THE CIRCULATION OF AMPHORAE IN THE EASTERN MEDITERRANEAN FROM THE 5th TO THE 10th CENTURY AD.

Kyriakidou Theodora Nikoleta

UNIVERSITY CENTER OF INTERNATIONAL PROGRAMMES OF STUDIES
SCHOOL OF HUMANITIES, SOCIAL SCIENCES AND ECONOMICS

A thesis submitted for the degree of
Master of Arts (MA) in Black Sea and Eastern Mediterranean Studies

February 2023
Thessaloniki – Greece
Student Name: Kyriakidou Theodora Nikoleta
SID: 2201210006
Supervisor: Dr. Flora Karagianni

I hereby declare that the work submitted is mine and that where I have made use of another’s work, I have attributed the source(s) according to the Regulations set in the Student’s Handbook.

February 2023
Thessaloniki - Greece
ABSTRACT

This dissertation was written as part of the MA in Black Sea and Eastern Mediterranean Studies at the International Hellenic University. The study focuses on the study of commercial amphorae of the Byzantine period from the 5th until the 10th century AD. The material that is going to be studied, results either from the land excavation site or from the shipwrecks through the underwater excavations. The study of amphorae will explore the raw materials that were transported, trade relations and transactions, the means of transport (amphorae) as well as the trade routes that connected the regions of the Eastern Mediterranean during this period. Since the area to be studied extends over a vast coastline and includes a plethora of islands, it is certain that in the effort to study and locate the main commercial stations and roads, the research of some ancient ports will be included. More specifically on the trade relations and trade routes that developed between the regions of the Eastern Mediterranean, the study of commercial amphorae is the most reliable, if not the only, method. Ceramics, whether intact vessels or sherds, are the most common findings of excavations and often the only means of dating archaeological finds. Therefore, the systematic study of the pottery and its comparison with similar examples from other areas testifies in addition to the dating, the production workshops, the origin of the vessels and therefore the relations between the areas and the transactions.

As for the raw materials that were transported, the specialized analyzes carried out on the amphorae testify to the type of their content, making clear the products to be transported. In this way an attempt is made to understand the products that were imported or exported in each region. In this case the amphorae to be studied contained mainly oil and wine. In conclusion, North Africa and the Eastern Mediterranean are interconnected through trade routes. The Black Sea region can be added to this network. The connecting link of all regions and trade relations during this period is the Aegean and Istanbul, which controls both the moving products and the other transactions. The movement of products, although mainly by sea, is not limited to the coastal areas as the sole recipients of the goods, but they penetrate inland, thus making the commercial networks even more complex. The aim of this dissertation is the study of as many commercial networks as possible as well as the identification of raw materials that were imported and exported in the areas to be studied.

Special tribute I would like to pay to my supervisor Dr. Flora Karagianni for her guidance and insight observations during the preparation of this dissertation thesis.

Keywords: Late Roman and Byzantine amphorae, trading routes, shipwrecks, maritime trade, Eastern Mediterranean.

Kyriakidou Theodora Nikoleta
28/02/2023
PREFACE

Since my undergraduate studies, the study of ceramics was of particular interest to me. The attendance of pottery courses was always a pleasant process and not a mandatory procedure. Also, pottery is the most common find in an excavation and often the only way for a researcher to conclude in a dating. Therefore, this makes the study of pottery very important for the archaeological research and an essential tool for the archaeologist.

My knowledge in pottery was expanded during my first MA dissertation at the International Hellenic University as object of my study was the Hellenistic fine pottery from the plot Karasavvidou in Veroia. Since I strengthened my knowledge on the pottery of the Hellenistic period, I considered it is crucial to proceed with the study of the later period, the late Roman and early Byzantine era, with the study of Byzantine amphorae. The choice of amphorae as the only shape of study in this dissertation is due to its extensive production and circulation throughout the Mediterranean during this period. Also, apart from the fact that it is a crowded form with many typologies per period and region, the study of commercial amphorae advocates to draw conclusions about the economy of these regions during the early Byzantine period as well as the commercial networks that existed.
CONTENTS

ABSTRACT .............................................................................................................................................. i
PREFACE ................................................................................................................................................ ii
INTRODUCTION ...................................................................................................................................... 1
HISTORICAL CONTEXT ............................................................................................................................ 2
I. TYPOLOGY OF AMPHORAE ................................................................................................................. 4
   I.i. LATE ROMAN AND EARLY BYZANTINE AMPHORAE ................................................................. 4
       (5TH – 7TH CENTURY AD) ............................................................................................................... 4
   I.ii. BYZANTINE AMPHORAE (7TH – 10TH CENTURY AD) .............................................................. 7
   I.iii. GÜNSENIN TYPE AMPHORAE (FROM THE 10TH CENTURY ONWARDS).......................... 9
II. AREAS OF AMPHORAE PRODUCTION AND DISSEMINATION .................................................. 11
   II.i. AEGEAN ISLANDS ...................................................................................................................... 11
       II.i.i. Kos ........................................................................................................................................ 11
       II.i.ii. Chios ................................................................................................................................... 12
       II.i.iii. Paros ................................................................................................................................. 13
       II.i.iv. Samos ................................................................................................................................ 13
       II.i.v. Crete and Pseira ................................................................................................................. 14
   II.ii. MACEDONIA AND THRACE ..................................................................................................... 16
       II.ii.i. Thessaloniki ....................................................................................................................... 16
       II.ii.ii. Chalkidike ......................................................................................................................... 17
       II.ii.iii. Philippi ............................................................................................................................ 18
       II.ii.iv. Thasos ............................................................................................................................. 19
   II.iii. ASIA MINOR AND CONSTANTINOPLE .................................................................................. 19
       II.iii.i. Saraychane ....................................................................................................................... 19
       II.iii.ii. Yenikapi ........................................................................................................................... 20
       II.iii.iii. Kucukcekmece Lake Basin ............................................................................................. 20
       II.iii.iv. Parion ................................................................................................................................ 22
       II.iii.v. Cilicia ............................................................................................................................... 23
   II.iv. CYPRUS ...................................................................................................................................... 23
   II.v. SYRO-PALESTINE ..................................................................................................................... 24
       II.v.i. Beirut .................................................................................................................................... 25
       II.v.ii. Apamea ............................................................................................................................. 26
       II.v.iii. Homs .................................................................................................................................. 26
   II.vi. NORTH AFRICA ....................................................................................................................... 26
II.vi.i. Lamluda ........................................................................................................ 27
II.vi.ii. Naukratis ...................................................................................................... 27
II.vi.iii. Istabl Antar-Fustat ...................................................................................... 28

III. SHIPWRECKS .................................................................................................. 29

IV. CONCLUSIONS .................................................................................................. 31

BIBLIOGRAPHY ....................................................................................................... 34

LIST OF FIGURES .................................................................................................. 40

FIGURES .................................................................................................................. 44
INTRODUCTION

The most common shape for transporting and storing liquid and solid food was amphorae. Etymologically, the word amphora comes from the ancient words ‘αμφή’ and ‘φέρω’, thus indicating that both hands were used to carry the vessel as well as its content. Amphorae have been known since antiquity, but during the early Christian and Byzantine periods they were widespread until the time of the Paleologues, when they were abandoned. Therefore, during this period of great distribution, the name of the amphora changes to ‘κούφον’ in the early Christian era and to ‘μεγαρικόν’ or ‘μαγαρικόν’ during the Byzantine era.¹

Morphologically, amphorae were vessels of large dimensions, often with several inclusions inside the clay and had thick walls capable of withstanding transportation.² Their shape served their loading and placement on transport ships with the aim of saving space and avoiding breakage. For this reason, the body is closed, usually ribbed to adjust with the fingers of the carrier and not slip, with a narrow neck, rounded base and two handles for transportation. The shape of these vessels, in addition to preventing breakage due to their durability and service in transport, also helped to stack them in the storerooms of ships with the following manner: shoulders, necks and mouths of four amphorae of the lower layer formed a socket suitable to receive the lower part of the upper layer of amphorae, while their handles filled additionally the empty spaces that were formed between the layers and also supported the vessels of the upper layer from the sides. (Fig. 1) Consequently, a good ship loading should be done with amphorae of the same shape, either with tall bodies or with short and sturdy, to achieve the perfect fit between them.³ For the insurance of the commodity contributed the lids, which were used to seal the rim. In this way the outflow of the product was avoided as well as its adulteration. The use of amphorae is not limited only to commercial purposes. There are quite a few cases where they are found in residential or ecclesiastical storage areas for grain and liquid storage. Other not so common uses of them are their incorporation as structural material in the vaults of the buildings, as drain piped while there are usually served as lids in vessels.⁴

---

¹ Bakirtzis 2003, 70-71.
² Petridis 2013, 38.
³ Bakirtzis 2003, 71-73.
HISTORICAL CONTEXT

The beginning of the Byzantine empire is marked by the foundation of Constantinople in 324 AD by Constantine the Great, while the fall of the empire in 1453. Constantinople was also called New Rome as the political seat of the emperor was transferred to the new capital. These eleven centuries of life of the Byzantine empire were full of upheavals of fundamental importance. Two of the most important changes over the centuries that disrupted Byzantine politics, society but more so the territorial extent of the empire were the rise of Islam and the settlement of the Arabs on the eastern and southern shores of the Mediterranean in the 7th century as well as and the conquest of Asia Minor by the Turks in the second half of the 11th century AD.\(^5\) In terms of geographical extent, the Byzantine state was much larger during the early period of the empire.\(^6\)

The transfer of the capital from the west to east also meant that Constantinople inherited the geographical space of the Roman Empire. Therefore, the main role of the New Rome was to restore the old, enlarged boundaries of the empire. So, in the 4th century, after the treaties with the Persians, the territories of the Balkans, the Black Sea, Syria and Egypt belonged to the territories of Constantinople.\(^7\) At the end of the 4th century, after the death of emperor Theodosius in 395 AD, the empire was divided in two administrative center, the western led by Honorius and the eastern led by Arcadius.\(^8\) The 5th century was marked by the fall of Rome as after a period where the empire was divided into two part, the empire once again gets only one emperor.\(^9\) In the 6th century emperor Justinian through long wars he led the empire to the height of its territorial extent.\(^10\) He managed to extend the boundaries of the empire in Africa to the Atlantic, south of the Iberian Peninsula, Sardinia, Corsica, almost all of Italy and all of Dalmatia.\(^11\)

From the middle of the 6th century and throughout the 7th century, new people entered the background, ushering in a new period of disputes after the death of Justinian in 565 AD. The borders changed radically as Longobards settled in northern Italy, the Slavs northwest and north of the once-conquered Balkans as far as the Aimos, the Arabs conquered Syria, Palestine, Egypt and northern Africa.\(^12\) In the 8th century the two great fronts besieging the empire, the Slavs and the Arabs, remain active.\(^13\) In the 9th century AD emperor Basil I the Macedonian deal with ecclesiastical, geographical and domestic political issues. The new territorial expansion included the annexation of areas of southern Italy. Additionally, he

\(^6\) Mango 1990, 16.
\(^7\) Karagiannopoulos 1985, 52-53.
\(^9\) Karagiannopoulos 1985, 97.
\(^11\) Karagiannopoulos 1985, 53.
\(^12\) Karagiannopoulos 1985, 53, 123.
\(^13\) Stathakopoulos 2017, 157-162.
managed to dominate the Adriatic while in the Mediterranean he succeeded to intercept the Arabs.\textsuperscript{14}

Regarding the impact of the historical events of the empire on the production and circulation of amphorae, until the 5\textsuperscript{th} century Rome and its provinces were the largest center of amphorae production. With the fall of Rome in 476 AD and the doubling of imperial territories from Justinian, the eastern Mediterranean dominated in production and trade of amphorae from the late 5\textsuperscript{th} until the 7\textsuperscript{th} century AD.\textsuperscript{15} Although, the period between 5\textsuperscript{th} and 7\textsuperscript{th} century, appear to had been an extremely busy period in the Aegean, amphorae production began to decline after the 7\textsuperscript{th} century AD due to the loss of trade security provided by the Roman Empire as the Eastern Roman Empire developed into the Byzantine state. Additionally, from the middle 7\textsuperscript{th} century and onwards, important changes in the Empire’s frontiers and size took place as Arabs penetrated into the central Mediterranean basin: Syria, Palestine and Egypt that until then had provided the Empire with agricultural products fell to the Arabs in 640s. The defeated Asia Minor was the most important and the most enduring bulwark of Byzantine strength. Except of the Arabs’ penetration, already from the end of the 6\textsuperscript{th} century and throughout the 7\textsuperscript{th} century, the Balkans received a large wave of Slavic colonization. So, during this century changes took place in the structure of the administration and the extent and nature of commerce.\textsuperscript{16} From the end of the 9\textsuperscript{th} to the beginning of the 11\textsuperscript{th} century, Byzantium successfully faced enemies on three fronts that occupied it in the previous centuries as well: west to Italy and the Adriatic, north to the Balkans and Black Sea and east to Syria and Caucasus.\textsuperscript{17}

\textsuperscript{14} Karagiannopoulos 1985, 142. \\
\textsuperscript{15} Diehl 2007, 7. Silver 2017, 185. \\
\textsuperscript{17} Stathakopoulos 2017, 194-195.
I. TYPOLOGY OF AMPHORAE

I.i. LATE ROMAN AND EARLY BYZANTINE AMPHORAE

(5TH – 7TH CENTURY AD)

In the period under examination (5th until 10th century AD) the types and the subtypes of amphorae that are produced and moved in the Mediterranean are quite large. The greatest diversity of types is observed in Late Roman period and early Byzantine times, while in Byzantine period the few types seem to imitate their predecessors. The first type of early Byzantine amphorae to be developed is Late Byzantine Amphora 1 (LRA 1).\(^{18}\) (Fig. 2) S. Demesticha divides LRA 1 in three subgroups according to their typology and chronology.\(^{19}\) These are cylindrical amphorae with the vertical axis highlighted. The cylindrical body is basically covered by sparse grooves, which near the base and shoulders usually become denser. The body ends in a rounded base that usually follows the lines of the body without particular configuration. Most of the time it also has the same grooves or is undecorated, but less often the existence of a knot is observed. At the upper point of the vessel there is a relatively low cylindrical neck that ends in a cylindrical and narrow rim. Often below the rim there is a groove from which start two asymmetrically placed vertical handles ending at the shoulder of the vessel, that never exceed the height of the rim. The height of the first type does not exceed 50 to 55 centimeters, while in capacity they ranged from 10 to 19 liters. The clay is sandy with some fine limestone and mineral inclusions and ranges from pinkish to reddish-yellow color. Late Roman Amphora 1 is the most widespread type of the first centuries of the Byzantine Empire, both geographically and quantitatively. It begins to be produced in the early 5th century and continues to spread until the 7th century throughout the Mediterranean and beyond. South Asia Minor and more specifically Cilicia is suggested as the place of origin, but kilns of Late Roman Amphorae 1 were also found in Northern Syria, Cyprus, Kos, Rhodes and Leipsi Island.\(^{20}\) The main use of Late Roman Amphorae 1 was for transportation of wine and secondarily, perhaps, of oil. Empereur and Picon was recognizes 15 pottery kilns producing LRA 1. They located the kilns in the regions of Cilicia, north Syria, Rhodes and Cyprus.\(^{21}\) A kiln of LRA 1 was also revealed on the southern coast of Cyprus and dates in the 6th to 7th century AD.\(^{22}\) Finally, Soli-Pompeio, Elaiussa-Sebaste, Aegeai (Yumurtalik/Ayas), Kos Island/Halasarna, Paros Island/Naoussa, Lipsi Island, Zygi-

\(^{18}\) According to Hayes type 5 (Hayes 1992, 63-64), Gerousi 1997, 252.

