Eastern Mediterranean shipwrecks as indicators of ancient trade in the late fourth to the mid first century BC

Study of the Hellenistic amphora wreck evidence & early Italian imports in the eastern Mediterranean area
(Greece, Cyprus & International waters)

A thesis by
Lucie S. Vidličková

Submitted to the Department of History and Archaeology of
the University of Crete
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

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Master program: Ancient Mediterranean World
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May 2011

To my parents and
all, who gave continuous support.

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Foreword

The present thesis is devoted to a systematic preliminary research of amphora wrecks with the aim to demonstrate their archaeological potential for a study of amphora distribution. Maritime archaeology brought this once-vanished evidence of ancient trade back to light. Merchant ships lost at the sea are often preserved and dated by the virtue of transport amphorae carrying commodities traded for consumption, but never reaching their port of call. Transport amphorae if identified as a part of a cargo of a sunken ship stand, among the land evidence, as significant indicators of ancient trade. Unfortunately, rarely are these two sources of evidence brought together in a detail study, due to the uneven quality of wreck records. In 1961, Virginia Randolph Grace, a distinguished scholar dedicated to amphora study, wrote:

These dry studies [referring to land excavations] will be increasingly supplemented by divers. As they range further with better techniques along the shores of the ancient world, through their reports lost cargoes will mark for us the paths of ancient trade.[i]

Through the examination of amphora carriers, which sank between the late fourth century and the middle first century BC in the territorial waters of Greece and Cyprus or were lost on their long voyage in the international waters of the eastern Mediterranean, the present thesis examines the available archaeological evidence and bring it closer to previously established patterns of amphora distribution.

To set the aims and limits of the present study, Chapter 1 (Introduction) treats the potential and core issues in maritime archaeology today and outlines current state of the research. Chapter 2 (Historical background) briefly outlines the history of maritime archaeology in the selected areas, which are studied in the present paper. Among these, Turkish maritime archaeology is as well briefly examined, since it played a significant role in the history of the discipline.

Due to the great variability of discovery circumstances, their interpretations and reliability of available reports regarding amphora wrecks sites, Chapter 3 (Classification of finds) focuses on systematization of various underwater sites with the aim to determine wrecks which are sound indicators of amphora distribution for the ancient economic study. Chapter 4 (Attested amphora types) examines in detail the attested amphorae, which were recorded in the cargoes of confirmed wreck sites and represent the indicators of passed trade activities. Among the Hellenistic cargoes, early Italian imports, which fall within the chronological range of the present thesis

[i] *Grace.*

are examined in detailed, attesting early popularity of Italian wine in the eastern Mediterranean. Among these, new discoveries dated generally to the first century BC are examined, expanding slightly the chronological limits of the present study. Chapter 5 (Conclusion) examines the collected evidence in the light of our current knowledge of amphora distribution to set the presented data in a wider archaeological context.

The study is accompanied by the update of amphora wreck sites presented in the Catalogue of the thesis; and together with two tables of potential and previously listed wrecks, represent collective source for amphora merchant ships wrecked within the period under consideration.

Annotation

All numbers written in **bold** stand for the entry serial number of a specific wreck in the Catalogue of this thesis. Reference to catalogue of excluded finds (Table 1) and unpublished sites (Table 2) is given by citing the Table (Table 1 or Table 2), followed by the serial number of the wreck in the table, written in **bold**. Reference to the catalogue of *Parker* is given by abbreviation **P** written in **bold**, followed by the serial number of the wreck in his catalogue. Reference to Gibbins' catalogue follows the same manner, using abbreviation **G** for *Gibbins*. Frequently cited works are abbreviated, written in *italics* and the full reference is given in Abbreviations. Russian writing is written in azbuka or transliteration is used, following the Pontos books example[ii]. Greek is kept in alphabet, if not representing abbreviations for periodicals.

Furthermore Online Research Material (*ORM*) and Internet resources (*IR*) are used in the citations throughout the present study. The links cited in the former serve as a significant source of wider research material, including articles, photographs and video footage used for the present research, while the links cited in the later served as a support during the initial stage of the research (e.g. research databases - JSTOR, Dyabola, L'Année philologique). Reference to Oxford Roman Economy Project (*OREP*), which is based in the Faculty of Classics, at the University of Oxford, refers to a shipwreck database created by Julia Strauss, giving the shipwreck entry number in the database[iii].

[ii] See also *Pontos* in Internet Resources.

[iii] The link given to Oxford Economy Project in the Internet Resources at the end of this study provides general link to the project, since the catalogue became inaccessible by January 2011.

Acknowledgements

It is a pleasure to thank those who made the present thesis possible, such as my supervisors Pavlina Karanastasi, Eleni Zimi and Nikolaos Stambolidis, for their guidance during the progress of this study. I am grateful to Kalliopi Baika and Giorgos Koutsouflakis, whose encouragement, friendship and support enabled me to develop a better understanding of the subject. To Giorgos Koutsouflakis, I am also indebted for his generosity in providing me with selected research material from his ongoing project in the southern Euboean Gulf and recently surveyed wreck site in Cape Armenistis, Leipsoi.

I am heartily thankful to Theotokis Theodoulou, who provided me with helpful reference and information concerning several Greek surveyed wrecks; to Ilias Spondylis, for sharing information about shipwrecks discovered during his research in Pagasitic Gulf; to George F. Bass and Bridget Buxton, who offered research material, directions and information concerning wrecks in Turkish territorial waters and enhanced my understanding of maritime archaeology along the Turkish Mediterranean coast.

For research information, video material and photos related to the deepest Hellenistic shipwreck in the eastern Mediterranean, I would like to express my gratitude to David Jourdan. He has been more than generous to my many requests. I also owe my thanks to Mark Lawall, for his invaluable comments on selected amphora material.

Finally, I would like to show my appreciation for the support provided by the John Morrison Memorial Fund for Hellenic Maritime Studies research award, granted by the British School at Athens. The grant enable the creation of the Eastern Mediterranean Maritime Archaeology Foundation (*EMMAF*), which during its short existence grew into a potential enterprise, which is now under the direction of a multinational and multidisciplinary team. My indebtedness belongs to all, who dedicated their time to this endeavor initiated during my research for the present thesis: Nikolaos Kontakis, Kristian Lorenzo, Dora Giannopoulou and most importantly to the first contributors, who entrusted us with research material from their present or past projects: George F. Bass, Nicolle Hirschfeld, Giorgos Koutsouflakis, David Jourdan and most recently Mark Lawall and Theotokis Theodoulou.

Any remaining errors, lapses in judgement and omissions in the present thesis are the responsibility of the author alone.

April 2011
Athens

Ancient sources

Athenaeus	S.D. Olson (*trans*.), *Athenaeus, The Learned Banqueters* (Loeb Classical Library) London 2006.
Cato	W.D. Hooper (*trans*.), *Marcus Portius Cato, On Agriculture* (Loeb Classical Dictionary, London 1934.
Demosthenes	A.T. Murray (*trans*.), *Demosthenes, Private Orations*, 6 vols., IV 1936 (reprinted 1946, 1958), (Loeb Classical Library) London 1958.
Diod.	Ch.L. Sherman (*trans*.), *Diodorus of Sicily,* 12 vols., VII (Loeb Classical Library) London 1952.
Pliny	H. Rackham (trans.), *Pliny, Natural History,* 10 vols., IV, 1945 (reprinted 1960), (Loeb Classical Library), London 1960.
Strabo	H.L. Jones (trans.), *The Geography of Strabo*, 8 vols., VI, 1929 (reprinted 1950), (Loeb Classical Library) London 1950.

Bibliographical abbreviations

AA	Archäologischer Anzeiger.
AAA	Athens Annals of Archaeology (*Αρχαιολογικά Ανάλεκτα έξ Αθήνων*).
ABSA	Annual of the British School at Athens.
ADelt	Archaiologikon Deltion (*Αρχαιολογικόν Δελτίον*).
AE	Archaiologike Ephemeris (*Αρχαιολογική Εφημερίς*).
AErgoMak	To Archaiologiko Ergo sti Makedonia kai Thraki (*Το Αρχαιολογικό Έργο στη Μακεδονία και θράκη*).

AJA	American Journal of Archaeology.
AM	Mitteilungen des Deutschen Archäologischen Instituts, Athenische Abteilung.
AMA	The Ancient World and Archaeology (*Античний мир и Археология*), Saratov.
AnatSt	Anatolian Studies.
AnnRepCyp	Annual Report of the Department of Antiquities (Cyprus).
Antikythera	unsigned, 'Τα ευρήματα του ναυαγίου των Αντικυθήρων', *AE* 1902, 145-171.
Antikythera TAPS	G.D. Weinberg, V.R. Grace, G.R. Edwards, H.S. Robinson, P. Throckmorton & E.K. Ralph, 'The Antikythera Shipwreck Reconsidered', *TAPS* 55.3, 1965, 3-48.
APS Yearbook	A yearbook of the American Philosophical Society.
AR	Archaeological Reports.
Archaeonautica	French academic periodical dedicated to the topic of marine archaeology.
ASAAMIO	Annuario della Scuola Archeologica di Atene e delle Missioni Italiane in Oriente.
AT	Archaiologia kai Technes (*Αρχαιολογία και Τέχνες*).
BCH	Bulletin de Correspondance Hellénique.
CDCW	G. Shipley, J. Vanderspoel, D. Mattingly, L. L. Foxhall (eds.), *The Cambridge Dictionary of Classical Civilization*, Cambridge 2006.

CQ	Classical Quarterly.
CR	The Classical Review.
Eiring & Lund	J. Eiring & J. Lund, *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens, September 26-29, 2002*, Athens 2004.
EEKM	Epeteris Etaireias Kykladikon Meleton (*Επετηρίς Εταιρείας Κυκλαδικών Μελετών*).
Enalia	The Journal of the Hellenic Institute of Marine Archaeology.
Gibbins	D. Gibbins, 'Shipwrecks and Hellenistic trade', in Z.H. Archibald, J.K. Davies, V. Gabrielsen & G. J. Oliver (eds.), *Hellenistic Economies*, London & New York 2001, 273-312.
Grace	V.R. Grace, *Amphoras and the Ancient Wine Trade* (Excavation of the Athenian agora, Picture Book No. 6, First edition) Princeton 1961.
Guarducci	M. Guarducci, *Epigrafia Greca*, 4 vols., Rome 1967-1968.
HAA Kos	History-Art-Archaeology of Kos, First International Scientific Symposium, Kos 2-4 May 1997 (*Ιστορία-Τέχνη-Αρχαιολογία της Κω, 1ο Διεθνές Επιστημονικό Συμπόσιο, Κως 2-4 Μαϊου 1997*).
IJNA	International Journal of Nautical Archaeology (publication of Nautical Archaeology Society).
Iliria	Publication of the Academy of Sciences of Albania.
INA Quarterly	Publication of the Institute of Nautical Archaeology (previously *INA Newsletter*).

INA Newsletter	Publication of the Institute of Nautical Archaeology. Before 1979 - *AINA* Newsletter (nowadays *INA Quarterly*).
JDAI	Jahrbuch des Deutschen Archäologischen Instituts.
JFA	Journal of Field Archaeology.
JGS	Journal of Glass Studies.
JHS	Journal of Hellenic Studies.
Journal E&T	Monthly journal of the General Secretariat for research & Technology, Athens (in Greek).
JRA	Journal of Roman Archaeology.
Micha	P. Micha, 'Amphora Shipwrecks in the Aegean, A Database of the Ephorate of Underwater Antiquities', *Skyllis* 7, 2005-06, 82-93.
NAS Newsletter	Publication of the Nautical Archaeology Society.
Nessana	V. Grace, 'Stamped Handles of Commercial Amphoras', in H.D. Colt (ed.) *Excavations at Nessana* I, 3 Vols., London 1962, 106-130.
NGSRR	National Geographic Society Research Reports.
OCD	S. Hornblower & A. Spawforth (eds.) *The Oxford Classical Dictionary,* 3rd ed., Oxford 1996.
Parker	A. J. Parker, *Ancient Shipwrecks of the Mediterranean & Roman Provinces* (BAR Int. Ser., 580), Oxford 1992.
REG	Revue des études grecques.
RStLig	Rivista di Studi Liguri.

TAPS	Transactions of the American Philosophical Society.
TO ERGO YPPO	Publication of the Ministry of Culture, Athens (*ΤΟ ΕΡΓΟ ΥΠΠΟ - Το έργο του Υπουργείου Πολιτισμού στον τομέα της Πολιτιστικής Κληρονομιάς*).
TürkArkDerg	Türk Arkeoloji Dergisi.
VDI	Vestnik Drevnej Istorii (*Вестник Древней Истории*)[iv].

Institutional abbreviations

AIA	Archaeological Institute of America. Publisher of American Journal of Archaeology (*AJA*).
AINA	American Institute of Nautical Archaeology. Not long after affiliating with Texas A&M University, the institute shortened its name to *INA*.
Antiquity Trust	Charity founded in 1927 by English archaeologist O.G.S. Crawford, which publishes the Antiquity - academic journal dedicated to subject of Archaeology.
ASA	Archaeological Society at Athens (εν Αθήναις Αρχαιολογική Εταιρεία), which publishes the following periodicals used in this study as reference: *AAA*, *ADelt*, *AE*.
BIAA	British Institute at Ankara. Publisher of Anatolian Studies (*AnatSt*).
BSA	British School at Athens. Together with Society of the Promotion for Hellenic Studies (*SPHS*), the British School at Athens publishes the Archaeological Reports (*AR*).

[iv] Trans. Bulletin of Ancient History.

CAARI	The Cyprus American Archaeological Research Institute.
CAIA	Canadian Archaeological Institute at Athens.
CMA	Centre for Maritime Archaeology of the University of Southampton.
CMG	Corning Museum of Glass. Publisher of Journal of Glass Studies (*JGS*).
EfA	École française d'Athènes. Publisher of Bulletin de Correspondance Hellénique (*BCH*).
EUA	Ephorate of Underwater Antiquities of the Ministry of Culture (ΕΕΑ - Εφορεία Ενάλιων Αρχαιοτήτων).
GDMM	General Directorate of Monuments and Museums of the Ministry of Culture and Tourism (Turkey), which publishes the Türk Arkeoloji Dergisi (*TürkArkDerg*).
HCMR	Hellenic Centre for Marine Research (ΕΛ. ΚΕ. Θ.Ε. - Ελληνικό Κέντρο Θαλάσσιων Έρευνων). It was founded in 2003 by the integration of National Centre for Marine Research (*NCMR*) and Institute of Marine Biology of Crete (*IMBC*).
HIMA	Hellenic Institute of Marine Archaeology (I. ΕΝ. Α.Ε. - Ινστιτούτο Εναλίων Αρχαιολογικών Ερευνών). Publisher of Enalia periodical.
IMBC	Institute of Marine Biology of Crete (ΙΘΑΒΙΚ - Ινστιτούτο θαλάσσιας Βιολογίας Κρήτης).
INA	Institute of Nautical Archaeology (formerly *AINA*).
IOFR	Institute of Oceanographic and Fishing Research (Ι. ΩΚ. Α. Ε - Ινστιτούτο Ωκεανογραφικών και Αλιευτικών Ερευνών).

MIT	Massachusetts Institute of Technology.
NM	National Archaeological Museum of Athens.
NAS	Nautical Archaeology Society. Publisher of the *IJNA* and *NAS Newsletter*.
NCMR	National Centre for Marine Research (ΕΚΘΕ - Εθνικό Κέντρο Θαλασσίων Ερευνών), formerly Institute of Oceanographic and Fishing Research (*IOFR*). By the integration of *NCMR* and Institute of Marine Biology of Crete (*IMBC*), which took place in 2003, the Hellenic Center for Marine Research (*HCMR*) was created.
NG	National Geographic.
NIA	The Norwegian Institute at Athens.
NTNU	The Norwegian University of Science and Technology.
SPHS	Society for the Promotion of Hellenic Studies, which publishes the Archaeological Reports, together with the British School at Athens.
TINA	Turkish Institute of Nautical Archaeology.
WAMM	Western Australian Maritime Museum.
WHOI	Woods Hole Oceanographic Institution.

Online research material

AMPHORAS	The Amphoras Project is maintained by P. M. Wallace Matheson and it contains over 11,000 articles. The project is making available part of the archive collected by V.R. Grace. http://projects.chass.utoronto.ca/cgi-bin/amphoras/well?

EMMAF	Eastern Mediterranean Maritime Archaeology Foundation represents a new source for maritime archaeology initiated by the author to serve as a resource for scholars involved in studies connected with maritime archaeological research and bringing Greek maritime archaeology closer to the international scientific audience. http://www.emmaf.org/
Lawall	M. Lawall, 'Mark Lawall's identification of the Nauticos assemblage', *EMMAF*, 17.4. 2011, Slide presentation from the DEGUWA conference in Frankfurt (17-19 February 2006) with accompanying modified text by M. Lawall. http://www.emmaf.org/mark-lawalls-identification-of-the-nauticos-assemblage-2.htm
Monakhov	S. Ju. Monakhov, 'Towards a typology of Knidian Amphoras of 4th-2nd century BC', in *The Bosporan phenomenon: Greek culture on the periphery of the ancient world [Боспорский феномен: греческая культура на периферии античного мира]* St. Petersburg 1999, 161-172; Trans. O. Bakich & P.M.W. Matheson in *AMPHORAS* http://projects.chass.utoronto.ca/amphoras/trans/sym-t99.htm
Nauticos	'The deepest shipwreck in the eastern Mediterranean', *EMMAF*, 11.11. 2010, Video footage recorded at the site and reproduced with the permission of David Jourdan (Nauticos Corporation). http://www.emmaf.org/the-deepest-shipwreck-in-the-eastern-mediterranean.htm
Samos	**'**Deltia Typou', Reports of the Ministry of Culture (*Δελτία Τύπου, Υπουργείο Πολιτισμού και Τουρισμού*), 29.10.2009 http://www.yppo.gr/2/g22.jsp?obj_id=33892

Simossi	A. Simossi, ‘Εφορεία Ενάλιων Αρχαιοτήτων: 30 χρόνια ερευνητικής δράσης’, *AT* 115, 2010, 95-105 (available on Scribd). http://www.scribd.com/doc/46105285/

Abbreviated words

Comm.	Communication.
Esp.	Especially.
m.	Meters.
Pers. comm.	Personal communication.
Trans.	Translation.

Brief dictionary

Aegaeo	Research vessel of Hellenic Centre for Marine Research (*HCMR*), which was built in 1985.
Asherah	Two-person submersible. The first commercially built American research submersible, launched in 1964 by *AINA*.
AUV	Autonomous Underwater Vehicle.
Calypso	Ship called *Calypso* is connected with the story of J.-Y. Cousteau, who has leased the ship in 1950.
Dakar	Israeli submarine, which was lost January, 24, 1968 and rediscovered by Nauticos Corporation in 1999. During the search for *INS Dakar*, the deepest ancient shipwreck in the eastern Mediterranean was located[v].
GIS	Geographic Information System.
HOV	Human Occupied Vehicle.
ROV	Remote Operated Vehicle.
ROV Super Achilles	Remote Operated Underwater Vehicle of *HCMR* with the ability to dive to 1000 m.
SCUBA	Self-contained underwater breathing apparatus.
Thetis	Submersible of *HCMR*, which is equipped with two robotic arms with the possibility of lifting objects up to 100 kg in weight.
Virazon	Boat originally build for army in 1953. It was brought to Turkey in 1964 for the University of Pennsylvania. In

[v] See the Nauticos wreck in this study.

1979 it was acquired by *INA* and redesigned for the research in maritime archaeology.

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[*] All numbers used in the maps stand for a serial number of a specific wreck in the Catalogue of this thesis.

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Fig. 5 A Dressel 1 C (Will Type 5) from the Chios Lithi wreck (Chios wreck B). Foley *et. al.* 2009, Fig. 4.

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Chapter 1

Introduction

1.1. Potential and problems of wreck archaeology

Although the overall study of wrecks in the eastern Mediterranean is still at an early stage, recording and cataloguing of wreck sites, followed by careful examination of their cargo is very promising. Shipwrecks are increasingly becoming the most important source for ancient maritime trade[1]; furthermore, as snapshots of the social, economic and technical activities of the past, well-preserved wrecks, if recorded and published, can supply important information regarding various topics of archaeological study, as for example ancient construction techniques[2].

The major potential of wreck sites for ancient economic history lies within the closed contemporary deposits of their cargoes, which serve as an archaeological evidence for further study. A caution is required during an examination of a cargo, since even though many shipwrecks represent a single stratigraphic group, various elements of disturbance can appear at an underwater site and contaminate the contemporary assemblage of the deposit[3]. Furthermore, located assemblage of a cargo must be understood as preserved remains of the actual consignment[4].

The majority of discovered and preserved cargoes contain transport amphorae. The amphora consignment represents the most characteristic cargo over the whole Mediterranean area[5]. The potential of these commercial jars for illuminating the

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[1] *Gibbins*, 273.

[2] The full potential of wreck evidence for ancient construction was revealed through the work of Dick Steffy and his apprentices on the excellently preserved remains of the Kyrenia hull. Steffy's study of the hull for the Kyrenia final publication (which is being edited by Susan Katzev) was completed couple of years ago (G. F. Bass, 21.2. 2010, *comm.*via email). Steffy became during his life the most important scholar in ancient shipwreck reconstruction. Apart from his study of Kyrenia, he published a preliminary report of the 11th century Serçe Limani's reconstruction (Serçe Limani A, see **P** 1070) and his publications on this topic are numerous, see e.g. Steffy 1995, 1975 (for general discussion); 1987, 1982, 1981 (for the 11th century Serçe Limani wreck); 1989, 1985 (for the Kyrenia wreck). Steffy's key publication is: *Wooden Shipbuilding and the Interpretation of Shipwrecks* (Steffy 1994). For further notes concerning the Kyrenia ship, see also Vinson 1990, 16-17 and further bibliography given in the main catalogue: Kyrenia (**7**).

[3] Archaeological remains of a shipwreck, deposited at the same during the wreckage of a ship, represent a a single stratigraphic group which is regarded as one of the main advantages that underwater sites have over land sites. *Gibbins*, 273. If a wreck is quickly covered by protective sediment, the possibility of preservation is comparable to the preservation found in frozen lands or dry desert sands, where the maintenance of organic and inorganic material is at a high level. For further discussion concerning the possible elements of disturbance, which can contaminate a contemporary assemblage of an underwater deposit see Parker 1981, 309-335.

[4] Part of a cargo may float away during the sinking, disintegrate, be moved by waves or human activity (e.g. fishing). See Muckelroy 1978, 158-159 & Fig. 5.1.

[5] *Parker,* 31. Ceramics together with stone and glass, if present at an underwater site, survive well in the environment, even though glass may suffer badly. From these artifacts, amphorae are the most frequently discovered and one of the most useful in the terms of chronology (Rauh 2003, 115). Amphora samples from Antikythera can serve as an example: the jars, among other items discovered, provided dating for the glass vessels salvaged from the cargo. Weinberg in *Antikythera TAPS*, 30-39; the glass vessels of Antikythera are also included in recent works of Weinberg, see e.g. Weinberg & Stern 2009. For the coins, which confirmed the date of the wreck, see Oikonomidou 2001, Yalouris 1990, Kritzas 1978. For further discussion of stone, ceramics and glass, concerning their deterioration and conservation treatment, see Robinson 1998, 71-80.

ancient economic history is universally recognized[6] and their positive assistance in amphora studies was most recently demonstrated by Mark Lawall[7]. Wreck archaeology, therefore, has been associated particularly with these commercial jars[8]; and as such, it is mandatory to keep in mind that they appear underwater in two circumstances: either as part of a cargo's consignment or as isolated finds. Both of these circumstances hold archaeological evidence, nevertheless the significance of an isolated find and the information it contains cannot be compared to a contemporary assemblage of a wreck's cargo. If an underwater find proves to be a wreck site, the fundamental and the most important knowledge the archaeologist should attempt to clarify is the assemblage's date. This can be obtained solely by a study of archaeologically preserved material. In practice it means either survey of the visible part of the cargo and selection of potential[9] or intact amphora samples, which will be raised to provide a date for the wreck site or excavation of the wreck and further research of the contemporary assemblage of a cargo, with such work providing positive assistance for typological studies[10]. If the date of a cargo's consignment cannot be established, its archaeological evidence for trade in that particular period is lost.

The cause of difficulties in quantitative studies starts very often already in the process of the first investigation of the site. Many sites are researched very briefly and not published and if published, various difficulties prevent us from using the available wreck data as overall evidence of trade. Some of these reasons are: the geographical imbalance of researched areas[11], the varied level of extent of

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[6] See 'Introduction' in *Eiring & Lund*, 11.

[7] Lawall *forthcoming*. Lawall, who studied various stamps and rim forms of the amphorae from Kyrenia, linked them to the deposit of Ephesos well LB and established a preliminary interpretation of the early Rhodian legible stamps and the identification of the names they carried with either a fabricant or an eponym. For further discussion see infra pp. 28-30.

[8] See Gibbins 1990, 376.

[9] By the term 'potential' is meant, for example, an amphora fragment with a preserved stamp which can provide improved stamp chronologies.

[10] Archaeologists do not necessarily raise samples at every underwater site which is surveyed and amphora consignment is sometimes identified underwater. Nevertheless, even if no samples are raised, an archaeologist is responsible for recording the cargo with the amphora types attested in the main assemblage and establishing the date of wrecking through the identification of the amphora consignment. This should be followed by an archaeological report.

[11] Some areas have been extensively surveyed, while other still await scientific investigation. See *Gibbins*, 279-281.

investigation during a survey or an excavation[12], the diverse degree to which wrecks represent actual sailing[13], as well as the problem of identification of a wreck site and its distinction from disposed cargo, which represent the major difficulty in the case of shallow water finds[14]. Moreover, due to the shortage of available publications, the study associated with ancient wrecks requires consideration of all available resources[15], including press and preliminary reports, together with final publications[16]. The great variability and uneven quality of published reports bring us to the question of their reliability. In 1992, Parker wrote:

No complete, authorized list of shipwrecks will ever be possible: the pace of discovery (which includes the clarification or confirmation of vague reports) is too fast, the means of dissemination of correct too diffuse.[17]

All the above issues, which are present in archaeological research associated with wreck data, slow down the progress in this branch of archaeology, which is further complicated by the importance of protection of existing sites. At present, the extent of researched areas and published wrecks, which could be subject of current or future comprehensive studies is not reliable for any genuine interpretation of the data. Nonetheless, recently discovered wreck sites present new amphora evidence that must be taken into account, since it already begins to show divergence between our present knowledge and earlier interpretations which is significant for the study of ancient economy.

1.2. Previous research: databases and catalogues

The potential of closed deposits of wrecks was recognized in the 1960s through 1980s after a series of excavations. Porticello, El Sec, Kyrenia, Serçe Limani

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[12] Some wrecks are known to us through full excavation, for example Kyrenia (**7**); some through partial excavation, as Serçe Limani B (the wreck site was abandoned after one season, due to the huge boulders that have slid down on it and might come loose during the excavation and cause injury to divers; G.F. Bass, 21.2. 2010, *comm.*via email; see also Pulak 2005, 82-85); while many sites have been looted and only briefly surveyed, therefore stay practically unknown (for example Corfu, where the amphora type present in the cargo was not identified, see Throckmorton 1970, 225). The difficulty of varying extent of investigation was discussed as well by *Parker*, 6. Most of the sites listed in the present thesis are only surveyed.

[13] *Gibbins*, 274.

[14] This difficulty was brought to my attention by G. Koutsouflakis, experienced Greek maritime archaeologists (*pers.comm*., April 2011)

[15] *Parker*, 3-4.

[16] A comprehensive study of material raised from a Hellenistic wreck site is, at the moment, available only for Mahdia shipwreck, see Hellenkemper Salies *et.al.* 1994.

[17] *Parker*, ii.

Hellenistic wreck[18] and Grand Congloué remain some of the most often cited and debated in chronological studies[19]. Nevertheless, the collection of wreck sites for quantitative analysis which is an unpleasant task owing to the difficulties discussed above, was ventured much later.

The first substantial catalogue of ancient shipwrecks was published in 1992 by Parker in his book on *Ancient Shipwrecks of the Mediterranean & Roman Provinces*[20]. The study lists 1,189 shipwrecks in the Mediterranean region alone and represents a considerable sample for Mediterranean studies and historical inference. It assists wreck research until today and has not been surpassed or upgraded by any publication of similar extent.

A recent effort to collect wreck data for quantitative analysis, but of a smaller scope, is the so-called Oxford Roman Economy Project (*OREP*), based in the Faculty of Classics, at the University of Oxford. The project includes a database which lists shipwrecks from Classical to Roman Imperial period[21].

Furthermore, David Gibbins who outlined the problems and potential of wreck archaeology in his chapter published in *Hellenistic Economies*, presented another catalogue with Classical and Hellenistic sites[22]. His recognition and analysis of several core issues in wreck archaeology reveal difficulties, which are often experienced in research associated with underwater sites. His investigation of the uneven degree of surveyed areas led him to believe that Greece is "the greatest lacuna in Mediterranean wreck data."[23].

In the Aegean area, a recent attempt of Paraskevi Micha to publish collective amphora wreck material led to the presentation of 110 amphora wreck samples, from which 22% are Hellenistic[24]. Micha's brief study illuminates our knowledge of the chronology of amphora entries in the *EUA*'s database. Her chart reveals, now up substantially, that 46% of the entries are of unknown date, while 9% are Hellenistic[25].

In Anatolia, a database assembled in 2000-01 under the direction of then *INA* Bodrum director Tufan Turanli, based on the information that was available in *INA*

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[18] In this study Serçe Limani B. See also infra n. 32 for further reference.

[19] Lawall 2004, 175.

[20] *Parker.*

[21] By January 2011, the database became inaccessible, nevertheless since *OREP* is an ongoing project, it is most probable that it will be made public again. The link for the *OREP* project is listed in the Internet resources (referred to hereafter as *IR*) at the end of this study.

[22] *Gibbins*. Wrecks published in Gibbins' catalogue, which fits the chronological and geographical scale of the present study, were previously listed in *Parker*. Cf. *Gibbins* & *Parker.*

[23] *Gibbins*, 280; see also Gibbins 1991, 353.

