113



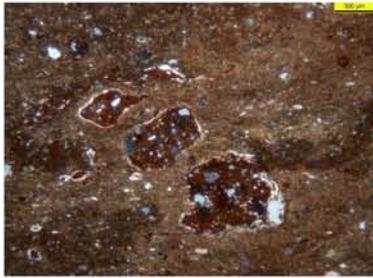
Cup-shaped rim 129



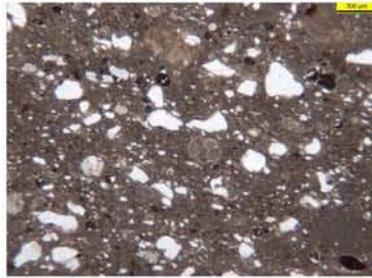
Agora M 54 140



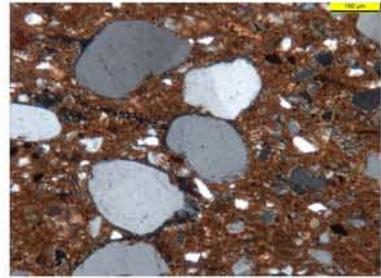
Dressel 25 172



Dressel 25 183



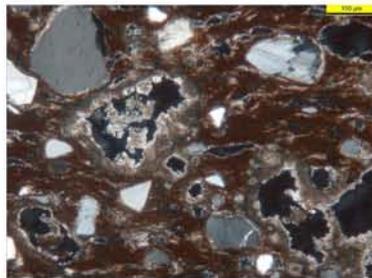
Baggy jar 192



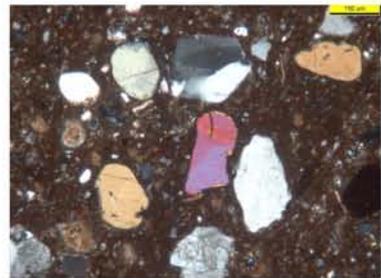
Baggy jar 193



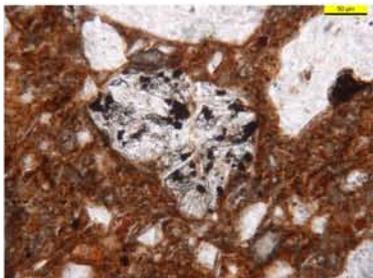
Baggy jar 195



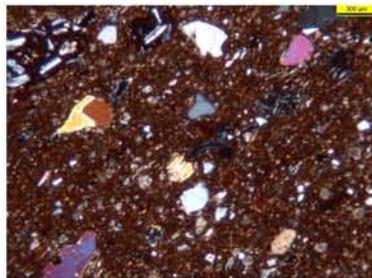
Van der Werff 2 198



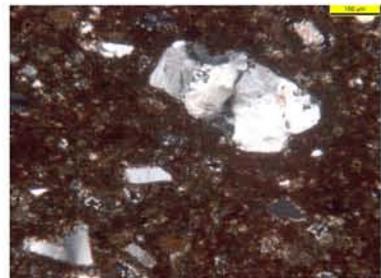
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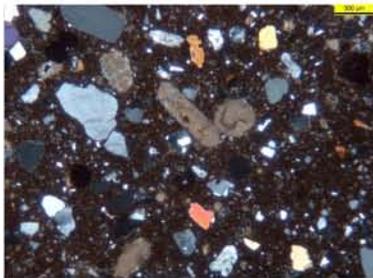
Dressel 1A 210



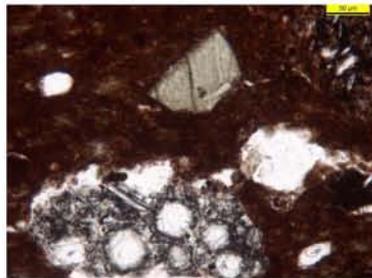
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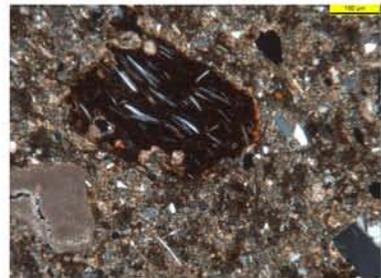
Dressel 1B 216