\(^{19}\) Demesticha 2014, 601-602.


\(^{21}\) Demesticha 2014, 601.

\(^{22}\) Reynolds 2005, 565.
Petrini, Paphos, Amathous are some of the production centers, while in Halasarna Late Roman Amphorae were also reused for infant injections. (Fig. 3)

The second most common type is the Late Roman Amphora 2 (LRA 2). (Fig. 2) It is about a globular, broad bellied amphora with cup-shaped, everted rim, short tapering neck, wide shoulder, ring-shaped handles or with oval-shaped section starting from the neck and ending to the shoulder, spherical body with parallel grooving from shoulder down to the belly and a rounded base that sometimes bears a central knob. Drab brown to pinkish-red clay, fine grained, hard with large lime inclusions and sometimes mica. There are two subtypes of Late Roman Amphorae II: A) fairly shallow straight grooving, short neck with large bulging mouth and B) wavy grooving, deeply cut to form a series of sharp ridges, longer neck with smaller mouth. The second type of amphorae appeared already from the late 4th century but it became very common in the Aegean and the Black Sea from the third quarter of the 5th century until the 7th century AD. They are found in the Black Sea, in the Eastern Mediterranean and mainly in the Aegean area (Samos, Chios, Cyprus) but also in smaller numbers in the West (France, Spain, Britain). Probably, LRA 2 originated from the area of Eastern Aegean Sea, but kilns producing LRA 2 were found in Erionida in Peloponnese and in Alasarna of Kos. In the light of current research, production centers are: Dilesi, Khios, Argolis/Khaliæis-Kounoupi, Paros Island/Nausa, Kos Island/Halasarna, Cyprus Island/Paphos, Zygi, Amathous and Crete/Gortina (Fig. 4) Late Roman Amphorae 2 were used for the transportation of oil and wine.

The third type of Late Roman Amphorae (LRA 3) is slightly different from the previous two as losses both the cylindrical or globular body and the rounded base. (Fig. 2) There are amphorae with slender body, slightly bulbous, pointed foot, conical and short neck, small ring rim and short handles starting from neck and ending on shoulder. The specificity of the Late Roman Amphora 3 also lies in the fact that an early subtype A appeared as early as the 1st century AD and continues until the 5th century, when it is replaced by the later subtype B. Type A characterized by its unique handle and the fine close-set ribbing of the body, while from the end of the 4th century AD type B has two handles and wider ribbing. The clay is buff brownish or reddish-brownish, clearly enough often with some traces of lime. Western Asia Minor is considered to be their place of origin, while examples of the type are found in the Eastern Mediterranean and the Black Sea. It is observed that this is not a frequent type among the excavation finds as both in Saraçhane and Halasarna of Kos (two well studied archaeological sites) only one Late Roman Amphora of type 3 was found. (Fig. 5)

23 Kara 2021, 79.
24 Diamanti 2010 (a), 64, 66.
28 Kara 2021, 75.
29 Diamanti 2010 (a), 108.
The peculiarity of the Late Roman Amphora 4 (LRA 4) lies mainly in its small ring-shaped handles and the absence of neck. (Fig. 2) The body is long and cylindrical with tapering and conical lower part and base. The shoulder pass to the short and beadlike rim directly from the shoulder. The small thick ring handles attached at the edge of the shoulder. Sharp ridges decorate the shoulder and the part just above the base. The clay is thick and sandy with dull brownish to buff brown and sometimes greyish color, containing some calcite. Late Roman Amphora 4 appears in the South-Eastern Mediterranean as well as in Western Europe, from the 4th to the 6th century, their spread limited progressively in the Gaza area. (Fig. 6) Due to this later limited production of the type 4 and their origin from Gaza, they are also named as ‘Gaza Amphorae’.

The next type is Late Roman Amphora 5/6 (LRA 5/6) or according to Hayes’ classification in types 8 and 7 respectively. (Fig. 2) It is actually a type of amphorae with a bag-shaped body, rounded base and shoulder, cylindrical and short neck, straight and ring collar-rim with ring handles attached at the edge of the shoulder. The variation in the composition of the clay separates the amphorae of this shape into two subtypes. Late Roman Amphorae 5 have a sandy buff to reddish clay with very sandy texture, while Late Roman Amphorae 6 have a well-fired, hard reddish clay in the core with a grayish surface. As regards the ribbing of the two subtypes, the first one has a close-set ribbing on body widening close to base. The second type shallow grooving on all body surface. According to Hayes classification type 7 (LRA 6) has two subtypes depending on the configuration of the rim in a) amphorae with flat molding rim with a small band at the junction of the rim with the neck and b) amphorae with simpler rim and slightly ridges at the end of the shoulder forming a carination. The first subtype produced mainly in the 5th century, while the second one seems to be later (later 6th until the 7th century AD). The amphorae with the above features belong to a long tradition of amphorae production of the same shape stretching from the 2nd to the 9th century. Late Byzantine Amphorae 5/6 as well as their subtypes date from the 5th until the 7th century AD. Palestine and Egypt are identified as the place of production of this age-old shape. Nevertheless, its spread is observed throughout the Aegean Sea, Cyprus as well as Carthage. Olive oil, brined fish and fish products are thought to have been carried by these amphorae, but the most heavily transported product is wine.

Another quite different in shape is Late Roman Amphora 7 (LRA 7). (Fig. 2) There are carrot-shaped amphorae with long and tapering body, angular shoulder, narrow neck, oval section handles crudely attached on shoulder and neck and sharp bottom. Late Roman Amphorae 7 also have two subtypes depending on the structure of the shoulder and the toe spike. The first variation has a sharp angular and carinated shoulder and corrugations that look like screws on the toe spike. The second variation is formed with a more sloping shoulder without screw-like corrugations on toe spike, also neck on second subtype is quite longer. The clay is dull brown with soft, thick

---

35 Kara 2021, 81.
and sandy texture, gold mica flakes and a few straw-impressions. The dating of these amphorae extends from the 5th until the 7th century AD. The origin of the Late Roman Amphorae 7 is attributed to the Nile Valley, perhaps in Oxyrhyncus region. However, they spread through the Mediterranean Sea and mainly found in Egypt.  

A long cylindrical amphora with concave neck, heavy squarish rim and two short straplike handles, named ‘North African’, appeared in the late 4th century and continued to be produced until the 5th century AD. A shallow ribbing covers all the surface of the body. (Fig. 7) The clay is hard, pinkish-red in color. The origin of the type is probably from Northern Africa, from where took their name.

One more type with long and cylindrical body is the ‘Spatheion’ or otherwise LRA 8 of Riley’s classification or types 13 and 14 of Hayes’ typology. ‘Spatheia’ got their name from their resemblance to swords, they are also referred to the egyptian papyri as units of measurement. There are slend carrot-shaped amphorae with pointed toe, short neck, heavy molded rim and two small handles attached on the neck. (fig. 8) The clay is reddish, buff at surfaces, hard and fairly sandy in texture (LRA 8b). Hayes differentiates the ‘Spatheion’ in subtype B conforming to the smaller size, the bulging rim, the tiny handles attached on neck, the short toe and the color of the clay, which becomes slightly sandy greenish- or yellowish-buff (LRA 8a). The type probably evolved from the North African cylindrical amphorae around 400-450 AD. Consequently, LRA 8 originates from North Africa and perhaps also from Northern Italy. The type appeared in the 5th century, while the subtype LRA 8a introduced in late 6th century until the 7th century AD.

I.ii. BYZANTINE AMPHORAE (7TH – 10TH CENTURY AD)

The Byzantine amphorae that began to be produced in the 7th century AD are a development or imitations of the Late Roman Amphorae, that were analyzed above. The majority of Later Byzantine Amphorae divided in those imitating two Aegean amphorae types, LRA 1 and LRA 2. The most common type that is considered as development of the earlier LRA 2, is also known as byzantine globular amphorae. The type of LRA 13, which was first recognized by Riley in his study of the pottery from Berenice, is problematic. Some scholars, tend to identify these byzantine

39 Reynolds 2003 (b), 726. N. Poulou also supports that after the 7th century AD there are still imitations of LRA 2. Poulou 2001, 243-245. Poulou 2014, 138-139.
40 Vroom 2005, 61.
41 Poulou 2014, 874.
globular amphorae with the Late Roman Amphorae 13 (LRA 13)\textsuperscript{42}, according to Riley’s typology, but others do not accept this identification.\textsuperscript{43}

Byzantine globular amphorae have spherical body with convex base, slightly flattened. The neck varies from conical to cylindrical, especially in the upper part. The lip ranges from vertical, simple shaped from the upper end of the neck to out-curved, hollow inside. The handles are vertical, arched, oval in cross-section and start from the neck, often just below the rim and ending at the shoulder of the vessel. (Fig. 9-10) Moreover, in individual examples of the type were found inscriptions, mostly incised while examples from Kos show small seals on the necks or handles of spherical amphorae. The wider family of Byzantine spherical amphorae covers a large chronological range, as they appear already from the first decades and mainly from the middle of the 7\textsuperscript{th} century and continue until the 9\textsuperscript{th} century, while they are found in almost the entire Mediterranean.\textsuperscript{44}

As early as the second half of the 6\textsuperscript{th} century LRA 13 gradually began to replace LRA 2 with its complete replacement sometime in the 7\textsuperscript{th} century.\textsuperscript{45} Late Roman Amphorae 13 have oval body with broad belly, decorated with combed grooving mainly on the upper part of the body, plain and rounded base, tapering neck and two shallow arched and oval cross-section handles rise from the center of the shoulder to the neck just below the rim. The largest diameter is at shoulder height. The structure of the rim varies in the amphorae of this type classifying them into different subtypes. (Fig. 11) The clay is soft, sandy orange-brown, sometimes buff at surfaces with silvery mica.\textsuperscript{46} Compared the two types, both Late Roman Amphorae 2 and Late Roman Amphorae 13 have tapering neck and combed grooves either with globular (LRA 2) or with more oval (LRA 13) body.\textsuperscript{47} Late Roman Amphorae 13 have a simpler rim, higher neck, solid and larger handles and simpler base. The origin of LRA 13 located in the Aegean, mainly in Eastern and Southern Aegean Sea.\textsuperscript{48} LRA 13 were discovered in Constantinople\textsuperscript{49}, Kos Island\textsuperscript{50} and in the shipwreck of Yassi Ada\textsuperscript{51}. Additionally, LRA 13 were also produced in Africa, Syria, Egypt, Constantinople, Corinth, Black Sea and Italy.\textsuperscript{52} The discovery of a kiln producing LRA13 in Kos confirms the production of the type on the island. The production of LRA 13 amphorae in Kos is also interesting for another reason. It is characterized by

\textsuperscript{43} Riley 1979, 231-232. According to Hayes types 10 and 29. More specifically type 10 was considered similar to type 9B (LRA 2 type b according to Riley). Also, the difference between the two types is mainly in the comb grooving of the body. Type 10 has a deeper grooving, but mostly less wavy than type 9b, comparing with the shallow grooves on the shoulder of type 29. Hayes 1992, 66, 71. N.Poulou does not agree with Riley’s classification and supports that imitations of LRA2 could not categorized only in one type as they provide plethora of different typological characteristics and clay’s texture. Poulou 2014, 138-139, fn. 67. Zachariadis 2020, 299-300.
\textsuperscript{44} Diamanti 2010, 92-95. Zachariadis 2020, 300-301.
\textsuperscript{45} Diamanti 2010, 80. Bakirtzis 2003, 76.
\textsuperscript{46} Hayes 1992, 66, 71. Diamanti 2010, 73, 80-81.
\textsuperscript{47} Diamanti 2010, 73.
\textsuperscript{48} Diamanti 2010, 81.
\textsuperscript{49} Hayes 1992, 66, 71.
\textsuperscript{50} Diamanti 2010, 80-81.
\textsuperscript{51} Bass 1982, 157-160, figs. 8.4, 8.5.
\textsuperscript{52} Poulou 2014, 139.
their extensive sealing practice. This is the first time, that a production site of sealed late Roman amphorae has been identified.\(^{53}\) However, some scholars argue that the spherical amphorae produced after the 7\(^{\text{th}}\) century AD do not all belong to the same type. According to N. Poulou as LRA 13 cannot characterized all later amphorae with globular body as there are differences in topology and clay depending on the area of origin of the vessel.\(^{54}\)