[24] *Micha*, Fig. 2. Unfortunately since most of the sites mentioned by Micha are unpublished and not treated in detail, the overall character of their cargo remains unknown. Regional and national archives, which stay unpublished or are reported without further details were discussed by *Parker*, ii.

[25] *Micha*, Fig. 3.

archives at the time, represents so far the last coordinated effort to collect the wreck data discovered by various groups[26] into a single database[27]. Recent discoveries are, for the most part, reported at conferences and in preliminary reports.

1.3. Refining our knowledge

The main reason why the present study focuses on the Hellenistic period in the eastern Mediterranean is because our understanding concerning this chronological and geographical part of the ancient economic history is rather incomplete. Even though the importance of maritime trade during Hellenistic period is undoubted, the attention given to Hellenistic trade in ancient economic study is rather limited[28].

Amphora chronologies were for long time deficient and the focus was kept on major classes of stamped amphorae[29] with the unstamped being frequently overlooked[30]. Hellenistic amphorae received only minimal attention[31]. Moreover the amount of well preserved and recorded Hellenistic wrecks which contributed to amphora study is extremely small: the most often cited wreck remains that of Kyrenia in Cyprus; moreover records in Greece and Turkey rarely produce publications of

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[26] *INA*, *RPM Nautical Foundation*, *TINA*, Ministry of Culture of Turkey, local museums and private individuals.

[27] To make a complete database of all surveyed sites, access to *INA*'s records and data of the Ministry of Culture (Turkey) would have to be granted to a researcher and subsequent publication of wreck data could put many sites in jeopardy (B. Buxton, 27.11. 2010, *comm.*via email). The published material appear mostly in *INA Quarterly* (*INA Newsletter*) and *AnatSt*. The earlier reports are cross referenced in *Parker*.

[28] The intensity of the Hellenistic maritime trade was demonstrated by *Parker*, whose collective study of ancient shipwrecks revealed that Hellenistic and Republican wrecks hold second position in the most frequently discovered sites, right after Roman Imperial wrecks. See *Parker,* 8. Late Hellenistic and Roman Imperial era wrecks represent more than 75 per cent of all recorded wrecks across the Mediterranean prior to 1500 AD. Rauh 2003, 105. For a debate on the possibility of causes of the higher incidence of shipwrecks in the period under discussion, see Rauh 2003, 108. The lack of attention given to Hellenistic period in the ancient economic study is discussed by Göransson 2007, 193. For further information concerning Hellenistic period, see Archibald *et.al*. 2011.

[29] Lawall 2004, 171; 'Introduction' in *Eiring & Lund*.

[30] The first impulse for taking the unstamped amphorae into account was given by J.A. Riley and J.-Y. Empereur (cited in 'Introduction' in *Eiring & Lund*, 11; as well as in Lund 2004, 211). Jean-Yves Empereur has demonstrated how inappropriate is to focus on stamped amphora handles without noting their relationship to the quantified unstamped handles. He points out the unstamped amphorae in the Benaki collection in Alexandria, which were discarded. See Empereur 1982 (also cited in Rauh 1999). See also Lawall 2001, 536; Göransson 2007, 19-20, both with further reference. At the present, the unstamped amphorae are increasingly coming to the fore.

[31] Lawall 2004, 173.

amphora samples[32]. A gap in our knowledge is also noticeable in the state of amphora and trade study of the eastern Mediterranean area, which led to the first scientific gathering focused on transport amphorae of the eastern Mediterranean, initiated with the aim to cover this apparent lacuna[33].

The past decades of maritime archaeology revealed the strength and weakness of this rather new archaeological scientific discipline. If we are to make a step forward we need to refine our current knowledge. The purpose of the present thesis is therefore to call attention to amphora wreck sites in the eastern Mediterranean and their contribution to amphora studies. Before we will be able to have a solid foundation for further comprehensive research relying on wreck data, multiple conditions must be met prior to their analyzes. First, we need to achieve good reliability of gained information from systematic underwater surveys and the diffusion of such information to the academic community[34].

For the amphora studies, the basic knowledge expected to be gained at an underwater site by a ceramicist includes: amphora types, contemporary variation in forms and improved stamp chronologies (if present), all serving the understanding of a wreck's date and its previous zone of operation[35]. Furthermore, for wider ancient economic study, the overall character of the cargo must be examined in detail and published. Unfortunately, as becomes clear throughout the thesis, these conditions were not always fulfilled during an underwater survey. The time of a maritime archaeologist is often limited and the conditions at an underwater site are not always suitable for a research.

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[32] The published data in Greece and Cyprus is discussed below. In Turkey, the best studied Hellenistic wreck site remains the Serçe Limani B wreck, see Pulak 2005, 82-85; Bass 1975, site C (No. 15); Bass 1974, 335, site 2; Haldane 1991, 216-217; *Gibbins*, 289-290 & **G** 53; **P** 1071. For the amphora material see Pulak & Townsend 1987, 31-57; Empereur & Tuna 1988, 341-56; Grace 1986. The shipwreck represents one of the sites, where archaeobotanical investigations were applied, Haldane 1990, 1991. Apart from several amphorae published from Hellenistic sites of Kizil Burun, Knidos and Gökertme (Cowin 1986), the Serçe Limani B wreck remains the only Turkish Hellenistic site with published amphora material.

[33] *Transport Amphorae and Trade in the Eastern Mediterranean. Acts of the International Colloquium at the Danish Institute at Athens, September 26-29, 2002*. The proceedings were published in *Eiring & Lund*. For the account on other scientific gatherings aimed on amphora studies as well as Hellenistic and Roman pottery see 'Introduction' in *Eiring & Lund*, 11-12.

[34] This is one of the purposes of the Eastern Mediterranean Maritime Archaeology Foundation (*EMMAF*), which was initiated by the author. *EMMAF* delivers information and research material from surveys and underwater excavations straight from archaeologists to anyone, who intends to study it. See *EMMAF* in *IR* and Online Research Material (referred to hereafter as *ORM*). For more information see as well: Acknowledgements.

[35] These are the expectations discussed by Mark Lawall at the DEGUWA conference in Frankfurt (17th-19th February 2006). I would like to thank M. Lawall for providing me with the original slide from the conference, which is published at the official *EMMAF* site with Mark Lawall's accompanying modified comments, see *Lawall* in *ORM*. For the printed paper from the conference which treats the Nauticos site, see Lawall 2005-06, 76-81. Concerning the interpretation of the evidence of ship's zone of operation, a caution is required due to the existence of many entrepôts in Antiquity. Most cargoes were assembled in series of ports of call, or from goods collected at an entrepôt, as discussed by Parker 1990, 343.

The present study focuses on classification of known underwater sites and their potential for ancient economic and amphora study. The question addressed is: How many wreck sites of the period studied were recorded so far in the eastern Mediterranean and what is their potential to serve as indicators of amphora distribution? The question is gradually answered through an examination of known amphora wrecks, as well as by a presentation of recent discoveries in the main catalogue, which illuminate and further improve our understanding of eastern Mediterranean trade.

Before reaching the examination of the amphora wreck data, it is essential to outline the history of the discipline in the areas studied. The history of maritime archaeology in Turkey is briefly discussed as well, as it plays a significant role in the eastern Mediterranean maritime archaeology[36].

[36] It also serves as a brief background for the additional information that is presented in this study through some amphora evidence from Turkish wreck sites.

Chapter 2

Historical background

2.1. Brief account on maritime archaeology in Greece

The early discoveries made in Greece were brought to light by sponge divers and fishermen[37]. In 1884, sixteen years before the well known salvage of Antikythera, the first systematic archaeological survey took place[38]. During this survey, Christos Tsountas conducted the investigation in the narrows of Salamis with the aim to locate archaeological remains of the historical battle of Salamis, which took place in September 480 BC[39]. Despite that the survey did not bring any fruitful results, it represents an initial attempt in Greek maritime archaeology.

In 1900, the well-known salvage of Antikythera took place and other surveys followed. The climax of the underwater exploration came later, in postwar endeavors, one of them in the island of Chios[40]. Here, an expedition conducted by the team of the British School at Athens focused on the eastern and northeastern coast of Chios and produced several discoveries. The team was based in Emporio, where an excavation directed by the M.S.F. Hood and J. Boardman took place (June-July 1954). The underwater expedition concentrated on the coastal waters, as well as on the area between Chios and nearby islands[41].

In 1959, the first Greek diving archaeologist, Nikos Yalouris, travelled around the Peloponnese and explored the ruins of ancient Pheia (modern Katakolo), as well as sunken remains of buildings and wrecks[42]. Early 1960s are marked by Peter Throckmorton's presence in Greece, which led to several surveys[43]. The interest in Greek underwater exploration was noticeable due to the incoming foreigners, some of them internationally known as J.-Y. Cousteau.

In 1973, the foundation of Hellenic Institute of Marine Archaeology (*HIMA*) played a key role in the development of this quite new branch of archaeology, and soon afterwords the realization of an underwater archaeological heritage and the need to protect it led to the formation of the official state agency: The Ephorate of

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[37] Bascom 1971, 263.

[38] See Lolos 2003; Catsambis 2006. For the general account of the history of maritime archaeology in Greece, see as well: Agouridis 1997, 181; Delaporta 1999.

[39] Lolos 2003.

[40] The cause of the events was directly influenced by the invention of self-contained underwater breathing apparatus (SCUBA), developed in 1943 by Jean-Yves Cousteau and Emile Gagnan. Earlier underwater works were frequently resulting in fatal injuries, as it was in the case of Antikythera.

[41] Garnett & Boardman 1961. For another example of postwar surveys, see Braemer & Marcadé 1953; Leatham & Hood 1958/59.

[42] Agouridis 1997, 181.

[43] For example in the area of Methone, see Throckmorton 1965.

Underwater Antiquities (*EUA*), which took place in 1976, with G.Papathanassopoulos as the first Ephor[44].

The EUA constituted a realization of the explicit provision of the Archaeological Law of the country, that antiquities were protected, wherever they were: "in rivers, lakes or on the seabed" (KN 5351/32 article I)[45].

The protection of the cultural heritage is an important issue and since its independence in 1830, Greece has enacted legislation for the protection of the cultural heritage on land as well as underwater[46]. Unfortunately, although the need of national possessions of the ancestors and their cultural heritage were distinguished quite clearly, the gaps in the laws remained[47]. In 1981, the Hellenic Institute for the Preservation of Nautical tradition was founded in Athens. The institute coordinated the Kyrenia II experimental boat archaeology project and organizes symposiums, which are being held biennial since 1985: *Symposium on ship construction in Antiquity.* The proceedings are published in volumes of *Tropis.*

The most outstanding events of the recent years can be seen in collaborations of the Ephorate of Underwater Antiquities (*EUA*) of the Greek Ministry of Culture with various institutes. For example, *EUA* joined the Hellenic Centre for Marine Research (*HCMR*, at the time *NCMR*) for the collaboration in mapping the Aegean seafloor, aimed on the discovery of Greek ancient nautical heritage[48]. The project started in 2000 with the examination of deeper waters in Greece[49]. The examination of the seabed, using side scan sonar images, resulted into selected sonar targets, all exceeding the depth range of scuba diving. Remotely operated vehicle (*ROV*) and two submersible *Thetis* of *HCMR* were subsequently used from the operating research vessel *Aegaeo* to examine the selected targets[50]. The combination of sub-bottom profiling and side-scan sonar data is very effective, and during the above research, several ancient wrecks were located, including those that fall within the range of this study[51]. Simultaneously, from 1999, the Ephorate of Underwater Antiquities and the Norwegian University of Science and Technology (*NTNU*) with the Norwegian

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[44] The improvement of maritime archaeology after the foundation of *HIMA* and *EUA* is discussed by *Gibbins*, 283-84 with more detailed account of Alonnisos shipwreck.

[45] Delaporta 1999; see also Strati 1999, 67 & n. 9.

[46] Strati 1999, 66. Strati gives further reference concerning the study of the protection of Antiquities during the War of Independence, see Idem, n. 6.

[47] Ibid., loc. cit.

[48] Sakellariou 2005, 28.

[49] For a brief summary of researched areas see *Simossi* in *ORM*, 97.

[50] Sakellariou *et.al.* 2007.

[51] See Kythnos wreck (**8**) and Chios Lithi wreck (**3**).

Institute at Athens (*NIA*) started another collaboration with the aim to locate cultural remains in the depth below 50 meters[52].

The most recent effort aimed on the deeper waters of Aegean, took place in September-October 2010 in northern Sporades, where the Woods Hole Oceanographic Institution (*WHOI*) joined the Ephorate in examining the sea-bottom with the use of two *AUV*s. Greece thus came to the realization of the potential of these depths, which are accessible only to mixed-gas divers, and therefore are rarely looted[53].

2.2. Brief account on maritime archaeology in Cyprus

The history of maritime archaeology in Cyprus can be traced back to the formative years of the discipline. The importance of the research in Cypriot waters is reflected in a great number of international scholars interested in local research, including Polish, German, British, French, American and other. The ultimate example of the importance of this area was emphasized by the discovery of Kyrenia and its excavation and reconstruction. First underwater surveys in Cyprus were harbour surveys which were easier to conduct. As an example can serve the known Paphos harbour survey, which took place 1959-1961[54]. In 1965, the Paphos harbour was researched again by a Polish archaeologist Wiktor Daszewski[55], followed by a German research in 1969[56].

Early reports on shipwrecks drew interest of Teddy Hall, who arrived to Cyprus with his student Jeremy Green. These two scholars, together with Michael Katzev, made a pre-disturbance survey of Kyrenia shipwreck[57]. Of a great importance in the history of Cypriot maritime archaeology was the excavation of Jean-Yves Empereur, who uncovered the harbour at Amathus[58].

The first survey that was carried out with the cooperation of only Cypriot bodies took place at a shipwreck found near Larnaka-Mazoto Bay. The shipwreck is at present being excavated by Stella Demesticha. The Chian amphorae, which

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[52] Delaporta *et.al*. 2006, 79-87.

[53] The potential of these depths was emphasized already in 2001 by *Gibbins*, 281. For the earlier cooperation of the *EUA* with *WHOI*, see e.g. Foley *et.al.* 2009. The 2010 survey in Northern Sporades was briefly reported in *Deltia Typou* and by *EMMAF*. *EMMAF* provided as well brief video footage of the *AUVs*. See *Deltia Typou* & *EMMAF* in *IR* for the links.

[54] The so called Operation Aphrodite. Leonard & Hohlfelder 1993, 365-79.

[55] Daszewski 1981, 327-36 (in Polish).

[56] Åström 1971.

[57] Green *et.al*. 1967, 46-56. Green afterwords worked around Cape Andreas (1969-70), see Green 1973, 141-178.

[58] Empereur 1995, 131-138.

represent the wreck's cargo, were tentatively dated to the third quarter of the fourth century BC[59]. Cypriot underwater archaeology, however, focuses for the most part on harbour projects[60].

Recent investigations concentrate on the area of Episkopi Bay. Justin Leidwanger in collaboration with Gisela Walberg's excavation of Bronze Age site Episkopi-Bamboula (University of Cincinnati), began a survey of this area in 2003[61]. Furthermore, Duncan Howitt-Marshall, another scholar involved in recent research in Cyprus, has preliminary surveyed areas to the East and to the West of Paphos harbour[62].

Regarding the institutions that contributed to the research and study of the ancient maritime Cyprus, it is necessary to mention The Cyprus American Archaeological Research Institute[63] (*CAARI*), which hosted a major underwater archaeological congress *The Res Maritimae*, with its proceedings published in *CAARI's* own monograph series[64].

2.3. Brief account on maritime archaeology in Turkey

Despite that the wrecks discovered in Turkey are not included in the catalogues of the present thesis, they are taken into account in further analysis to set the study to wider archaeological context. The history of Turkish maritime archaeology must be outlined as it plays a crucial role in the eastern Mediterranean area and the maritime archaeology itself.

The Turkish waters are rich in sunken ships. Most of the Turkish coastline is high or steep and thus the collision with a shore would lead the sunken ship to slide down the rocky slope, which led to scattered condition of many wrecks[65]. One of the most significant roles in the early days of maritime archaeology was played by Peter Throckmorton. This American photojournalist lived on sponge boats during 1958-59, trying through the communication with Turkish divers to find ancient remains underwater. One of the shipwrecks, which was recorded by Throckmorton, was the oldest then known located in Cape Gelidonya. Throckmorton contacted Professor Rodney Young at the University of Pennsylvania Museum, informing him about his

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[59] Stella Demesticha recently published a preliminary report of the wreck in *IJNA*, see Demesticha 2011, 39-59.

[60] The investigation continued in Paphos harbour (the Paphos Harbor Exploration Project). Hohlfelder 1995a. The survey led to the discovery of a site, which is presented in the main catalog: Moulia (**10**) and is located in a natural reef southeast of Paphos. Hohlfelder 1995b.

[61] Leidwanger 2005a, 9-14; 2005b, 269-77; 2007, 70-86.

[62] Howitt-Marshall 2003, 28-37.

[63] For the expeditions conducted by the institute, see Leonard 2008, 133. See also *CAARI* in *IR*.

[64] Swiny *et.al*. 1994.

[65] Rosloff 1981, 279.

discovery. Professor Young's doctoral student, G.F. Bass was sent to be an archaeologist in an excavation of this Bronze Age wreck[66]. Cape Gelidonya became the first shipwreck to be excavated on the seabed[67].

In 1961, after the excavation of Cape Gelidonya, G.F. Bass returned to Turkey together with his team, including an archaeologist, who was to play a significant role in maritime archaeology: Frederic van Doorninck. During four seasons in Yassiada, they excavated the seventh century Byzantine wreck, which was as well among the wrecks found by Throckmorton[68]. During the excavation, Michael Katzev joined the team and more than a decade later, these former students were playing crucial roles in creation of American Institute of Nautical Archaeology (*AINA*).

In 1961, the Turkish Government created the Bodrum Museum dedicated to maritime archaeology by official decree under the jurisdiction of the Ministry of Culture. Furthermore, since its creation in 1970s, *AINA* played a significant role in Turkish maritime archaeology[69].

2.4. Maritime archaeology in International waters

It is only recently, the last decade and a half, that the deep seabed became accessible to those with funding and expertise. Ballard was reported to use technology capable of reaching 20, 000 feet, back in 1997, which is enough to reach 98 per cent of all ocean floors[70]. Maritime archaeology in the eastern Mediterranean is nevertheless concentrated still on coastlines, due to their easier accessibility and higher potential for locating a wreck site. Research in deep international waters requires very high budget[71], therefore, most of the discoveries are accidental as in the case of the Nauticos wreck site which was spotted for the first time during a search for Israeli submarine Dakar[72].

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[66] Bass 2005, 14.

[67] See "Cargo from the Age of Bronze: Cape Gelidonya, Turkey" in Bass 2005, 48-55; Muckelroy 1978, 14-15.

[68] Bass 2005, 15. Frederic van Doorninck, after the campaign in Yassiada, undertook the study of the broken bits of wood from the hull, and later on wrote his doctoral dissertation on a reconstruction of the ship and its anchors, which was the first reconstruction of a wrecked ship on the seabed. In the 1960s, Richard (Dick) Steffy and van Doorninck started a long term cooperation which lasted until recently.

[69] Nowadays Institute of Nautical Archaeology. The institute has two official partners in Turkey: The Turkish Institute of Nautical Archaeology (*TINA*) and the Bodrum Museum of Underwater Archaeology.

[70] The Times, 1. 8. 1997, 1.

[71] For example in the case of Nauticos site, an estimated cost of $1,191,708 was proposed in 2003 for the wreck's survey. D. Jourdan, 15.6. 2009, *comm.*via email.

[72] Jourdan 2009. The name Nauticos in association with the wreck was used for the first time by Mark Lawall, Lawall 2005-06. For further information concerning the protection of archaeological heritage in international waters see O'Keefe 1999, 244.

Chapter 3

Classification of finds

3.1. The need of preliminary classification

The present thesis gathers all available material, including attested as well as potential wreck sites, provided that such finds are safely or at least tentatively associated with the period studied and fall within the geographical area under consideration. Nevertheless, due to the current knowledge of individual sites which varies greatly, a primary classification of the finds is necessary for the selection of attested amphora wreck sites, which can be treated as an archaeological evidence of amphora distribution.

From the collected 59 underwater finds, 26 are excluded from further analysis for various reasons which are discussed below[73] and could lead to misinterpretation in the archaeological evaluation. The remaining 33 confirmed amphora wreck sites are treated in the main study to achieve preliminary but reliable interpretation.

To clarify the character of various finds, they are selectively listed in three separate catalogue-forms according to the extent of our knowledge regarding their cargo. The first two catalogue-forms are of a smaller scope (Table 1, which lists excluded finds and Table 2 with unpublished sites); while the third represents the main catalogue with more informative entries, presenting underwater sites for which we have further archaeological evidence, as well as new discoveries.

3.2. Classification groups

To understand the necessity of the wrecks' classification, basic characteristics of an underwater find that can be further examined, must be defined. An underwater find which can contribute to the present study must be an attested and located amphora wreck site with its consignment identified and dated to provide chronology for the specific wreck and illuminate our understanding of amphora evidence and distribution. The discoveries, which do not fulfill the above conditions are excluded from the main catalogue and presented as excluded finds, grouped according to the difficulty which does not allow their treatment as an archaeological evidence for further analysis (Table 1).

The discoveries, which fulfill the above conditions but were reported only briefly and thus can be classified as unpublished, are taken into account in final evaluation of the amphora wreck evidence. Nevertheless, to avoid gaps in the main catalogue they are listed separately due to the lack of information concerning their discovery and cargo (Table 2).

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[73] See the discussion in Chapter 3.2.1. Excluded finds.

The final group of the finds represents wreck sites which are safely dated and frequently yielded at least one published amphora sample. Most importantly it lists new discoveries, which represent an update to earlier wreck data[74]. The importance of these finds is demonstrated by their further study, where various amphora types present in the cargoes are evaluated.

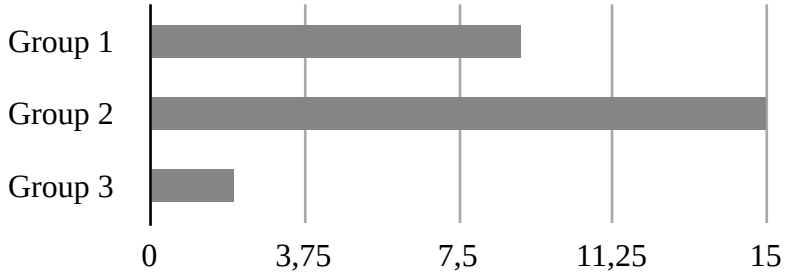
3.2.1. Excluded finds*

Excluded finds are classified according to three main reasons, which lead to their absence in further study. They can be characterized as follows:

Group 1) Unverified sites
Group 2) Sites with uncertain chronology or unidentified cargo
Group 3) Re-dated sites

The above groups belong to the so-called Classification I given in Table 1[75]. Each excluded find is classified to one of the above groups, according to the main reason why the site is omitted in final evaluation. From the total of 26 excluded finds, nine are unverified sites, fifteen are sites with uncertain chronology or unidentified cargo and two are re-dated sites (Chart 1). None of the sites classified under the above three groups, was confirmed to represent Hellenistic wreck site with identified amphora consignment. For better understanding of the character of such finds, it is vital to have a closer look on each of these classification groups.

Chart 1



[74] New discoveries serve as an update to catalogues of *Parker, Gibbins* and *OREP.* Reference to previous catalogues is given by abbreviation **P** for *Parker*, **G** for *Gibbins* (Table 10. A1), *OREP* for Oxford Roman Economy Project shipwreck database, all followed by a serial number of the wreck in the specific catalogue.

* All excluded finds are listed in Table 1.

[75] See column 3 in Table 1.

Group 1 - is represented by artifacts, which may or may not originate in wreck's cargo. Such artifacts may have been dragged out of the sea by fishermen or sponge-draggers, discovered in ports and confiscated, delivered to authorities or simply found their way to various museums. The provenance of such material in a wreck's cargo cannot be confirmed until the eventual location of a wreck which yielded it. To understand whether the specific artifact originated in a cargo is demanding task and requires careful examination of both: the *in situ* deposit (if located) and earlier discovered finds. According to the different manners of the discovery and additional knowledge provided by material recovered, their association with an ancient cargo can be further strengthened or weakened.

In the eastern Mediterranean, exceptional attention is given to discoveries of works of art, dragged out from the sea without the actual knowledge of their provenance. Such finds are frequently believed to come from a wreck site, as in the case of Artemision and Marathon, which were tentatively associated with Hellenistic underwater sites[76]. Nevertheless, while skyphoi and a lamp linked with the Artemision site and dated from the second to the early first century BC suggest Hellenistic date[77]; the discovery made near Marathon, where no associated ceramics were recovered to provide closer chronology which could be assigned to a potential cargo cannot be dated to the Hellenistic period. For the Marathon site, we have only *terminus post quem* provided by the Ephebe of Marathon[78]. Until the eventual location of these sites, their cargoes stay unknown.

The most recent discoveries of Hellenistic works of art dragged out from the sea, were made in the area of Kalymnos[79]. In May 2006, an equestrian statue recovered together with a Knidian amphora, strengthened the possibility of existence of a cargo. During a further examination of the Knidian sample, traces of copper oxide attested the long coexistence of both items in the same marine environment[80]. The amphora sample represents a distinctive Knidian form with stamps, rolled rim, a long cylindrical neck, long handles and tapering body which ends in the characteristic ringed toe. The arched top of the handles suggests that the jar does not belong to an early production[81]. The sample was dated by G. Koutsouflakis, in the first century BC[82] and thus may originate in a late Hellenistic cargo.

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[76] See Table 1, **5** for Artemision; Table 1, **16** for Marathon; both with further reference.

[77] Wünsche 1979.

[78] See also infra n. 83.

[79] Reference to various discoveries is given in Table 1, **11**. For the summary catalogue of bronze statues recovered from the marine area of Kalymnos, see Koutsouflakis 2007, 46-50 with further reference. Whether the finds come from one or more shipwrecks is not certain, see Idem, 46 & n. 6.

[80] Koutsouflakis 2007, 45.

[81] Whitbread 1995, 68.

[82] Koutsouflakis 2007, 46, 52. For the amphora sample and preserved stamps, see Idem, Fig. 3, 5 a - b. For the discussion concerning the stamps see Idem, 45-46 & n. 5.

Group 2 - consists of sites, where no accurate chronology was assigned to a cargo. These sites appear as a result of insufficiently studied deposits; or they are represented by wrecks, which traded consignment that cannot provide closer date[83]. The difficulties in dating can be as well associated with minor classes of amphorae, which are not yet chronologically refined or types, which stay unidentified, since the unidentified consignment cannot be accurately dated. Therefore, if the cargo does not include other class of artifact, which could provide the date (e.g. coins), the chronology of the wrecking cannot be established. Known are also sites, where the amphora consignment was looted or destroyed to such level that the identification was not possible[84].

Two of the wrecks listed in this group: Koppo and Sporades A (Table 1, **14**, **24**) contain various amphora types in their cargo, from which only one type was identified; nevertheless in both cases the date was proposed only tentatively and no published samples are available for further refining of the site chronology.

Group 3 - comprises shipwrecks, which were previously classified as Hellenistic and later re-dated to other period. This is usually due to the contradictions in early reports, or as a result of reported cargoes, which had not been at the time visited by an archaeologist, who would confirm the date of the wrecking. It can also represent visited sites, from which retrieved amphora samples were awaiting cleaning from their marine encrustation and subsequent closer examination resulted into later re-dating. They are listed in the present study to avoid confusion between this thesis and previous catalogues, which may list them as Hellenistic.

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[83] Roof tiles, perishable material or works of art. Statues can provide only *terminus post quem*. They were often carried overseas even decades or centuries after their production date, which is confirmed by several wrecks that carried much later ceramic consignment than was the chronology of statues on board e.g. Antikythera (**1**). Therefore, for example Marathon site, which has not yet been located, but yielded a Hellenistic statue providing us with *terminus post quem*, cannot be classified with certainty as Hellenistic, because the site may be later.

[84] E.g. Corfu (Table 1, **6**), and Xerolimni (Table 1, **26**) where the cargo of the wreck accumulated in concreted sherds is so fragmentary and eroded that the identification is not possible. Howitt-Marshall 2003, 33.

3.2.2. Confirmed amphora wreck sites*

Amphora wreck sites, discussed in this section, stand for confirmed amphora wrecks with identified cargoes which were dated to the period studied[85]. Nevertheless, since apart from their chronology and amphora consignment, no further information was published, they are not treated in the main catalogue to avoid gaps in individual entries[86]. The wrecks listed in Table 2 are taken into account as additional archaeological evidence for the amphora distribution.

It should be made clear right from the start that the study presented in the following lines is far from comprehensive since the currently published material is limited[87]. Undertaking research of amphora wreck sites is a laborious task that along with the results it produces, brings to light many limitations of such a study. Furthermore, a date of a wreck which is most frequently defined by an amphora assemblage, is still very often established based on a single sample, which does not lead to the overall understanding of the wreck's cargo[88]. The available brief reports often do not inform about anything else than the discovery of a cargo itself and thus are insufficient for any further withdrawal of additional information.

3.2.3. Catalogued sites

The main catalogue of the study, as was already briefly outlined[89], includes wreck sites previously catalogued (5 wrecks), which either yielded at least one amphora sample (4 wrecks[90]) or for which additional information regarding their cargo is available (1 wreck)[91]. Most importantly, it contains previously not catalogued sites (15 wrecks) which represent 75% of the catalogue entries. From the sites, previously uncatalogued, only two were omitted in *Parker*'s study, as the remaining

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* All sites of the present section, which falls within the classification of confirmed but unpublished sites are listed in Table 2.

85 All the sites were confirmed and dated by an archaeologist and thus are treated in the final evaluation of amphora types attested in the cargoes. Except for Hydra-Spetsai (Table 2, **5**) which was reported by Winter (1982), all sites listed in Table 2 were included in Micha's brief study. See supra p. 5 & *Micha*. In the case of these unpublished wreck sites, I rely entirely on the information provided by the above reports and some additional reports given in reference of the individual entries in Table 2.

86 Only in cases, when a sample and additional information was provided to me for further study by an archaeologist who was present at the survey; or further publication exists, were such entries included in the main catalogue, as in the case of Samiopoula (**13**), Kythnos (**8**) and Telendos (**20**).