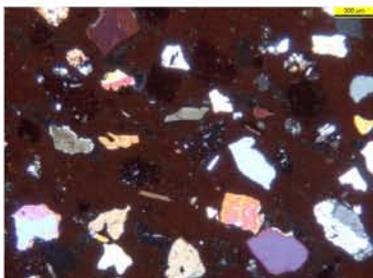
Dressel 1C 222



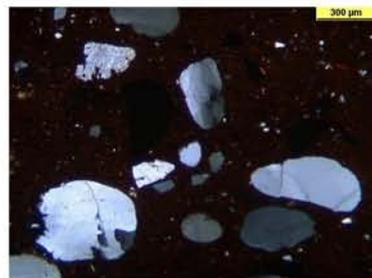
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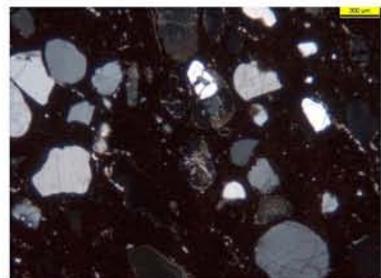
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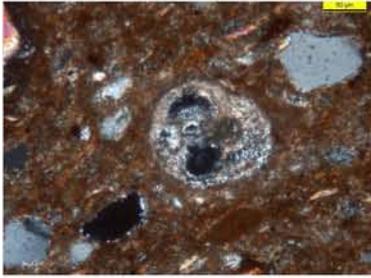
Dressel 1C 240