Amphorae following the formal lines of the Late Roman Amphorae 1 became very popular in later times. Imitations of LRA 1 dating in the 8\(^{\text{th}}\) and 9\(^{\text{th}}\) centuries AD. The survivals of LRA1 borrow the morphological characteristics of the original type. The body is ovoid to cylindrical, or fusiform, often with a larger diameter at the shoulders. The rim is formed by the upper end of the neck, usually outturned. The handles are vertical, arched or angular, oval in cross-section and start, just below the rim and ending at the shoulder of the vessels. The external surface of the body is covered, in most examples, by wide parallel grooves.\(^{55}\) (Fig. 12)

The Late Roman Amphorae with sharply pointed foot evolved into a new type during the 9\(^{\text{th}}\) and 10\(^{\text{th}}\) centuries AD. This later type has round ring around the mouth, grooved body and two wide handles, fixed on the shoulders, near the base of the usually high neck and immediately below the rim. These amphorae, made of pink or red clay, are large containers due to their shape, whose height exceeds half a meter.\(^{56}\) (Fig. 13)

Imitations of Palestinian bag-shaped Late Roman Amphorae 5 was discovered in several regions of the Eastern Mediterranean. Depending on the place of origin of this later variant of LRA 5 the clay ranges from very sandy, pale orange, and lime, dark grey, hard-fired, fine dark brown fabric with fine gold mica and organics or pale salmon to buff clay with somewhat soapy surfaces and common fine lime.\(^{57}\) (Fig. 14)

I.iii. GÜNSENIN TYPE AMPHORAE (FROM THE 10\(^{\text{TH}}\) CENTURY ONWARDS)

Although the time frame of the present dissertation extends to the 10\(^{\text{th}}\) century, it is important to mention the Günsenin type amphorae that begin to be produced during this century and their spread continues until the 12\(^{\text{th}}\) century AD. (Fig. 15) In the first type (Günsenin 1) are grouped amphoras with a rounded body, short and wide neck and a straight rim. The walls at the height of the belly are thick and taper towards the rounded base. The amphora has two D-shaped and robust handles attaches on the slopping shoulder and the rim. Asymmetry is often observed in both the neck and the handles of these amphorae. The clay is soft, coarse with an orange-

\(^{53}\) Diamanti 2010, 74, 84.  
\(^{54}\) Poulou 2014, 138-139.  
\(^{56}\) Type 3 in Ch. Bakirtzis classification. Bakirtzis 2003, 77-78.  
\(^{57}\) Reynolds 2003 (b), 731.
red or light brown-orange colour, with limestone and mica. The exterior surface of the
body covers with a yellowish slip. As regards the usual ribbing of amphorae, Güsenin 1 has also ribbing on the exterior surface. The place of origin of these
amphorae is considered to be the region of Marmaras and more specifically Ganos
and Marmaras Island and they spread through the whole Aegean Sea, Black Sea,
Turkey and the Balkans from the 10th until the 11th century AD.\textsuperscript{58} Investigations in
Ganos and the Marmara Island brought to light centers of production for this amphora
type.\textsuperscript{59} (Fig. 16)

The second type of Güsenin amphorae has pear-shaped body ending in a
rounded base. The neck is narrow and slightly flaring ending in a wide-splayed folded
rim. The upward sloping handles are slightly taller that the rim and attached on the
narrow neck and the slopping shoulder. Their clay is orange-brown in color and fairly
hard in texture. The exterior body is partly or entirely ribbed with a smoothening of
the ribs at the lower part of the vessel. Their origin is still unknown (maybe from
Aegean or Black Sea) but they are identified with certainty in Turkey and Aegean
from the middle 11th (maybe from the 10th) until the early 12th century AD.\textsuperscript{60} (Fig. 17-18)

There are several other types and sub-groups of Güsenin amphorae whose
production begins after the 10th century and for this reason they will not be covered in
this study.

\textsuperscript{59} Poulou 2012, 317.
II. AREAS OF AMPHORAE PRODUCTION AND DISSEMINATION

The study of the production and dissemination of late Roman and early Byzantine amphorae throughout the eastern Mediterranean cannot be fully covered in the scope of a master's thesis. For this reason, a selection will be made of the largest amphora production centers in this area as well as the largest commercial centers in which they were traded. Thus, the geographical area under consideration will be divided into the following subsections: the islands of the Aegean Sea, the coasts of northern Greece (Macedonia and Thrace), the western coast of Asia Minor, Mesopotamia as well as North Africa.

II.i. AEGEAN INSLANDS

II.i.i. Kos

The analysis of the areas of production and circulation of late Roman and early Byzantine amphorae will begin with the Aegean islands as there is quite a large amount of information and a multitude of areas. The examination will start with the case of Kos Island. (Fig. 19) More specifically in Kos were discovered both domestic production and imported examples of Late Roman Amphorae 1. The nearby coastal production centers of Cilicia, Northern Syria and Cyprus are identified as areas of introduction of amphorae to the island. The local production of type 1 amphorae on Kos is confirmed by their many failed, distorted and overbaked examples, which are apparently the refuse of a domestic workshop, the homogeneous composition of their clay (relatively fine-grained and clean clay, with few impurities and mica) and the homogeneity of their morphological characteristics. Morphologically, they are characterized by more slender proportions and a careful construction concept compared to imported amphorae of the same type. Very important is the fact that imported LRA 1 found in Halasarna very often bear inscriptions either of religious context (crosses, Christogram) or abbreviations with the owner’s name or numerical indications. These inscriptions were placed on the surface of the vessels after firing thus stating that it is not a construction element but is connected with the circulation, the trade and the content of the utensil. Imported LRA 1 in Halasarna date at least from the middle of the 6th century, while the majority of local amphorae is also dated from the end of the same century. Thus, imported and domestic amphorae of this type coexist from the late 6th until the middle the 7th century AD. (Fig. 20)

Continuing with the LRA 2 in Kos it is observed that relatively few examples are found, dating in late 5th and early 6th century AD. This lack of LRA 2 seems to be supplemented by type 13 which began to be produced in Kos at the end of the 6th century or the beginning of the 7th century and is the most frequent type of amphora in Halasarna. In terms of typology, it is a simpler shape compared to the LRA 2 with a smaller rim, more robust handles, straight ridged decoration and a rounded base that
lacks the stem that LRA 2 amphorae often had, instead a small, shallow knob appeared. The production of LRA 13 is attested similar to the production of LRA 1 on the island, with the presence many failed (twisted and undercooked) examples and the similarity of the clay to other local vessels. In fact, the location of a production kiln of this type leaves no room for doubt. (Fig. 19)

However, the most important result that emerged from the study of amphorae type LRA 13 of Halasarna, apart from their domestic production, is their sealing practice. For the first time a laboratory of late Roman sealed amphorae is found and indeed with a relatively large number of examples. Sealings are usually circular in shape and were found on the neck of the amphora, they often preserve cruciform monograms and inscriptions. The standardization and organization of amphora production and circulation indicated by their presence contributes to the understanding of a particular aspect of late Roman and early Byzantine sea trade. LRA 13 date after the middle 6th century and mainly from the late 6th until the first half of the 7th century AD, a period that coincides with the production period of amphora LRA 1 in Kos. (Fig. 21-22)

In addition to the above types, which are the most frequently found examples, few sherds of other types of amphorae are found on the island. Only 5 sherds of sharp-bottomed amphorae, the so-called Samian amphorae, were discovered at the excavations in Halasarna, thus testifying sporadic commercial relations of the island with their production center. Other types of Late Roman amphorae found in Kos are LPA 4 produced in Gaza, which has a strongly fusiform body with a conical base. LRA 4 at Halasarna appears as early as the end of the 5th century or at the latest until the first half of the 6th century AD. Finally, at the beginning of the 6th or the first half of the 7th century AD century, the bag-shaped LRA 5/6 appears on the island. These amphorae also come from the area of Palestine, outline a sporadic but notable contact of Halasarna with Palestine.61 (Fig. 19)

II.i.ii. Chios

A port in a natural cove is also situated on the island of Chios, in site Emporio. Chios belongs to the islands that gather several types of late Roman amphorae from many different areas such as the LRA 1 (Fig. 23), LRA 2 (Fig. 24), the Palestinian type 5/6 (Fig. 25), LRA 4 from Gaza and the so called ‘spatheia’ from Tunisia (Fig. 26). The most amphorae from the fortress of Emporio have cylindrical bodies ending in a knob foot. There is only one exception where the foot knob is replaced by a simple blunt end. Instead, the floor of the fortress was abundant of LRA 2. The body ribbing of Emporio’s LRA 2 could also be softly flattened in an upward or downward direction to create a wave impression. It is also possible that precursors of LRA 1 can be found within the extant examples from Emporio. In the 7th century the mass imports of amphorae from North Africa stopped. At the same time (7th and 8th centuries), in the archaeological strata of Chios, is observed the existence of

61 Diamanti 2010, 153-158.
amphorae, which are imitations of two very popular types known throughout the Mediterranean during the early late Roman period, the LRA 1 and LRA 2.\textsuperscript{62}

II.i.iii. Paros

The island of Paros is the third largest island of the Cyclades, which after the foundation of Constantinople was at the center of the maritime trade routes. The intense life on the island during the 6\textsuperscript{th} century as well as the strong religious feeling of the locals is evidenced by the quite large number of churches (basilicas of Ekatontapyliani, of “Treis Ekklisies” outside Paroikia, and of “Aghios Georgios” in Voutakos). Very close to the two largest cities of the island, Paroikia and Naousa, there were two big natural harbors that served as ports, thus strengthening the commercial life of the island. The very strong presence of the island in the Aegean is attested by the discovery of a pottery workshop in the Zoodhochos Pighi cove at the north-east of Naousa. The Parian workshop produced late roman amphorae of two types, LRA 1 (Fig. 27) and LRA 13 (Fig. 28), from the second half of the 6\textsuperscript{th} until the first half of the 7\textsuperscript{th} century AD. As the contents of the amphorae, wine has been suggested for LRA 1 and oil for LRA 13. Both the cylindrical LRA 1 and the ovoid LRA 13 of Paros made of quite fine brown clay with few inclusions. The ceramic kiln located in Paros is the second known workshop producing both LRA 1 and LRA 13 during the 6\textsuperscript{th} and 7\textsuperscript{th} centuries.\textsuperscript{63}

II.i.iv. Samos

On the south-eastern coast of Samos Island, was located the ancient city. The ancient port was situated over the west cape of the modern one. On the island and more specifically in Episkopeio, which was destroyed in 670 AD, a large concentration of late roman amphorae was found. A large number, approximately 120, of LRA 1 were found in the Episkopeio as well as five more amphorae of the same type in the Tunel of Eupalinos. (Fig. 29) LRA 2 are the most popular type in the Tunel of Eupalinos, while at least more than five examples were saved in a storage area of the Episkopeio.  (Fig. 30) Also, very common in the cisterns of the island was the bell-shaped, almost spherical, amphorae. Their belly is almost sphaerical and they have pointed end. The neck is short and ends in a wide and flattened rim, while the handles, which attached on the rim and the upper part of the shoulder, are noticeably smaller in proportion to the size of the amphora. The entire body is covered with shallow and sparse ribbing, which at the height of the shoulder and near the base becomes denser. (Fig. 31) Most examples of this type are found in two cisterns, at the Hraion and at the Pythagoreion. The fact that this type of amphora is absent from many areas where late Roman pottery is found, as well as that it is found in large quantities on the island of Samos, reinforces the view that it is the production of a local workshop. Finally, from the archeological research at Episkopeio, amphorae of type 8 according to Riley’s classification, or as Grace named them ‘Spatheia’,


\textsuperscript{63} Diamanti 2015, 541-545. For more details about the workshop and the kilns see Diamanti 2016, 691-697. Poulou-Papadimitriou 2018, 35.
emerged. (Fig. 32) The importance of the island is proven by the discovery of two Byzantine lead seals and a Roman cameo. Cameos belonged to the emperor’s treasury and was used only by himself and his family members. The discovery of this cameo is related with to the presence of high officials in the fortress during the Roman period.⁶⁴

At the island of Leipsoi, south of Samos, were discovered workshops producing imitations of LRA 1 dating in the 8th century AD.⁶⁵

II.i.v. Crete and Pseira

The island of Crete is quite rich in early byzantine amphorae. There are several sites that provide many types of local and imported amphorae. The most important archaeological sites which save early byzantine amphorae are Herakleion, Gortyn, Mochlos, Eleutherna, Itanos and the islet of Pseira, situated near the north-east coast of Crete. On the island were discovered plethora of early byzantine amphorae from Northern Africa, Syria, Cyprus, Palestine (LRA 5/6), Gaza (LRA 4) and Tunisia (spathia).⁶⁶ Among the early findings, the survivals of LRA 2 constitute a large section of the transport vessels that have been found on the island, mainly in the excavations at Heraklion, Gortyn, Eleutherna as well as on the neighboring islet of Pseira constitute the main bulk.⁶⁷

The transition from the late roman amphorae (4th to 6th century) to the early byzantine (7th to 9th century) was marked by the circulation of globular amphorae. These amphorae are later survivals of LRA 2, the so-called globular Byzantine amphorae or, according to Riley’s classification, LRA 13.⁶⁸ (Fig. 11) The amphorae of this type found in Crete correspond to either local production or imported products. Imported globular byzantine amphorae were found in Knosos, Herakleion, Eleutherna, Gortyn, Mochlo, Pseira and Agia Galini.⁶⁹ Additionally, later imitations of LRA 1 were recognized among the amphorae from Crete and Pseira.⁷⁰

Then, some important archaeological sites of Crete that brought to light late Roman and early Byzantine amphorae will be presented. Gortyn located in central Crete in the Mesara plain. In the early byzantine period (until the 8th century AD), Gortyn was a major political and episcopical center, which revealed a variety of imports from north Africa, Asia Minor, Cilicia, Syria and Palestine. More specific there were found LRA 1, Palestinian LRA 5/6 and a spatheion. The main amphora types manufactured from local orange-red clay with small quartz fragments, clay pellets and micritic limestone are several Byzantine Globular Amphorae.⁷¹

Itanos is situated at the easternmost extremity of Crete and considered as a crossroad between Crete, Asia Minor, Syria, Palestine and Egypt. The ancient