87 The lack of published material still represents the greatest difficulty in amphora wreck research. *Parker*, ii.

88 E.g. Chios Lithi wreck (**3**), Samiopoula (**13**).

89 See also supra p. 17.

90 Antikythera (**1**), **P** 44; Dhrapi (**4**), **P** 363, **G** 16 (Dhrapsi); Kyrenia (**7**), **P** 563, **G** 31; Preveza A (**12**), **P** 904.

91 Seriphos (**15**), **P** 1075, **G** 56.

13 sites are new discoveries, which took place after Parker's publication[92]. As with the rest of the study, among the Hellenistic sites, the catalogue includes also cargoes that represent early Italian imports to the eastern Mediterranean[93].

The catalogue was drawn up in the autumn of 2010. All shipwrecks, located in Greek, Cypriot and international waters, are listed in alphabetical order. The names of wrecks are, in the interest of clarity and ease of reference, geographical[94]. All amphorae discovered in the confirmed catalogued wreck sites are discussed in the following chapter.

[92] Kato Fana (**5**) is not listed in *Parker*'s catalog, as well as Kitriani (**6**), which even though it was discovered in 1990, it was not known to Parker, since the ADelt 1990 Chr. B'2 in which the discovery was published, was printed in 1995.

[93] Such wrecks are mostly attested by Lamboglia 2 consignment, which was recorded in 9 cargoes and sporadically by Dressel 1 A - C. Only Preveza A (**12**) includes Graeco-Italic amphorae, which were dated between 200 - 150 BC, thus approximately at the time, after which the Graeco-Italic export ceased and was replaced by Dressel 1.

[94] The only exception is the Nauticos site, see supra n. 72.

Chapter 4

Attested amphora types

4.1. The archaeological significance of transport amphorae*

Transport amphorae represent the most frequently discovered archaeological evidence, which helps to define the date of a wreck. They also serve as indicators of a wreck site, provided that they belong to a contemporary and identical assemblage. The forms of these commercial jars, together with their presence or absence in known closed land deposits enabled their dating within narrow chronological margins. Closed contexts with their destruction levels play a crucial role in such chronologies[95]. Moreover, the present methodology of amphora studies, which includes apart from the examination of form of the pot and its stamps, fabric analysis and chemical analysis of the clay, such as X-ray fluorescence spectrometry and neutron activation analysis, allows archaeologists to trace the place of origin of these commercial pots[96]. The knowledge of the provenance of an amphora together with its attested presence in a wreck's cargo illuminate our understanding of their distribution and trade activities of its production center. Hence, the archaeological evidence of transport amphorae in shipwrecks is twofold: dating and trade. Moreover as contemporary assemblages in the case of wreck closed deposits, amphorae positively assist in typological studies.

To obtain the full potential of systematically recorded data from an underwater site, not only well-conducted surveys are required to allow good grounds for further study but the amphora study itself must be advanced. Lawall has recently identified two major gaps in amphora research in the eastern Mediterranean: the first one, which was already outlined in the Introduction, is the focus that is kept mostly on pre-Hellenistic amphorae, or in the case of Hellenistic, on the stamps rather than on the amphorae themselves[97]. The second problem can be seen in minor stamp classes which are frequently disregarded[98]. Noticeable is, however, the progress in the amphora studies of the Hellenistic period which is evident, for example, in kiln-site research[99].

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* The potential of transport amphorae was already briefly outlined in Chapter 1.

95 The destruction levels in deposits at Carthage and Corinth (destroyed 146 BC), at Samaria (108 BC), at Athens and Piraeus (86 BC) and at Delos (87/69 BC) are critical for the established chronologies. See also Rauh 2003, 115. For further discussion of important elements in chronology, see Lawall 2005, 31.

96 Whitbread 1995, 44-48.

97 Lawall 2004, 176. See also supra p. 6.

98 Ibid., 177 & n. 46.

99 Kiln studies contributed to chronology and understanding of Thasian amphorae: the publication of Yvon Garlan of the amphora stamps from the Kounouphia kiln-site on Thasos provided essential breakthrough for the Thasian stamp chronology, see Lawall 2004, 176 & n. 42 with further reference; kiln site research improved our knowledge of Knidian and Rhodian amphorae as well, see Eiring *et.al.* 2004, 459 & n. 7 with further reference.

Regardless the difficulties in amphora scholarship, the study of available amphora wreck data can enhance our understanding of amphora distribution. Nevertheless, caution is needed in such an examination and any interpretation must be understood as preliminary, given the limited state of our knowledge. All the amphorae discussed in this chapter were attested in the cargoes as part of the main assemblage and do not represent impurities, therefore stand for an actual distribution of the type across the eastern Mediterranean. Since they were discovered in the main assemblage of the cargo, they were certainly traded and not intended to be consumed during the ship's journey[100]. All amphorae are studied as indicators of amphora distribution without further investigation of their exact quantities in the cargo[101]; only their concentration in the cargo is mentioned, determining the predominant type in the assemblage which does not consist of single amphora consignment. As in any previous studies of amphora wrecks, this thesis relies entirely on available information which directly rests on the extent of wrecks' investigation.

4.2. South Aegean amphorae

South Aegean amphorae are the most frequently discovered types in the Hellenistic cargoes of the eastern Mediterranean, demonstrating active production of the South Aegean Islands. Although in the fourth century BC, when earlier regional shipping breaks down[102], northern amphorae seem to predominate[103], southern Aegean production becomes apparently popular in the Hellenistic period[104]. From the southern Aegean Islands, amphorae from Rhodes, Knidos and Kos are the most frequently attested types in shipwrecks as is demonstrated by the fact that fifteen out

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[100] A careful classification of the amphora data in this study was aimed on preventing difficulties discussed by Rauh (1999, 165 with n. 13), which led to misleading interpretations of the amphora distribution. I nevertheless suggest special caution in the case of unpublished shipwrecks, where my knowledge is limited to the available brief reports cited in reference in Table 2. I would also suggest special caution in the case of Kato Fana wreck, where I recommend study of the original report given by Garnett & Boardman 1961. The identification of the Kato Fana site as an actual wreck site was confirmed by the *EUA's* archaeologist Th. Theodoulou, October 2010, *pers.comm.*

[101] Since only two Hellenistic shipwrecks, which were catalogued in the present thesis were selected for excavation: Kyrenia (**7**) and Styra A (**17**), with the former believed to be previously looted and the later being still in process of excavation, it is difficult to estimate the original size of the cargoes. The attested amount of jars in Kyrenia, is discussed below and in Lawall *forthcoming.* The remaining catalogued wrecks are only surveyed, which does not allow any estimation of the preserved size of the cargo, since only the visible part can be recorded.

[102] For the earlier period of the late sixth and fifth centuries BC, when most of the shipping in the Aegean area seems to be of regional scale, see Lawall 2006, 268.

[103] Amphorae from Mende, Akanthos, Thasos, Samothrace, and Ainos are widely distributed. Some northern Aegean amphorae appear now in the South Aegean: for the land evidence, see citations provided by Lawall 2006, 269 & n. 26, for the amphora wreck evidence see *Micha,* 84-85.

[104] Rhodian, Knidian and Koan amphorae are attested in great numbers at Athens, where, Knidian in the later second century BC start to predominate. For the discussion of further evidence, see the chapter on each specific amphora type below.

of twenty catalogued wreck sites include at least one of these amphora forms[105]. The fourth type discussed in this section, Chian amphorae, reflects luxury wine shipping attested in two wreck sites listed in the present study[106].

4.2.1. Rhodian

The influence and power of Rhodes, especially in the Hellenistic period is undisputed[107]. Rhodes certainly played a role as an entrepôt, as was suggested by Parker[108] and its influence is confirmed by both: ancient sources[109] and archaeological evidence[110]; as for example by the transport amphorae discussed below.

The production date of Rhodian amphorae extends in several centuries. The earliest wine jars belong to the last quarter of the fourth century BC[111] and the latest, to the early second century AD[112]. During the early production, they appear in a

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[105] See also Hydra-Spetsai in Table 2, **5,** which carried Koan amphorae. The pattern is supported also by the isolated amphora evidence observed at the bottom of the sea in Greek territorial waters, where Rhodian, Koan and Knidian amphorae of the Hellenistic period seem to predominate. The observation is based on approximately twenty years experience of a maritime archaeologist G. Koutsouflakis in the Greek territorial waters. G. Koutsouflakis, January 2011, *pers.comm*. The popularity of these types is attested as well in the land deposits; see especially further discussion of Rhodian and Knidian amphorae below.

[106] On popularity of these amphora types, see also Rauh 2003, 116. Further reference is given in the subchapters of this section.

[107] Gabrielsen confirms: “Modern scholarship duly acknowledges the importance of Rhodes in Hellenistic times. It is agreed that, politically the city-state occupied a leading position among the powers of the second league, at least until 167 or 164 BC; and that economically, it became a prosperous trade centre with commercial connections that were both numerous and extensive.” Gabrielsen 1997, 5. Gabrielsen broadly discusses the influence of Rhodes and the trade strategies. For important historical events, which had influence on Rhodian trade, see Idem, 66. For the relation between Rhodes and Rome which had an impact on Rhodian trade, see Rauh 1999, 162-186; Schmitt 1957. For the relations between Rhodes and Rhodian Peraea, see Rice 1999; Bean 1954. On the significance of Rhodes, see also Rauh 2003. On the Hellenistic period, see Archibald *et.al*. 2011.

[108] Parker 1990, 343. See also Gabrielsen 1997.

[109] For example, Strabo claims: “[Rhodes] controls the seas for a long time and destroyed piracy, and became a friend to the Romans and to those of the kings who were well disposed both to the Romans and to Greeks.” Austin 1981, No. 92.

[110] The evidence of intensive production, especially in the second century BC, is attested by thousands of stamped handles, which were uncovered during the Danish excavation at Lindos, as well as by a large body of material in the Benaki Collection in Alexandria. Göransson 2007, 160 & n. 433 with further reference. For the amount of fragments inventoried in Athens, see Koehler & Wallace Matheson 2004, Fig. 1.

[111] The early unstamped amphorae of the fourth century BC, which were made on Rhodes before the introduction of stamping are, as Monakhov remarks: “virtually impossible to reliably identify.” They could be found among the mushroom-shaped rims. Monakhov 2005, 70.

[112] Göransson 2007, 160 with further reference; Whitbread 1995, 53 with further reference.

considerable variety of forms, for example, jars with arched handles[113], mushroom[114] or rolled rims. After the first half of the third century BC, their shape becomes relatively standardized: handles are attached just below the rim and rise to the conventionally known Rhodian acute angled shape, after which they tapper slightly to join the top of the shoulders. The body is rather oblong, ending in a small peg toe. The rims are rolled and the surface is creamy[115]. This simple conception of the jars and their relatively stable form which ranges in date from the mid-third century to the first century BC, led to the dating of many cargoes within the span of these centuries, without an attempt to assign them within narrower chronological margins[116].

The lack of a study in the morphological developments of the Rhodian form of transport amphorae, as opposed to the intensive study of the epigraphic evidence of the Rhodian stamps, represents a leading difficulty, which was recently addressed by Monakhov, who proposed the classification of the Rhodian form into several variants[117]. Monakhov distinguishes *long-necked* Rhodian jars (Monakhov's Type 1) from *short-necked* (Monakhov's Type 2), the latter appearing only for a while since its production seems to terminate by the end of the first quarter of the third century BC; while the Type 1 continues to the first century BC[118]. His subdivisions of Type 1 include six successive variants: I - A (*Kyrenia* variant), I - B (*Koroni* variant), I - C (*Myrmekion* variant), I - D (*Pietroiu* variant), I - E (*Villanova* variant with two series: early I-E-1 & late I-E-2) and I - F (*Alexandrian* variant)[119]. In the Roman Imperial period, which is not discussed by Monakhov, slight modification appears in the handles[120].

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[113] *Grace*.

[114] Mushroom-shaped rimes include many subdivisions of form and fabric. The known places of manufacture of this amphora type include, apart from Rhodes: Erythrai, Klazomenai, Samos, Ephesos, the area near Knidos and further sites eastward along the Datça Peninsula and Kos. Lawall 2005, 33 & n. 14; see also Nørskov 2004, *esp*. 287-291. Rhodian mushroom rimmed jars are attested in Kyrenia and discussed below, see infra pp. 28-30, 44. For the Rhodian mushroom rimmed amphorae, see also Monakhov's variant I - A in Monakhov 2005; Finkielsztejn 2001, Pl. A, 2.

[115] Whitbread 1995, 53; *Grace*.

[116] E.g. Dhrapi (**4**).

[117] Monakhov 2005.

[118] Ibid., 71.

[119] See Monakhov 2005 for the characteristics of each variant. For Monakhov's type 2, which was not recorded in the studied cargoes, see Idem, 86.

[120] Göransson 2007, 160. The later types are much narrower in the body and their handles become "horned". The form clearly developed from the late Hellenistic prototypes by the late first century BC and lasted into the early second century AD. Peacock & Williams 1986, 102-104 (Class 9).

Rhodian jars most probably carried wine[121] and their production centers were located in Rhodes and east of Datça[122]. They were often stamped on both handles: one carrying the name of an eponym and the second the name of a fabricant[123]. The names were frequently accompanied by a Rhodian device, like a rose or a head of the sun-god Helios[124].

Hellenistic stamped Rhodian amphorae are among the best studied commercial pots, due to their frequent stamping, which can provide accurate dating for archaeological contexts[125]. The date of the introduction of the stamping practice of the Rhodian amphorae is still a subject of debate, nevertheless it most probably falls to the beginning of the third century BC and continued for two and a half centuries[126].

The advanced studies in Rhodian ceramic epigraphy and the lack of attention to morphological developments of the Rhodian amphorae dated from the fourth to the first century BC, led to either accurately dated cargoes where legible stamps are preserved providing archaeologists with improved stamp chronologies (e.g. Kyrenia), or cargoes with no legible stamps where the jars might span more than a 50-year period in our current understanding of their production and use (e.g. Dhrapi, Samiopoula and Skrophes).

Rhodian amphorae were identified at ten wreck sites collected in the present study (Map 2)[127]. Two of these wrecks (Map 2, A and B) were excluded from the main catalogue, since apart from their identified and dated amphora consignment, no further information concerning their discovery and character of their cargo is

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[121] Whitbread 1995, 54 with further reference to ancient sources. It is nevertheless accepted that wine was not the only product, which was traded in the jars. See Gabrielsen 1997, 71.

[122] For excavated production centers, see Whitbread op.cit., 54 with further reference. On amphora production in the Rhodian Peraea in the Hellenistic period, see Şenol *et.al.* 2004, 353-359 with further reference to earlier publications.

[123] Grace &Savvatianou-Petropoulakou 1970, 289.

[124] Göransson 2007, 160; Whitbread 1995, 53.

[125] Göransson 2007, 19, Monakhov 2005, 69. For the research history on Rhodian stamping, see Idem, 70-71.

[126] Kats suggests second half of the second decade of the third century BC for the start of Rhodian stamping, dating the early magistrate group to 280-265 BC. Kats 2002, 156-167. Finkielsztejn, who established “lower chronology” for the period 270-108 BC, suggest the beginning of the stamping roughly at the turn of the fourth and third centuries BC. Finkielsztejn 2001, 48 & n. 53. It is certain that the early Rhodian amphora stamping still needs to be refined, among with the reexamination of primary sources. As Monakhov noted, the need of the reexamination of our knowledge based on known deposits was already demonstrated by Börker & Burrow 1998 (cited in Monakhov 2005, 71). See also Lawall 2002 for the Pergamon deposit. For summarized developments of the chronology of Rhodian stamping, see Monakhov 2005, 70-71.

[127] I would like to remind reader that Rhodian amphorae attested in previously catalogued sites (*Parker*), which stay unverified (Deep Tow site: Table 1, **8**; Rhaphina: Table 1, **22**), have uncertain chronology (Koppo: Table 1, **14**; Cyprus: Table 1, **7**) or are represented by a small number of jars, which were not associated with the main assemblage (as Rhodian and Knidian amphorae at Kitriani site, see Catalogue: **6**) are not taken into account. Map 2 shows the distribution of the Rhodian amphorae in the cargoes. Numbers refer to the entry of the wreck in the Catalogue. The Dhrapi wreck is classified under the second century BC, even though the date suggested in the present thesis falls within the late third-early second century BC, see infra pp. 30-31.

currently available[128]. From the eight catalogued wrecks, three have not any published samples[129]. Two wrecks have one amphora published[130] and another two wrecks yielded more than one sample, subsequently published[131]. The remaining wreck, Samiopoula, is discussed below based on a single sample provided to me for further study[132]. Besides Samiopoula, Kyrenia and Antikythera, all the recorded cargoes with Rhodian amphora consignment were reported to have no other amphora types on board and thus represent a single amphora shipment.

The earliest Rhodian amphorae, attested in the eastern Mediterranean Hellenistic cargo, were discovered in Kyrenia wreck (**7**; Pl. 9; Map 2)[133]. Several legible amphora stamps have been preserved and together with two coins provide a *terminus post quem* for the wreck's date, which is used as a fixed point in amphora studies. The importance of the cargo lies within the preservation of early Rhodian stamps, since the initial stage of the Rhodian stamping remains still poorly understood due to the scarcity of published examples from Early Hellenistic closed deposits[134]. The potential of the cargo was therefore quickly understood and most recently studied by Lawall[135].

The most frequent Rhodian form, present in the Kyrenia cargo is a mushroom rimmed, conical body type (Fig. 3, No. 454)[136]. The exact amount of these amphorae cannot be defined with certainty, since the wreck was disturbed before its scientific excavation. Nevertheless, the attested number is just over 300 individual pieces, of

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[128] Stegna Archangelou (Map 2, B) and Syros A (Map 2, A), see Table 2, **10**-**11**. The exact date of these wrecks was not reported, nevertheless they are listed in Micha's study under Hellenistic period. See *Micha*.

[129] Skrophes (**16**) where only two underwater pictures are available; Moulia (**10**), where the raising of concreted samples was not possible and thus the cargo was identified underwater and Nauticos (**11**), where only underwater video and pictures are available. For the video footage from Nauticos site see *EMMAF* & *Nauticos* in *IR*. For the reference concerning the available research material for the wrecks, see reference entry in the Catalogue.

[130] Dhrapi (**4**) and Telendos (**20**); a sample retrieved from the later is fragmental.

[131] Antikythera (**1**) and Kyrenia (**7**). All samples presented below were confirmed to come from identical assemblage of a wreck.

[132] I do not have permission to published the studied sample in the present thesis and thus reader will have to wait for the publication. For the permission to study the sample I would like to thank Mr. Th. Theodoulou.

[133] Bibliography for Kyrenia wreck is listed in the Catalogue, see Kyrenia (**7**). For amphora capacities, where the Kyrenia is among the discussed evidence, see Wallace Matheson & Wallace 1982, 293-320; Wallace 2004, 429-430. For the first published profile drawing of an amphora from Kyrenia wreck, see Bass & Katzev 1968, 172. For the C^{14} date of the almonds from the wreck, see Swiny & Katzev 1973.

[134] Lawall *forthcoming*. Recent attempt to specify the early Rhodian chronology is offered by Kats; see supra n. 126. For the earliest period see also Finkielsztejn 2001, 54-55. For later Rhodian stamps of periods IB through V (c. 270-108 BC), we have G. Finkielsztejn revision of Grace's chronology. Finkielsztejn 2001; Finkielsztejn 2000 (for later Rhodian stamps); cf. Grace & Savvatianou-Petropoulakou 1970, 289-302; Grace 1985, 7-13; and 1974.

[135] Lawall *forthcoming.*

[136] It represents Monakhov's variant I - A, which belongs to the earliest development of Type I (*long-necked* jars), see Monakhov 2005, 72. I would like to thank Mark Lawall for his permission to reproduce the plate published here in Fig. 3.

which 39 are stamped[137]. The legible Rhodian stamp types and pairings, which were studied by Lawall include the following names[138]:

API|API
API|-
APIΣ/TI|-
ΔIO/API|-
API-ΔIO
NIKA/TIMO|-
IωN|-
IωN-TIMO
TIMAP-AΛE
ΠA monogram with ΓO-ΔA

The above pairings reveal that there are at least five pairs of legible names attested in the stamps of these jars, with only one point of overlap between the pairs (API-API). As suggested by Lawall, if one of the names in each pair is an eponym, there must be at least four years presented in these jars, which accordingly confirms that the Kyrenia ship was trading jars of a minimum span of four years for their production date. Detail study of the jars' rim forms, linked to different pairings of stamps they carried, and further linkages between the Kyrenia material and other early Rhodian stamped jars, led Lawall to preliminary identification of the names with either a fabricant or an eponym[139].

Furthermore, Lawall's study explores also the unstamped jars mixed with the main cargo. In 2004, the reconsideration of the Kyrenia material led to a minor changes in earlier Katzev's typology, which due to the assistance of Neutron Activation Analyses of the fabric allowed better identification of the provenance of the unstamped jars. The Neutron Activation Analysis applied on the second relatively large group of 25 fractional jars present in the Kyrenia cargo (Fig. 3, Nos. 374, 390) revealed Rhodian provenance, as in the case of four full sized jars (Fig. 3, No. 433), which has similar rounded rim as the 25 fractional jars. Hence, the Rhodian jars from

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[137] Lawall reports that one of these stamps may belong to the Turkish mainland production instead of Rhodes proper, see Lawall *forthcoming*.

[138] The inscriptions are cited according to the following usage: Handle 1|Handle 2; - symbolizes missing part. See also *Guarducci*.

[139] For example, Lawall distinguishes a group of amphorae reading API, which is characteristic by the consistent form of the rim (see fig. 3, Nos. 758, 310, 454) from the group, which pairs ΔIO with API, where the rim form differs from the first group (Fig. 3 No. 339) and thus is believed to be made by a different fabricant (in this case ΔIO). If this pattern is correct, API appears in the the Kyrenia consignment as a fabricant and an eponym. For further interpretation of these early stamps, see Lawall *forthcoming*.

the cargo gives a clear indication of the early coexistence of triangular and rounded rims[140].

Nevertheless, the most important argument suggested by Lawall is the date of the wreck. Taking in account numismatic evidence[141] and the comparison of the deposit with the Ephesos Well LB, Lawall argues that the date of the wreck (and subsequently the eponyms) should be placed within the first decade of the third century BC[142]. Moreover, he suggests that the date is unlikely to be much later than 294 BC[143]. The amount of the attested material is nonetheless still not satisfactory and even though it is certain that the Kyrenia deposit represents an important early Rhodian assemblage, further refining of the earliest period of Rhodian amphora stamping will have to await additional evidence to confirm Lawall's preliminary interpretation based on the ceramic linkage between Kyrenia and Ephesos Well LB.

Two other published Rhodian amphora samples, discovered in the assemblage of a Hellenistic wreck, carried identifiable stamps. The first one was found in the cargo of the Dhrapi wreck (**4**; Pl. 6; Map 2). The Dhrapi sample was raised during a survey in 1979 and published by G. Papathanassopoulos[144]. In his brief report, Papathanassopoulos does not propose any date for the amphora neither the wreck. On the other hand, *Parker* in his catalogue provides a date range from 250 to 50 BC[145]. Closer examination of the jar's morphology allows further narrowing of the date. The sample has a simple rolled rim, the handles join the long neck just below the rim and raise to the characteristic bent after which they fall to join the top of the shoulders (Pl. 6). The body is quite broad, if compared to jars of the first century BC, which have a tendency to become taller and slimmer[146]. The toe has clearly defined edges and cylindrical form. The shape fits the description of Monakhov's I - E variant, which dates from the late third to the second century BC[147]. Further evidence is provided by

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[140] Lawall *forthcoming*.

[141] Two legible coins help to confirm the date of the wreck. One of Antigonos Monophthalmus (minted in 313 and 301 BC) and the other of Demetrios Poliocretes (minted between 306 and 294).

[142] Cf. the discussion concerning the stamp TIMAP in Monakhov 2005, 72 with further reference to the published examples of the stamp. For new recorded evidence of this amphora stamp found in Olbia, see Lawall *et.al.* 2010, 371-372.

[143] The suggestion that the date is not likely to be later than 294 BC depends on an assumption of Irwin Merker, who argued that during the period when Demetrios was minting the coin type found in Kyrenia, Cyprus was under his control and not under the control of Ptolemies, therefore if the ship sunk well after 294 BC, when the Ptolemies reestablished control of the eastern Mediterranean, then the wreck's assemblage should have included Ptolemaic coins. Lawall *forthcoming.* If this suggestion is correct, we arrive at slightly earlier date than the one suggested by Kats and Monakhov and closer to the date proposed by Finkielsztejn. See also supra n. 126.

[144] Papathanassopoulos 1980, Fig. 4. For a raised lead anchor stock from the wreck site see Idem, Fig. 3.

[145] **P** 363; Micha lists the Dhrapi wreck among the Rhodian cargoes of Hellenistic period without giving any closer date, see *Micha*, 85.

[146] Grace & Savvatianou-Petropoulakou 1970, 198.

[147] The so-called *Villanova* variant, see Monakhov 2005.

pair of stamps depicting a characteristic rose of Rhodes[148]. In Greek territorial waters, the Telendos (**20**; Pl. 7-8; Map 2) wreck dated to the Hellenistic period also yielded a sample with a recognizable rose stamp[149]. The stamp is not accompanied by any inscription and the second stamp of this jar is too shallow to be recognized.

The Telendos amphora is fragmentary, since it was raised from a very scattered cargo, where no intact jars were found (Pl. 7). It has a rolled rim, long neck, and one fully preserved handle which slightly tapers to join the top of the shoulder. The second handle is preserved only partially and the body is missing (Pl. 8). The jar was dated to the early second century BC[150].

The morphology of the Dhrapi amphora and the pair of rose stamps allow the narrowing of the jar's date to the late third-early second century BC. The overall character of the Dhrapi assemblage remains nonetheless unknown, due to land slides which covered the remaining cargo[151].

Another wreck, dated to the beginning of the second century BC, was located in Cyprus near Moulia rocks (**10**, Map 2). An assemblage, which represent the cargo of the wreck is concreted in the upper part of a rock. The mass of pottery measures *ca*. 2.8 by 1.5 meters with a thickness of *ca*. 1 meter. Fragments of whole vessels are reported to form what appears to be a ceiling of a small cave. They were studied *in situ* by an archaeologist and dated between 200 and 185 BC[152].

The 2002 survey of *EUA* and *NCMR* (nowadays *HCMR*), which led to the discovery of Telendos, brought to light another two wrecks, one of which, the Skrophes wreck (sometimes referred to as Leros wreck), carried Rhodian consignment. Skrophes wreck (**16**; Map 2) is represented by an assemblage scattered from 25-42 meters, in which several intact jars were observed[153]. The cargo was reported to carry only Rhodian consignment and was dated by an archaeologist to the first century BC[154]. No closer date was assigned. Skrophes shipwreck is listed by Micha under the Roman Imperial period together with Samiopoula[155]. Nevertheless, whereas in the case of Skrophes no sample is available for further study and thus we must remain with the date proposed above, a sample from Samiopoula (also generally

[148] Papathanassopoulos 1980, 166.

[149] Delaporta *et.al.* 2003, Fig. 12.

[150] Ibid., 46-47.

[151] Papathanassopoulos 1980, 166.

[152] Hohlfelder 1995b, 49-51.

[153] Delaporta *et.al*. 2003, Figs. 8-9.

[154] No amphora sample was published. Delaporta *et.al.* 2003, 45-46.

[155] *Micha*, 86.

dated to first century BC) allowed me to attempt a sequence amphora comparison with the aim to arrive at a closer date[156].

Before we reach the attempt of refining the date of the Samiopoula sample, let us examine another wreck with Rhodian consignment which is considered to date with certainty to the first half of the first century BC. Four amphorae from Antikythera wreck (**1**; Map 2) were published in 1902[157] (Pl. 1, Fig. 1[158]). One of these amphorae is Rhodian (Pl. 1 & Fig. 1, second from left). The early publication of the jars in *Antikythera,* encouraged a search in the storerooms of the National Museum at Athens, which led to identification of the jars published in 1902. Furthermore, closer examination of other jars, which were stored with the Antikythera material, their inspection and comparison of their marine deposit with the attested ones, led Grace to the conclusion that they come from the same cargo[159]. The identical classes and approximate date has strengthen this hypothesis.

The above analysis led to the identification of another four Rhodian amphorae originating in the Antikythera cargo (Pl. 2-3). From the total of the five Rhodian jars from Antikythera, three were stamped. Unfortunately the stamps are not legible (see Pl. 2) and thus cannot provide improved stamp chronologies[160]. Virginia Grace dated the Rhodian amphorae to the first century BC, due to their relatively slim body, which manifests later development of the Rhodian jars. They show careless manufacture, compared to the earlier production of the third and second centuries BC[161]. Furthermore, a sequence amphora comparison allowed *Grace* to place these jars sometimes after 86 BC and further parallels lower the date to after 82 BC[162]. Recent evidence of discovered coins: late cistophoric silver coins among with Pergamene tetradrachus dated to the first half of the first century BC, more precisely 85-67 BC

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[156] I would like to emphasize that none of the Koan amphorae, also present in the Samiopoula cargo, were available for this study and thus the below discussion depend solely on a single sample. The amphora capacity of the sample which could help the chronology is not known to me. It could nevertheless help to define the date. As Grace initially proposed, sometimes during the first century, the capacity of the jars was reduced, see Grace in *Antikythera TAPS*, 7. Later on, a collective amphora study and capacity measurements led to the suggestion that while in the middle to third quarter of the second century BC, the capacity of common Rhodian container was from 28 to well over 29 liters, it seems to have fallen gradually to about 26 liters at the date of the Antikythera wreck and in the second or third quarter of the first century BC it dropped below 23 liters. Wallace Matheson & Wallace 1982, 298. See also Grace 1949, 175-189.

[157] *Antikythera*, 160-161 & supplementary Pl. H 1-4 reproduced in this study as Pl. 1.

[158] The profile drawings were made by V. Grace after the identification of the jars in the National Museum at Athens. One of the jars, which was published in *Antikythera* still intact, was discovered by Grace in fragmental condition (Cf. Pl. 1 and Fig. 1 in this study).

[159] Grace in *Antikythera TAPS*.

[160] Ibid, 6.

[161] Grace in *Antikythera TAPS*, 6.