Dressel 1C 246



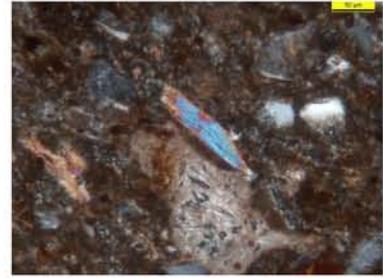
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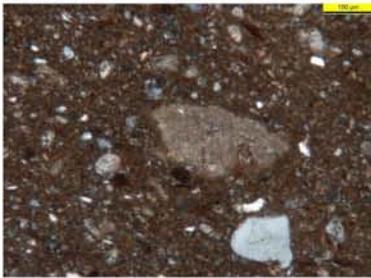
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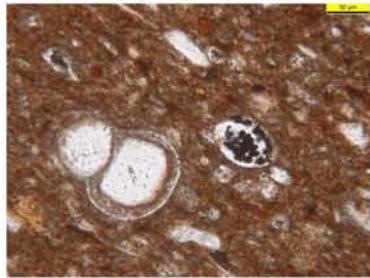
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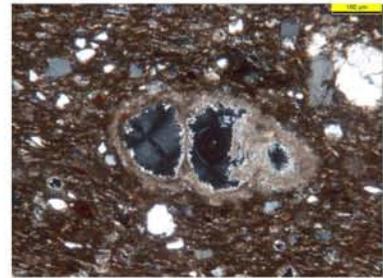
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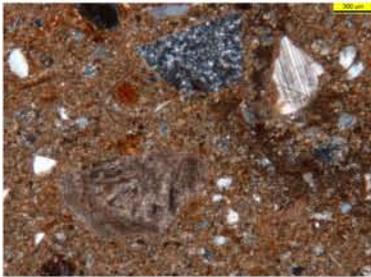
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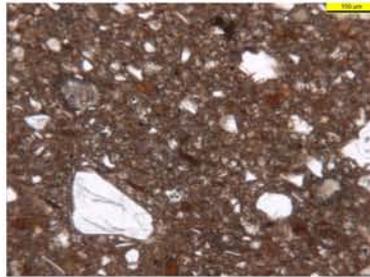
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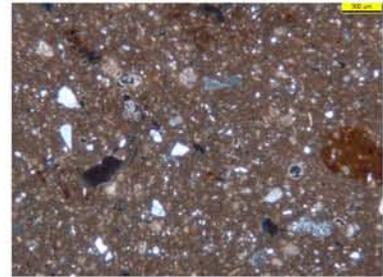
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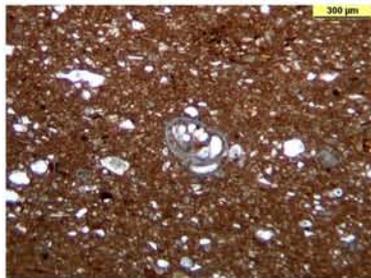
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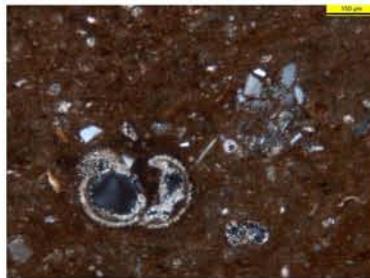
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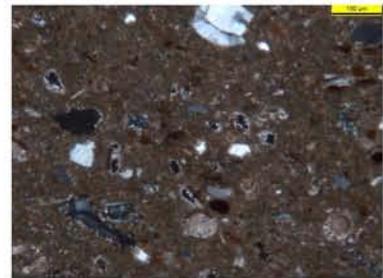
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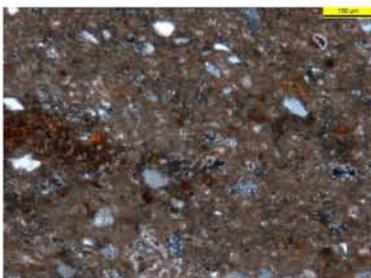
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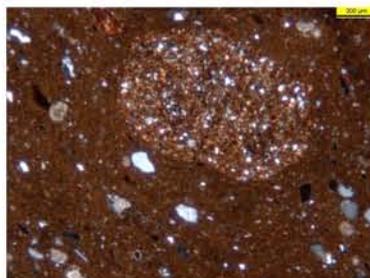
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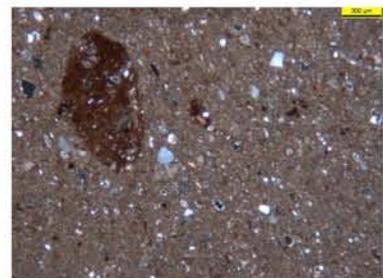
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Lamboglia 2 284



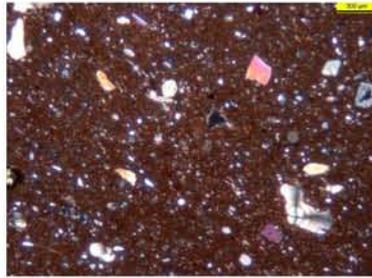
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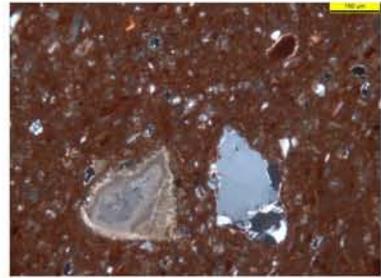
Dressel 6A 296