⁶⁴ Gerousi 1997, 251-256.
⁶⁵ Poulou-Papadimitriou 2018, 32.
⁶⁹ Poulou 2014, 139.
⁷⁰ Poulou 2018, 199-200.
⁷¹ Poulou-Papadimitriou - Nodarou 2014, 876.
settlement of Itanos dates from the 4\textsuperscript{th} until the 8\textsuperscript{th} century AD, exactly like Gortyn. However, contrary to Gortyn, which preserves a variety of listed amphora types, Itanos preserves only examples of two early types. In Itanos’ amphorae was not observed local production but only the import of two very important types, the LRA 1 and the LRA2 dating in the 7\textsuperscript{th} century AD. Also, in this area there was not identified later types of amphora or later imitations of the two main earlier types. More specifically, the petrographic analysis of LRA 1 of Itanos showed that these are amphorae from the same workshop with a possible origin in Cyprus, North Syria or Sicilia. Then, it is possible that Itanos functioned as an entry gate for this type of amphora in eastern Crete. Concerning LRA 2 it is observed that they were also show a great homogeneity among their surviving examples but in this case their place of origin cannot be determined.\textsuperscript{72}

Pseira islet is located near the north-east coast of Crete and preserves an early byzantine settlement. The residence of the settlement divided in three phases, which helps also in the study of the pottery. The first phase dates from the end of the 6\textsuperscript{th} or the beginning of the 7\textsuperscript{th} until the second half of same century and characterized by the introduction of LRA 1 and LRA 2. Nevertheless, the majority of the material comes from the second phase of the settlement dating form the end of the 7\textsuperscript{th} until the 9\textsuperscript{th} century AD. Among the imports to the island are some byzantine globular amphorae, imitations of LRA 1 and the so called \textit{spatheia}.\textsuperscript{73} (Figs. 9-10-11) Additionally, two findings from Pseira testify the existence of Samian amphorae dating in the 8\textsuperscript{th} and 9\textsuperscript{th} centuries AD.\textsuperscript{74}

In northwestern Crete, on the hill of Petra in Siteia was revealed a cemetery of the byzantine period. The sherds of amphorae are very few and date between the 7\textsuperscript{th} and the 9\textsuperscript{th} centuries AD. All the surviving sherds belong to globular amphorae produced both in Cretan workshops and outside the island. The Cretan examples come from all the above referred regions, except Itanos. Finally, was found a few sherds from amphorae of type Güsenen 1 dating in 10/11\textsuperscript{th} century AD.\textsuperscript{75}

In the modern city of Herakleion, ancient Handakas, were unearthed numerous byzantine movable objects. The existence of amphorae is not too large. Among the findings is preserved a globular Byzantine amphora from the 8\textsuperscript{th} century\textsuperscript{76} (Fig. 33) and a Palestinian LRA 5/6 with glazing on the handles and the neck, an element rare in transport vessels.\textsuperscript{77} (Fig. 34)

The intense production of local amphorae in Crete, as well as the preservation of some common morphological features among the products of local workshops, leads some scholars to the conclusion that Cretan amphorae should have a separate name in the literature of Byzantine Cretan Amphorae. Also, the discovery of many different local clays leads to the conclusion that there were many laboratory facilities

\textsuperscript{72} Poulou-Papadimitriou - Nodarou 2014, 876-877.
\textsuperscript{73} Poulou-Papadimitriou - Nodarou 2014, 875-876.
\textsuperscript{74} Poulou-Papadimitriou 2018, 33.
\textsuperscript{75} Poulou-Papadimitriou 2012, 315, 317.
\textsuperscript{76} Poulou-Papadimitriou 2008, 154.
\textsuperscript{77} Poulou-Papadimitriou 2001, 244.
within the island. As for the imported amphorae on the island, it is observed that the circulation of amphorae is much greater until the 7th century, while from the 7th century and onwards imports are limited. However, apart from the quantity of imports, it seems that their regions of origin are also changing. It is observed that from the middle of the 7th century, Crete stopped importing amphorae from Palestine, Syria and Cilicia, while imports from the Western Mediterranean and North Africa were greatly reduced. On the contrary, all imported Byzantine amphorae dating from the 7th century onwards came almost entirely from workshops in the Aegean area.

II.ii. MACEDONIA AND THRACE

II.ii.i. Thessaloniki

From the excavation that took place in the early Christian storage rooms of the port came to light examples of late roman amphorae. The storage property of the structures was sealed by the discovery of an intact LRA 2. This amphora was found in situ between the storage constructions. Additionally, from the embankments corresponding to the use of the western building of the storage rooms, before they were reconstructed in the 7th or 8th century, a significant amount of 5th-7th century pottery was collected from amphorae, mainly from LRA 1 and LRA 2. Some of them bear engraved or written inscriptions in red, resembling to those from Torone. However, amphorae were not lack from the later royal storage rooms, which were constructed after the destruction of the older ones due to the invasions of Slavs in 620-630 AD. Among the amphora fragments found in the site’s destruction layer, there are mainly survivals of LRA 1 and possible variants of the globular Aegean-type.

A rescue excavation in Thessaloniki preserved parts of two roads and two insulae adjacent to the southern side of Hagia Theodora, which main phase dates around 5th to 6th centuries AD. In the excavation was discovered a storage room, pitheon, with 14 re-used LRA 4 (Fig. 35) and a base of a LRA 1 (Fig. 36) and dating at the end of the 5th or the 6th century AD. At the junction of the two streets were discovered part with the rim and the handle of a LRA 2, bearing a graffiti at the shoulder. Also, at deposit area 2 was revealed part of a LRA 1 with a red dipinti on the shoulder of the vessel. (Fig. 37)

A typical example of late Roman amphorae in second use in Thessaloniki is the church of Hagia Sophia. During the excavations, it was found that dozens of mid-Byzantine amphorae had been placed in the spaces between the vaults of the ground floor and the side walls of the galleries. Their use had a double purpose, on the one

79 Poulou-Papadimitriou 2011, 405-406.
80 Chatzioannidis-Tsamisis 2013, 190-194.
hand it lightened the construction of the massive cubic building, on the other hand it improved its acoustics.82

II.ii.ii. Chalkidike

From the area of Chalkidike as a case study we will take the area of Torone where a detailed study of Late Roman Amphorae has been done. More specifically, a late Roman cemetery was discovered on Terrace IV. The pottery found in the cemetery dates from the 2nd until the 6th or the late 7th century AD, while the excavated tombs dates from the 4th until the 6th century AD. It is impressive the fact that the amphorae in Torone were not used as offerings in the tombs but they were used as inhumation containers for infants.83

The most frequent type in Torone is LRA 2 (Type I), while the second most common type is LRA 1 (Type II). (Figs. 38-39) Among the amphorae group are not missing the types that come from North Africa (Tunisia) and Palestine. More specifically the most abundant LRA 2 in Torone dates from the 4th to the late 6th or early 7th century AD. On the surface of some LRA 2 from Torone is obvious the existence of graffiti. Also, although this type is believed to have been used to transport oil, the Torone examples appear to have contained wine. The second most crowded type, LRA 1, testify that in Torone’s amphorae the neck was constructed separately and then attached to the rest of the body. According to Torone’s categorization the third type, the so called Samos cistern type, is quite similar to LRA 1 as it has an ovoid and long body with a rounded base, a short neck and two oval cross-section handles starting from the neck and ending at the upper part of the shoulder. (Fig. 40) It is probable that 5598 fragments from the Torone excavation belong to this type. This type was not classified among the most common recognized types from other areas. However, there are similar examples in Black Sea and the Aegean. For example, Scorpan refers similar amphorae from Tomis in Black Sea and Kuzmanov from Bulgaria. The most accepted dating for this type is from the 4th to the 6th century. Torone's type IV corresponds to Riley's Palestinian LRA 3. (Fig. 41) Only a few small fragments of type V (Fig. 41) were discovered in Torone, which associated with LRA 10 or class 45 of Peacock and William. The majority of Torone’s sherds come from the belly of the amphorae and also bearing diagonal wheel-ridges. Type VI is also very fragmentarily preserved, represented by a few sherds from the belly of the vessels. (Fig. 42) Of great interest is the preserved stamped incuse inscription on the neck in one of the examples of the type that reveals its origin from the present-day region of Tunisia. This type categorized by Peacock and William in class 34 and were also labeled as Africana II amphorae. Africana II Amphorae have a quite large distribution in the Black Sea and the Mediterranean and date from the 2nd until the late 4th century AD. As the container of these vessels was proposed the oil and the fish products. Finally, type VII is similar to Torone’s Type III and also very rare. (Fig. 43) Similar amphora in fabric and shape was discovered in

82 For Hagia Sofia see Tantsis 2003, 85.
83 For more details about the cemetery and how the amphorae functioned as inhumation containers see Papadopoulos 1989, 67-78.
Corinth. According to the data up to now, there is no local production of late Roman amphorae in Torone.

II.ii.iii. Philippoi

In the excavation of the early Christian city of Philippoi, that flourished from the 4th until the 7th century AD, there were found almost all the late roman types of amphorae. Late Roman Amphorae 1 have a dominant presence among the early Christian amphorae imported from the Middle East to Philippi. (Fig. 44) Much less, but certainly Aegean LRA 2 (Fig. 45) and LRA 3 (Fig. 46) of the same period can be found. Palestinian amphorae of type LRA 4 (Fig. 47) and LRA 5/6 (Fig. 48) also make their appearance in the area. Amphorae with Cretan origin were also found in a few cases. More specifically, the LRA 1 found in Philippi belong to the upper part of the bodies. They are made of pinkish gray to yellowish fine-grained clay and they are very similar to the corresponding examples of Cyprus from the site of Panagia Aimatousa. LRA 1 shows its greatest concentration in the layers of the 6th and late 7th centuries AD, similar to other regions in the Aegean Sea. The less popular LRA 2 was also survived in fragments and dates mainly to the 5th and the second half of the 7th century. Philippoi’s LRA 3 correspond to a very small percentage of amphorae compared to other types. They were made of yellowish clay and they date in the 6th century AD. In sherds were also preserved the LRA 4. Among these sherds of Philippoi there were recognized two subtypes dating in the 5th and the 6th century AD. Additionally LRA 4 from Philippoi resemble with the type IV from Torone, which date also in the 5th century AD. The Palestinian LRA 5/6 from Philippoi have sandy reddish clay and bear many similarities with amphorae from other sites dating from the 5th until the 8th century. Instead of Eastern Mediterranean production, African amphorae come from the area of Tunisia. These amphorae can be categorized in Riley’s 8th type and date in the early 7th century.85

From the study of the material found in the area in the southwestern part of the university’s excavation, finds not only of late roman but also of early byzantine amphorae were emerged. The later types in Philippoi attributed to imitations of LRA 1, to the globular byzantine amphorae and to some African types. Similar to LRA1, its survivals are the most frequent find among the amphorae of the early Byzantine period. Among the imitations of LRA 1 in Philippoi can recognized to subtypes according to Hayes. Byzantine globular amphorae from the area divided in two groups. The first one is similar with amphorae the Yassi Ada shipwreck, while the second one seems to be later development of the first group and dates later in the 8th or 9th century.86

85 For the Late Roman Amphorae in Philippoi see Trivyzadaki 2005, 27-79.
86 Zachariadis 2020, 305-306.
II.ii.iv. Thasos

The importance of Thasos in Byzantine sea trade is testified by the two harbors, that existed on the island. The amphorae from the island of Thassos is rich both typologically and ceramologically, as Thasos was located on the maritime routes to Constantinople. Imported amphorae cover most of the well-documented Western and Eastern types but the most common type in the island corresponds to LRA 2.

II.iii. ASIA MINOR AND CONSTANTINOPLE

II.iii.i. Saraçhane

One of the most well-studied and published, if not the most, fully analyzed archaeological excavations of trade amphorae is Saraçhane in Constantinople. For this reason J.W. Hayes divides the amphorae into several subgroups according to their morphological characteristics and the composition of their clay. However, due to the limited extend of the present study, we will not deal so much with the subgroups of each amphora type.

In the archaeological layers of Saraçhane were found LRA 1 (Hayes’ type 5), which appear already from the 5th century, but they are the most common type in the layers of the 6th and 7th centuries AD. The also widespread LRA 2 (Hayes’ type 9) was found in the layers of the 6th and 7th centuries of the ecclesiastical complex, but in contrast to the first type, it is absent from the layers of the 5th century. The long cylindrical LRA 3 (Hayes’ type 3) in Saraçhane dates from the 4th until the 7th century AD. LRA 4 (Hayes’ type 6) is the second most frequent type among the findings of the church complex. (Fig. 49) LRA 3 appeared in Saraçhane already from the second quarter of the 5th century AD and continued at least until the late 6th century. The examples from the 5th century are more. The slender and ribbed LRA 5/6 represented in Saraçhane by Hayes; types 8 and 7, respectively. Both the two types appeared in the 6th century and continued until the 7th century AD. The Egyptian carrot shaped LRA 7 was also testified in the church complex and its dating ranges from the early 6th to the core of the 7th century. LRA 8 or the so called Spatheion divided into two subtypes. The small one 8a (Hayes’ type 14) and the large one 8b (Hayes’ type 13). Only a few sherds of subtype 8b were revealed, which are not dated. Instead, fragments of 8a subgroup date in the 7th century AD. From the complex’s findings are not missing the African examples (Hayes’ type 1) of the late 4th and 5th century.