[162] See *Antikythera TAPS.* Grace links the jars to the deposit of debris from the destruction of Athens by Sulla in 86 BC, which seems to be earlier. Grace in *Antikythera TAPS*, 6 & Fig. 3. For further stamp evidence, linked to one of the Rhodian jars from Antikythera, which seems to push the date after 82 BC, see Idem, 7. See also Grace & Savvatianou-Petropoulakou 1970, 297-298.

and few Ephesian bronze coins dated to 70-60 BC, provide *terminus post quem* for the Antikythera wreck[163]. Bringing all the available evidence of the ship's cargo together[164], we arrive at the date in the second quarter of the first century BC for the wreck site.

The Samiopoula sample has a simple rolled rim, relatively slim, oblong body which ends in a small peg toe and sharply angular handles. The handles are more fully adjusted to the narrower body than in the Agora sample SS 8602 used by Grace for a sequence comparison[165]. They also raise higher and after the bend slight 'bowing' of the handles appear, suggesting later date. The Samiopoula sample certainly fall within later a production than the Antikythera jars; nevertheless I would argue that the sample is earlier that a jar from Augustan deposit published by Grace[166], which shows very careless manufacture[167].

The remaining catalogued wreck, where Rhodian amphorae have been identified in the main assemblage, is located in international waters and named in this thesis: the Nauticos wreck (**11**; Pl. 30, 31; Map 2)[168]. The team of the Nauticos Corporation spent 20 minutes at the site, which was discovered during the search for Israeli submarine INS Dakar. They have recorded the cargo, which was later studied by Mark Lawall, based on the video footage[169]. At least one Rhodian amphora was with certainty identified in the cargo (Pl. 21, white arrows). Mark Lawall has dated the form from the very late second to the early first century BC[170]. Nevertheless the remaining types, mostly Pamphylian amphorae have narrowed the date of the wreck site to the first half of the first century BC[171].

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[163] Yalouris 1990, 135-136 Pl. 31:3-5; Oikonomidou 2001, 541-544 with the catalogued coins.

[164] For the study of Hellenistic pottery used on board, see Edwards in *Antikythera TAPS*, 18-27; for the early Roman pottery, see Robinson in *Antikythera TAPS*, 28-29; for the glass vessels, which are believed to be part of the cargo, see Weinberg in *Antikythera TAPS*, 30-39; Weinberg & Stern 2009; for the ship's remains, which are to be republished (G. Koutsouflakis, April 2011, *pers. comm.*) and C^{14} dating see Throckmorton in *Antikythera TAPS*, 40-47 & Ralph in Idem, 48. For further bibliography see the Catalogue: Antikythera (**1**). For the Koan or possibly Pseudo-Koan amphorae from the cargo see infra p. 42.

[165] Grace in *Antikythera TAPS*, Fig. 3, A.

[166] Ibid. Fig. 3, C.

[167] In the amphora sequence used by Grace to date the Antikythera jars, the Samiopoula sample is most probably to be placed between the Curium sample and the sample from the Augustan deposit. For the Curium sample from Cyprus, which was raised from the Graeco-Roman tomb, see as well Grace 1947, 488, Fig. 6.

[168] See also supra n. 72.

[169] Lawall 2005-06. For the Mark Lawall's original slide presented at the DEGUWA conference in Frankfurt which refers to the wreck site, see *Lawall* in *ORM*. For the video footage, see *EMMAF* in *IR*: Explore-International Waters.

[170] Lawall 2005-06, 76.

[171] See the Pamphylian amphorae in this study at infra p. 47.

Rhodian amphorae, which appear also in two other wrecks, reported by *Micha*[172], represent familiar cargo in the Hellenistic wreck sites. Their popularity, which attests the appreciation of their consignment was evidenced as well in Turkish territorial waters[173], where they were recorded in cargoes of Arap Adasi, Fethíye, Gökova, Sarah Ky, Serçe Limani C and Serçe Limani D[174].

4.2.2. Knidian

Knidian amphorae were produced from the Archaic period until the sixth century AD[175]. The late Classical and Hellenistic Knidian amphorae were divided by Monakhov to two main types: Type I with tall-cylindrical neck, mushroom-shaped rim and bevelled toe[176] and Type II with rolled rim, long cylindrical neck and tapering body, which in the third century ends in the characteristic ringed toe. All the jars included in the present study belong to Monakhov's type II, in which several variants were distinguished[177].

Knidian jars were made from a characteristic red clay and are believed to have carried wine[178]. The popularity of Knidian wine was confirmed by the study of Koehler and Wallace Matheson which demonstrated that Knidos was the major source of wine imported into Athens in the Hellenistic period[179]. Furthermore, the collection of datable stamped handles imported by Athens from 220 BC until 108 BC, shows that Athens' import of Knidian amphorae was most intensive during Grace's period IV A (188-167 BC)[180].

Knidian amphorae were often stamped, bearing the ethnic and the names of an eponym and a fabricant. In the period IV A, stamps contain the names of *phrourarchoi*, which in some cases replace the *eponym*[181]. This period was connected to a historical event by Grace, who believed that it was the time of Rhodian control of

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[172] Stegna Archangelou and Syros A. See Table 2, **10**, **11**.

[173] The geographical term "Turkish" is used in this thesis as a reference to the present geographic and political unity.

[174] All these wrecks were catalogued in *Parker*. The reference follows the sequence of their citation in the text: **P** 50, 399, 457, 1038, 1072-1073. One Rhodian amphora was also published from the Kizil Burun site; see Cowin 1986, 58-59 & Pl. 3.

[175] The starting date for the production of the Knidian jars was previously placed in the third century BC. Whitbread 1995, 68. French-Turkish excavation on the Datça peninsula has pushed the beginning of the production date back to the Archaic period (sixth century BC). Göransson 2007, 157; *Monakhov* in *ORM*, 162.

[176] Type I has four variants, see *Monakhov* in *ORM*, 162-164.

[177] Ibid., 164-169.

[178] Whitbread 1995, 68 with further reference to ancient sources.

[179] Koehler & Wallace Matheson 2004, 163 & Fig. 1.

[180] Ibid., Fig. 2.

[181] Whitbread 1995, 68.

Knidos[182]. Therefore she proposed starting date of 188 BC, when the Peace of Apameia took place, the treaty which granted Rhodes with a new territory on the nearby mainland[183]. The ending date of the period IV A, 167 BC, is connected to the Rome's declaration of Delos as a free port, which led to a decrease of the power of Rhodes[184]. Grace suggested that the *phrourarchoi* named in the stamps were mercenaries employed by Rhodes, since the names does not seem to be Rhodian neither Knidian[185].

Archaeological evidence shows an influence of Rhodes in Knidian jars of this period. Some of the amphorae carry cream slip in imitation of Rhodian ones[186]. Furthermore, Neutron Activation Analysis of some Knidian amphorae of this period revealed Rhodian fabric[187]. However, the evidence of Koehler and Wallace Matheson's study which demonstrates the massive production of the Knidian amphorae in the Phrourarchoi period attested by high number of the datable stamped handles in the Athenian deposits, led the authors to an argument that there was a cooperation between the two states rather than control, since no suppression in the Knidian trade occurred, but the opposite[188]. If we accept the fact that the *phrourarchoi* were not mercenaries but may have been Knidian amphora manufactures[189], the connection to the historical events proposed by Grace can be weakened and a question of lowering the chronology, which was initially set forth by

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[182] Grace & Savvatianou-Petropoulakou 1970, 318-319.

[183] Gabrielsen 1997, 47; Walbank 1979.

[184] Gabrielsen 1997, 64, 66-69. For the relations between Rhodes and Rome in the 160s BC, see Gruen 1975; Berthold 1984, 203-207; Ager 1991. The time is often stressed to be a critical moment for history of Rhodian trade, particularly the wine trade. Rostovtzeff 1941, 771-772; Schmitt 1957, 159-160; see also Rauh 1999, 162 with n. 4. Nevertheless, Rhodes certainly did not lose all of its trade connections. The city state of Rhodes seems to be dominant in the Egyptian wine markets towards the end of the second century, which is attested by stamped amphora handles in Alexandria. Rauh 1999, 166 & n. 20 with further reference.

[185] Grace & Savvatianou-Petropoulakou 1970, 318-319; Grace 1985, 14.

[186] *Grace*; Koehler & Wallace Matheson 2004, 167 & Fig. 7.

[187] This does not necessarily mean that they were made on Rhodes, since similar clay deposits may well exist on the Datça Peninsula; nevertheless the jars are recognizable from the typically reddish-tan clay of Knidos and demonstrate Rhodian influence. Koehler & Wallace Matheson 2004, 167 & n. 12 with further reference. See also Grace 1985, 17-18.

[188] Koehler & Wallace Matheson 2004.

[189] See Ibid., 168 for supporting evidence.

Koehler and Wallace Matheson, should be the next focus in Knidian stamp research[190].

Another period of Knidian stamping, which differs from the known pattern of naming the ethnic, the names of an eponym and a fabricant, dates from the late second to the first century BC (period VI), when a pair of officials referred to as *duoviri*, are named in the stamps together with an *eponym*, a fabricant and the ethnic[191].

Knidian amphorae of Hellenistic period are attested in Greek territorial waters[192]. They were recorded in the following shipwrecks: Aspronesia-Kalapodia, Leipsoi and Styra B. Koan amphorae were found among the Knidian in Styra B and Leipsoi cargoes, however in the later one, the Koan are represented only in few jars observed at the site, while Knidian jars clearly predominate[193].

The cargo of Aspronesia-Kalapodia (**2**; Map 3) is scattered and only one amphora is reported to be preserved almost intact. It has one handle, part of the neck and part of the rim missing. The jar was located in the depth of 21 meters, shallower than the main assemblage of the cargo and thus is suggested to have been left behind during illegal visit to the site[194]. It is nevertheless identical with the jars in the main assemblage and certainly belonged to the cargo of the ship. The description of the sample refers to a rolled rim[195], long slim neck, oval body, which tapers to a characteristic ringed toe. The shape was dated from the end of the second to the mid first century BC[196].

Styra B shipwreck (**18**; Map 3) is due to its location in shallow waters badly scattered (Pl. 25)[197]. A fragment of stamped Knidian amphora with characteristic reddish-tan was raised, and among with the Koan sample (discussed below) provides

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[190] Koehler and Wallace Matheson, who briefly examined the known deposits of Knidian stamped handles suggest that in the Middle Stoa Building Fill, where the attested Knidian stamps are closely knit with those of the early period of phrourarchoi, the Rhodian amphorae (of which the chronology was lowered, see Finkielsztejn 2001) may provide a test case of the new chronology. It is nevertheless certain that the Phrourarchoi period, as Koehler and Wallace Matheson note, cannot be moved much in date away from the 188-167 BC range associated with increased Rhodian activity in the area. Koehler & Wallace Matheson 2004, 168-169. Until the amphora stamp evidence is reexamined in detail, no new chronology can be developed, therefore, the present study follows the general dates for the Knidian stamps, which can be established based on Grace's publications. Grace & Savvatianou-Petropoulakou 1970, 317-324; Grace 1985, 13-18; for the summary of Grace's work see Empereur & Hesnard 1987, 20-21.

[191] Whitbread 1995, 68; Grace & Savvatianou Petropoulakou 1970, 317-324.

[192] The term "Greek" refers to the present geographical and political unity.

[193] Koutsouflakis November 2010, *pers.comm.*

[194] Delaporta *et.al.* 2003, 44-45 & Fig. 7.

[195] *Δακτυλιόσχημο* is rather to be translated as ring-shaped, nevertheless I follow the English terminology.

[196] Delaporta *et.al.* 2003, 45.

[197] I would like to thank Giorgos Koutsouflakis for his generosity in providing me with photographic material regarding the wreck and his permission to publish the accompanying plates.

a date for the wreck site. The Knidian fragment of Styra B has a rolled rim, one fully preserved handle and a slim, long neck. The body is missing. Under the place where the handles join the neck, a groove is noticeable (Pl. 19). The preserved handle carries a three lines stamp (Pl. 17). Part of the stamp is legible:

ΕΠΙ [Δ]Ι[Ο]ΝΥΣΙ
[Ο] Μ - Ν - Π? -
Ν -

Διονύσιος appears in the Grace's period IV A (188-167 BC, Phrourarchoi period)[198], period V (146-108 BC)[199] and VI B (97-88 BC, Duoviri period)[200]. The closest parallels to our stamp, which start by citing the eponym: ΕΠΙ ΔΙΟΝΥΣΙΟΥ were recorded and published by Grace and they belong to the first century BC[201]. Most of these stamps[202] are accompanied by the ethnic Κνίδιον, which could be present in the Styra B stamp as well (Pl. 17)[203]. Nevertheless Grace's examples, which carry both ΕΠΙ ΔΙΟΝΥΣΙΟΥ in the beginning of the stamp and the ethnic Κνίδιον, are accompanied by various devices, from which none is traceable in the Styra B sample[204]. In all the examples, the eponym is followed by different name than in our sample[205]. Whether the Διονύσιος in our stamp is identical with those of *duoviri* period published by Grace is uncertain. We can be quite confident that there

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[198] Even through the title *phrourarchos* often accompanies the eponym in the stamps of this period, the eponym does not necessary have to be entitled *phrourarchos*. Grace 1985, 14; Grace & Savvatianou-Petropoulakou 1970, 319.

[199] *Jefremov's* much different chronology is omitted in the present study, since he did not take account of the wider range of Aegean and Mediterranean evidence available to Grace and Koehler (see also Lawall 2005, n. 8). For Jefremov's modified chronology, which was received with skepticism by Empereur & Garlan (1997, 181-182), see Jefremov 1995. For recent work on the Knidian chronology, see Koehler & Wallace Matheson 2004.

[200] Grace 1985.

[201] See for example: Grace & Savvatianou-Petropoulakou 1970, E 170, E 176; Grace 1934, 262 Nos. 175-176.

[202] Except for E 176, see Grace & Savvatianou-Petropoulakou 1970, 349.

[203] Legible N is present in the second, as well as in the third line. Furthermore, the first letter in the third line resembles the letter K suggesting that the ethnic could had been originally included. In the stamps E 170 (Grace & Savvatianou-Petropoulakou 1970) and No. 175 (Grace 1934, 262) the ethnic as well appear on the third line.

[204] Stamp E 170 contains an anchor, stamp No. 175 contains an amphora and stamp No. 176 contains a fragmentary circular seal. None of these devices are traceable in our stamp. See supra n. 201 for the stamps' reference.

[205] Even though the second line of our stamp cannot be fully reconstructed, several letters can be recognized including M, N, second line seems to carry as well Π, therefore it is improbable that the illegible name of our stamp fit any of the names preserved in the Grace's stamps. Cf. Pl. 17 & reference provided in supra n. 201.

may have been still other eponyms with the same name which were not yet recorded in the discover deposits[206].

Further evidence, concerning the date of our fragmental sample can be delivered by the morphological study, which is nevertheless limited since the body of the jar is missing. If we examine the characteristic shapes of the Knidian amphora development with a careful concern to the periods in which Διονύσιος is attested as an eponym in the stamps, we can arrive at a closer date.

In the period IV A, we have an example of an intact jar, which was dated based on its stamp to the early Phrourarchoi period, sometime after 188 BC[207]. The shape of the jar differs from the Styra B Knidian amphora in its cream slip, which nevertheless does not exclude the possibility that our sample could be placed in the Phrourarchoi period, since not all the jars of the period carry the slip[208]. However, the morphology of the Styra B sample (Pl. 19) suggests later production than the jar dated to the period IV A, because the stamped top of the handles, which are at first long becomes in the later period shorter as in the Styra B amphora and the neck becomes narrower[209]. The characteristic shape of the period V is demonstrated by the jar from the Athenian Agora which is dated to the second half of the second century BC[210]. The jar occurs to have longer neck and arched handles, which rise after their upper attachment in contrast to the Styra B sample.

Close parallel to this form can be provided by a fragmental jar, preserved to the same extent as the Styra B example[211]. It has a rolled rim and a fully preserved handle which is attached just below the rim. The handles are closely attached to the body, the stamped part of the handle seems to be rather flattened on the top, while the bottom side of the upper part is arched as in the Styra B example. The neck is cylindrical in the upper part and slightly wider in the lower part. The fragment carries a different eponym but belongs to the Duoviri period[212].

Even though none of the stamps attested in the land deposits is identical with the Styra B stamp, the closest parallel, regarding the stamp and the morphology of the

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[206] Grace & Savvatianou-Petropoulakou 1970, 329, E 72.

[207] Grace 1985, 16-17 & Pl. 3 No. 14, 17 (for the stamp of the jar); *Grace*, 64 second jar from the left.

[208] See supra p. 35 with n. 186-187.

[209] The handles of the Knidian Styra B sample are attached closer to the body as in the jars of the sequence series from the Athenian agora, dated to the first half of the first century BC. *Grace*, 64 fourth and fifth jar from the left. The earlier dates to the early fist century BC while the latter dates after 86 BC. Nevertheless, period VI B, in which Διονύσιος is attested as eponym, ends in 88 BC and thus our sample must be earlier than the latter jar of the series (if the name is to be identified with the attested eponym of the Duoviri period).

[210] *Grace*, 64 third jar from left; see also Grace & Savvatianou-Petropoulakou 1970, 318.

[211] Grace & Savvatianou-Petropoulakou 1970, Pl. 57, E 97.

[212] Period VI B (97-88 BC) which includes the eponym Διονύσιος has 10 so far attested eponyms accompanied by duoviri, see Grace 1985, 35.

sample seems to suggest a date in the Grace's period VI B, therefore in the early first century BC.

The most recently discovered wreck presented in this study, the Leipsoi wreck (**9**; Map 3; Pl. 14-15) yielded one intact Knidian sample (Pl. 29)[213]. The shape belongs to the Monakhov's variant II-G. This variant is characteristic by its rolled rim, long neck which is cone-shaped in its lower part, elongated body and ringed toe. The type existed throughout the last third, whole second and first half of the first century BC[214]. The Leipsoi amphora has the toe missing, but the characteristic applied ring is present. The handles from their upper attachment rise to an arch and then slightly taper to join the shoulders. The shape falls to the second century BC and further sequence amphora comparison suggest date in the second half of that century[215].

The examination of the amphora wrecks in the Turkish territorial waters, brings further evidence of the popularity of the Knidian wine in the eastern Mediterranean, where several forms of the Monakhov's type II are present in the sunken cargoes. One sample was raised from the Gökertme B shipwreck and subsequently published (Fig. 4)[216]. Furthermore, the earliest recognized variant of the Type II which carries the characteristic stamp with a ship's prow[217] was attested in one of the jars discovered in a shipwreck located at the northwestern tip of Kapidağı peninsula, near Erdek. The wreck is known in bibliography as Halkoz Adasi[218]. One jar, which belongs to the Knidos-area prow-stamp group was identified based on its shape (since it is unstamped) by Mark Lawall also in the wreck of Kyrenia, Cyprus[219] (Fig. 3, No. 029). The subsequent period II-B is divided to "early" (II-B-1) and

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[213] I would like to thank Giorgos Koutsouflakis for his kind permission to include the wreck and the sample in the present thesis, since it represents unpublished material.

[214] *Monakhov* in *ORM*, 168.

[215] Similar shape was published by *Grace*, 64 third jar from left, which was dated to the second half of the second century BC. The jar preceding this shape (Idem, 64, second jar from left) dates to 168-167 BC and does not yet have the elongated body of our sample. See also Grace 1949, 186 & Pl. 19, Nos. 7, 9. Towards the end of the second century, Knidian containers obtain smoother silhouette of the shoulder and body, furthermore, the capacity of the vessels decreases. See *Monakhov* in *ORM*, 169; Empereur & Hesnard 1987, 60 & Pl. 3, No. 15.

[216] Cowin 1986, Ill. 20; for the wreck see P 325, Rosloff 1981, 279-80, Fig. 4.

[217] For an intact jar with a ship's prow stamp (back then tentatively identified as Samian), see Grace 1971, 82-83 & Pl. 15, Nos. 15-17. See also Lawall *et.al.* 2010, 373 with further reference.

[218] P 496; Pulak 1985a, 2-3 (site II); Pulak 1985b, 212-213; Pulak 1985c, 47-62 (site 1). For the stamp type, see also Börker 1986. For further information concerning Knidian jars with this specific stamp and their date, see *Monakhov* in *ORM*, 164-165 with further reference.

[219] Lawall *forthcoming*; Lawall *et.al*. 2010, 373. The Kyrenia evidence fits well with the suggested date for this class of stamps in the early third century BC. For further citations, see Idem, n. 912.

"late" (II-B-2) series, the later being attested in the Serçe Limani B cargo (Fig. 2, Pl. 12)[220].

4.2.3. Koan

Koan amphorae were produced from the fourth century BC to the first century AD[221]. Kos held an important place in trade, due to its location on the main route from the Black Sea to the eastern Mediterranean[222]. Ancient sources attest the significance of the island and its wine. Diodorus refers to the harbour:

> *...Κῷοι μετῴκησαν εἰς τὴν νῦν οἰκουμένην πόλιν καὶ κατεσκεύασαν αὐτὴν ἀξιόλογον πλῆθός τε γὰρ ἀνδρῶν εἰς ταύτην ἠθροίσθη καὶ τείχη πολυτελῆ κατεσκευάσθη καὶ* ***λιμὴν ἀξιόλογος***.[223]

Koan wine has also several references in the literary sources[224] from which it is known that the Koan wine was mixed with large amounts of sea water[225].

The most characteristic features of the Koan amphorae, which make them easy to be recognized from other types, are double barrelled handles. Apart from the handles, their greenish surface is also to be noticed, as imitations of Koan amphorae are attested in archaeological records[226]. They have rolled rim, tight arched long handles which join the neck just below the rim and drop to broad shoulders, that represent the widest part of the body. The body tapers from shoulders to a small peg toe[227]. However, not all Koan amphorae carry the above characteristics. There are three different types distinguished: double-barrelled handled amphorae, amphorae with mushroom-shaped rim and single handles; and amphorae with triangular rim, S-

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[220] Some of the jars of this "late" series carry the stamps of the Zenon Group as in the case of the Serçe Limani B wreck. See *Monakhov* in *ORM*, 166. For the material published from the Serçe Limani B wreck, see Empereur & Tuna 1988, 341-57; Pulak & Townsend 1987, 31-57; Grace 1986. For the remaining variants of Type II, see *Monakhov* in *ORM*.

[221] Whitbread 1995, 81; Göransson 2007, 152. For the production sites, see Whitbread 1995, 82, 85 with further reference; Georgopoulou 2005. For the publications of kiln debris (including stamp fragments) from Kos, see also Georgopoulou 2001; Kantzia 1994.

[222] Göransson 2007, 152 & n. 290; Georgopoulou 2005, 179.

[223] *Diod*. XV, 76. 2.

[224] *Strabo* 14.2. 19; Demosthenes, *Against Lacritus*, XXXV, 32, 34, 35; for some further allusions to Koan wine in Latin text which are not cited here, see Michalis *et.al. forthcoming*, n. 10. On the imitations of Koan wine, see Pliny, *N. H.*, XIV. X. 79; Cato, *On Agriculture*, CXII.

[225] *Grace*; Whitbread 1995, 82 with further reference to ancient sources.

[226] The red clay of the Koan amphorae is often covered with a light coating. *Grace*; Grace 1949, 186. Amphorae with double-barrelled handles were not exclusively produced on the island of Kos, see e.g. Jöhrens 2009, 2010 for Miletus; Monakhov 1990 for Kolophon. See also Göransson op.cit., 153.

[227] Whitbread 1995, 81.

shaped handles, which are similar to North Aegean amphorae[228]. The Koan amphorae, as other types of Greek transport amphorae become during their production time gradually taller and narrower[229]. Compared to other types of transport amphorae, they are rarely stamped and the chronology of the preserved stamps remains poorly understood[230].

Koan amphorae were recorded at 10 wreck sites, from which one is not listed in the main catalogue[231]. They often appear as a secondary cargo or are represented by very few pieces recorded at a wreck where other types predominate as in the case of Styra A, where they are among the Brindisian amphorae, at Leipsoi among with Knidian and at Nauticos among the main consignment of Pamphylian amphorae, as well as few Rhodian and Lamboglia 2 jars[232]. This model correlates well with our evidence of the attested Koan fragments on land. The number of the Koan findings is rather low compared to other classes of amphorae and most of them are dated to the second and first century BC[233]. Indeed the evidence gathered in the present thesis which strengthens the above hypothesis, reveals that from the nine catalogued sites, seven (78%) falls within the above chronological range, while two (22%) are earlier.

A cargo of Koan amphorae was located in 1954 in Kato Fana (**4**) and reported by Garnett and Boardman[234]. The cargo was identified by amphorae, scattered over a large area in the depth of 2-5 meters and dated to fourth or third century BC[235].

Wrecks with at least one sample published are: Styra A (**17**), Syrna (**19**) and Antikythera wreck (**1**). In the main assemblage of Styra A[236] (Pl. 11), Koan amphorae are represented by few jars among the main Brindisian cargo. One Koan amphora was raised (Pl. 20)[237]. It has partially preserved rolled rim, distinctive double

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[228] Göransson 2007, 152 & n. 396, 397 with further reference. These types of Koan amphorae were presented at the *Third Scientific Meeting for Hellenistic Pottery*. Georgopoulou 2005, 179.

[229] *Grace*.

[230] For the study of Koan stamps, see Grace & Savvatianou-Petropoulakou 1970, 363-364; Grace 1985, 18. The stamps were never organized into a chronological sequence. For further reference to publications on Koan chronology, see Lawall 2005, 32 with n. 10. The chronology of the class' typological development and Koan stamps needs to be refined. For some preliminary suggestions, see Finkielsztejn 2004.

[231] Hydra-Spetsai, see Table 2, **5**.

[232] For the occurrence of other ceramic types at Nauticos site which were tentatively identified, see Lawall 2005-06 and *Lawall* in *ORM*.

[233] Georgopoulou 2005, 182.

[234] Garnett & Boardman 1961.

[235] Ibid., 105. Garnett & Boardman provide a profile drawing of a fragmental jar from the same find spot H in Kato Fana, which nevertheless dates to the Late Hellenistic period, see Idem, 110 No. 10 and 11 (for Chian sample recovered in the same spot). Whether these were found as isolated jars in the proximity of the cargo is not mentioned. The wreck is omitted in *Parker* and subsequently in *Gibbins*.

[236] All plates from the Styra A wreck site are reproduced with kind permission of G. Koutsouflakis.

[237] See also Michalis *et.al. forthcoming*.

barrelled-handles which join the neck just below the rim, raise slightly[238] to a tight arch and then fall to join the sloping shoulders. The neck has an offset at its base. The lower part of the shoulder has a pronounced carination, which represent the widest part of the body. The body tapers to a small peg toe. The surface of the amphora is characteristically pale[239]. The closest parallel provided by a complete sample from the Athenian agora suggest date in the second half of the second century BC[240].

Styra B shipwreck, due to its location in shallow waters has been severely scattered and the clusters of concreted amphorae did not yielded any intact sample (Pl. 25). Nevertheless, a fragment of a Koan amphora was raised (Pl. 26). It has a rolled rim, double barrelled handles, which joins the neck under the rim and drop to sloping shoulder. The sample does not seem to have a strongly pronounce offset at the base of the neck, neither a strong carination at the base of the shoulder. With its broad shoulders, it suggests a date in the second century BC[241].

Leipsoi, which represents the most recently discovered wreck of this study, was dated based on a Knidian amphora discussed earlier. Knidian amphorae represents the main type in the Leipsoi's assemblage and from the few Koan pieces spotted in the cargo, no samples were raised. This is the case as well in Samiopoula cargo, where the amphorae, including Koan jars, stay unpublished and thus the wreck is discussed in this study based on a single Rhodian sample available for the dating.

The Samos shipwreck was briefly reported by the Ministry of Culture[242] and represent recent unpublished find. The report refers to a cargo of Koan amphorae dated to the third century BC, scattered from 25-40 meters at the northeastern side of Samos.

From Syrna shipwreck, one Koan sample was published by Paraskevi Micha, who does not provide any closer chronology apart from the classification under the Hellenistic period[243]. Nevertheless, sequence amphora comparison allows narrowing of the date to the second century BC[244].

From the Antikythera shipwreck, several amphorae, which could be Koan or possibly pseudo-Koan since the characteristic pale surface coloring is missing from

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[238] The handles do not raise higher than the rim as is characteristic in Pseudo-Koan amphorae. Cf. Peacock & Williams 1986, 107.

[239] Again supporting the fact that it is not an imitation of Koan amphora. See also *Grace*.

[240] *Grace*, 56 the third jar from left. The jar from Styra A wreck was previously dated to the first century BC in Michalis *et.al. forthcoming.* Measurements of the sample were taken: height 0.82 m, maximum diameter of the body 0.36 m, knob height 0.02 m, thickness of the lip 0.008 m, capacity of the amphorae: 38 liters. See Idem.

[241] *Grace*, 56. For the Knidian sample preserved with legible stamp from the wreck site, see supra pp. 36-38.

[242] See *Samos* in *ORM*.

[243] *Micha*, 86 & Fig. 5.

[244] *Grace*, 56.

them[245] were discussed and published by V. Grace (Pl. 4-5)[246]. No traces of stamps were found on these jars and thus they were dated based of their stylistic features between 88 and 69 BC[247].

In Nauticos assemblage, at least two amphorae were identified as Koan (Pl. 28) and dated by Mark Lawall based on the sequence amphora comparison sometimes after 100 BC[248].

In Turkey, the Koan amphorae were attested in Yalikavak shipwreck (Pl. 13) and in Bodrum area; the cargo of the later is located in 35 meters and was dated to the first century BC[249]. Yalikavak shipwreck was studied *in situ* by Cemal Pulak from the Henri Delauze's submersible. Due to the submersible's circular dome, which reduces an object to at least half of its original size, it was difficult to comprehend the amphora type[250]. However, the consignment was tentatively identified with first century Koan amphorae[251]. An examination of a photograph taken at the site in 2008 using a small outland *ROV* due to the depth of 88 meters in which the wreck is located, confirms the identification. The assemblage consists of a single amphora type with recognizable offset and shape of Koan amphorae, whose relatively slim body support the placement in the first century BC; perhaps, sometimes after 100 BC (Pl. 13)[252].