Dressel 6A 298



Dressel 21-22 301



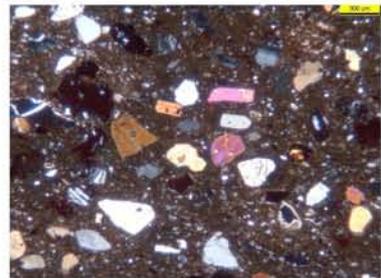
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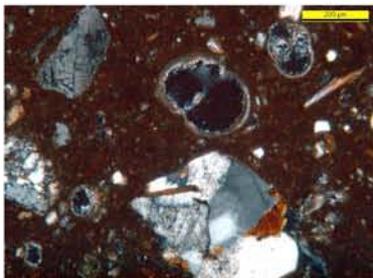
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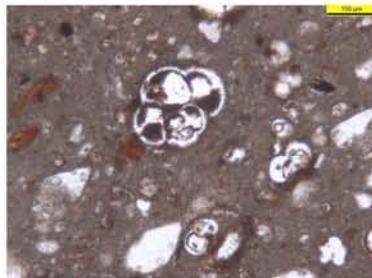
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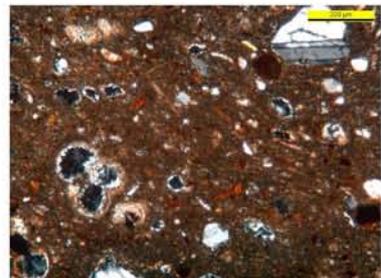
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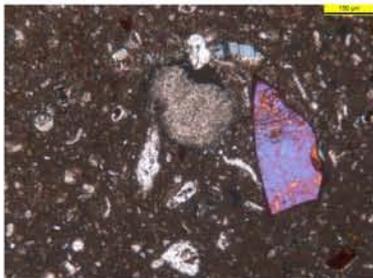
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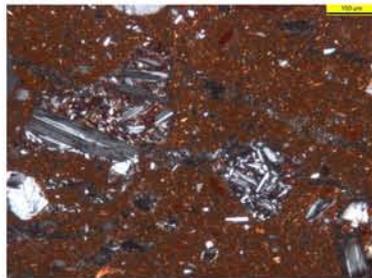
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Dressel 21-22 318



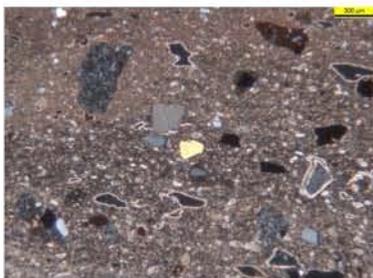
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Dressel 2-4 322



Dressel 2-4 323



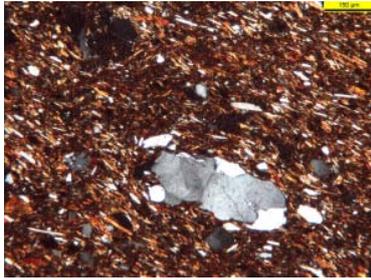
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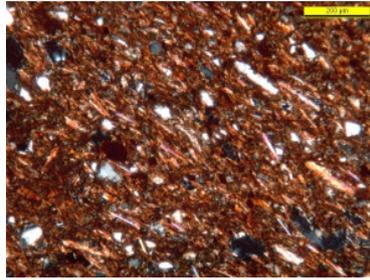
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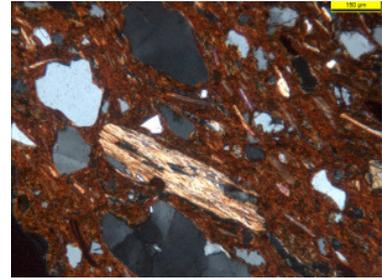
Dressel 9 341