Continuing with the later examples after the end of the 7th century, it is observed that in Saraçhane the imitations of LRA 2 are preserved. The new types called LRA 13 (Hayes’ types 10 and 29). Both the two subtypes appeared in Saraçhane in the 7th and 8th century AD. Additionally, the first type of Gülsenin’s typology (Hayes’ type 54) is the most common mid-Byzantine amphora type in Saraçhane, counting about 30-50% from the total number, dating from the 10th to the

---

87 Karagianni 2013, 25.
12th century AD. The surviving sherds of the type are considerably larger than the surviving fragments of amphorae of other types, because of their thicker walls.89

II.iii.ii. Yenikapi

During the construction of a railway in the area of Yenikapi90, part of the port of Theodosius was revealed, which was founded at the end of the 4th century during the reign of Theodosius I (379-395 AD) to cover the ever-increasing needs of the new capital, Constantinople. In ancient times, it was called Portus Theodosiacus and was the second largest port of Constantinople. During the excavations, 37 shipwrecks dating from the 5th to the 10th century were discovered, of which 31 have been classified as cargo ships. however, only 4 ships still retain their cargoes, indicating that probably only these 4 ships were active at the time of their sinking.91 The ships that saved their cargos are YK 1, YK 3, YK 12 and YK 35.92

YK 1 is the first shipwreck that was unearthed in Yenikapi of Constantinople. YK 1 was fully of byzantine amphorae dating in late 10th or early 11th century AD. (Fig. 50)The amphorae of YK 1 perhaps linked the amphorae from YK 12 and also linked therefore to the wine production in the area around Ganos.93 YK 3 preserved only some roof tiles, marble items and mortars and dates in the 10 or the 11th century AD.94 The YK 12 shipwreck of Yenikapi is one of the most well-preserved shipwrecks from the harbor of Theodosius and was excavated together with its cargo of amphoras. (Fig. 51) The amphorae of the 9th century that constitute the cargo of the ship can attributed to a Crimean origin and they imply a mid-Byzantine connection between YK 12 and the Black Sea.95 Other scholars suggest that the amphorae from YK 12 belong to Günsenin’s first type, originating from Ganos and dating in the 10th/11th century AD.96 Sherds of early byzantine amphorae of the 5th century, originating also from Black Sea, were revealed at YK 35 shipwreck. YK 35 is one of the earliest shipwrecks found at Yenikapi.97

II.iii.iii. Küçükçekmece Lake Basin

Very important is the contribution of the study of Küçükçekmece Lake Basin (Bathonea?) to the West of Constantinople, which preserves a multitude of late Roman amphora types, which testify to the trade relations of Constantinople with other regions. As in most areas, in Küçükçekmece Lake area, the most numerous

89 Hayes 1992, 66, 71, 73-75.
90 Although the archaeological findings from Yenikapi come from shipwrecks, their amphorae will be studied in this chapter, and not in the chapter with the rest of the shipwrecks, as during their discovery were not carried out maritime excavations, as well as because the ships sank while anchored in the port and not in the open sea.
92 Kocabaş, 2015, 11.
93 Pulak, Ingram, Jones 2014, 59.
amphorae belong to the Anatolian and Aegean types 1 and 2, while there are not missing types from Levant area, Egypt North Africa while also from Black Sea region. Examples of LRA 1 is one of the most dense (21%) types found in the Küçükçekmece Lake Basin excavation layers. It is known that LRA 1 is produced in the Aegean coasts of Anatolia, some Aegean and Mediterranean islands (Kos Island/Halasarna settlement, Cyprus, Crete) and mostly in the Cilicia Region.

LRA 2 reach 27% of the total number of amphorae in Küçükçekmece Lake Basin excavations. (Fig. 52) The first production of the type dates already from the 2nd century AD, but the standardization of the form is thought not to have occurred before the end of the 4th century AD. Considering the amphora forms uncovered in the settlement, it is possible to give the LRA 2A group amphorae to the 5th - early 7th century AD, and the LRA 2B and LRAC subgroups to the late 6th – early or mid-7th centuries. Dipinti found on LRA 2 from Küçükçekmece provide information about the workshop and trade of the amphorae as well as their contents. It is very important to mention that LRA 2 from Constantinople (Sarachane and Port of Theodosius) are the same with those from Küçükçekmece, indicating the very close commercial relationship of the area with Constantinople. There is also the possibility that it represents the amphora production workshop.

Although LR 3 amphorae are not among the densest (6%) types uncovered in the settlement, they are seen in almost the entire excavation area. (Fig. 53) The main known production centers of the Aegean amphora type are Kos Island and Ephesus. In the light of today's data, the LRA 3 samples recovered from the settlement are mostly intensely mica tempered, brown paste and slipped in the same color. Considering the evidence and recommendations regarding the product carried by the LRA 3, the most common thought is that they contain wine, due to the presence of resin residues. It has been suggested that the amphorae of Ephesus, the main place of mass production, carried "expensive wine". Considering all the LRA 3 samples unearthed in the excavation, it is possible to say that the LR 3 amphorae which were produced by Ephesus and the Ephesian wine was transported to the Küçükçekmece Lake Basin in these vessels. One of them, the slightly outward-opening concave-bottomed amphora is thought to be dated to the 6th century AD.

LRA 4 it is the rarest type (4%) of late Roman amphorae along with type 7. (Fig. 54) In the LRA 4 encountered in the Küçükçekmece Lake Basin, a perishable paste condition, possibly due to production, is encountered. For this reason, it was observed that the amphora fragments crumbled and dispersed. The forms found in the Küçükçekmece Lake Basin are dated to the 6th-7th centuries AD.

Although LRA 5/6 are represented by a small percentage (8%) in the settlement of Küçükçekmece Lake Basin they can be detected in almost the entire area. (Fig. 55) On the one hand, a low-quality clay of the type, similar to LRA 4, is probable, while on the other hand it is possible to talk about the presence of dipinto writings on some of the body fragments found. c.The production area of these two groups of amphorae, which is thought to have been produced between the 4th and 10th centuries AD, has been proven by current research in Abu Mina and Abu Billou (Egypt), apart from the historical Palestine Region.
Egyptian LRA 7 are also quite rare (4%) in Küçükçekmece area. One of the most striking features of these amphorae, there are fermented holes from its first use or secondary use. (Fig. 56) It was understood that the said holes were opened with the help of a drill. This form, which belongs to the type of amphora known to have been produced in Egypt, is thought to be dated to the mid-7th century AD to the end of the 7th century AD. It is quite remarkable that resin residues were encountered in an amphora similar to the form found here in Egypt. LRA 7 are known to carry fish as well as wine.

Although not in high concentration (only 5%) African amphorae are not missing among the lake’s findings. (Fig 57) The small Spatheion that was found in the settlement is thought to have been produced in North Africa (Tunisia). Although it has been suggested that Spatheia carry products such as honey, lentils and olive oil, it is thought that the main product it contains was wine. Compared to other examples, it can be suggested that it belongs to the 3C subtype and is dated to the second half of the 7th century AD.

Significant is the existence of a Zeest 80 amphora dating in the end of the 4th or the beginning of the 5th century AD, however the type was introduced in the 1st century AD and continued until the 7th century AD. It is thought that the amphora has grown in size over time and has reached a version with a capacity of 100 liters. According to this information, although its height and width are not negligible, it is found in small pieces and in few numbers in the excavation area.98

II.iii.iv. Parion

The ancient city of Parion is located in the village of Kemer in the Biga district of Çanakkale, north of the Troas region. Parion has a good geographical and strategic location and an important commercial port. The excavation at the Parian Slope Bath gave large quantities of amphorae. They have been imported from important production areas such as Italy, North Africa (Tunisia), Aegean Islands, Asia Minor, Southern Black Sea, Cilicia and Levant and dated between the middle of the 1st century BC and the first quarter of the 7th century AD.

LRA 1 were found in the excavations carried out in the city of Parion. (Fig. 58) It is the amphora type with the most intensive use and finds in the archaeological layers. Parian fragments of LRA 1 divided into three subtypes, the Proto-LRA 1A, LRA 1A and LRA 1B and dating from the 4th until the 6th century AD. LRA 2 in Parian Baths are represented by a few sherds. (Fig. 59) Two parts of LRA 2B, one part of rim and neck belonging to subtype LRA 2B/C and a part of a handle. LRA 3 are not missing from the set of findings. (Fig. 60) Fragments of this type are more than those of LRA 2 and dated from the 4th until the 6th century AD. Amphorae fragments belonging to different parts of the body can safely be assigned to LRA 4, which were dated from 5th to 7th century AD. (Fig. 61) Bag-shaped amphorae (LRA 5/6) represented in Parion Slope Bath with some fragments of rim, shoulder and base

98 For more details about the Late Roman Amphorae from Küçükçekmece Lake Basin see Kara 2021, 74-93.
dating from the 3rd until the 7th century AD. (Fig. 62) Finally, the African type names Spatheion is not missing from Parion. (Fig. 63) Two types of Spatheia are preserved in the Baths, one with a wide rim and the other with a slightly narrower one, dating in the 5th and 6th centuries AD.\(^99\)

II.iii.v. Cilicia

Cilicia was proposed as the place of origin of LRA 1 due to the large quantities of the type in the region but also due to the excavation of a quite large number of kilns producing these amphorae.\(^{100}\) Many kiln sites are known in Cilicia and more specific at Soli and at Elaiussa were revealed two kilns attributed to LRA 1 production.\(^{101}\) Other producing centers of LRA 1 were Ayaş, Yumurtsalik, Karatas, Tarsus and the independent Arsuz/Rhosus, which lays between Cilicia and Syria.\(^{102}\) Cilicia developed very early commercially, along with Antioch, Phoenicia, Palestine and Cyprus, as Cilician products were distributed to international markets from the 5th century AD. Cilicia had close relations with the island of Cyprus which is often witnessed by the similar color and texture of the clay.\(^{103}\)

II.iv. CYPRUS

Cyprus is the only island opposite the coast of Syria and it is only 65 km from Cilicia and 105 km from Syria. Moreover, Cyprus is located on the sea road that leads from the Aegean area to the coastal Syria.\(^{104}\) The strong presence of LRA 1 and the existence of at least three kilns that produced this type prove the systematic production of the type on the island. The kilns were found in Paphos, Amathus and Zygi, while according to petrographic analysis two kiln of LRA 1 must be located at the area between Amathus and Paphos and between Akrotiri peninsula and Palaipaphos.\(^{105}\) Although Kourion has been suggested as production center of LRA 1.\(^{106}\) Additionally, LRA 1 were identified in Kourion, Ayios Philon, Lapithos, Dhiorios, Kalavassos-Kopetra, Alassa Kition and Salamis, with the highest concentration in the south, where two or three kiln sites have been located, while during underwater surveys sherds discovered in Aktoriri-Dreamer’s Bay, Cape Zevgari, Cape Andreas, Konia.\(^{107}\) LRA 1 in Cyprus date from the 4th until the 7th century AD. It is very important to note that the same LRA 1 kiln (in Amathus,

---

\(^{100}\) Diamanti 2008,13.
\(^{102}\) Reynolds 2005, 566.
\(^{103}\) Demesticha 2013, 176. Demesticha 2015, 59.
\(^{105}\) Demesticha 2019, 1.
\(^{107}\) Demesticha 2015, 59.
Paphos and Zygi) were used later for the production of LRA 13, which are considered to be imitations-survivals of the earlier LRA 2.\textsuperscript{108} (Fig. 64)

One of the most well studied production centers of Cyprus, which in parallel also brought to light many imported amphorae of the island, is the ancient harbor of Amathus. In Amathus except of the local LRA 1 and LRA 13 were also revealed types of other regions which imported to the island, thus testifying to the commercial relations of the island with other regions. Although Amathus provides a local production of LRA 1 there are not missing imports of the same type from other Aegean centers but also from other Cypriot regions. (Fig. 65) Among the non local products were also recognized fragments of LRA 2 (Fig. 66), which must also be attributed to an Aegean workshop. Gazan LRA 4 represented by two different types of clay among the harbor’s examples. (Fig. 67) Palestinian 5/6 are fewer than LRA 4 but they are also testifying two different textures of clay.\textsuperscript{109} (Fig. 68)

Another well-studied area of Cyprus with both land and sea surveys is the Cape Kiti in Larnaca. Compared to surviving amphorae from other periods, the late Roman amphorae from Cape Kiti are much fewer and seem that they do not come from a Cypriot workshop. Also, after petrographic analysis a great similarity of the clay with the local examples of Cilicia was observed.\textsuperscript{110}

Finally, underwater surveys were also conducted at the ancient port of Amathus. From the excavation of three wells were unearthed fragments of late roman amphorae.\textsuperscript{111}

II.v. SYRO-PALESTINE

Syro-Palestine is a very large geographical area very rich in late Roman amphorae, but mainly of the types produced along its coastline. These types are mainly LRA 4, LRA 5/6 and the Beirut amphora type. The most well-studied and published area is Beirut, although other regions with less literature will occasionally be discussed.