4.2.4. Chian

In the Hellenistic period, the intensive production of the southern Aegean Islands is reflected in the discoveries of the Hellenistic cargoes transporting the above discussed amphorae. Apart from the above types, Chian amphorae are among the finds, even though they are not attested in such great numbers as Rhodian. Chian amphora production lasted from around 600 BC to the first century BC[253].

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[245] As Grace noted, it is possible that the surface of these jars have been "soured off as they rolled at the bottom of the sea." Grace in *Antikythera TAPS*, 10 & n. 15.

[246] Grace in *Antikythera TAPS*, 10-11, 15-17 & Pl. 4 & 5, No. 12. One of the amphorae, together with small Koan was previously published in *Antikythera*, Suppl. Pl. H, 3,1 reproduced in Pl. 1 in this study.

[247] Grace in *Antikythera TAPS*, 11. For the graffiti attested on two of the Koan jars, see *Antikythera*, and *Antikythera TAPS*, 11 & Figs. 6, 7. For the date of the wreck see supra pp. 32-33.

[248] Lawall 2005-2006, 76.

[249] Pulak 1985a; **P** 105.

[250] Cemal M. Pulak, 24.4. 2010, *comm*.via email.

[251] Bass 1990, 21.

[252] See *Grace*, 56. Compare as well to the Koan recorded at Nauticos site, Pl. 28. I would like to thank Bridget Buxton for her permission to include the Yalikavak photograph in the present study.

[253] Göransson 2007, 146; Whitbread 1995, 135. They nevertheless continue to appear as devices on Chian coins until the third century AD. Grace & Savvatianou-Petropoulakou 1970, 359-363.

The characteristic feature of the early Chian amphorae is the bulbous neck[254]. In the third quarter of the fifth century, the bulbous neck is replaced by a straight, long neck and the characteristic shape of the Chian amphora from the fourth to the first century BC can be described as follows: rolled rim, long handles joins the long neck under the rim and drop to join the shoulders. A distinct articulation between the gently sloping shoulder and the body represents the broadest part of the jar. The body is piriform in shape. It ends in a sharply pointed toe, which nevertheless appears as a solid continuation of the body[255]. Possible production sites were located in Chios[256]. Chian amphorae were most likely transporting wine, since the Chian wines were regarded as the finest in the ancient times[257]. The Chian stamps, which dates from the third or possibly late fourth century BC to the first century BC include monograms, abbreviations and single names[258]. They often have impressed circle on the neck or handles[259].

Only two shipwrecks with Chian consignment were so far recorded in the area studied; one in Kolokythia bay[260] and the second in Kythnos (**8**). No samples from the Kythnos shipwreck were published until today; nevertheless, an underwater photograph taken at the site shows characteristic piriform shape of the Chian body[261]. It has a long straight neck and a distinct articulation at the base of the shoulder. The sample was dated to the late fourth or early third century BC. The amphora mound of the wreck measures 20 x 20 meters and contains another amphora form, which stays unidentified[262]. The Kythnos wreck stays until now the deepest located shipwreck in the Aegean.

4.2.5. Other South Aegean amphorae and unidentified types

Seventeen jars with short neck, round-body and mushroom rim, were attested in the Kyrenia cargo, with at least ten bearing a stamp with letter O on one handle

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[254] See e.g. *Grace*, 44. This characteristic feature appears on the jars dated before the third quarter of the fifth century BC. Göransson 2007, loc.cit. ; Whitbread 1995, 136. For a shape of the mid fifth and third quarter of the fifth century BC, see Whitbread 1995, 136 & Pl. 4.35.

[255] Göransson 2007, 146, Whitbread 1995, 136-137.

[256] See Whitbread op. cit., 138.

[257] See Athenaeus 1. 29, 31-33; Pliny, *N.H.* 14.9.73.

[258] Whitbread 1995, 135 & Fig. 4.34. For the earlier stamps, see Idem, loc.cit.

[259] Ibid., 135.

[260] The wreck stays unpublished, see Table 2, **6**.

[261] Sakellariou *et.al.* 2007, Fig. 5, B.

[262] Sakellariou *et.al.* 2007. The assemblage was disturbed by a trawling activity in the area and many amphorae were moved from their original position or broken. Among the Chian, one jar tentatively identified as Samian was raised together with two clustered vessels. See Sakellariou 2005, 29-30. For the unidentified amphora type in the assemblage, see the below chapter 4.2.5. Other South Aegean amphorae and unidentified types.

(Fig. 8[263]). The fabric is dark grayish tan in color and the toe form suggests production in Samos, Ephesos and as far as Kos. It is most probable that the jars are of a Samian production[264]. Three other mushroom rimed jars from Kyrenia were tentatively attributed to Paros. The identification of both of these amphora types is strengthened by Neutron Activation Analysis. One of the jars of the Parian group is stamped with the letters ΦΙ[265] (Fig. 9, B; Pl. 10). There is one more group of small jars from the Kyrenia cargo with rolled rim, which was tentatively identified as Parian (Fig. 9, A); while the remaining jars in the Kyrenia assemblage seems to originate in other areas of the eastern Mediterranean[266]. One Samian jar was as well tentatively identified in the Kythnos assemblage[267].

The only unidentified amphora type from the catalogued wrecks is amphora group in Kythnos shipwreck, which accompanied the Chian amphorae discussed above[268]. They are said to resemble the unidentified type which appears in late Classical wreck of Chios-Oinousses and may therefore represent the succeeding production of the so far unidentified form[269].

4.3. Corinthian and Corcyrean amphorae

Corinthian transport amphorae have been extensively studied by C.G. Koehler[270] and divided into two series: Type A, which represent the form that belongs to a stylistic tradition of the Corinthian jars of the Geometric period[271] and by the early seventh century BC develops to a shape which can be considered as an early

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[263] I would like to thank Mark Lawall for his kind permission to reproduce the figure.

[264] Lawall *forthcoming*. Finds at a wreck site located near Küçük Keramit Adasi is said to resemble the Samian jars from Kyrenia; see **P** 559; Rosloff 1981, 282.

[265] See Ibid. for further discussion.

[266] Jars of possible Palestine production were on board, together with amphorae found in the stern of the ship, which were most probably used on board and did not belonged to the cargo. See Lawall *forthcoming* for the possible provenance of these.

[267] See supra n. 262.

[268] See Catalogue (**8**) and supra p. 43-44.

[269] For the unidentified form from Chios-Oinousses wreck site, see Foley *et.al.* 2009, 287-288 & Fig. 13; Kourkoumelis *et.al. forthcoming*. For the Kythnos wreck, see Sakellariou *et.al*. 2007, *esp*. 378-379.

[270] Koehler treated the Corinthian amphorae in detail in her doctoral thesis *Corinthian A and B transport amphoras* (Koehler 1978a). In 1981 she added a subcategory to her Corinthian type A (Koehler 1981), and in several articles she gradually refined the typology and the chronology of this group (Koehler 1978b, Koehler 1979, Koehler 1992). She is currently preparing two major monographs of Corinthian A and B respectively. See Göransson 2007, n. 46. For the fabrics of this amphora type, see Whitbread 1995, 255-346.

[271] Koehler 1981, Whitbread 1995, 255.

transport amphora[272] and continues until about 300 BC[273]; and type B (Corcyrean)[274], which was produced from the last quarter of the sixth century BC until the early second century BC[275]. Corinthian A type with its roughly spherical body and broad cylindrical neck has been attested at an unpublished wreck site at Kynosoura[276].

From the catalogued sites, we have one shipwreck which was carrying a cargo of Corcyrean amphorae. The earliest of their production has thick rounded rim, arched handles, short cylindrical neck with ridged or offset band at the upper part and a turnip-shaped body[277] which ends in small cylindrical toe[278]. Only a small number of the jars dated to this initial period were stamped[279]. By the middle of the fifth century, the body becomes ovoid, ending in knob toe applied separately to the body, often with a groove marking the join. The rim is defined by band of ridges, grooves or offsets and the handles raise just beyond of the rim[280]. From that time towards the early third century BC, the amphorae become longer and slimmer with neck and handles increasing in height, while the lower body becomes increasingly pointed[281]. By the second quarter of the third century BC the body develops biconical appearance and the quality of the production decline. In their latest stage, the shoulders become more rounded and the body becomes slimmer[282]. They most probably carried wine[283].

The Seriphos site (**15**) consists of amphorae, which were dated to the third quarter of the third century BC. The cargo of the wreck is preserved in two concentrations, the first located in the depth of twelve meters, while the main assemblage is scattered from 25-32 meters and covers an area of 10.5 x 8 meters. One sample was raised during the survey, nevertheless it stays unpublished and thus we

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[272] Whitbread 1995, 256. For the variation of Type A and Type A′ see Koehler 1981, Whitbread & Koehler 1984.

[273] Göransson 2007, 82 with further reference.

[274] Grace has tentatively assigned these amphorae to Corcyra (Corfu). See Grace's text in Boulter 1953, 108-109, No. 166. Koehler argued they are of Corinthian origin, see Koehler 1978b. For further discussion and mineralogical analysis which supports the Corinthian origin, see study of Farnsworth 1970, which was nevertheless weakened by the study of Whitbread 1995 (cited in Göransson 2007, 90-91). Kiln complex excavated in the early 1990s at Figareto at Corfu by K. Preka-Alexandri and D. Kourkoumelis has been used by the excavators as a strong argument in assigning this type to Corfu. See Preka-Alexandri 1992, 50; Kourkoumelis 1990, 43.

[275] Whitbread 1995, 258; Göransson 2007, 88 with further reference.

[276] Table 2, **7**.

[277] Koehler 1978a, 33 & Pl. 28, Nos. 212-214.

[278] Whitbread 1995, 259.

[279] The stamps has wider variety than Corinthian A, including letters, ligatures, monograms and devices. Whitbread 1995, 259.

[280] Koehler 1978a, 35; Whitbread 1995, 259.

[281] Whitbread op.cit., 259.

[282] Whitbread 1995, 260.

[283] Ibid., loc.cit. with further reference.

rely on the identification presented to us in brief reports[284]. The cargo certainly represents an early Hellenistic shipment of Corinthian wine.

4.4. Unique amphora consignments

This section of the study deals with cargoes, which are at present unique in the eastern Mediterranean wreck records. Two wrecks are discussed in this section: Nauticos shipwreck located in the International waters of the eastern Mediterranean and Styra A wreck located in the southern Euboean Gulf. The main assemblage of the Nauticos shipwreck contains of Pamphylian amphorae, while the main type in Styra A, Brindisian amphora, is treated in the present section and not among the Italian imports, due to the recent suggestions that they may have originated as well in other places than originally suggested[285].

4.4.1. Pamphylian

Pamphylian amphorae were attributed to Pamphylia based on their epigraphic evidence preserved in stamps[286]. Pamphylia is located on the South coast of ancient Asia Minor and the amphorae from here are suggested to have contained wine[287], even though oil may as well represent commodity traded in these jars[288]. The Pamphylian amphorae have relatively short neck and handles with rounded bodies. They are stamped, based on our present evidence, only on one handle[289]. The stamps of Pamphylian amphorae do not include any titles, nor prepositions and their function is uncertain. Differences in clay of these jars suggest the existence of various related classes[290]. The chronological range of the amphorae remains uncertain[291].

The main assemblage of the Nauticos wreck site consists of Pamphylian amphorae (Pl. 18, 30-31). Due to the depth of the Nauticos wreck, no stamps were detected on the jars, since the sensibility of the camera does not allow identification

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[284] Touchais 1986, 734; Kazianes *et.al.* 1990, 225; *Micha*, 85.

[285] On the Italian origin of the amphorae, see Peacock & Williams 1986, 82. For further discussion, see 4.4.2. Brindisian, infra p. 48. Both of the types: Pamphylian amphorae and Brindisi, were not attested in any of the cargoes catalogued by *Parker*, 17-18.

[286] A stamp with *digamma* provides a link to Pamphylia. Such stamps were attested in deposits in Antioch, Athens, Delos and Rhodes and especially in Alexandria, where the largest group is in the Benaki collection. See *Nessana*, 126; Grace 1973; Grace & Savvatianou-Petropoulakou 1970, 367-369. Stamps, which seems to be of this class were uncovered as well at Kos, Rhodes and Cyprus, Sarafand, Gezer, and Nessana. Grace 1973, 191.

[287] *Nessana*, 106, 126; Grace 1973, 183 & n. 2 with further reference.

[288] Grace 1973, 195 & n. 22.

[289] Grace 1973, 191.

[290] *Nessana*, 126.

[291] Grace 1973, 192-195. For the amphora type, see also Grace 1956, 324 & n. 4.

of such details[292]. Nonetheless, the underwater pictures taken at the site show a characteristic shape of these amphorae with their plain rim and full body, which ends in a drip-shaped toe. Lawall has proposed a production date for the jars in the mid first century BC[293]; therefore at a time when Pamphylia was under Roman administration[294]. Pamphylian amphorae are found in considerable number in Alexandria[295], which together with the location of the wreck suggest that the ship's destination was Egypt.

4.4.2. Brindisian

Brindisian amphorae are widely distributed in the western and eastern Mediterranean[296]. They have thickened plain rim, cylindrical neck, rounded handles and oval body, which ends in a knobbed base. The handles are stamped in Latin but Greek characters also appear[297]. A kiln site was located north of Brindisi, Italy[298]. They may have carried wine or olive oil[299] and their production date ranges from late second century BC to the mid first century BC[300].

Recent discoveries suggest an existence of northern Peloponnesian production of late Hellenistic form which was provisionally named 'Greek' Brindisian, since it closely resembles the Brindisian amphorae. The jars have high, carefully elaborated rims, nearly spherical bodies and rounded knobbed toes[301]. Later examples of this type are known from an unpublished site at Aigio[302]. They frequently appear in late second and early first century contexts in Greece and elsewhere[303]. They differ from

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[292] For the attested stamps of Pamphylian amphorae, see *Nessana*, 126-127; For two complete stamped jars in Alexandria, see Grace 1973, Fig. 2. For the shape development see also Grace 1973, 198 & Figs. 8-9.

[293] He suggests later date than the Pamphylian jars provided by the site in Maresha in Israel. See Lawall 2005-06, 77*; Lawall* in *ORM.*

[294] Grace 1973, 195. A milestone, which was found near Side and belonged to the road built by M. Aquillius between 129 and 126 BC shows that Pamphylia was part of Roman province of Asia from its creation in 133 BC and around 80 BC was attached to Cilicia. See 'Pamphylia' in *OCD*.

[295] Fraser 1972, 172-173.

[296] Peacock & Williams 1986, 82; Tchernia 1969; Sciarra 1972.

[297] Peacock & Williams 1986, 82 (Class 1).

[298] Ibid., 82.

[299] Peacock & Williams 1986, loc.cit.; Rauh 1999, 163 & n. 9.

[300] Peacock & Williams 1986, 83.

[301] Lawall *et.al.* 2010, 396.

[302] The type is on display in the Aigio museum. I would like to thank Mark Lawall for bringing this to my attention. Yannis Lolos may have a similar shapes at a kilnsite at Sikyon. M. Lawall, 16.3. 2010, *comm.*via email.

[303] The type is illustrated in *Grace,* 38 third jar from left (therefore attested in Athens, where it often appears in Sullan sack context; see Lawall 2005, n. 20). Examples are known also from Thessaloniki (Adam-Veleni *et.al.* 1996, fig. 18), Pella (Chrysostomou 1996-1997, 226 & fig. 62), Olbia (Lawall *et.al.* 2010, 396-397; Pl. 298, L 306) and possibly Marissa (Finkielsztejn 1999, fig. 111b).

the Italian Brindisian production in coarser and browner fabric as well as rim form and arrangement of handles[304].

The Brindisian amphorae raised from the Styra A assemblage (Pl. 22-24) with their high elaborated rim may belong to 'Greek Brindisian' production[305]. The do not bear the simple rim of the Italian production but have elaborated rim attested on the recently distinguished 'Greek' Brindisian. They represent a unique find in Greek territorial waters and date the wreck from the late second to the early first century BC.

[304] For the jar of the Italian production, see Baldacci 1972, 7-28; further reference is cited in Peacock & Williams 1986, 82-83. For the discussion of the 'Greek' Brindisian, see Lawall 2005, 33 & n. 20; Lawall *et.al.* 2010, 396. For possible predecessors of the 'Greek' Brindisian jars, see Lawall *et.al.* 2010, n. 970; Koehler 1978a.

[305] They were previously discussed in Michalis *et.al. forthcoming.*

4.5. Italian imports*

A growing political and commercial influence of Rome which, in the eastern Mediterranean and more closely Aegean, becomes evident in the second half of the second century BC[306] is, apart from the land discoveries, reflected in the recorded cargoes of the eastern Mediterranean. If we look at the Mediterranean data, amphora cargoes of Late Hellenistic-Roman Republican era form the largest concentration of attested wrecks[307]. Several wreck sites attest the presence of Italian amphorae of the Roman Republican era, which carried commodities intended for consumption in the eastern Mediterranean[308].

Italian amphorae in the Aegean certainly do not suffer from lack of attention. They were extensively studied by Elizabeth Lyding Will[309], Nicholas Rauh[310] and John Lund[311] and recently examined by different approach of Mark Lawall, who summarizes our evidence of the western amphoras in the Aegean as compared to Aegean patterns of production and distribution[312].

4.5.1. Graeco-Italic

The earliest Italian imports in the eastern Mediterranean area are attested by Graeco-Italic amphorae[313]. The Graeco-Italic amphorae were rarely stamped and were frequently overlooked in the past; it was maritime archaeology which first called attention to this amphora type[314]. Their distinctive features are: triangular rim, cylindrical neck, carinated shoulder and body, which tapers to a toe. The earliest imports, discovered in the eastern Mediterranean and as far as Syria and the Black sea are represented by the Will's form *a*, which dates from the late fourth to the early third century BC[315]. Various forms of the Graeco-Italic amphorae were identified with different places of origin. The earliest form is believed to have been made in Sicily

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* The term Italian refers to the present geographical unity.

306 Rauh 1999, 162; Lawall 2006, 272.

307 Rauh 2003, 106-107.

308 For the discussion of Rome rising influence on the Rhodian trade see Rauh 1999, 162; Rostovtzeff 1941, 171-172. Further bibliography on the topic was summarized by Rauh 1999, n. 3-4.

309 Will 1997.

310 Rauh 2003; Rauh 1999.

311 Lund 2000.

312 Lawall 2006.

313 The term Graeco-Italic was for the first time used by Fernand Benoît in his description of a group of amphorae discovered at the Grand Congloué site off Marseilles (cited in Will 1982, 339).

314 Will 1982, 338.

315 Ibid., 341-344, Lund 2000, 78-80.

and possibly Aegean[316]. Form *b* is most likely Italian, form *c* may originate in Cosa, while form *d* was possibly produced somewhere near Cosa and Pompeii and form *e* may come from Spain[317].

Graeco-Italic amphorae were attested in unpublished Syros B wreck[318] and in the assemblage of the Preveza A wreck (**12**). The Graeco-Italic amphorae from Preveza A wreck were tentatively identified as Will's form d[319] (Pl. 27), which represents the most widespread form of Graeco-Italic amphora[320]. Form d dates to the first half of the second century BC[321]. The stamps of this type are rare and among them sometimes appear graffiti and painted inscriptions[322]. They were distributed to various places in Italy, Spain, France, Greece, Israel, Turkey, Cyprus, Egypt and Libya[323]. They are most often attested in land finds and Preveza A represent the only safely identified cargo where this type was discovered underwater in the area studied[324]. It is most probable that the amphorae carried wine[325].

4.5.2. Lamboglia 2

Due to the similarities of Lamboglia 2 with Dressel 6, Peacock and Williams has placed them under the same class and thus they sometimes appear in the bibliography cited by both names[326]. Lamboglia 2 was divided to three main forms, which differ from each other in rim form, body shape and base[327]. Form A, which is attested in the catalogued sites of the present thesis appears from the second to around the mid first century BC and has thickened rim with slight overhang which is triangular to squarish in profile, thick oval handles joins the long cylindrical neck and falls to join the shoulders which tapers to a pronounced carination between the shoulders and body, which is thick-walled and bag-shaped. The body is wider in its lower part and then tapers to pointed spike. This type is sometimes stamped on the neck. The origin of the Form A was tentatively placed in Apulia[328]. Lamboglia 2 is

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316 Will 1982, 341-344; Peacock & Williams 1986, 84.

317 Peacock & Williams 1986, loc.cit.

318 Table 2, **12**.

319 **P** 904; for the amphora form see Will 1982, 348-353 & Pl. 85: f.

320 Will 1982, 348.

321 Peacock & Williams op. cit., 85.

322 Will 1982, 350.

323 Ibid., 351-353; Lund 2000, 80 & Fig. 5.

324 See also Rhaphina, Table 1, **22**.

325 Lund 2000, 80 with further reference.

326 Peacock and Williams 1986, 99; *Micha*.

327 Peacock and Williams 1986, loc.cit.

328 Ibid., 99 with further reference.

generally believed to represent a wine jar[329], even though oil was as well suggested as a commodity traded in these jars[330].

Briefly reported wreck sites found near Thasos and Areopolis stand as an evidence of full shipment of Lamboglia 2 to the Aegean[331]. Furthermore, *Micha* has published further indicators of the popularity of Italian products in the Aegean markets. Among the previously known wrecks off Thasos and Areopolis, she contributed to our knowledge by several wrecks, from which most stay unpublished but are identified in her paper as wrecks with Lamboglia 2 consignment[332]. From the four unpublished and previously unlisted sites, two carried mixed cargo of Lamboglia 2 with Dressel 1[333]. This amphora wreck evidence contributes to the ongoing discussion regarding the intensity of the Italian trade in the eastern Mediterranean at that time[334].

The catalogued sites where Lamboglia 2 is attested in a cargo are represented by three wrecks, from which only one stands for full Italian amphora shipment. Kitriani (**6**) carried Lamboglia 2 as its main consignment (Fig. 6). The wreck site is badly scattered[335]. From three raised amphora necks, one was published (BE 90/10-1 in Fig. 7), among with the following material: body of an amphora with neck missing (BE 90/10-3 in Fig. 7), one intact amphora preserved in two pieces (BE 90/10-9) and a toe (BE 90/10-5)[336]. On the inner walls of the sample BE 90/10-3 preserved resinous linings suggest that the original content of the amphora was wine[337]. The wreck site is dated from the end of the second to the early first century BC[338].

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[329] Evidence from the Madrague de Giens shipwreck (Formenti *et.al.* 1978) as well as Kitriani wreck (see infra p. 51) suggests that wine was carried. See also Rauh 1999, 163 & n. 9.

[330] Peacock & Williams 1986, 100.

[331] For Thasopoula see Table 2, **13**. Areopolis (Table 2, **2**) is generally disregarded in amphora studies, see Tchernia 1986, 72; and again by Lawall 2006, 272.

[332] Antidragonera (Table 2, **1**), Parapola (Table 2, **8**), Cape Mytikas (Table 2, **3**) and Gavdopoula (Table 2, **4**).

[333] Cape Mytikas (Table 2, **3**) and Gavdopoula (Table 2, **4**).

[334] For the most recent discussion of full shipments of Lamboglia 2, which overlooks the evidence presented by *Micha*, see Lawall 2006, 272.

[335] For the published photographs of the wreck, see Simossi 1995, Fig. 263, B & 264 A.

[336] Simossi 1995. The last fragment from left in Fig. 7 represent a small Knidian sample which was raised from the shallower assemblage of Kitriani wreck and dated by Simossi to the first century BC. Simossi 1995, 527. It most probably represent a contamination of the cargo, since neither Knidian or Rhodian fragments, which were identified in the shallower assemblage were located in the main assemblage of the cargo, which is represented solely by Lamboglia 2 jars. For the Rhodian fragments, see Simossi 1995, 527. See also *Micha*, 86. For the raised samples, see Idem, Figs. 263 A (Knidian fragment), 264 B - D, 265 A (for the Lamboglia 2).

[337] Simossi 1995, 527.

[338] Simossi 1995.

In the remaining catalogued cargoes, Lamboglia 2 is attested by only few jars[339]. Both of the types were dated to the first half of the first century BC. One amphora was published from the Antikythera wreck site (Pl. 1, Fig.1)[340] and one was observed in the main assemblage of Nauticos wreck (Pl. 21, green arrow)[341].

4.5.3. Dressel 1

Dressel 1 belongs to another type, which attests the presence of Italian economic influence in the eastern Mediterranean. The distinctive features of this amphora form are: short triangular rim, long neck with long handles and cylindrical body. They are often stamped on the rim. Even though, not attested as frequently as the previously discussed amphora type, several wrecks carry Dressel 1 either in a mixed cargo together with Lamboglia 2[342] or in a single cargo consignment as in the case of catalogued Chios Lithi wreck (**3**). Several forms of Dressel 1 were recognized, the earliest form (Dressel 1A) developed from the Graeco-Italic amphorae sometimes around 130 BC and its production lasted to the middle of the first century BC[343]. They were manufactured at a number of sites in Campania, Latium and Etruria[344]. Their distribution in the eastern Mediterranean is confirmed by finds in Greece, Cyprus, Turkey, Israel, Egypt and Libya[345]. Dressel 1B appear from the first quarter of the first century BC until the last decade of the first century BC[346] and in the eastern Mediterranean area, the jars of this form were recorded at sites in Greece, Turkey and Egypt[347].

Dressel 1 C, which is attested in Chios Lithi shipwreck (**3**) was produced in Campania and perhaps also Etruria in the late second-early first century BC[348]. The sample raised from Chios Lithi wreck has a high collar-rim, ribbed handles, long spindle shape body with a short spike and carried and incuse stamp (Fig. 5)[349]. The form dates the wreck site from the late second to early first century BC.

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[339] This of course do not necessarily mean that the cargo did not carried more jars of this type, nevertheless, only one piece in each cargo was identified and it is certain that they represented a minor part in the cargo, where other amphora types predominate.

[340] *Antikythera;* Grace in *Antikythera TAPS.*

[341] Lawall 2005-06; *Lawall* in *ORM.*

[342] As in the case of unpublished sites at Cape Mytikas (Table 2, **3**) and Gavdopoula (Table 2, **4**).

[343] Peacock & Williams 1986, 87.

[344] Riley 1979, 134-135; Peacock & Williams op.cit., 86-88 (Class 3); Empereur & Hesnard 1987, 30-33; Lund 2000, 82 & n. 44 with further reference to sources, which are not cited.

[345] Lund 2000, 82 & n. 45-49 with a detail reference to the attested finds in the areas cited.

[346] Peacock & Williams 1986, 89-90; Lund 2000, 83. The form is a direct successor of Dressel 1A, see Peacock & Williams 1986, 90.

[347] Lund 2002, 83 with further reference.

[348] Peacock & Williams op.cit. 91-92; Lund 2000, 83.

[349] Foley *et.al.* 2009; for the type see Peacock & Williams 1986, 91-92.

Chapter 5

Conclusion

5.1. Evaluation of the current amphora wreck evidence

All amphorae discussed in the fourth chapter of the present thesis serve as valid indicators of ancient trade. The characteristics of each amphora type, together with their attested evidence in a cargo of a shipwreck were discussed above, while the present section focuses on their evaluation together with our current knowledge of amphora distribution. These trading containers stand as preserved archaeological evidence of perishable commodities that they contained. While the research of amphora typology and their dating has progressed, our knowledge about the contents of the amphorae is much less refined. The amphora lids that were protecting the merchandise from being spilled are rarely preserved and even though it is believed that amphorae were mostly carrying olive-oil, wine, dried fish beside other good, our evidence is unsatisfactory. Preserved resin on the walls of the amphorae may serve as an indicator of the traded commodity, nevertheless to determinate the contents of the amphora include, apart from the coating of the interior of the jars with resin and pitch, also analyzes of residues by means of gas chromatography-mass spectrometry; as well as taking in count the finds made inside the sealed amphorae and other factors[350]. Furthermore, the intensity of trade with certain commodities is difficult to trace, as it is for example in the case of grain trade, since grain is perishable material[351]. We have an occasional archaeological evidence on commodities traded in the commercial amphorae, as in the case of 2005 survey off Chios Island, where amphorae from the fourth century BC wreck revealed ancient DNA of olive, oregano and possibly mastic through molecular biological analysis[352]. Unfortunately, present evidence of amphora contents is insufficient for further interpretations. Nevertheless, amphorae which are preserved in almost every wreck illuminate our knowledge of trade.

The Rhodian amphorae, which are attested at 10 wreck sites, from which 8 are catalogued, range in date from the early third century BC to the first century BC (see Chart 2). During the third and early second century BC, the Rhodian wine exports dominated Athenian, Delian and Alexandrian markets[353]. While in the third century, most of the amphora circulation in the Aegean stays on narrow regionalism, Rhodian amphorae with their wide distribution represent an exception to this pattern[354]. Between 220 - 150 BC, Rhodian amphorae were the most widely distributed type in the Mediterranean and the good relations of Rhodes with Ptolemaic Egypt to which it

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[350] Lund 2004, 212.

[351] For further discussion on grain trade, see for example Peacock & Williams 1986, 57-59. For other perishable material see “Introduction” in Garnsey *et.al.* 1983.

[352] Foley *et.al.* 2009.

[353] Rauh 1999, 165; 2003, 125.

[354] Lawall 2006, 270.

was assimilated by Ptolemy I in 294 BC enabled to maintain good trade relations with many maritime states[355].

Certain decline of Rhodian wine trade appears during the second century, when a change in the current archaeological data clearly suggests that after the declaration of the free port at Delos, the expanding distribution of Knidian wine jars supplements the hitherto dominant Rhodian ones[356]. In the late second century BC, a decline of Rhodian exports is obvious as well in the western Mediterranean, the Adriatic and Black sea regions[357]. Nevertheless, Rhodes kept certainly exporting to Alexandria, where after 166 BC there seems to be a rise in the Rhodian imports collected[358]; while Knidian imports attested in greater numbers at Athens seem to drop dramatically in Alexandria at that time[359] . The wide distribution during the first half of the Hellenistic era is sometimes explained as a result of the activity of Rhodian merchants "as middlemen to the Ptolemaic grain trade" and possible existence of combined shipments of wine and grain[360].