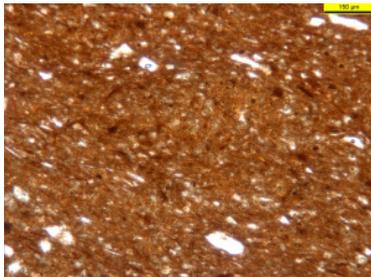
Rhodian A 10



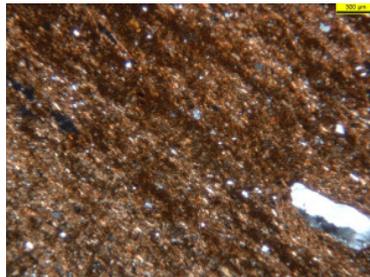
Rhodian A 14



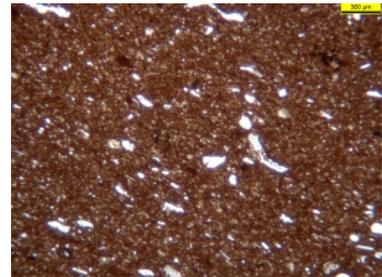
Agora F 65-66 A 80



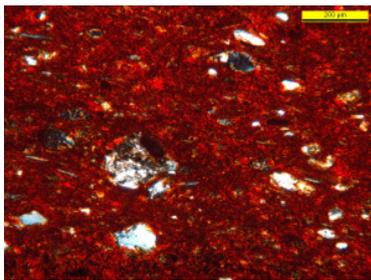
Agora F 65-66 A 81



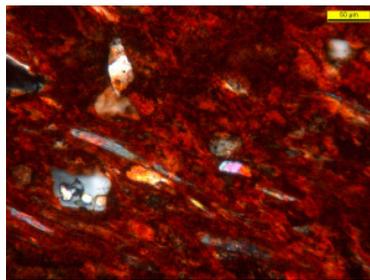
Agora F 65-66 A 91



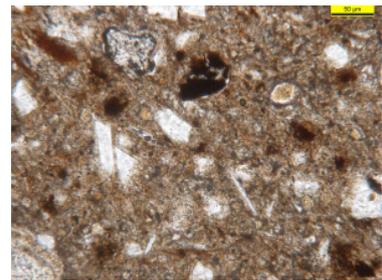
Cup-shaped rim A 111



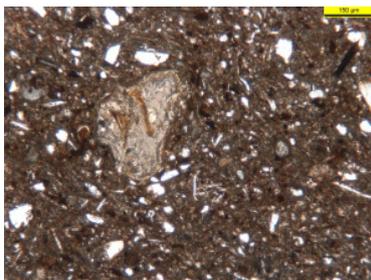
LR 3 B 381



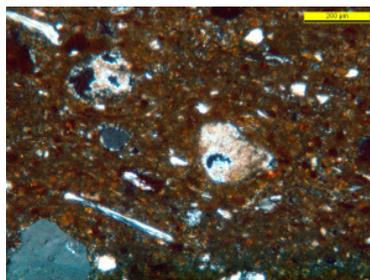
Ephesus 56 B 397



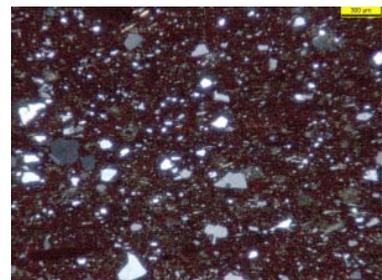
Cup-shaped rim C 120



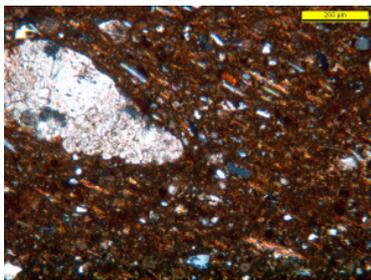
Cup-shaped rim C 124



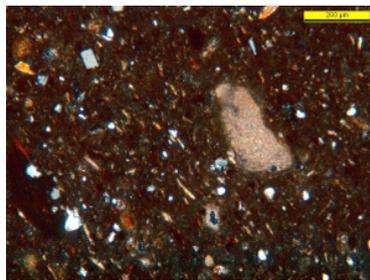
Local Aegean 1 C 152



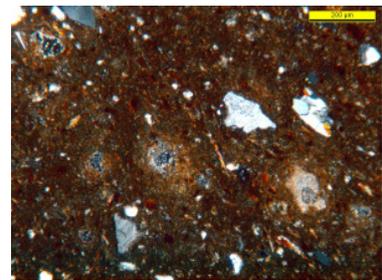
Local Aegean 1 C 157



Mushroom rim type C 527



Mushroom rim type C 531



Mushroom rim type C 98103