Initially, Gazan LRA 4 were produced in several areas of Gaza and Negev region such as Ashkelon, Be’er-Sheva, Nahal Besor and Oboda. Local LRA 4 divided in three subgroups: the early LRA 4A with squat body, the elongated LRA 4B and the latest subtype LRA 4C. They stop being detected in Umayyad period, as in contexts of this period from Pella and Jarash they are absent. Palestinian LRA 5/6 were produced in many sites of the region and they were being distributed all over the Levant, especially in Palestine and Jordan. The typological development of the type extends from the 4\textsuperscript{th} until the 7\textsuperscript{th} century. In 4\textsuperscript{th} and 5\textsuperscript{th} centuries the body tends to be rectangular, while during the 6\textsuperscript{th} and 7\textsuperscript{th} centuries became more spherical. LRA 5 with

\textsuperscript{108} Demesticha 2003, 469-470, 472. For more details about the LRA 13 workshops in Paphos and Amathus see Demesticha 2005, 169-176.
\textsuperscript{109} Empereur 2018, 181-189.
\textsuperscript{110} Demesticha 2015, 59.
\textsuperscript{111} Empereur, Verlinden 1987, 7-18.
globular body were discovered in Gerasa and Negev. Also, in Negev were found some amphorae resembling both with LRA 4 and LRA 5. Around the late 7th and early 8th centuries a local production of amphorae with Arabic inscriptions was found in Ramal Rahel. One more local workshop may be located to Caesarea, which were active during the Byzantine period. Examples of LRA 6 are limited to a few examples with a rounded body to the earlier items and elongated body to the later ones. Finally, African amphorae distributed to the coastal sites of Syro-Palestine. For example, LRA 7 however they are very scarce, they discovered in Caesarea and Tell Keisan, while spatheia were revealed in Shavei Zion.112 (Fig. 69)

II.v.i. Beirut

Beirut seems to be the most well-studied area of Syro-Palestine for its imported and local amphorae. Already from the 5th century, LRA 1 are the most abundant imported amphora type in the region. Aegean LRA 2 are rare in Beirut and the few examples of the type date from the late 4th until the middle 6th century. Similar to LRA 2, LRA 3 are also not common in the region. Examples of LRA 3 coming from contexts dating from the 4th to the 6th century. Gazan amphorae are also identifiable among the Beirut’s early imports, dating in the 4th and early 5th century, while Palestinian bag shaped LRA 5 is very popular among the rest of the amphora types.113 (Fig. 70)

The local production of Beirut is limited to a unique type of amphora produced only in this area from the late 1st to the middle of the 7th century AD.114 Beirut examples of byzantine period can be separated in two subtypes. The earlier subtype 8.1 has a small cone-shaped body ending in a domed base, band-like rim and small handles attached at the low part of the neck. Later subtype 8.2 is even smaller. The rim is absent as the upper part of the amphorae ending in a simple vertical ribbed neck. Subtype 8.1 appeared in the late 5th century until the first half of the 6th century AD, while subtype 8.2 dates from the late 6th until the early 7th century AD.115 Beirut amphorae are very common in Beirut’s territory but rare in northern Lebanon and outside Lebanon.116 (Figs. 71-72)

The excavation of a deposit from the roman imperial baths of the Umayyad period (650-750 AD) that dates in the first half of the 8th century AD helps to understand the transition from the Early Byzantine period to the Middle Byzantine period and the change in amphorae preferences. In Umayyad period crowded amphorae were LRA 5-6 (Fig. 70) and survivals of LRA 2, while LRA 4 and Beirut amphorae are absent. Only a few sherds of body and one of rim belong to LRA 1.117

112 Uscatescu 2003, 546-549.
113 Reynolds 2003 (a), 539-542.
114 Reynolds 2003 (a), 538.
115 Reynolds 2000, 390.
116 Vokaer 2017, 785.
117 Reynolds 2003 (a), 544. Reynolds 2003 (b), 726, 731.
II.v.ii. Apamea

The city of Apamea is located at the southern part of Syria, connecting with Antioch. Apamea was the capital of Syria Secunda since the early 5th century AD. Through the amphorae examples from Apamea, it is observed that none of the basic types are missing (LRA 1- LRA 7). The most common types remain those found throughout the wider region (LRA 4, LRA 5/6). In more detail, LRA 1 is one of the most widespread types in Apamea, but not the most frequent. (Fig. 73) LRA 1 is the most common imported type in the whole region of Syria and it was revealed in Dehes, Qal’at Sem’an, Sergilla, in the Homs region, Andarin, Hadir, Resafa, Qusair al-Saila, Bosra, Damascus and on the coast at Ibn Hani and Ras al-Bassit. The dating of the type follows the same chronology with the rest regions, from the 5th until the 7th century AD. LRA 2 in Apamea is quite rare. (Fig 74) Some LRA 2 fragments were found in Beirut, as already mentioned, and around Homs. LRA 3 is one of the most common imported types in Apamea, in contrast to the rest inner part of Syria. (Fig 75) Gazan LRA 4 is the most frequent type among Apamea’s imports from the 5th until the 7th century AD. (Fig 76) Also frequent are Palestinian LRA 5 and LRA 6 amphorae. LRA 5/6 in Apamea produced by a sandy pinkish-orange clay, a pinkish more calcareous fabric or a grey-black well-fired clay. (Fig 77) Few sherds of LRA 5/6 were discovered in Homs region, Bosra, Qal’at Sem’an, Damascus and Hadir. Then, Egyptian LRA 7 were found only in small unrecognizable sherds in Apamea, possibly dating in the 6th or 7th century AD. (Fig 78) Other LRA 7 sherds in Syria were discovered only in Qusair al-Saila near Resafa. Finally, Beirut amphorae although they are not often found outside of Lebanon, some examples are preserved in Apamea. This type is detected mainly in middle 6th to middle 7th century contexts with an exception of the 5th century example.118 (Fig. 72)

II.v.iii. Homs

The material to be analyzed below comes from surveys in the southern territory of Homs in Syria. Homs provides 21 sherds of LRA 1 later than those from Beirut, around the late 5th and 6th centuries AD. Additionally, LRA 1 in Homs are less common than in Beirut, Levantine coast and northern Syria. LRA 4 and LRA 5/6 are very rare in Homs, instead to Beirut’s samples.119

II.vi. NORTH AFRICA

North Africa is not only the center of production but also the place of origin at least of three certain types (Late Roman Amphora 7, Spatheion or Late Roman Amphora 8 and North African Amphora) of amphorae dating in the late Roman and early Byzantine periods. Also, in various regions of North Africa, not only domestic amphorae are found, but also several imported types produced in the Aegean regions. For the study of the amphorae from North Africa, elements from the regions of

118 For more details about Late Roman Amphorae in Apamea see Vokaer 2017, 779-787.
119 Reynolds 2014, 58-60.
Cyrenaica and more specifically from the settlement of Lamluda, Naukratis and Istabl Antar-Fustat in Egypt will be used.

II.vi.i. Lamluda

The amphorae from Cyrenaica are mainly local products while the majority of imported examples seem to come from Cyprus and the Aegean Sea and dating from the 4th until the 6th century AD. Especially, Lamluda located on the east-west road system connecting Cyrene with Egypt and on the north-south road linking the desert with the coast. Lamluda provides only imported types such as the abundant complex of LRA 1 made off pale brown clay with black and red inclusions. (Fig. 79) The composition of the clay testifies a Cypriot origin. Only one example of LRA 2 came to light in Lamluda, which dates in late 6th or early 7th century AD due to its elongated profile. The imported examples in Lamluda completed with some fragments attributed to a group of many LRA 13 (Fig. 80) and to a neck’s fragment of a LRA 17 or the so called ‘Africana Grande’ amphorae.120 (Fig. 81)

II.vi.ii. Naukratis

Naukratis preserved both imported amphorae and local products. Among the local amphorae from Naukratis were recognized three types, the LRA 5/6, LRA 7 and the type 53 of Peacock’s and Williams’ classification. The Egyptian variant of Type 53 has a grooved neck with a collar rim, the base is shorter than amphorae of Type 53 and its short handles tend to be upward at their lower part. This variant produced already from the 3rd century until the 7th or the 8th century AD. Their distribution in Egypt is popular, in contrast to Naukratis. LRA 5/6 represented in Naukratis by a few sherds. LRA 5/6 became very popular in Egypt already from the 6th century AD. The type divided in earlier and later examples. Both the two subtypes were discovered in Naukratis and characterized by a tubular neck with a simple rim and a tapering body ending in a spike. Early examples made of calcareous marl clay with limestone inclusions, and they constitute the majority of amphorae of this early subtype. Later items produced by Nile silt variants appeared in Naukratis around the early 7th century AD. From brown Nile silt were also constructed the Naukratis LRA 7. Typologically early LRA 7 have a more rounded shoulder, instead of the sharply carinated shoulder of the later ones.121 (Fig. 82)

The imported amphorae in Naukratis are not limited to the three African types that referred above. Compared to the rest of the introduced types, Late Roman Amphora 1 excels by far. (Fig. 83) Among the amphorae of Riley’s type 1, it is observed that there is a particular preference for amphorae of the type that come from Cilicia and Cyprus already from the 4th century AD, not only in Naukratis but also in Alexandria and Mareotis. Neighboring Palestine was a major producing center, such as also Gaza and Lebanon, which supplied Egypt and more specifically Naukratis with late roman amphorae. The Lebantinian LRA 4 from Naukratis dating from the 4th

120 Antonelli, Menozzi 2014, 886-888.
121 Thomas 2013, 14-15.
until the 7th century (Fig. 84) while bag shaped amphorae (LRA 5) from Gaza dating slightly later, from the 5th until the 7th century AD.\textsuperscript{122}

II.vi.iii. Istabl Antar-Fustat

Istabl Antar-Fustat provides us with very detailed information on the typology, production and use of LRA 7 in North Africa and more specifically in Egypt. (Fig. 85) Local amphorae of this type were made of brownish-red clay and covered by a solution of the same clay with water. They constructed in two parts, which were then joined together. Also, regarding the typological characteristics of the amphorae of the region, they initially present a curved outline of the shoulder, which later becomes more angular. In addition, the capacity of LRA 7 varies from 7 to 8 liters in contrast to other areas that hold 5 to 9 liters. The most interesting feature of the amphorae from Istabl Antar-Fustat is a small hole with a diameter of 4 millimeters at the height of the shoulder, which was opened after the vessel was fired and lined with resin. This practice probably belongs to the workshops of the wider region as it is found not only in the Egyptian LRA 7 but also in the Palestinians LRA 5. The prevailing explanations given by several scientists for this practice are either that it is a hole for the purpose of evaporating fermentation gases of the wine or that it is a hole that served commercial purposes. More specifically, before the purchase of the product they contained, a small hole was opened so that the product could be tested by the buyer without opening the stopper that secured the product. As LRA 7 are known to have contained wine and given the large production of wine in Middle Egypt, LRA7 were also found in Ashmunein, Behnasa, Sheikh Ibada, Tehneh el-Gebel, Zawyet el-Maletin and Edfu.\textsuperscript{123}

\textsuperscript{122} Thomas 2013, 16-17.

\textsuperscript{123} For more details about LRA 7 from Istabl Antar-Fustat see Vogt, Bourgeois, Schvoerer, Gouin, Girard, Thiébault 2002, 65-80.
III. SHIPWRECKS

The maritime area of Chios is full of shipwrecks of various dates with amphorae of many types. Seven shipwrecks seem to belong to the period under consideration. The first (1954) was located to the east of the islet of Agios Stefanos, in the bay of Lagadas, which contained amphorae of the late Roman type 1 and was dated to the 7th century AD. In 2001 around Pachy-Tholos promontory a scattered load of amphorae with Byzantine amphorae was found. The 2002 survey of Melanios bay in northern Chios brought to light the remains of a cargo with Byzantine amphorae from the 9th to 11th century AD. The continuation of the underwater excavations on the island revealed a large concentration of shipwrecks with late Roman amphorae in the area of Prasonesia. In the research of 2005, the remains of a shipwreck with LRA 2 were revealed, in 2007 on the Chios-Oinoussa bridge, a shipwreck with LRA 2 dates in the 6th and 7th centuries was found, as well as in 2008 a cargo with parts of LRA 2 scattered in the south of Prasonesia was also revealed. Concentration of LRA 2 were also found at the southwest of Pachy-Tholos promontory, at the northwest of the islet of Agios Stefanos and the Cape of Saint Isidore.\textsuperscript{124}

Moreover, a smaller concentration of concentration of shipwrecks can be found in the sea area of Crete. Three shipwrecks correspond to the period under consideration (5th-10th century AD). The first one was located on the slope of the western cape of Kapari bay and contained LRA 13 and a sample of a LRA 2. The second one is situated at the area of Aginara, at the eastern side of Dia. According to the cargo amphorae, which resemble with the second type of Bakirtzis’ globular amphorae, the shipwreck dated from the 9th to the 11th century AD. The last shipwreck from the area of Crete was located at the southwest side of the cape dividing Hagios Georgios and Kapari bay. Among the finds, a LRA 1 is identified as well as a second one that resembles to LRA 2 or to the later type 13. According to the pottery findings, the shipwreck must be dated between the 5th and 7th century, a period when the above two types of amphorae were circulating in the Aegean Sea.\textsuperscript{125}

Maritime research in the Cape Kiti area of Cyprus identified two shipwrecks dating in the Byzantine period. The first one was revealed in Kiti N2 area and the second one in Kiti N3. Both shipwrecks preserve examples of LRA 1. Amphorae from Kiti N2 area attributed to the second generation of LRA 1 and date in the 6th century (Fig. 86), while those from Kiti N3 belong probably to the third generation and date in the 7th century AD.\textsuperscript{126} (Fig. 87)

Yassi Ada is the largest and the most well-studied shipwreck found in the open Aegean Sea and is located between Kos and the coastal Asia Minor, today’s Bodrum. The shipwreck is dated in the 7th century AD according to its amphora

\textsuperscript{124} Theodoulou, Foley, Koukoumelis, Preka-Alexandri 2015, 41-54. Theodoulou, Koukoumelis, Preka-Alexandri, Foley 2016, 141-145.
\textsuperscript{125} Theodoulou, Foley, Evaggelistis, Koutsouflakis, Sakellariou, Tourtas 2015, 616-617, 320.
\textsuperscript{126} Demesticha 2015, 64-66.
The amphorae of Yassi Ada were divided into two types according to J.F.Bass and F.H. van Doorninck. In the first type (LRA 1) categorized amphorae with cylindrical tapering body and rounded base (Fig. 88-89), while in the second one (LRA 2) attributed amphorae with larger and globular body but also plain and rounded base. (Fig. 90-91) Both the two types have two vertical handles, asymmetrically attached on shoulder. Nevertheless, there are many later scholars who recognize both LRA 2 and the later LRA 13 (imitation of LRA 2) in the second type of Yassi Ada.

Parallels of the Yassi Ada amphorae were found in the Archaeological Museum of Constanța in Black Sea region. Type 1 amphorae have the same texture of clay, while the second type preserved similar grave and grooving. However, it is concluded that amphorae from Yassi Ada and Constanța originating from the same region. There is not proposed with safety any region as the production center, but scholars support that type 2 of Yassi Ada do not come from the Black Sea and they are imported. Although, an Aegean origin was suggested. Finally, regarding the inscriptions of the amphorae of Yassi Ada wreck, approximately one hundred and sixteen inscribed inscriptions were found on ninety-five of the four hundred and sixty recorded LRA 2/13 amphorae (while only three inscribed LRA 1 amphorae out of a total of 60).

Finally, shipwreck Dor D was sunk close to Israel with 749 amphorae. 89% of the amphorae were belong to the bah-shaped LRA 5. The ship possibly started from or went via Cyprus and was dated in the last quarter of the 6th century AD.