Four confirmed catalogued wreck sites with Rhodian consignment falls within the discussed period of the third and second centuries BC. At least two of these wreck sites stand for a single amphora shipment (Telendos and Moulia), while the remaining two represent an assemblage where either more than one amphora type appear (Kyrenia), or the remaining assemblage is not known (Dhrapi) and thus it is uncertain if the cargo consisted solely of Rhodian shipment. Two of these merchant ships were wrecked off Cyprus: Kyrenia (in the early 3rd century BC), where the Rhodian form represent the primary shipment of the cargo; and Moulia wreck (early second century BC), which stand as an indicator of the intensive trade and export of Rhodian wine to Cyprus and Levantine sites, which is attested mainly by the land finds and become considerable during the first half of the second century BC, therefore at the time of the ship's wrecking[361] . The attested evidence of stamped Rhodian amphora handles in

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[355] Rauh 2003, 67; see also "Cyprus" in *CDCW*.

[356] Rauh 1999, 165; 2003, 124-125; Grace & Savvatianou-Petropoulakou 1970, 282; Grace 1985, 7. See also *Grace*; Empereur 1982, 222-225. Good evidence is available at Delos, where the context had smaller chronological range. Rauh 1999, 165-166; Grace &Savvatianou-Petropoulakou 1970, 281; Grace 1952, 517. For the evidence collected at Athens, see Koehler & Wallace Matheson 2004. The collected data shows that the highest number of stamped Knidian amphora handles at Athens belong to the second century BC and they rise noticeably in the first half of that century. See Idem, Fig. 2.

[357] See the citations provided by Rauh 1999, 168 & n. 25.

[358] Rauh 1999, 167-168; 2003, 126.

[359] This quantitative studies are nevertheless revealed based on the collected stamped amphora handles and thus may be distorted, since the unstamped were not taken in account. *Grace* (cited in Rauh 2003, 126).

[360] Rauh 2003, 117. Grain, which represents perishable material may have been transported in Antidragonera shipwreck, which does not represent amphora wreck and thus is not listed in this study. See Kourkoumelis 1993a-c; 2002; Kourkoumelis & Theodoulou 2005-06.

[361] Calvet 1986, 514; Sztetyłło 1976, 9-15; for the concentration of Rhodian amphorae in Palestine and Syria, see Grace 1950, 135 & n. 4 (all cited in Rauh 1999, 168 & n. 23). For further discussion of this topic see Rauh 1999, 168 with further reference.

Cyprus supports the suggestion that Rhodian export to Cyprus during the second century drove locally produced Cypriot amphorae into extinction[362].

In our current wreck records, we do not have any evidence of the intensive Rhodian export to Alexandria, which is attested by the discovered stamped amphora handles and reaches its peak between 140 and 120 BC[363]. The reason for the absence of wreck evidence in the international waters is caused by lack of research in the area due to the reasons discussed above, which do not allow intensive survey between north African coast and the area under consideration[364].

The destination of the Dhrapi wreck cannot be established with certainty, nevertheless, due to the location of the wreck (see Map 2, **4**), we may suggest that the Dhrapi could had been destined for Athens, where in the late third century BC, Rhodian, Koan and Knidian imports are significant[365]. Furthermore, at the time, there seems to be a striking shift towards imports from Rhodes, and to a lesser extent, Kos and Knidos[366].

The increasing southern Aegean amphora production, which culminates into their export to the northern Aegean over the late third through the second century BC make quite tempting to assign the merchant wrecked near Telendos to such evidence of distribution; nevertheless we cannot exclude the possibility that it could had been as well intended for export to Athens.

The remaining catalogued cargoes fall within the first century BC. We can be certain that the Antikythera wreck represent a luxury shipment to the West. With its statuary works of art, furniture, luxury glass and few attested amphora types, the suggestion that the cargo was intended for Rome is reasonable. Antikythera has much different character from a simple amphora carrier, which was trading commodities for consumption.

The destination of Nauticos can be established with the help of land evidence: the Pamphylian amphorae, which are found in considerable number in Alexandria[367] stand as supporting indicator that the amphorae may had been intended for the consumption in that very place. The location of the wreck seems to confirm this suggestion.

Samiopoula, which carried a mixed cargo of Rhodian and Koan amphorae, together with Skrophes wreck with its single Rhodian amphora shipment were treated in this study, even though they do not fall within the range of the present thesis. As

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[362] Rauh 2003, 126.

[363] Lund 1999, 1993; Finkielsztejn 2001.

[364] See subchapter 2.4. Maritime Archaeology in International waters: supra p. 14.

[365] Koehler & Wallace Matheson 2004; Lawall 2006, 272.

[366] Lawall 2006, 270.

[367] Fraser 1972, 172-173.

new discoveries, which were not dated precisely but within the span of the first century BC, it was necessary to treat them within the present work.

Although not as widespread in the wider Mediterranean as Rhodian amphorae, the popularity of Knidian amphorae is still noticeable. Knidian amphorae attested in the studied Hellenistic wreck sites range from the second half of the second century BC to the early first century BC (see Chart 2); therefore their chronological range in which they appear in so far discovered cargoes is narrower than that of the previously discussed Rhodian types. Furthermore, the chronology of the wrecks with Knidian amphora consignment stands as an evidence of the intensified Knidian trade at the time when the Rhodian export is weakened, at least in the Aegean area. In two out of three of so far recorded Knidian Hellenistic cargoes, the amphorae are accompanied by Koan ones.

The distribution of Koan amphorae played certainly significant part in the Hellenistic trade. It is certain that the ignorance of unstamped amphorae, discussed in the first chapter distorts the record of the distribution of Koan as well as Chian amphorae, which were not stamped with such a frequency as Rhodian[368]. Recent analysis of E.L. Will of the Mediterranean transport amphorae at Arikamedu, which revealed some 400 diagnostic sherds belonging to the Mediterranean amphora types of which most are wine jars revealed that more than a half appears to be Koan[369].

In 2005-06, when Micha published a brief paper on the Aegean wreck sites, she noted based on then current data that *Koan amphorae of the Hellenistic period are practically absent from our records*[370]. Nevertheless, recent evidence gathered in the present study demonstrate a shift in the distribution pattern. Apart from the Syrna shipwreck (**19**), which was listed by *Micha*; we have a new evidence in the cargoes of Styra A, Styra B, Samos (which represents a single amphora consignment) and Leipsoi. Furthermore, previously omitted Kato Fana wreck also represents evidence of the Koan shipment. Koan amphorae were also recorded in the shipwrecks of Nauticos, Samiopoula, Antikythera and Hydra-Spetsai, which all date to the first century BC. They are distributed over the southern Aegean and attested in considerable number of Hellenistic wrecks (see Map 4[371]).

From the South Aegean Islands production, Rhodian, Knidian and Koan amphorae are the most frequently attested ones, with the Chian discovered so far only

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[368] See also Rauh 1999, 165 & n. 12.

[369] These Koan fragments date from as early as the second century BC. Will 1991, 1996, 1997, *forthcoming.*

[370] *Micha*, 85-86.

[371] Numbers in Map 4 represent reference to the Catalogue; wreck marked with capital **A** in Map 4 stands for Hydra-Spetsai wreck, see Table 2, **5**. Red indicates single Koan shipment, yellow indicates mixed cargoes or cargoes, where Koan amphorae are attested by few jars.

in two Hellenistic cargoes: in Kolokythia bay and Kythnos[372]. It has been noted that the quantities of Chian and Koan jars, whose stamped handles represent a small percentage in the known deposits[373], are distorted due to the uncertain manner of their stamping which may give us wrong picture of their patterns of distribution[374]. It is more than possible that the actual number of the traded Chian and Koan jars was greater than the count of their stamped handles indicate[375].

Some small evidence appear for the distribution of Samian and possibly Parian amphorae[376], as well as Corinthian and Corcyrean amphorae[377]; nevertheless compared to the evidence of Rhodian, Knidian and Koan, they represent a minor percentage of the amphora wreck evidence. The main evidence for their distribution place still lies within the land deposits, since the number of the recorded cargoes is inadequate. The place of destination can be suggested with certainty only in few examples, as it is in the case of Nauticos wreck site, where the combination of the land evidence and location of the wreck leaves us with very few potential ports of call.

During the Hellenistic period, Roman imports become gradually significant in archaeological records suggesting an early western economic penetration to the Aegean. The earliest wreck evidence of Italian imports in the area studied is attested by two cargoes, of which one stays unpublished[378]. The catalogued wreck: Preveza A (**12**) carried consignment, which was identified as Will form *d* and dates to the first half of the second century BC[379]. Second century represent the time, during which the economic Romanization which precedes the political and military one, becomes noticeable[380]. While through the third century BC, the presence of western amphorae in Athens and wider area of Aegean is sporadic[381], therefore may represent ‘leftovers’ from the Adriatic zone as suggested by Lawall[382]; in the second century, the western

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372 See supra p. 44. For the land evidence discovered in Kythnos, which suggest predominance of Rhodian imports, see Papanikolaou 2005.

373 See for example situation in Delos. Grace & Savvatianou-Petropoulakou 1970, 281.

374 Rauh 1999, 166. For the ignorance of unstamped amphorae, see supra n. 30 on p. 6.

375 Discussed mostly by Susan Sherwin-White (Sherwin-White 1978, 236-240) and Kerstin Höghammar (Höghammar 1993, 35; cited also in Rauh, who provides further reference, see Rauh 1999, 166 & n. 19).

376 In the cargo of Kyrenia, see supra p. 44.

377 See supra p. 45-46.

378 Syros B wreck, see Table 2, **12**.

379 See supra p. 49-50.

380 For further discussion of the economic Romanization, which was preceding the establishment of the provenance of Achaia, see Will 1997, 117-118.

381 Lawall 2006, 269.

382 Lawall 2006, 270.

economic presence in Athens and Aegean increases[383]. At the same time, West shows a decline in Aegean imports[384].

Significant western amphora imports attested in land discoveries of the southeastern Aegean appear in the late second and early first century BC, while in the northern and mainly northeastern Aegean they remain rare[385]. The pattern correlates well with our amphora wreck evidence. Most of our evidence lies in the southern Aegean area (see Map 5) and Lamboglia 2 represents the most popular form. The popularity of Lamboglia 2 is noticeable in land deposits at Corinth, where the early versions of this type outnumber the Aegean amphorae[386]. Nevertheless, the wreck evidence is very often overlooked. Reference is given usually only to the late second-early first century wrecks near Siphnos (Kitriani) and Thasos (Thasopoula), while the remaining stay absent in amphora studies[387]. The present study therefore contributes to the long discussion of the intensity of the Roman trade in the Aegean confirmed by the presented wrecks[388]. At the same time, in the late second century towards the first century BC, a massive penetration of Italian wines into Gaul and Spain attested by Dressel 1 and into the Adriatic, attested by Lamboglia 2[389] suggest a strong influence of Rome in economic activities of this late Hellenistic time.

It will be certainly challenging to continue improving our present knowledge in a wider view of amphora distribution as new discoveries are made. The list of shipwrecks and the evidence they bring to the ancient economic study is subject to a continuous adjustments and thus the present thesis remains a work sheet, since new discoveries will take place with each upcoming season. Only during the Southern Euboean Gulf survey, which took place in 2010, four potential Hellenistic wreck sites were located and another two wrecks, tentatively identified as Hellenistic, were found in the Pagasitic Gulf. Let us hope that with the new technologies and progressed techniques, maritime archaeology among with our land amphora evidence will become a reliable source of amphora distribution.

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[383] For the material attested in Athens, see Will 1997; for the evidence outside Athens, see Lawall 2006, 272 & n. 46.

[384] See Rhodian stamp graphs published by Etienne 1990 and Lund 1993 (also cited in Lawall 2006, 274, n. 53).

[385] Lawall 2006, 274.

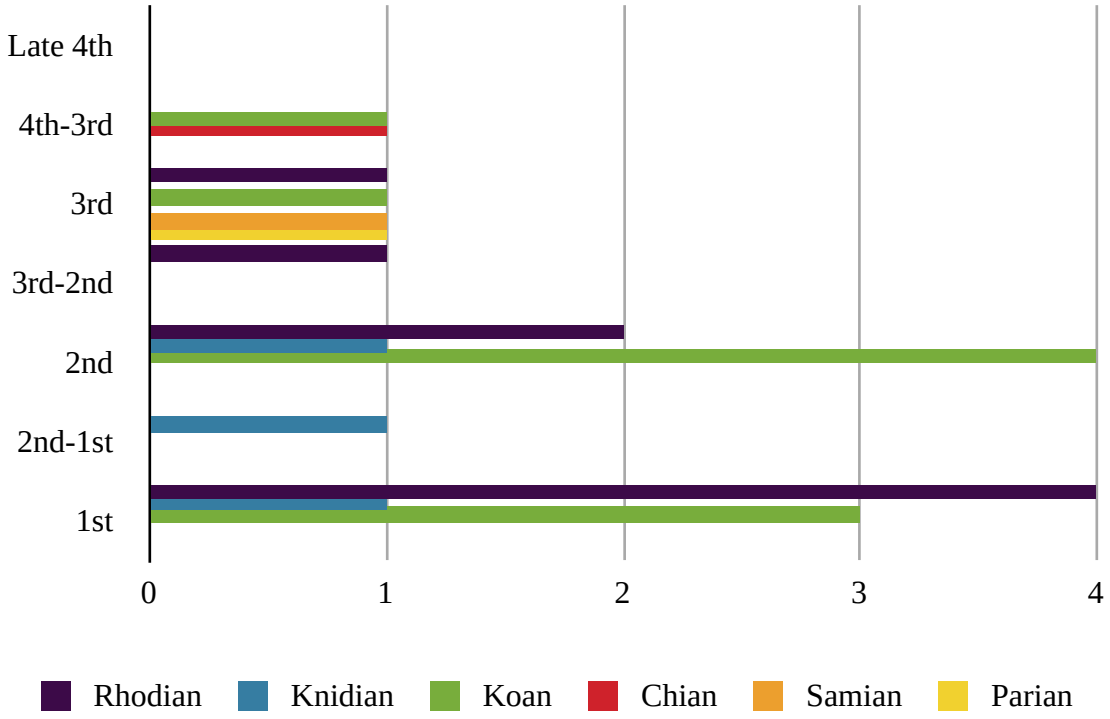
[386] Ibid., 272.

[387] Lawall 2006; Rauh 1999.

[388] For very briefly summarized attitudes of various scholars towards this discussion, see Lawall 2006, 265.

[389] See the citations provided by Rauh 1999, 168 & n. 26.

Chart 2


Late 4th
4th-3rd
3rd
3rd-2nd
2nd
2nd-1st
1st
0
1
2
3
4
Rhodian
Knidian
Koan
Chian
Samian
Parian

CATALOGUE

ANTIKYTHERA	**1**
Location	**Maps and illustrations**
Located northeast of Antikythera. Aegean. Greece.	Pl. 1-5, Fig. 1, Map 2.
Date	**Dating method**
Second quarter of the 1st century BC.	Dated by amphora samples, ceramics, Antikythera mechanism and coins which provide *terminus post quem*.
Ship type	**Preserved remains of a wreck**
Antikythera is often identified as a Roman loot ship, nevertheless the unique technique of statues' production, which seems to support the possibility that they were intended rather for export than plunder suggest that the wreck may represent remains of a merchant carrier.	The hull was left *in situ* under the remains of abandoned cargo and sand. In 1953, when the site was revisited by the crew of *Calypso*, Dumas recorded the state of the hull as perfectly preserved and covered by 40 cm of sand. Remains of the shipwreck, which were raised are fragmentary, but sufficient to reveal that the construction was shell-first. The following survive: more than a dozen fragments of plank of elm wood, ingots and lead weights.
Cargo	

Cargo is represented by various items, including amphorae: Rhodian, Koan and one Lamboglia 2, some of which were raised and published. Approximately half of the cargo remained on the seabed. Some of the Rhodian amphorae in the cargo were stamped, nevertheless the stamps are illegible and thus cannot provide better amphora chronologies.
Bronze and marble statues, bronze ornaments representing remains from wooden furniture, a gold earring (illustrating Eros playing a lyre), a necklace and other jewelry were among the finds.
The bronze statues from the cargo range in date from the fourth to second centuries BC. Among these are: a statue of a nude hero or a god, a philosopher's head, two male statues and fragmentary group of six figures. Thirty-six marble statues include seated and standing male and female figures as well as four horses, which are considered to be first century Roman copies of earlier Greek masterpieces. The marble statues are badly damaged by encrustation.

Other finds	**Evidence of life on board**
The Antikythera mechanism, which contains 30 bronze gears with as many as 224 presumably hand-cut teeth. The remains of the apparatus consist of more than 80 congealed fragments of disintegrating metal adorned with cryptic inscriptions and encrusted with corrosion. Coins from Pergamene dated to 85-67 and more closely bronze Ephesian coins dated 70-60 BC provide *terminus post quem* for the wreck.	Several samples of Hellenistic pottery from the shipwreck were raised and studied by G. Roger Edwards in *Antikythera TAPS*. One lamp was among these finds.
Depth	**State of preservation**
50-60 meters. Part of the cargo may have slid to greater depths.	The state of the cargo, which remained on the seabed is unknown.
Wrecking	
Wrecked most probably as a result of a collision with a rock, since the wreck is located at a base of a submarine cliff.	
Date of discovery	**Survey/Excavation season**

Discovered in 1900 by Dimitrios Kondos and Elias Stadiatis, sponge divers from Syme.	The wreck was salvaged (by order of the Greek government) from the end of November 1900 to the end of September 1901. The works were interrupted only during the Eastern for approximately one month. In 1953, Frédéric Dumas, a member of Cousteau's *Calypso* visited the site. In 1976, the site was revisited by J.-Y. Cousteau's team.
Further notes	
The wreck was discussed in countless amount of articles and books. Antikythera is well known, being the first ancient shipwreck discovered in Greece. It is located between Crete and Peloponnesus, in route where shipwrecks must have passed, going from Olympia to Constantinople. The discovery was announced to the government, which sent Navy ships with a team (including the sponge divers, who discovered the wreck) to lift part of the cargo, which was subsequently stored in the rooms of the National Museum. The team abandoned the site, before the work was completed, due to the tragedy of leaving two divers disabled and one dead. The bibliographical amount of Antikythera is considerable and only selective reference is given here. The material raised from the Antikythera shipwreck has been only partially studied. Great attention was given to a unique find, the Antikythera mechanism, which was researched primary by Derek J. de Solla Price. The most comprehensive study of various material was published in 1965 in the Transactions of the American Philosophical Society (*Antikythera TAPS*). Many artifacts from the wreck still await further study.	
Reference	

Antikythera.
Antikythera TAPS.
Bascom 1971, 262.
Casson 1994, 26.
Frost 1963, 126.
Kabbadias 1901, 205-208.
Kritzas 1978.
Merlin 1930, 406-8.
Oikonomidou 2001, 541-544.
Price 1974, 5-9.
Stais 1905.
Taylor 1965, 35-39.
Throckmorton 1970, 113-168.
Yalouris 1990, 135-136 & Pl. 31:3-5 (for the coin evidence).

Reference to previous catalogues	**Internet resources and press**
P 44.	*OREP* 36.

ASPRONESIA-KALAPODIA	**2**
Location	Maps and illustrations.
Located Near Leipsoi Island. Dodecanese. Aegean. Greece.	Map 3.
Date	**Dating method**
End of 2nd-mid 1st century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Cargo of Knidian amphorae. One amphora was recorded almost intact.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
30-40 m.	Scattered. Most probably previously looted.

Wrecking	
Wrecked on a cliff.	
Date of discovery	**Survey/Excavation season**
Discovered during a survey, which took place from 19th to 26th of June 2002.	Surveyed in 2002 by *EUA* and *NCMR*.
Further notes	
Equipment used during the survey included side-scan sonar, which was used from a support vessel *Thetis*. The result of the survey was the location of five new wreck sites.	
Reference	
Delaporta *et.al.* 2003, 44-45 & Figs. 5-7. *Micha*, 86 (Leipsoi Island).	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	

CHIOS LITHI	**3**
Location	Maps and illustrations
Located off the west coast of Chios, near Lithi. Aegean. Greece.	Pl. 16, Fig. 5
Date	**Dating method**
2nd-1st century BC.	Dated by raised amphora sample.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Approximately 40 scattered amphorae, apparently of the same type were located very close to the shore. The visible amphorae were heavily encrusted with marine growth and posidonia. A single Dressel 1C (Will Type 5) amphora was recovered with an incuse stamp on the rim. This sample provided the date for the wreck.	

Other finds	**Evidence of life on board.**
Unknown.	Unknown.
Depth	**State of preservation**
36-42 m.	Scattered. The wreck site was disturbed by landslides and wave action, which resulted into scattered condition of the cargo.
Wrecking	
The location of the amphora assemblage at the foot of a steep rocky-slope suggest that the wrecking was most probably caused by the collision with the rock.	
Date of discovery	**Survey/Excavation season**
Reported to *EUA* sometimes before survey.	Partially surveyed in 2005 by Greek-American team (*EUA* & *WHOI*).
Further notes	
The site was researched by *ROV* (*Super Achilles* of *HCMR*), which located the wreck at the depth of 36-42 m, the *AUV* and diver operation then followed. The location of the site near shore is a difficult environment for robotic survey and the research of the site was interrupted due to the damage caused to the *AUV*.	
Reference	
Foley *et.al.* 2009, 269-305.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*OREP* 67.

DHRAPI	**4**
Location	**Maps and illustrations**
Located off the Island of Dhrapi, between Hydra and Spetsae. Saronic Islands. Greece.	Pl. 6; Map 2.
Date	**Dating method**

Late 3rd-early 2nd century BC.	Dated by amphora sample.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	One lead anchor was found in proximity to the site and raised.
Cargo	
Rhodian amphorae. Five amphorae were recovered; one of them bearing a pair of stamps, with characteristic rose of Rhodes. The rest of the cargo is still on the seabed because of the sloping terrain, which is reaching steeply depth of 70 m.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
35-40 m.	Unknown.
Wrecking	
Most probably wrecked on a sloping terrain.	
Date of discovery	**Survey/Excavation season**
1979.	Surveyed in 1979. The survey was directed by G. Papathanassopoulos with assistance and cooperation of the Greek Navy.
Further notes	
G. Papathanassopoulos led a team of marine scientists and technicians to the site. The team included the following crew: E. Hadjidaki (archaeologist), N. Lianos (architect), S. Piskardelis (draughtsman), K. Konstantopoulos, E. Kyriakopoulos, L. Bistarakis and M. Tzefronis (underwater technicians).	
Further notes	
Micha, 85. Papathanassopoulos 1980, 166.	
Reference to previous catalogues	**Internet resources and press**

P 363, G 16.	*OREP* 33.

KATO FANA	**5**
Location	**Maps and illustrations**
Kato Fana is a small harbour, which lies on the southwestern shore of Chios. Aegean. Greece.	
Date	**Dating method**
4th-3rd century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Large number of small fragments of Koan amphorae is scattered over a large area.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
2-5 m.	Scattered.
Wrecking	
Most probably wrecked as a result of collision.	
Date of discovery	**Survey/Excavation season**
1954.	Surveyed in 1954 by *BSA*.
Further notes	
Reference	
Garnett & Boardman 1961, 105.	
Reference to previous catalogues	**Internet resources and press**

Previously unlisted.	

KITRIANI	**6**
Location	**Maps and illustrations**
The wreck is located approximately in the middle of the north side of the Kitriani Islet of the Platys Gialos Bay, which is located in the southeast part of Siphnos Island. Cyclades. Aegean. Greece.	Figs. 6-7.
Date	**Dating method**
End of the 2nd-beginning of the 1st century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
The cargo of the Kitriani wreck is preserved in two concentrations of amphorae. The first concentration is located in the depth of 6-8 meters, lying on a rocky bottom formed by the extension of the Kitriani Islet. It is represented by twelve clusters of broken amphorae, which were all sketched and photographed individually. The fragments of the amphorae were identified as Lamboglia 2, nevertheless several other amphora fragments of different types were observed in the concentration including a fragment of a lower part of small Knidian amphora dated to the first century BC and characteristic Rhodian handles dated by Simossi to the second half of the first century BC. The second and main concentration of the cargo lies on the seafloor covered in seaweed in the depth of 9-10 meters and consists of Lamboglia 2 amphorae. The visible assemblage expands over an area of approximately 11 x 6 meters. The following fragments were raised as samples: three necks, body of an amphora, which is preserved without its neck and amphora preserved almost completely in two pieces.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
6-8/9-10 m.	Scattered.
Wrecking	

Most probably wrecked as a result of collision with an underwater reef.	
Date of discovery	**Survey/Excavation season**
The wreck site was reported to *EUA* sometime before the survey.	Between the end of September - beginning of October 1990, the *EUA* conducted a survey with the aim to locate reported wreck site. The site was located and the existence of the wreck was confirmed.
Further notes	
On the inner walls of one amphora, remains of resinous linings we spotted, suggesting that the amphora could originally contain wine. The wreck is most probably identical with a site reported in press (*Eleftherotypia* 4.12. 1991) and subsequently in *AR* by French (1990-91, 64). *OREP* lists the site under the name Siphnos (*OREP*, 81) as a wreck site with unidentified cargo of the second century.	
Reference	
Micha, 86. Simossi 1995, 527-529.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*OREP*, 81.

KYRENIA	**7**
Location	**Maps and illustrations**
Located on the north coast of Cyprus, northeast from Kyrenia harbour.	Pl. 9-10; Fig. 3, 8-9; Map 2.
Date	**Dating method**
300-294 BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**

Merchant ship. Amphora carrier.	The wood of the hull remained in an excellent state of preservation, with its outer strakes still joined to the frames by bronze nails. A lining of ceiling planking is reported to rest on the exposed frames and the ship appears to have been lead sheathed. This sheathing was secured to the hull by tows of a bronze tacks. The evidence of patching was found (two rolls of lead sheathing). Wooden anchor's stock filled with poured lead were among the finds.
Cargo	
Large contributor to the Kyrenia cargo is Rhodes. Most of the jars belong to a mushroom rimmed, conical body type; and many carry legible stamps. The stamped jars represent the earliest development of early Rhodian stamped amphorae. All the jars were swirled inside with hot, black pine pitch to make them watertight. Samian jars, filled with almonds, were among the finds as well as amphorae of Parian and eastern Mediterranean production.	
Other finds	**Evidence of life on board**
29 millstones from volcanic Nisyros Island were serving in three rows as ballast of the ship. Two legible coins, one of Antigonos Monophthalmus minted between 316 and 301 BC and other of Demetrios Poliocretes minted between 306 and 294 BC provides *terminus post quem.* Black-glaze pottery was among the finds.	The good preservation of the wreck and distribution of small finds suggest two separate cabin areas for those on board. Furthermore, 4 oil jugs, 4 identical drinking cups, 4 salt dishes, 4 wine pitchers, 4 wooden spoons and dish with inscription EUP strengthen the evidence of the four persons' crew. A set of lead net weights was among the finds.
Depth	**State of preservation**
27-30 m.	Very good.

Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
Discovered by Andreas Cariolou in 1965.	Excavation seasons 1968-1969; directed by M. Katzev.
Further notes	
Conservation took place in 1969-1974.	
Reference	
AnnRepCyp 1970, 23. *AnnRepCyp* 1969, 14. *AnnRepCyp* 1968, 14. Green *et.al.* 1967, 46-56. Katzev 2005, 72-79. Katzev 1970a. Katzev 1970b. Katzev 1969, 55-59. Katzev 1968, 238-239. Swiny & Katzev 1973. Lawall *forthcoming*. Nikolaou 1975-76, 53 & Fig. 38. Nikolaou 1968-69, 48.	
Reference to previous catalogues	**Internet resources and press**
G 31; P 563.	

KYTHNOS	**8**
Location	**Maps and illustrations**
Located west of Kythnos. North Cyclades. Greece.	
Date	**Dating method**
Late 4th century-early 3rd century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**

Merchant ship. Amphora carrier.	Unknown.
Cargo	
A pile of amphorae spotted during the first dive with *Thetis* in March 2005 represents a wreck, which is so far the deepest discovered in the Aegean. The consignment consists of Chian amphorae and a group of unidentified type. The cargo was spread over an area of 20 x 20 m. The Chian type was dated to the late fourth century BC, representing an early Hellenistic cargo. The second type in the cargo is said to resemble the unidentified amphorae from Chios-Oinousses wreck. Samian amphora was tentatively identified in the cargo.	
Other finds	**Evidence of life on board**
	Pottery and cooking pots were among the finds and were dated as well to the late fourth century BC.
Depth	**State of preservation**
495 m.	Not mentioned, but most probably good, due to the location in deep waters.
Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
16th of March 2005.	The expedition took place between the 15th-22nd of march 2005.
Further notes	
The search for a wreck was initiated by the discovery of a bronze statue delivered to authorities (*EUA*) after being trawled from the sea west of Kythnos. The discovery took place in September 2004 and led to investigation of the area by *EUA* and *HCMR*, during which the Kythnos wreck was located. The equipment used during the 2005 survey included marine geophysical vehicles for the visual inspection of the selected targets.	
Reference	
Sakellariou *et.al.* 2007, 365-381. Sakellariou 2005, 28-30. Whitley 2004-2005, 91. Whitley *et.al.* 2005, 98.	

Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*Eleftherotypia* 19.10. 2004 (reports the discovery of the statue). *To Vima* 19.10. 2004 (reports the discovery of the statue). *To Vima* 23.3. 2005. *OREP* 79.

LEIPSOI	**9**
Location	**Maps and illustrations.**
Cape Armenistis, west of Leipsoi Island. Dodecanese. Aegean. Greece.	Pl. 14-15, 29; Map 3.
Date	**Dating method**
Second half of 2nd century BC.	Dated by Knidian amphora sample.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
The main assemblage of the wreck consists of Knidian stamped amphorae. Few Koan were observed in the main concentration of the cargo.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
First concentration of amphorae is located in 13 m. The main assemblage of the cargo is spread from 39-44 m.	Scattered over a large area.
Wrecking	
Wrecked on a coastline.	
Date of discovery	**Survey/Excavation season**

September 2010.	Surveyed by Giorgos Koutsouflakis (*EUA*).
Further notes	
Reference	
Unpublished. Information: G. Koutsouflakis.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	

MOULIA	**10**
Location	**Maps and illustrations**
Nearby Moulia rocks, to the southeast of the ancient port of Cyprus.	Map 2.
Date	**Dating method**
Early 2nd century BC. (Approximately 185 BC).	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
The ceramics were studied *in situ* by John R. Leonard. His inspection of the visible pottery led to the identification of the majority of sherds with Rhodian amphorae dating from 200 to 185 BC.	
Other finds	**Evidence of life on board**
	Miscellaneous pottery finds.
Depth	**State of preservation**
	Concreted to the rock.
Wrecking	
Probably wrecked on a reef.	

Date of discovery	Survey/Excavation season
Unknown.	Visited by archaeologists in 1994.
Further notes	
The site was visited in 1994 by Hohlfelder with a small group of archaeologists and architects. The location is known as “Cave of amphoras” as there is a shallow hollow in the natural reef, which has a ceiling of amphoras.	
Reference	
Hohlfelder 1995b, 49-51.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	

NAUTICOS	11
Location	**Maps and illustrations**
Located south of Cyprus.	Pls. 18, 21, 28, 30-31; Map 2.
Date	**Dating method**
First half of the first century BC.	Dated by amphorae studied through the video footage and photographic material.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
The main assemblage of the wreck consists of Pamphylian amphorae. Few other types were identified: Rhodian, Koan, Lamboglia 2. Furthermore, Hellenistic amphora with a thick-knob toe, possibly Dressel form 24 and Eastern Sigillata A of the first century BC were tentatively identified.	
Other finds	**Evidence of life on board**
Plain and fine wares. Four anchors and ballast stones.	Large cauldron, intact serving bowl and two intact pitchers and Hellenistic casseroles.

Depth	**State of preservation**
Just over 3000 meters.	Very good.
Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
The wreck was located in 1999 during a search for Israeli submarine INS Dakar.	The team spent 20 minutes at the site, recording it (video footage and photographs).
Further notes	
Reference	
Information: D. Jourdan. Lawall 2005-06, 76-81.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*Lawall in ORM; EMMAF; OREP*.

PREVEZA A	**12**
Location	**Maps and illustrations**
Near Preveza.	Pl. 27.
Date	**Dating method**
200-150 BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Cargo of Graeco-Italic amphorae, perhaps Will type d, has been only briefly reported. Five amphorae, which were brought to the Museum in Nikopolis were published in photograph.	

Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
18 m.	Unknown.
Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
Not reported.	Surveyed.
Further notes	
Reference	
Vokotopoulou 1969, 253 & Pl. 257b.	
Reference to previous catalogues	**Internet resources and press**
P 904.	*OREP* 306.

SAMIOPOULA	**13**
Location	**Maps and illustrations**
Located northeast of Samiopoula. Aegean. Greece.	Map 2.
Date	**Dating method**
Second half of the 1st century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Two piles of amphorae of the dimension 10 x 7 m marks an ancient wreck site. The cargo contains Rhodian and Koan amphorae. With the help of *Achileas* and divers, two amphorae were raised as samples.	
Other finds	**Evidence of life on board.**

Unknown.	Unknown.
Depth	**State of preservation**
45 m.	Not reported.
Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
Discovered in 2004 by *EUA* and *HCMR*.	Surveyed.
Further notes	
Reference	
Kourkoumelis *et.al. forthcoming*. Th. Theodoulou, 2010, pers.comm.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	

SAMOS	**14**
Location	**Maps and illustrations**
Located northeast of Samos. Aegean. Greece.	
Date	**Dating method**
3rd century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Koan amphorae form the main assemblage.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**

25-40 m.	Preserved in a good state.
Wrecking	
The wreck is located on a sloping terrain and thus was most probably wrecked as a result of collision.	
Date of discovery	**Survey/Excavation season**
20-25. 10. 2009 by *EUA*.	Surveyed.
Further notes	
Reference	
Th. Theodoulou, 2010, *pers.comm.*	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*Samos* in *ORM*.

SERIPHOS	**15**
Location	**Maps and illustrations**
Located in the entrance of Levadi Bay, on the east side of an underwater reef. Western Cyclades. Aegean.	
Date	**Dating method**
250-225 BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Hull was not uncovered.
Cargo	
The first visible assemblage is located on the east side of an underwater reef in the depth of 12 meters. It consists of sherds, which are identical with the main assemblage of the cargo in the depth of 25-32 m. The main assemblage is located on a sandy bottom, just below the reef and covers the area of 10.5 x 8 m. This concentration includes approximately 10 intact and many broken amphorae. One amphora was raised as sample and identified as a Corinthian B form of the third quarter of the third century BC.	

Other finds	**Evidence of life on board**
Unknown	Pottery has been spotted during the survey.
Depth	**State of preservation**
First assemblage-12 m. Main assemblage 25-32 m.	Not reported.
Wrecking	
Wrecked on an underwater reef.	
Date of discovery	**Survey/Excavation season**
Reported by Greek diver.	The location of the wreck was confirmed between 28-30 of May 1985.
Wrecking	
The wreck was discovered on the southeastern coast of the Sériphos Island, in the bay of Levadi, where the modern port of Levadi is situated. Local name of the place ‘καράβι’ suggests that the wreck was well known.	
Reference	
Kazianes *et.al.* 1990, 225. *Micha*, 85. Touchais 1986, 734.	
Reference to previous catalogues	**Internet resources and press**
P 1075.	*OREP* 80.

SKROPHES	**16**
Location	**Maps and illustrations**
Located near the Leros Island. Dodecanese. Aegean. Greece.	Map 2.
Date	**Dating method**
1st century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**

Merchant ship. Amphora carrier.	Unknown.
Cargo	
Rhodian amphorae form the main assemblage of the cargo.	
Other finds	**Evidence of life on board**
The area in the proximity of the cargo was investigated, but no other finds associated with the wreck were found.	Unknown.
Depth	**State of preservation**
25-42 m.	Scattered. Some amphorae were found intact.
Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
June 2002.	Surveyed by *EUA* and *NCMR*.
Further notes	
The shipwreck was located during the joint project of *EUA* and *NCMR* together with the shipwreck of Aspronesia Kalapodia and Telendos.	
Reference	
Delaporta *et.al.* 2003, 45-46 & Figs. 8-9.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	

STYRA A	**17**
Location	**Maps and illustrations**
Located north off Styra in southern Euboean Gulf. Greece.	Pls. 11, 20, 22-24.
Date	**Dating method**
Late 2nd-early 1st century BC.	Dated by amphora samples.

Ship type	Preserved remains of a wreck
Merchant ship. Amphora carrier.	Many nails were recorded and raised. During the 2010 excavation season, wood uncovered few meters from the main assemblage, may represent the remains of the hull.
Cargo	
The main cargo consists of Brindisian amphorae. Two Koan amphorae were raised from the shipwreck as samples among with fragmentary pieces of jars that seem to be small-sized versions of the Brindisian (size approximately ¼ of the normal Brindisian). The wreck represent the only cargo of Brindisian amphorae so far discovered in the eastern Mediterranean.	
Other finds	**Evidence of life on board**
Part of two tiles, 2 small pots with two handles, a metal vase of unidentified type (not restored yet), small part of a bronze statue, metal remains of a seat and a mortarium were raised from the site.	Mortarium, pottery.
Depth	**State of preservation**
43-45 m.	Preserved in good condition.
Wrecking	
Most probably wrecked as a result of collision with the shoreline.	
Date of discovery	**Survey/Excavation season**
2007.	The wreck is still in process of excavation (*HIMA*, *EUA*) as a part of Southern Euboean Gulf Project, directed by Giorgos Koutsouflakis.
Further notes	
Reference	

Koutsouflakis 2010, 220. Koutsouflakis & Argiris *forthcoming*. Koutsouflakis 2010, pers.comm. Michalis *et.al. forthcoming*.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*EMMAF*

STYRA B	**18**
Location	**Maps and illustrations**
Located at the north side of Saint Andreas Islet, next to Styra in southern Euboean Gulf. Greece.	Pls. 17, 19, 25-26; Map 3.
Date	**Dating method**
Late 2nd-early 1st century BC.	Dated by amphora finds. Several samples were raised.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
The cargo consists of Knidian and Koan amphorae. Some of the Knidian amphorae are stamped; one of the stamps is partially legible.	
Other finds	**Evidence of life on board**
No other finds were recorded.	Unknown.
Depth	**State of preservation**
8-15 m.	Scattered.
Wrecking	
Wrecked as a result of collision.	
Dat of discovery	**Survey/Excavation season**
2007.	Surveyed by *EUA* and *HIMA*.

Further notes	
Reference	
Koutsouflakis 2010, 221. Koutsouflakis & Argiris *forthcoming*. Koutsouflakis 2010, pers.comm.	
Reference to previous catalogue	**Internet resources**
Previously unlisted.	*EMMAF*

SYRNA	**19**
Location	**Maps and illustration**
Located near Astypalaea. Dodecanese.	
Date	**Dating method**
2nd century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
Cargo consists of exceptionally fine Koan amphorae. One sample was raised.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
Below 40 m.	Poorly preserved.
Wrecking	
Unknown.	
Date of discovery	**Survey/Excavation season**
2001.	Briefly surveyed.
Further notes	

In 2001, a fisherman from Astypalaea recovered 40,000 ancient coins from a shipwreck dated to the third century AD. This discovery led to a survey of the area, which resulted in the discovery of several wrecks: Roman, post-Byzantine and Hellenistic wreck of Syrna-Astypalaea, which is believed to have sunk in the third century BC.
Reference
Micha, 86 & Fig. 5.

Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	*OREP* 60 (Astypalaea).

TELENDOS	**20**
Cape Pnigmenos, near Telendos Island.	Pls. 7-8; Map 2.
Date	**Dating method**
Beginning of the 2nd century BC.	Dated by amphora finds.
Ship type	**Preserved remains of a wreck**
Merchant ship. Amphora carrier.	Unknown.
Cargo	
The cargo is located on a rocky slope. Amphorae were found even below the 70 meters but in low concentration, suggesting that they may have fallen there during the wrecking. They were identified as Rhodian, one fragment with characteristic rose stamp was raised. The sample dated the wreck site to the beginning of the second century, sometimes after 188 BC.	
Other finds	**Evidence of life on board**
Unknown.	Unknown.
Depth	**State of preservation**
60-70 m.	Scattered.
Wrecking	
The ship was most probably wrecked due to the strong southern and western winds, which led to decision of the captain to turn the ship towards the Cape Pnigmenos.	
Date of discovery	**Survey/Excavation season**

June 2002.	Surveyed by *EUA* and *NCMR*.
Wrecking	
The wreck was located during the joint research of *EUA* and *HCMR* in 2002 together with the wreck of Aspronesia Kalapodia and Skrophes wreck in Leros.	
Reference	
Delaporta *et.al.* 2003, 46-47 & Figs. 10-11.	
Reference to previous catalogues	**Internet resources and press**
Previously unlisted.	

TABLES

Table 1

No	Site	Classification I	Classification II	Summary Inscription	Bibliography
1	**Aï-Strate** Greece	1	E	Forty-one amphorae, mostly of Hellenistic and Roman date, were delivered to authorities and moved to a museum in the village of Potamia. The material stays unpublished.	French 1991-92, 33; *OREP* 42; Sapouna-Sakellaraki 1984, 126.
2	**Aï-Yannis** Off the east side of Chios, Greece	3	D	In the early reports, the site was identified as both: a single wreck site with Chian and Knidian amphorae dated from the late fifth to early fourth century BC (Touchais); and as two-wrecks' sites (Catling): one with a cargo of Chian amphorae of the fourth century BC and second with a cargo of Knidian amphorae of the second century BC. *OREP* completely omits the existence of Chian amphorae and lists only Aï-Yannis B with Knidian amphorae. The wreck was most recently identified as a Classical site with mixed cargo (Micha).	Catling 1984-85, 57 (his source is *Akropolis* 9.8. 1984); G 2-3; *Micha*, 84-85; *OREP* 66; P 19-20; Touchais 1985, 831 (his source is *Nea* 19.5. 1984).
3	**Akrotiri** Cyprus	1	D	The site was not safely identified as a wreck site and may represent a pottery disposal. Finds associated with the site were discovered ten hundred meters off the coast of Akrotiri and include: fragmentary amphorae with stamped handles, ware pottery from Pergamon and marble statuette.	*AnnRepCyp* 1977, 44; G 6; *Parker*, 49.
4	**Alexandroupoli** Greece	1	E	A group of amphorae, which is believed to come from a wreck site was seized in the area of Alexandroupoli.	*Micha*, 85.

5	**Artemision** Northern Euboea, Greece	1	E	The statue of Zeus/ Poseidon and the well-known ‘Horse and Jockey’ statuary group are well known pieces of art, which are believed to come from a wreck site. They were recovered from the sea near Cape Artemision and their discovery initiated an expedition (in 1928) with the aim to locate the site, which yielded the statues. The expedition unfortunately failed. In 2006, during the reinvestigation of the Artemision channel (*PWSS*), another team was unsuccessful in locating the wreck site. Finds associated with the wreck are: nearly completely preserved skyphos, a fragment of another skyphos and a lamp, which are dated from the second to the early first century BC, published by Wünsche (1979, Fig. 41). Ceramics, stone mills and lead anchor are discussed as well (Idem, 105-106).	Bascom 1971, 262; Heffner & Albright 1929, 117 & 141; Hemingway 2004; Kallipolitis 1972; Karouzos 1930-31; Mylonas 1944; *OREP* 34; P 57; Wünsche 1979.
6	**Corfu** Ionian Sea, Greece	2	E	The site was badly looted and destroyed by divers. The amphora consignment stays unknown and amphorae unidentified.	P 337; Throckmorton 1970, 225.
7	**Cyprus** Off the South coast of Cyprus.	2	E	The cargo of the wreck consists of Rhodian amphorae, some of them carrying stamps, which are illegible. The wreck was dated without certainty to the late second century BC and stays unpublished.	G 13; P 350.
8	**Deep Tow Site** Between Turkey and Libya in International Waters	1	D	Mapping of the seabed by the Deep Tow Vehicle of Scripps’ Institution of Oceanography revealed two amphorae, which were later identified as Rhodian and Coan and dated to third century BC. Whether they represent a nearby shipwreck is unknown.	P 356; Spiess & Orzech 1981, site I-B.

9	**Gavrion** Bay of Gavrion, Andros, northern Cyclades, South Aegean, Greece	2	E	The wreck which is reported to be approximately 30 meters long was investigated by divers. It was classified based on an inscription and very rough sketches presented to an archaeologist, who had identified the amphora shapes as pre-Roman and one as a Levantine 'Phoenician' form.	Bouzek 1982, 137; G 19; P 440.
10	**Hydra** (Ídhra) Eastern side of Peloponnese, southern tip of Hydra, Greece	2	E	The site was discovered by Greek divers. It was found completely looted, when investigated by *EUA* in 1977. Depth was not reported, only a summary account is available and not much is known about the wreck site. It is said to have been repeatedly visited by sport divers. Amphora type is unknown.	G 21; P 510; *OREP* 32 Throckmorton 1970, 225.
11	**Kalymnos** Dodecanese, Greece	1	E	Various papers report on underwater discoveries near Kalymnos. Finds recovered from the area are numerous, nevertheless, of special significance is a discovery of a Knidian amphora incorporated in bronze torso, which was delivered to the authorities in 2006. This find of an amphora provides date (first century BC) and strengthen the possibility of an existing cargo, which still awaits its discovery.	Blackman 2000-01, 122; Blackman 1999-2000, 122 & Figs. 180-81; Kazianes 1997, 1201 & Figs. 444 b - e; Kazianes 1994, 856 & Fig. 265 a - b; Koutsouflakis 2007; *OREP* 57-59; TO ERGO YPPO 1997, 131 & Pl. 2; TO ERGO YPPO 1998, 152 & Pl. 2; Tomlinson 1995-96, 1 & 37; Tomlinson 1994-95, 1; Whitley 2003-04, 72 & Fig. 95; Whitley et. al. 2006, 91 & Fig. 111.
12	**Kavalliani** Euboea, Greece	2	E	The Hellenistic wreck site of Kavalliani was brought to my attention by Giorgos Koutsouflakis. The material stays until today unpublished.	Unpublished.

13	**Keratea** Euboea, Greece	2	E	The cargo, which was dated to the Hellenistic period was briefly reported. The samples, which were raised from the site were not published.	Kazianes 1999, 856.
14	**Koppo** Cyprus	2	D	The wreck site is very badly scattered due to the wave activity in shallow waters, where the assemblage is located (2-3 m). The cargo is reported to be mixed, consisting of three unidentified types and Late Hellenistic Rhodian. Fragments of cooking coarse ware, a rim of a pithos and part of a moulded glass bowl were among the finds.	Bass & Katzev 1968, 170-71; G 28; P 554.
15	**Limeni** Southern shore of Limeni bay, southwest of Peloponnese, Greece	2	E	The site, which originally represented a large merchant ship with unpublished and unidentified amphorae was tentatively dated to early first century BC. Depth of the wreck is approximately 10-12 meters. Parker states that the site may be identical with Areopolis site, q.v. Areopolis in Table 2, 2.	P 597, *OREP* 307; Touchais 1978, 678.
16	**Marathon** Euboea, Greece	1	E	The famous ‘Marathon boy’ was netted in 1925. The discovery initiated a survey of the area, led by a French team in 1950 and followed by another research, conducted by J.-Y. Cousteau in 1976. The location of the wreck, which yielded the statue is unknown. Until the wreck is located and associated safely with the statue, the chronology of the site cannot be established.	Bass 1966, 79; G 39; Koutsouflakis 2010, 215; *OREP* 31; Rhomaios 1924-25.

17	**Mavronisi I** Paros, Cyclades, south Aegean, Greece	3	C	The Mavronisi I shipwreck was discovered during a brief survey in a Bay of Nausa in 1979. The cargo was preliminary dated to the first century BC by comparative material from the excavation at the Athenian Agora (Papathanassopoulos & Schilardi) and later re-dated to the first century AD (Bound). Two pictures with the visible Koan fragments were published.	Bound 1985, 149; *OREP* 82 (Paros A); P 791 (Paros A); Papathanassop-oulos 1980, 167 & Fig. 6; Papathanassop-oulos & Schilardi 1981, 140 & Fig. 9.
18	**Mavronisi II** Paros, Cyclades, south Aegean, Greece	2	D	Micha listed the site among the late Hellenistic Italian amphorae as a result of their tentative identification with Lamboglia 2. If this identification is correct, the wreck would represent early Roman import into Aegean.	*Micha*, 86; *OREP* 83 (Paros B); P 792 (Paros B); Papathanassop-oulos 1980, 167; Papathanassopoul os & Schilardi 1981, 140-1.
19	**Methone A** Greece	2	E	Hellenistic wreck site with amphora consignment. The amphora type stays unidentified and the cargo's date is uncertain. The site was only briefly reported.	G 43; *OREP* 305; P 693; Throckmorton & Bullitt 1963, 21.
20	**Piadha** North of Epidaurus, at south entrance of Piadha Bay, Greece	2	D	The site is located in 30-35 meters and was surveyed in 1979 by G. Papathanassopoulos (*EUA*). Its cargo consists of Laconian tiles. No closer date was assigned to the cargo.	G 48; *OREP* 30; P 810; Papathanassop-oulos 1980, 165.
21	**Preveza B** In the area of Actium, Greece	1	E	Amphorae of Corinthian A and B forms were discovered by fishermen in the 19th century. They are now located in the British Museum and may represent a material from a shipwreck.	Kapitän 1973, 186; Koehler 1978a, 30; *OREP* 300; P 905.
22	**Rhaphina** Greece	1	E	Two amphorae, which are now in an American collection are said to be found in shipwreck near Rhaphina. Hoffman classifies the amphorae as Rhodian and Graeco-Italic (cf. Hoffman & P 982). In the photograph published by Hoffman, the amphorae are not yet cleaned of their marine encrustation.	Hoffman 1971, Nos. 206-207; P 982.

23	**Samos** Northern Aegean, Greece	2	E	Shipwreck of Hellenistic or Roman period was discovered off the island of Samos. The cargo consists of amphorae (unidentified in the report).	*OREP* 65; Whitley 2004-05, 91; Ta Nea 24.8. 2004; To Vima 24.8. 2004.
24	**Sporades A** Northern Aegean, Greece	2	E	Several amphora forms were briefly reported, among which only Thasian amphorae were identified. The main mould measures approximately 30 x 20 meters. Chronology of the assemblage is uncertain (fourth to third century BC).	G 58; P 1109.
25	**Strovili** North-east off Chios, Greece	2	D	A shipwreck of Hellenistic period.	*Simossi* in *ORM*, 99.
26	**Xerolimni** West coast of Cyprus, north of the harbour of Agios Giorgos	2	D	A dense concentration of amphorae is reported to be fragmental to such a level that the identification of the amphora type was not possible. The cargo is however believed to represent a Hellenistic merchant ship and was tentatively dated between third and second century BC.	*AnnRepCyp* 1985, 51; Giangrande *et.al*. 1987, 192, Howitt-Marshall 2003, 28-37.

Table 2

1	**Antidragonera** Kythera, Greece	A group of Lamboglia 2 amphorae was located off Antidragonera, Kythera.	*Micha*, 86.
2	**Areopolis** Near Mani, Peloponnese, Greece	A merchant amphora carrier was attested by scattered assemblage, which contains Lamboglia 2. The size of the cargo suggests a ship approximately 30 m long. It is located in the depth of 6-14 meters. The wreck was dated to the first century BC.	Frost 1968, 40-43; *Micha*, 86; *OREP* 308; **P** 54.
3	**Cape Mytikas** Chios, Greece	A cargo of Lamboglia 2 and Dressel 1. One underwater picture was published.	*Micha*, 86 & Fig. 6.
4	**Gavdopoula** Crete, Greece	A cargo of Lamboglia 2 and Dressel 1.	*Micha*, 86.
5	**Hydra-Spetsai**	An undisturbed shipwreck with 250 amphorae of the first century BC was located at the depth of 47-50 m. The amphorae were identified as Koan.	Winter 1982, 550; Kathimerini 6.6. 1981.
6	**Kolokythia Bay** Chios, Aegean, Greece	A cargo of Chian amphorae.	*Micha*, 85.
7	**Kynosoura** Attika, Greece	A Hellenistic wreck with Corinthian A amphorae.	Koutsouflakis, January 2011, *pers.comm*.; *Micha*, 85.
8	**Parapola** Greece	A cargo with Lamboglia 2 amphorae.	Kazianes 2003, 1185-87; *Micha*, 85.
9	**Porto Koufo** Chalkidiki, Greece	A cargo with Thasian amphorae, amphorae from Samothrace and another unidentified type.	*Micha*, 85.
10	**Stegna Archangelou** Rhodes, Dodecanese, south Aegean, Greece	A group of Rhodian amphorae.	*Micha*, 85.
11	**Syros A** Cyclades, south Aegean, Greece	Cargo of Rhodian amphorae.	*Micha*, 85.
12	**Syros B** Cyclades, south Aegean, Greece	Cargo of Graeco-Italian amphorae.	*Micha*, 86.
13	**Thasopoula** Northern Aegean, Greece	A cargo of Lamboglia 2. The exact location and depth is unknown.	*Micha*, 86; **P** 1147 (Thasos B); Tchernia 1986, 72.

MAPS


Tekirdağ
Gebze
Çankırı
Çorum
Bandırma
Bursa
Çanakkale
Ankara
İnegöl
Eskişehir
Balıkesir
Yozgat
Sorgu
Kütahya
Kırıkkale
Ελλάς
Greece
Soma
Kırşehir
Boğazlıyan
Aegean Sea
Akhisar
Türkiye
Turkey
Manisa
Uşak
Bolvadin
Nevşehir
Patra
Athina
Turgutlu
Aksaray
İzmir
Nazilli
Konya
Niğde
Söke
Denizli
Isparta
Aydın
Burdur
Ereğli
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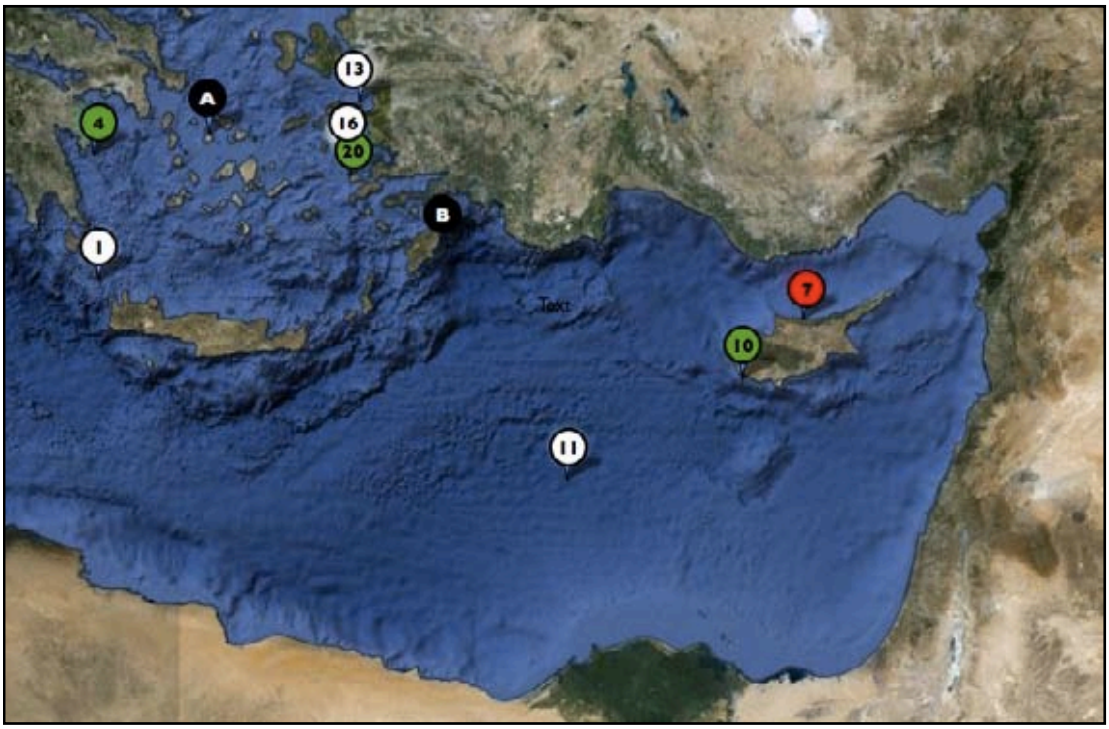
Karaman
Mersin
Adana
Manavgat
Silifke
Alanya
Iraklio
Cyprus
Saida
Haifa

Map 1


13
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16
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B
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7
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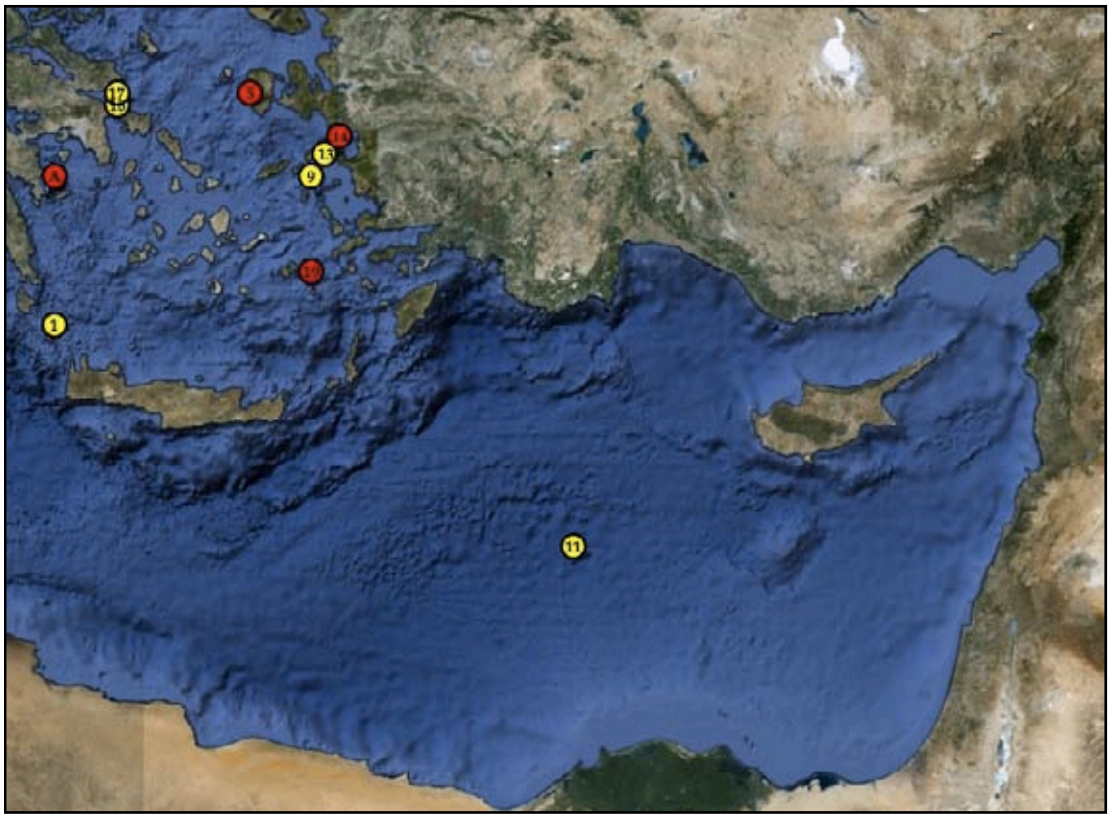
11