---

129 Diamanti 2010, 73-74, 111.
130 Bass, Doorninck 1982, 163-164.
131 Diamanti 2010 (a), 90.
132 Abdelhamid 2013, 96-97
IV. CONCLUSIONS

In summary, trading amphorae are exclusively utilitarian vessels, which were produced massively throughout Mediterranean, having as main purpose the transport of liquid and secondarily solid food.\footnote{Filis 2016, 787.}

There is no doubt that the dominant amphora types in the Eastern Mediterranean during early Byzantine times are LRA 1 and LRA 2. There are several centers of their production throughout the Mediterranean. The origin of the discovered amphorae attributed to several workshops according to the composition of the clay as well as some special morphological characteristics of each geographical area.

the uninterrupted production and circulation of the already known types is disrupted in the middle 7th century AD. In 640s with the Arab invasion in Egypt, Syria and Palestine shaped great social and economic changes in these regions affecting their production and trade relations with the rest of the Mediterranean. These regions stopped supplying Constantinople with products, therefore the distribution of their local amphorae in the Mediterranean was also limited. Additionally, from the 7th century the types of the two main types of amphorae, LRA 1 and LRA 2, changed. From the 7th century until the 10th century AD, when the Günsemin types appeared, imitations of the two basic types were prevailed, LRA 13 and the spherical amphorae.\footnote{Poulou-Papadimitriou 2001, 246. Poulou-Papadimitriou, Nodarou 2014, 873-875. Poulou 2018, 198.}

It is also very important that in areas where there is local production of a certain type of amphora there is no lack of imports of the same type. Indicating either that in several cases the local production of products was not enough to cover the needs of the citizens or that there were areas famous for the products they exported thus making them superior to the local ones. Overall, in the Byzantine period, the rarity of Levantine, Mediterranean and Aegean amphorae and the dominance of central Syrian amphorae is a clear indication of the self-sufficiency of the non-coastal settlements of Roman Syria. They were unable to tap the resources that reached the ports of the Levantine East.\footnote{Reynolds 2014, 62.}

The economic organization of Mediterranean is evidenced by the establishment of a commercial law, the *annona*. *Annona* was a roman tax in kind, which established by Diocletian and was paid by the agricultural societies of the empire. It is therefore reasonable to hypothesize that part of the production and distribution of amphorae from Mediterranean reflects some supply routes of Constantinople with products coming from the tax of *annona*.\footnote{Diamanti 2010 (a), 31-32.} An example of a ship that carried amphorae filled with goods that came from the payment of the *annona* is probably the shipwreck of Yassi Ada. According to scholars the amphorae originated...
from many different places, (containing olive oil and wine) and the capacity of the ship (about 800 amphorae) advocates the payment of such a tax.\textsuperscript{137}

A significant clue for the byzantine economy coming from the re-use of the amphorae. Already from ancient times Herodotus\textsuperscript{138} mentioned that amphorae filled with wine reached Egypt and then re-used as containers for water. In roman times, Pliny\textsuperscript{139} referred that it is better to put wine in vessels that previously contained vinegar than sweet wine or honey.\textsuperscript{140} Also, trading amphorae from Yassi Ada shipwreck preserve more than 100 graffiti (were applied after the firing). These graffiti sometimes referred to the owners of the vessels. However, some amphorae have more than one graffiti (two or four) testifying the reuse of the vessels and the concept of recycling adopted by the Byzantine economy in sea trade.\textsuperscript{141} The ‘recycling’ Byzantine economy is also evidenced by the practice of reusing sherds of amphorae as stoppers, in vaulting and in water pipes.\textsuperscript{142}

Moreover, the choice of the place of installation of the workshops near ports for the easy movement of goods as well as their placement near water and sources of clay proves that the social life of the people as also the city plan of the city was directly affected by economy.\textsuperscript{143} Economic purposes also determined the way that the cargo uploaded. This way, of placing the containers inside the ships, follows two basic rules of loading, the maximum exploitation of available space and the maximum protection of the clay packaging items from breaking, which is the result of their displacement.\textsuperscript{144}

For coastal cities, the existence of a port is of vital importance as it connected it with remote areas, strengthening commercial relations and therefore the economy of the region. The very great value of the port to the life and the maritime trading relations of an area is proved by the existence of more than one harbors in the same city. The increased trade and the needs of the city led to the creation of many ports. The most important example is the capital of the empire, Constantinople, which during this period had at least six harbors that have been developed in the Golden Horn and the Sea of Marmaras.\textsuperscript{145}

Certainly, there are cases of smaller commercial centers that maintained two ports during this period, such as Christoupolis (modern Kavala) and Limenas, the ancient port of Thassos. In these cases, the natural environment helped the construction of two harbors. Additionally, it is known that in Thasos the closed-protected by fortification walls harbor was used for military purposes while the open one for commercial activities. Additionally, the development of the above two cities

\textsuperscript{137} Poulou 2018, 205-206.
\textsuperscript{138} Herodotus III.6
\textsuperscript{139} Pliny XIV.25.128.
\textsuperscript{140} Filis 2016, 789, fn. 7.
\textsuperscript{141} Abdelhamid 2013, 97.
\textsuperscript{142} Bakirtzis 2003, 87-88.
\textsuperscript{143} Filis 2016, 792.
\textsuperscript{144} Bakirtzis 2003, 73.
was also strengthened by their geographical location, as they located on the road from Thessaloniki to Constantinople.\footnote{Karagianni 2013, 25-26}

Trade relations between remote areas are mainly evidenced by the identification of amphora types produced in very distant areas. The Mediterranean was besieged by olive oil from Tunisia, olive oil and wine from Syria in LRA 1 and from Aegean in LRA 2, wine and grain from Egypt in LRA 7, wine from Meander valley in LRA 3, from Gaza in LRA 4 and from Palestine in LRA 5/6. Trading activities between distant regions continued unbroken until the 7th century, when in 640 AD Arabs invade Syria, Palestine, Egypt and the Mediterranean Sea.\footnote{Poulou 2018, 197-199.} All trade routes started or ended in the capital of the empire, as Constantinople was the largest center of consumption and movement of goods. An example of distant trade that was interrupted after 640 AD by the Arab invasion is the supply of Constantinople with grain from Egypt.\footnote{Karagianni 2014, 23. Kocabaş, Türkmenoğlu 2014, 237.}

Therefore, the continued study and publication of excavated amphorae is vital for the progress of the research on trade relations and trade networks in Mediterranean Sea. Their study is necessary not only for the understanding of the amphora typology and their classification but much more for the understanding of the trade networks that were created between the Mediterranean port cities as well as the economy of each society. Future studies and publications will hopefully resolve the current incomprehensible issues.
BIBLIOGRAPHY


S. Demesticha, ‘Amphora Production on Cyprus During the Late Roman Period’ in *7ο Διεθνές Συνέδριο Μεσαιωνικής Κεραμικής της Μεσσηνίας, Θεσσαλονίκη, 11-16 Οκτωβρίου 1999*, Athens 2003, 469-476.


S. Demesticha, ‘Gone with the waves: scattered Roman amphorae in shallow waters around Cape Kiti, Cyprus’ in Per Terram, Per Mare: Seaborne Trade and the Distribution of Roman Amphorae in the Eastern and Central Mediterranean, S. Demesticha (ed.), Uppsala 2015, 55-76.


Ch. Diamanti (a), Local production and import of amphorae at Halasarna of Kos Island (5th – 7th c.), Athens 2010.

Ch. Diamanti (b), ‘Εντόπιοι υστερορωμαϊκοί / πρωτοβυζαντινοί αμφορείς από την Αλάσαρνα της Κω’ in Κεραμική της ύστερης αρχαιότητας από τον ελλαδικό χώρο (3ος – 7ος αι. μ.Χ.), Vol. 1, Thessaloniki 2010, 143-152.


M. Kaplan, Γιατί το Βυζάντιο; Μία αυτοκρατορία έντεκα αιώνων, Αθήνα 2018.


G. Koutsouflikas, ‘The transportation of amphorae, tableware and foodstuffs in the Middle and Late Byzantine period. The evidence from the Aegean shipwrecks’ in Multidisciplinary approaches to food and foodways in the medieval Eastern Mediterranean, S.Y. Waksman (ed.), Lyon 2020, 447-481.

C. Mango, Βυζάντιο. Η αυτοκρατορία της Νέας Ρώμης, Αθήνα 1990.


P. Petridis, Πρωτοβυζαντινή κεραμική του ελλαδικού χώρου, Αθήνα 2013.

N. Poulou-Papadimitriou, ‘Βυζαντινή κεραμική από τον ελληνικό νησιωτικό χώρο και από την Πελοπόννησο (7ος-9ος): Μια πρώτη προσέγγιση’ in Οι σκοτεινοί αιώνες του Βυζαντίου (7ος-0ος αι.), Athens 2001, 231-266.


LIST OF FIGURES

Fig. 1: Stacking amphorae in ships. (Bakirtzis 2003, fig. 15)

Fig. 2: Late Roman Amphorae 1-7 according to Riley’s typology. (Riley 1921, fig. 10)

Fig. 3: Distribution of LRA 1. (Riley 1981, fig. 14)

Fig. 4: Distribution of LRA 2. (Riley 1981, fig. 15)

Fig. 5: Distribution of LRA 3. (Riley 1981, fig. 12)

Fig. 6: Distribution of LRA 4. (Riley 1981, fig. 13)

Fig. 7: North African amphorae (Peacock & Williams 1986, fig. 84)

Fig. 8: Spathione (Peacock & Williams 1986, fig. 120)

Fig. 9: Byzantine Globular Amphora from Pseira (Poulou-Papadimitriou, Nodarou 2014, figs. 3a, 3b, 4)

Fig. 10: Byzantine Globular Amphora from Pseira (Poulou-Papadimitriou, Nodarou 2014, figs. 7a, 7b, 8, 9)

Fig. 11: LRA 13 from Pseira (Poulou-Papadimitriou, Nodarou 2014, figs. 5a, 5b, 6)

Fig. 12: Later imitation of LRA 1 from Leipsous island. (Poulou-Papadimitriou 2014, 138, 148, figs. 17 a-b)

Fig. 13: Late Roman Amphorae with sharply pointed foot dating in the 9th and 10th centuries AD (Bakirtzis 2003, pl. 18, fig. 1-6)

Fig. 14: Imitations of bag-shaped LRA 5 from Beirut (Reynolds 2003, fig. 1.9-10)

Fig. 15: Günserin’s types and subtypes (Günsenin 1990, fig. 3)

Fig. 16: Distribution of Günserin’s type I (Günsenin 1990, fig. 4)

Fig. 17: Distribution of Günserin’s type IIa (Günsenin 1990, fig. 13)

Fig. 18: Distribution of Günserin’s type IIb (Günsenin 1990, fig. 14)

Fig. 19: LRA 1, LRA 2, LRA 13, LRA 4, LRA 5/6, Samian amphora from Kos Island (Diamanti 2010, 178, fig. 12.1.8)

Fig. 20: Imported (a) and local (b) LRA 1 from Halasarna of Kos (Diamanti 2010, 179, figs. 12.1.9.1 a,b)

Fig. 21: LRA 13 from Halasarna of Kos (Diamanti 2010, 179, figs. 12.1.9.2)

Fig. 22: LRA 13 from Kos (Diamanti 2010, 152, fig. 3.4 a, b)

Fig. 23: LRA 1 from Chios (Ballance-Boardman-Corbett-Hood 1989, pl. 25, fig 280)
Fig. 24: LRA 2 from Chios (Ballance-Boardman-Corbett-Hood 1989, pl.24, figs. 236, 237)

Fig. 25: LRA 5/6 from Chios (Balance-Boardman-Corbett-Hood 1989, pl.25, fig. 243)

Fig. 26: Spatheion from Chios (Balance-Boardman-Corbett-Hood 1989, pl. 25, fig. 232)

Fig. 27: LRA 1 from Paros (Diamanti 2015, 543, fig 4)

Fig. 28: LRA 13 from Paros (Diamanti 2015, 543, fig 5)

Fig. 29: LRA 1 from Samos (Gerousi 1997, 253, fig. 1)

Fig. 30: LRA 1 from Samos (Gerousi 1997, 253, fig. 1)

Fig. 31: Samian amphora (Gerousi 1997, 255, fig. 3)

Fig. 32: Samian amphora (Gerousi 1997, 255, fig. 4)

Fig. 33: Byzantine globular amphora from Handakas, Crete (Poulou-Papadimitriou 2008, 154, fig. 2)

Fig. 34: LRA 5/6 from Handakas (Poulou-Papadimitriou 2001, 259, fig. 20)

Fig. 35: LRA 4 from pitheon in Thessaloniki near Hagia Theodora (Akrivopoulou-Slampeas 2014, 293, fig. 3)

Fig. 36: LRA 1 from pitheon in Thessaloniki near Hagia Theodora (Akrivopoulou-Slampeas 2014, 295, fig. 10)

Fig. 37: LRA 2 from the Deposit area 2 (Akrivopoulou-Slampeas 2014, 294, fig. 5)

Fig. 38: Torone’s type I (Papadopoulos 1989, 84, fig. 11 a, c)

Fig. 39: Torone’s type II (Papadopoulos 1989, 87, fig. 12)

Fig. 40: Torone’s type III (Papadopoulos 1989, 90, fig. 13 b)

Fig. 41: Torone’s type IV and V (Papadopoulos 1989, 94, fig. 14)

Fig. 42: Torone’s type VI (Papadopoulos 1989, 96, fig. 15)

Fig. 43: Torone’s type VII (Papadopoulos 1989, 99, fig. 17)

Fig. 44: LRA 1 from Philippoi (Trivyzadaki 2005, 40)

Fig. 45: LRA 2 from Philippoi (Trivyzadaki 2005, 54)

Fig. 46: LRA 3 from Philippoi (Trivyzadaki 2005, 59)

Fig. 47: LRA 4 from Philippoi (Trivyzadaki 2005, 65)

Fig. 48: LRA 5/6 from Philippoi (Trivyzadaki 2005, 72)

Fig. 49: LRA 4 from Saracane (Hayes 1992, fig. 22-5)

Fig. 50: Yenikapi 1 shipwreck with its cargo (Pulak, Ingram, Jones 2014, 60, fig. 25)
Fig. 51: Yenikapi 12 shipwreck with its cargo (Özsait-Kocabaş 2018, 358, fig. 2 a, b)
Fig. 52: LRA 2B from Küçükçekmece Lake Basin (Kara 2021, 76, fig. 1a)
Fig. 53: LRA 3A2 from Küçükçekmece Lake Basin (Kara 2021, 77, fig. 4 a, b)
Fig. 54: LRA 4 from Küçükçekmece (Kara 2021, 81, fig. 10)
Fig. 55: LRA 5/6 from Küçükçekmece (Kara 2021, 81, fig. 11)
Fig. 56: LRA 7 from Küçükçekmece (Kara 2021, 82, fig. 12 a, b)
Fig. 57: Spatheion from Küçükçekmece (Kara 2021, 84, fig. 17 a, b)
Fig. 58: LRA 1 from Parion (Akkaş 2020, 196, fig. 10)
Fig. 59: LRA 2 from Parion (Akkaş 2020, 198, fig. 11)
Fig. 60: LRA 3 from Parion (Akkaş 2020, 200, fig. 12)
Fig. 61: LRA 4 from Parion (Akkaş 2020, 203, fig. 13)
Fig. 62: LRA 5/6 from Parion (Akkaş 2020, 205, fig. 14)
Fig. 63: Spatheia from Parion (Akkaş 2020, 207, fig. 15)
Fig. 64: Local LRA 1 and LRA 13 from Amathus, Cyprus (Empereur 2018, 184, fig. 1)
Fig. 65: Imported LRA 1 from Cyprus (Empereur 2018, 188, fig. 5-F7)
Fig. 66: Imported LRA 2 from Cyprus (Empereur 2018, 188, fig. 5-F8)
Fig. 67: Imported LRA 4 from Cyprus (Empereur 2018, 188, fig. 5-F9-F10)
Fig. 68: Imported LRA 5/6 from Cyprus (Empereur 2018, 188, fig. 5-F12)
Fig. 69: Distribution of LRA 4 and LRA 5/6 in Syropalestine (Uscatescu 2003, 547, fig. 1)
Fig. 70: LRA 5 from the Roman Imperial Baths in Beirut (Reynolds 2003(b), 727, fig. 1.9-10)
Fig 71: Beirut amphorae from the Roman Imperial Baths in Beirut (Reynolds 2003(a), fig. 1.9-10)
Fig 72: Beirut amphorae from Apamea, Syria (Vokaer 2017, 802, fig. 6b)
Fig. 73: LRA 1 from Apamea, Syria (Vokaer 2017, 797, fig. 1b)
Fig. 74: LRA 2 from Apamea, Syria (Vokaer 2017, 798, fig. 2.1)
Fig. 75: LRA 3 from Apamea, Syria (Vokaer 2017, 798, fig. 2.2-9)
Fig. 76: LRA 4 from Apamea, Syria (Vokaer 2017, 798, fig. 2.15-17)
Fig. 77: LRA 5/6 from Apamea, Syria (Vokaer 2017, 800, fig. 4.1-6)
Fig. 78: LRA 7 from Apamea, Syria (Vokaer 2017, 801, fig. 5.2)
Fig 79: Neck of a LRA 1 from Lamluda (Antonelli, Menozzi 2014, 894, fig. 5.1)

Fig 80: Neck of a LRA 1 from Lamluda (Antonelli, Menozzi 2014, 894, fig. 5.4-6)

Fig. 81: Rim of an Africana Grande from Lamluda (Antonelli, Menozzi 2014, 894, fig. 5.2)

Fig. 82: Local LRA 7 from Naukratis (Thomas 2013, 15, fig. 37)

Fig. 83: Imported LRA 1 from Naukratis (Thomas 2013, 16, fig. 38)

Fig. 84: Imported LRA 4 from Naukratis (Thomas 2013, 17, fig. 39)

Fig. 85: LRA 7 from Istaib Antar-Fustat (Vogt, Bourgeois, Schvoerer, Gouin, Girard, Thiebault 2002, 68, fig. 2)

Fig. 86: LRA 1/B from Cape Kiti N2 (Demesticha 2015, 65, fig. 6)

Fig. 87: LRA 1/B from Cape Kiti N3 (Demesticha 2015, 66, fig. 7)

Fig. 88: First type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 156, 8-1)

Fig. 89: First type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 157, 8-3)

Fig. 90: Second type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 158, 8-4)

Fig. 91: Second type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 159, 8-5)
Fig. 1: Stacking amphorae in ships. (Bakirtzis 2003, fig. 15)
Fig. 2: Late Roman Amphorae 1-7 according to Riley’s typology. (Riley 1921, fig. 10)

Fig. 3: Distribution of LRA 1. (Riley 1981, fig. 14)
Fig. 4: Distribution of LRA 2. (Riley 1981, fig. 15)

Fig. 5: Distribution of LRA 3. (Riley 1981, fig. 12)
Fig. 6: Distribution of LRA 4. (Riley 1981, fig. 13)

Fig. 7: North African amphorae (Peacock & Williams 1986, fig. 84)
Fig. 8: Spatheion (Peacock & Williams 1986, fig. 120)

Fig. 9: Byzantine Globular Amphora from Pseira (Poulou-Papadimitriou, Nodarou 2014, figs. 3a, 3b, 4)

Fig. 10: Byzantine Globular Amphora from Pseira (Poulou-Papadimitriou, Nodarou 2014, figs. 7a, 7b, 8, 9)
Fig. 11: LRA 13 from Pseira (Poulou-Papadimitriou, Nodarou 2014, figs. 5a, 5b, 6)

Fig. 12: Later imitation of LRA 1 from Leipsous island. (Poulou-Papadimitriou 2014, 138, 148, figs. 17 a-b)
Fig. 13: Late Roman Amphorae with sharply pointed foot dating in the 9th and 10th centuries AD (Bakirtzis 2003, pl. 18, fig. 1-6)

Fig. 14: Imitations of bag-shaped LRA 5 from Beirut (Reynolds 2003, fig. 1.9-10)
Fig. 15: Günsenin’s types and subtypes (Günsenin 1990, fig. 3)

Fig. 16: Distribution of Günsenin’s type I (Günsenin 1990, fig. 4)
Fig. 17: Distribution of Güsenin’s type IIa (Günsenin 1990, fig. 13)

Fig. 18: Distribution of Güsenin’s type IIb (Günsenin 1990, fig. 14)
Fig. 19: LRA 1, LRA 2, LRA 13, LRA 4, LRA 5/6, Samian amphora from Kos Island (Diamanti 2010, 178, fig. 12.1.8)

Fig. 20: Imported (a) and local (b) LRA 1 from Halasarna of Kos (Diamanti 2010, 179, figs. 12.1.9.1 a,b)
Fig. 21: LRA 13 from Halasarna of Kos (Diamanti 2010, 179, figs. 12.1.9.2)

Fig. 22: LRA 13 from Kos (Diamanti 2010, 152, fig. 3.4 a, b)
Fig. 23: LRA 1 from Chios (Ballance-Boardman-Corbett-Hood 1989, pl. 25, fig 280)

Fig. 24: LRA 2 from Chios (Ballance-Boardman-Corbett-Hood 1989, pl.24, figs. 236, 237)
Fig. 25: LRA 5/6 from Chios (Balance-Boardman-Corbett-Hood 1989, pl. 25, fig. 243)

Fig. 26: Spatheion from Chios (Balance-Boardman-Corbett-Hood 1989, pl. 25, fig. 232)

Fig. 27: LRA 1 from Paros (Diamanti 2015, 543, fig 4)
Fig. 28: LRA 13 from Paros (Diamanti 2015, 543, fig 5)

Fig. 29: LRA 1 from Samos
(Gerousi 1997, 253, fig. 1)

Fig. 30: LRA 2 from Samos
(Gerousi 1997, 253, fig. 1)
Fig. 31: Samian amphora
(Gerousi 1997, 255, fig. 3)

Fig. 32: Spatheion
(Gerousi 1997, 255, fig. 4)

Fig. 34: LRA 5/6 from Handakas
(Poulou-Papadimitriou 2001, 259, fig. 20)

Fig. 33: Byzantine globular amphora from Handakas, Crete
(Poulou-Papadimitriou 2008, 154, fig. 2)
Fig. 35: LRA 4 from pitheon in Thessaloniki near Hagia Theodora (Akrivopoulou-Slampeas 2014, 293, fig. 3)

Fig. 36: LRA 1 from pitheon in Thessaloniki near Hagia Theodora (Akrivopoulou-Slampeas 2014, 295, fig. 10)

Fig. 37: LRA 2 from the Deposit area 2 (Akrivopoulou-Slampeas 2014, 294, fig. 5)
Fig. 38: Torone’s type I (Papadopoulos 1989, 84, fig. 11 a, c)

Fig. 39: Torone’s type II (Papadopoulos 1989, 87, fig. 12)
Fig. 40: Torone’s type III (Papadopoulos 1989, 90, fig. 13 b)

Fig. 41: Torone’s type IV and V (Papadopoulos 1989, 94, fig. 14)
Fig. 42: Torone’s type VI (Papadopoulos 1989, 96, fig. 15)

Fig. 43: Torone’s type VII (Papadopoulos 1989, 99, fig. 17)
Fig. 44: LRA 1 from Philippoi (Trivyzadaki 2005, 40)

Fig. 45: LRA 2 from Philippoi (Trivyzadaki 2005, 54)

Fig. 46: LRA 3 from Philippoi (Trivyzadaki 2005, 59)

Fig. 47: LRA 4 from Philippoi (Trivyzadaki 2005, 65)

Fig. 48: LRA 5/6 from Philippoi (Trivyzadaki 2005, 72)
Fig. 49: LRA 4 from Sarayhane
(Hayes 1992, fig. 22-5)

Fig. 50: Yenikapi 1 shipwreck with its cargo (Pulak, Ingram, Jones 2014, 60, fig. 25)
Fig. 51: Yenikapi 12 shipwreck with its cargo (Özsait-Kocabaş 2018, 358, fig. 2 a, b)

Fig. 52: LRA 2B from Küçükçekmece Lake Basin (Kara 2021, 76, fig. 1a)
Fig. 53: LRA 3A2 from Küçükçekmece Lake Basin (Kara 2021, 77, fig. 4 a, b)

Fig. 54: LRA 4 from Küçükçekmece (Kara 2021, 81, fig. 10)

Fig. 55: LRA 5/6 from Küçükçekmece (Kara 2021, 81, fig. 11)
Fig. 56: LRA 7 from Küçükçekmece (Kara 2021, 82, fig. 12 a, b)

Fig. 57: Spatheion from Küçükçekmece (Kara 2021, 84, fig. 17 a, b)
Fig. 58: LRA 1 from Parion (Akkaş 2020, 196, fig. 10)

Fig. 59: LRA 2 from Parion (Akkaş 2020, 198, fig. 11)
Fig. 60: LRA 3 from Parion (Akkaş 2020, 200, fig. 12)

Fig. 61: LRA 4 from Parion (Akkaş 2020, 203, fig. 13)

Fig. 62: LRA 5/6 from Parion (Akkaş 2020, 205, fig. 14)
Fig. 63: Spatheia from Parion (Akkaş 2020, 207, fig. 15)

Fig. 64: Local LRA 1 and LRA 13 from Amathus, Cyprus (Empereur 2018, 184, fig. 1)
Fig. 65: Imported LRA 1 from Cyprus
(Empereur 2018, 188, fig. 5-F7)

Fig. 66: Imported LRA 2 from Cyprus
(Empereur 2018, 188, fig. 5-F8)

Fig. 67: Imported LRA 4 from Cyprus (Empereur 2018, 188, fig. 5-F9-F10)
Fig. 68: Imported LRA 5/6 from Cyprus (Empereur 2018, 188, fig. 5-F12)

Fig. 69: Distribution of LRA 4 and LRA 5/6 in Syropalestine (Uscatescu 2003, 547, fig. 1)
Fig. 70: LRA 5 from the Roman Imperial Baths in Beirut (Reynolds 2003(b), 727, fig. 1.9-10)

Fig 71: Beirut amphorae from the Roman Imperial Baths in Beirut (Reynolds 2003(a), fig. 1.9-10)
Fig. 72: Beirut amphorae from Apamea, Syria (Vokaer 2017, 802, fig. 6b)

Fig. 73: LRA 1 from Apamea, Syria (Vokaer 2017, 797, fig. 1b)
Fig. 74: LRA 2 from Apamea, Syria (Vokaer 2017, 798, fig. 2.1)

Fig. 75: LRA 3 from Apamea, Syria (Vokaer 2017, 798, fig. 2.2-9)
Fig. 76: LRA 4 from Apamea, Syria (Vokaer 2017, 798, fig. 2.15-17)

Fig. 77: LRA 5/6 from Apamea, Syria (Vokaer 2017, 800, fig. 4.1-6)
Fig. 78: LRA 7 from Apamea, Syria (Vokaer 2017, 801, fig. 5.2)

Fig 79: Neck of a LRA 1 from Lamluda
(Antonelli, Menozzi 2014, 894, fig. 5.1)

Fig 80: Neck of a LRA 13 from Lamluda
(Antonelli, Menozzi 2014, 894, fig. 5.4-6)
Fig. 81: Rim of an Africana Grande from Lamluda

(Antonelli, Menozzi 2014, 894, fig. 5.2)

Fig. 82: Local LRA 7 from Naukratis (Thomas 2013, 15, fig. 37)

Fig. 83: Imported LRA 1 from Naukratis

(Thomas 2013, 16, fig. 38)

Fig. 84: Imported LRA 4 from Naukratis

(Thomas 2013, 17, fig. 39)
Fig. 85: LRA 7 from Istabl Antar-Fustat

(Vogt, Bourgeois, Schvoerer, Gouin, Girard, Thiébault 2002, 68, fig. 2)

Fig. 86: LRA 1/B from Cape Kiti N2 (Demesticha 2015, 65, fig. 6)
Fig. 87: LRA 1/B from Cape Kiti N3
(Demesticha 2015, 66, fig. 7)

Fig. 88: First type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 156, 8-1)
Fig. 89: First type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 157, 8-3)

Fig. 90: Second type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 158, 8-4)
Fig. 91: Second type of amphorae from Yassi Ada shipwreck. (Bass-Doorninck 1982, 159, 8-5)