Map 2

Map 3



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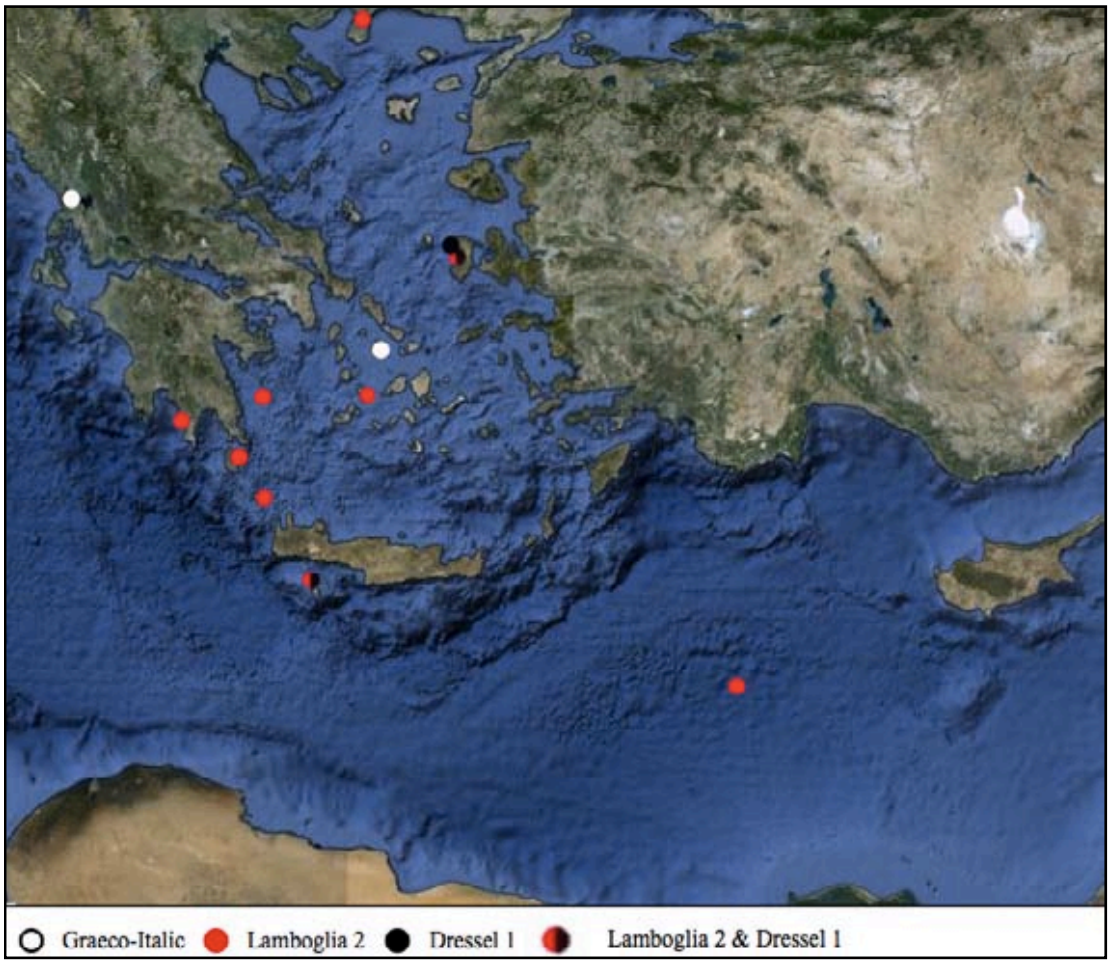


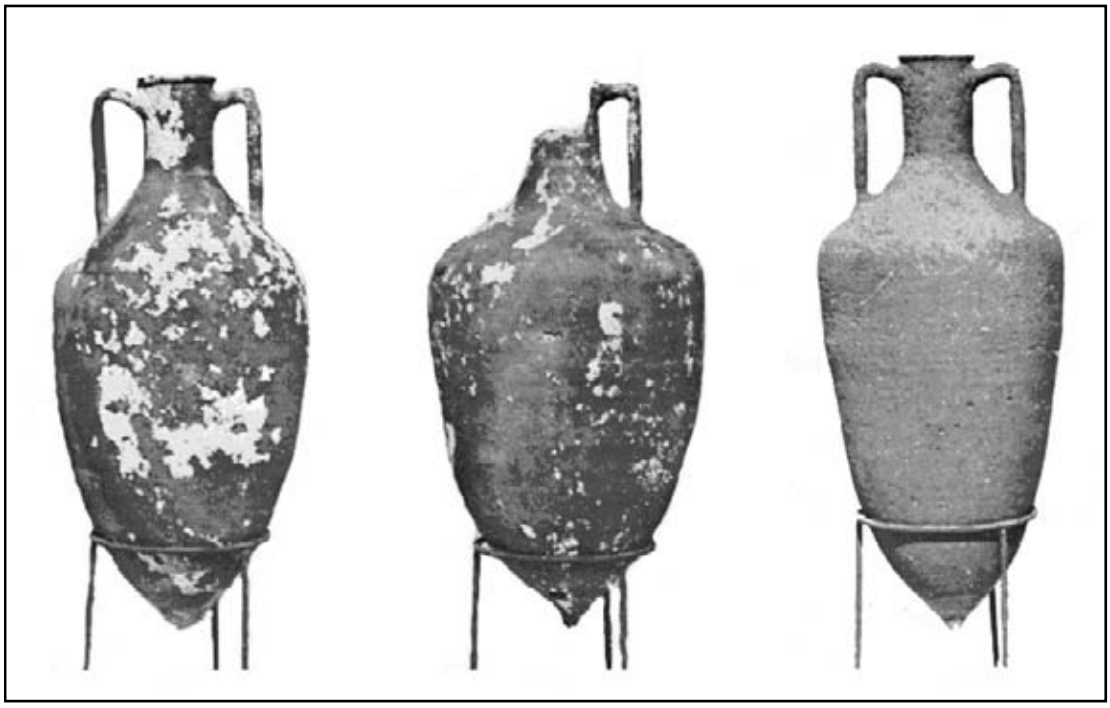
Map 5

PLATES

Pl. 1

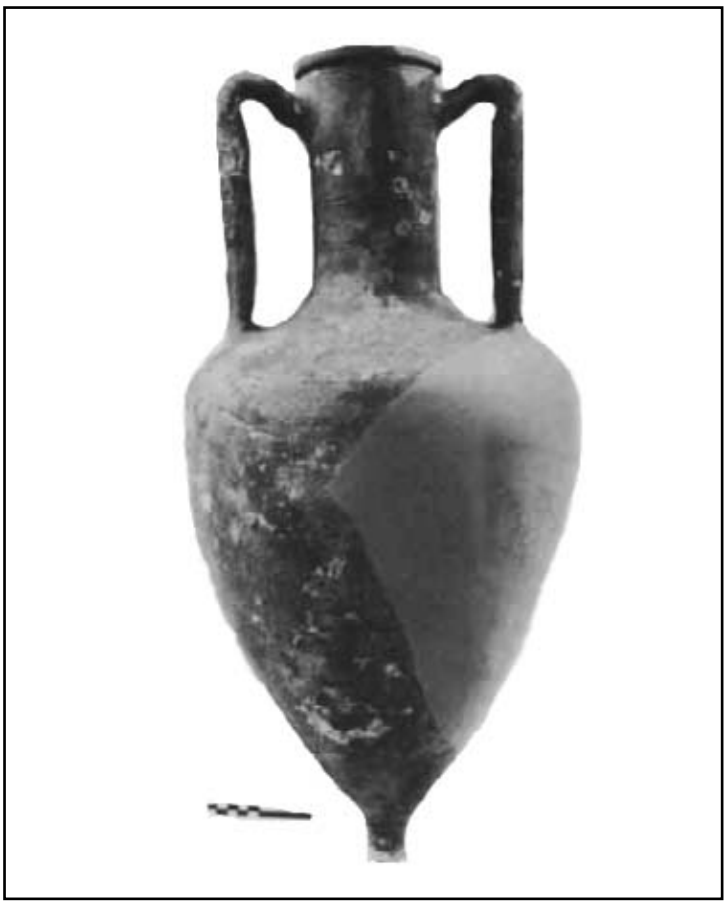
Pl. 2

Pl. 3



Pl. 4

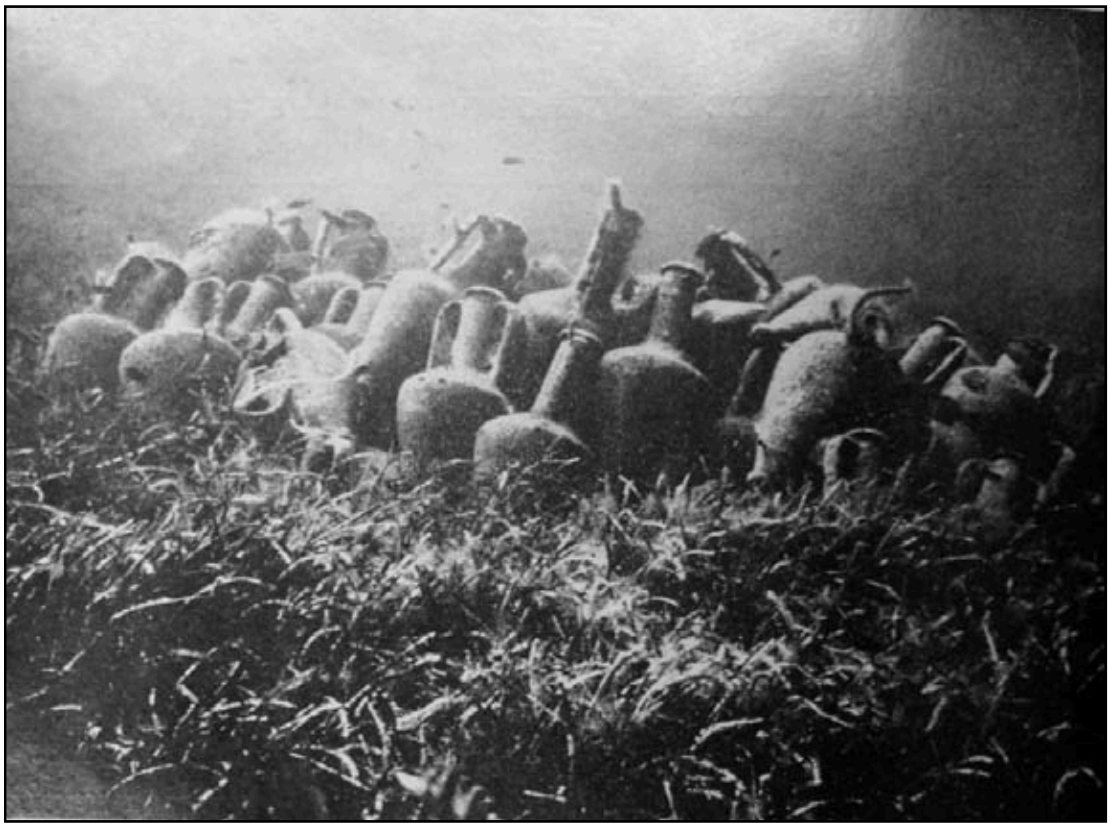
Pl. 5



Pl. 6

Pl. 7

Pl. 8



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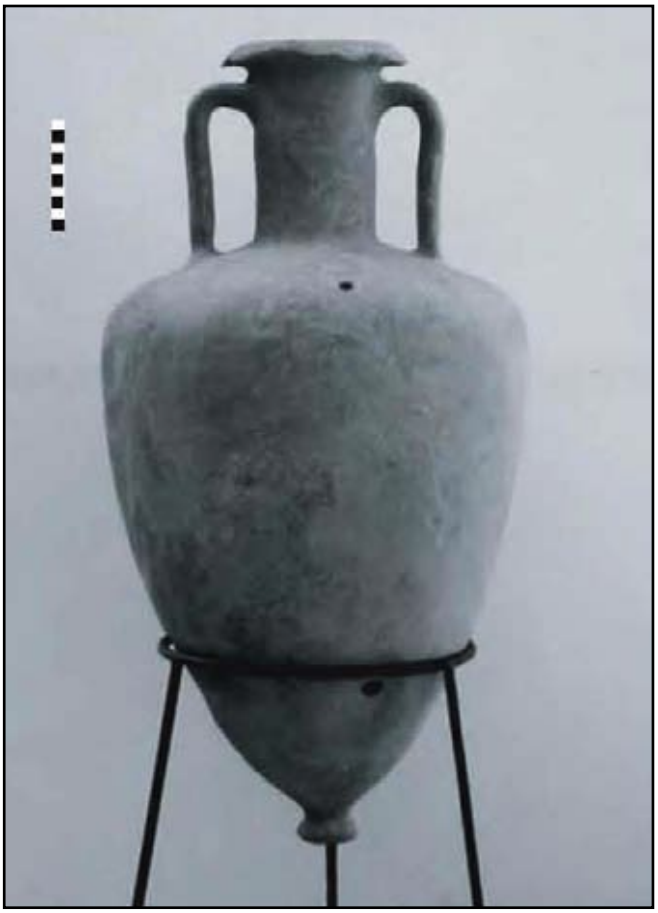


Pl. 10

Pl. 11

Pl. 12

Pl. 13

Pl. 14

Κάτοψη αρχαίου ναυαγίου
περιοχή Αρμενιστή - Λειψών.
Ακτογραμμή
Μέγιστο βάθος 48m
N
Φωτομωσαϊκό: Βασίλης Μεντόγιαννης - 2010©

Pl. 15

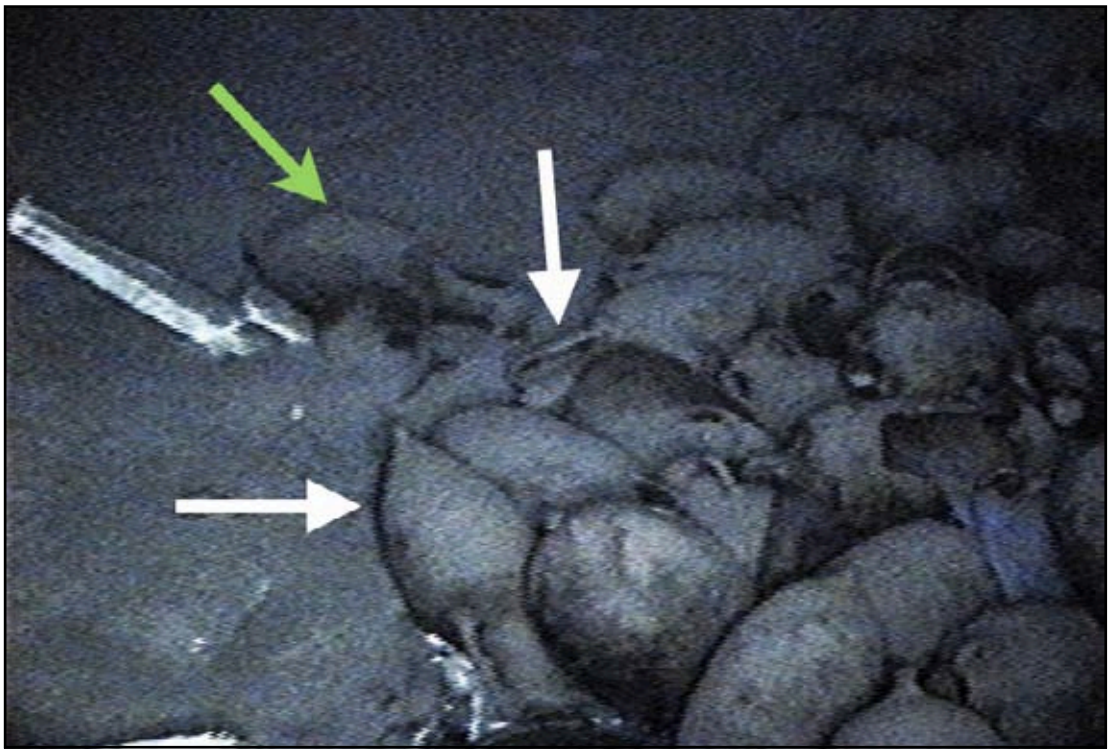
Pl. 16

Pl. 17

Pl. 18

Pl. 19

Pl. 20



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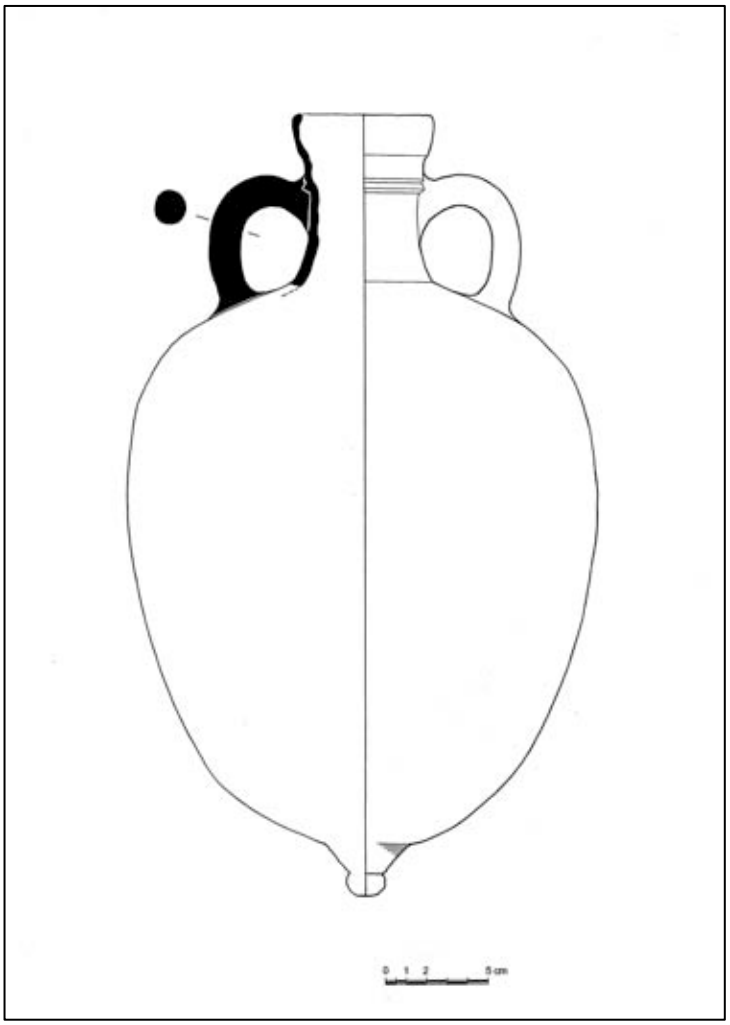
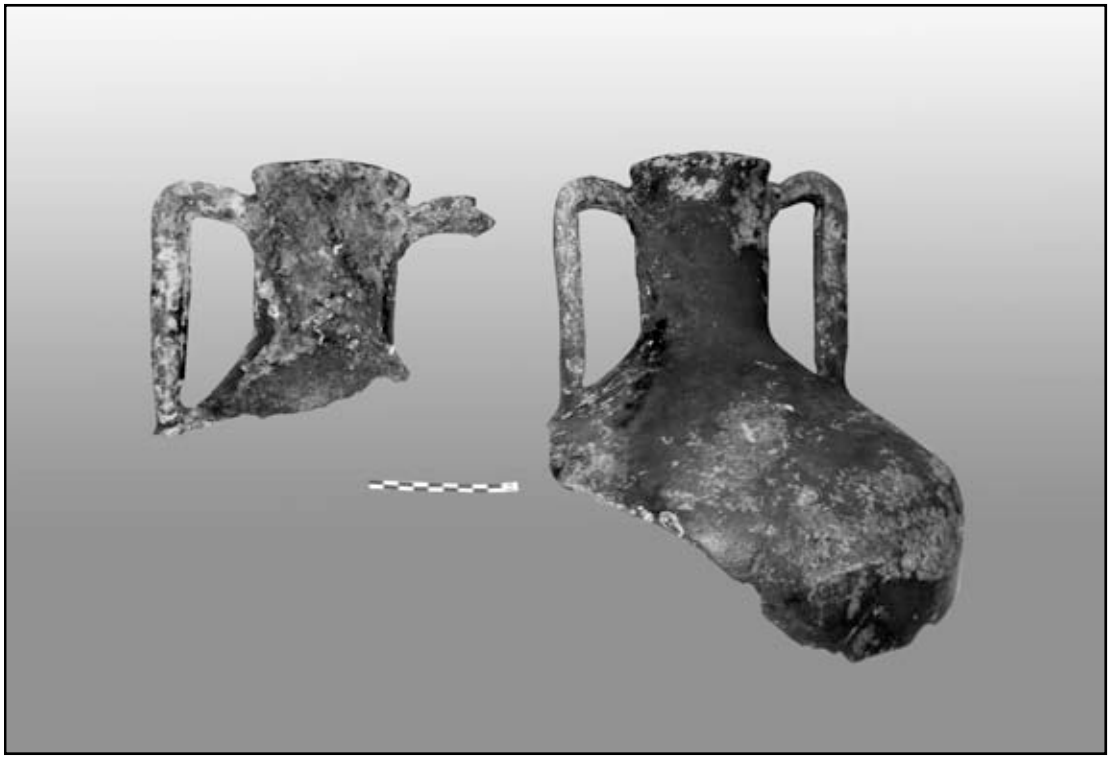


Pl. 22

Pl. 23

Pl. 24

Pl. 25

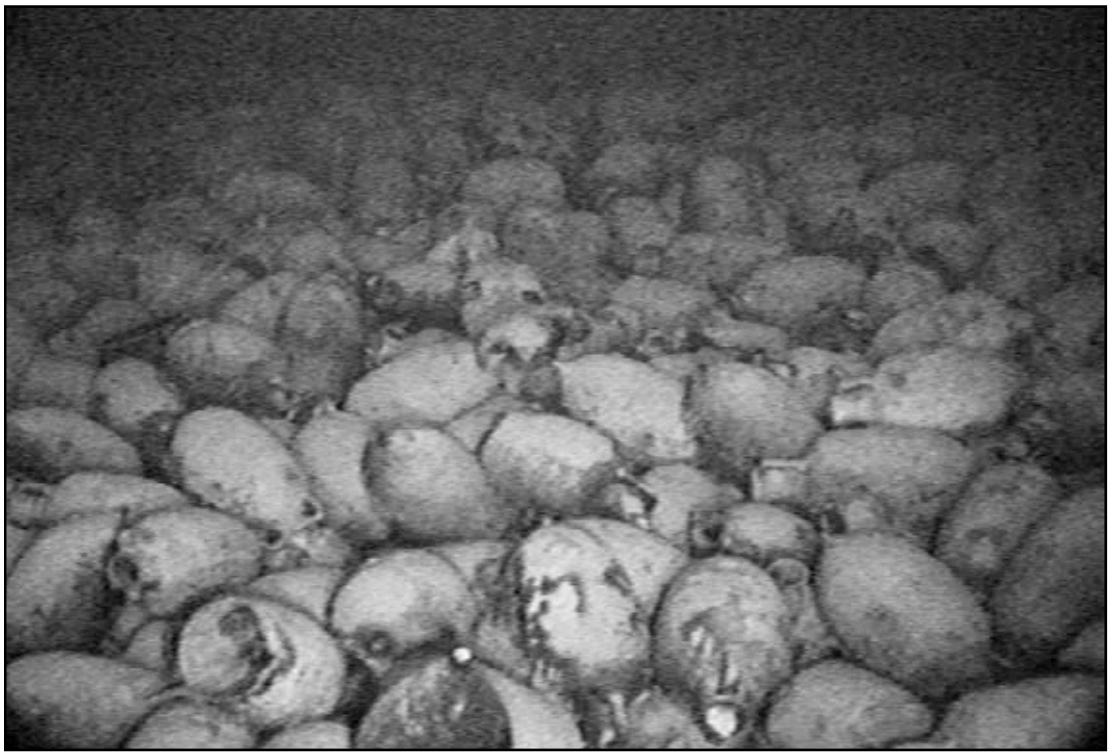


Pl. 26

Pl. 27

Pl. 28

Pl. 29



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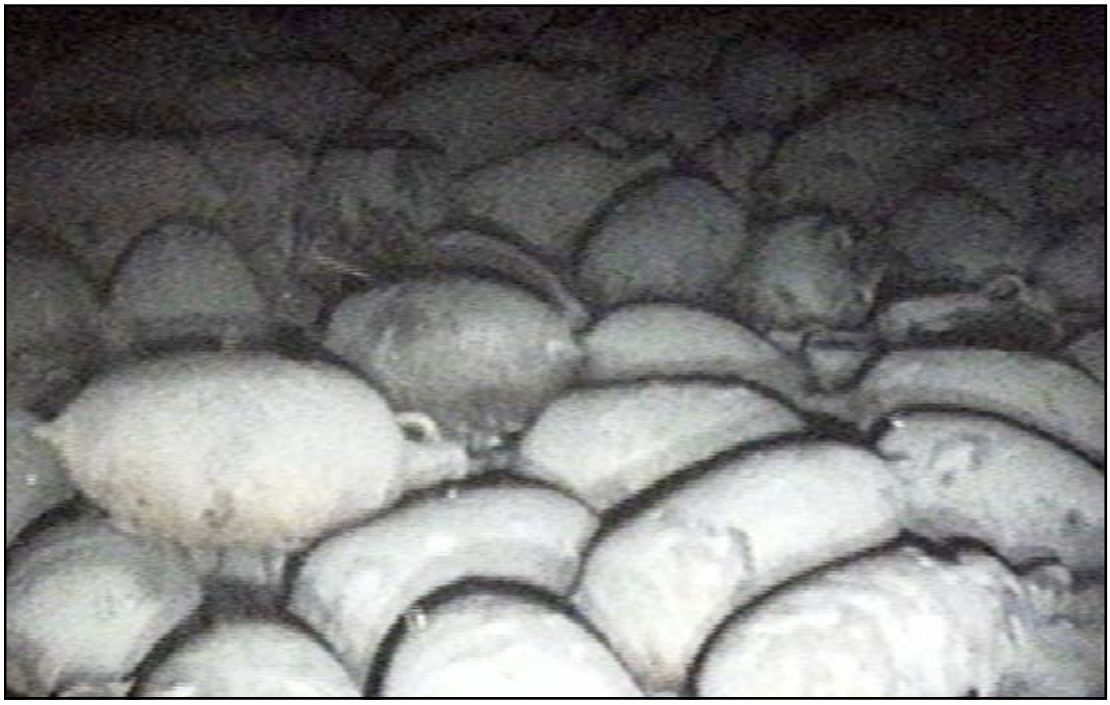

Pl. 31

FIGURES

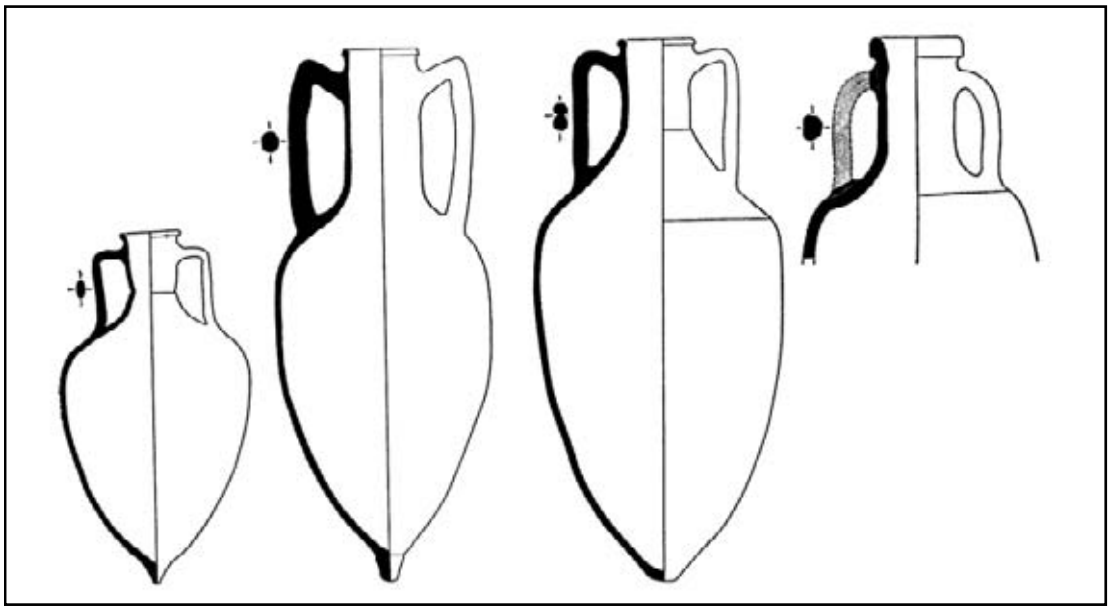

Fig. 1

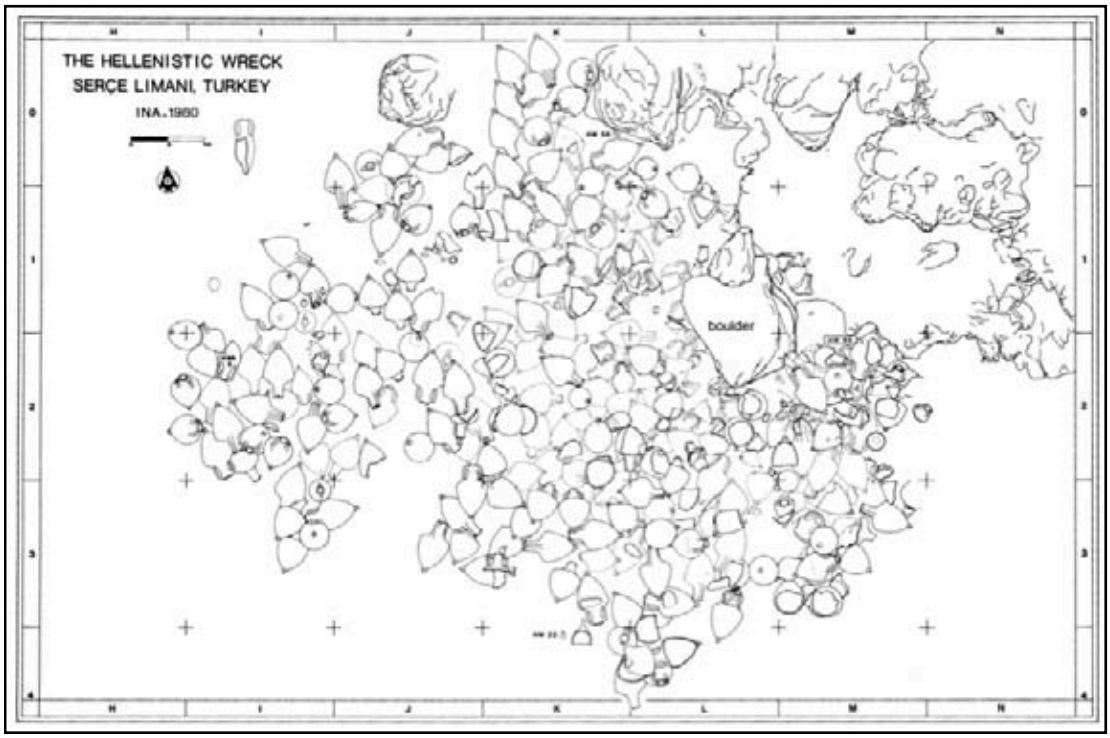
THE HELLENISTIC WRECK
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Fig. 2

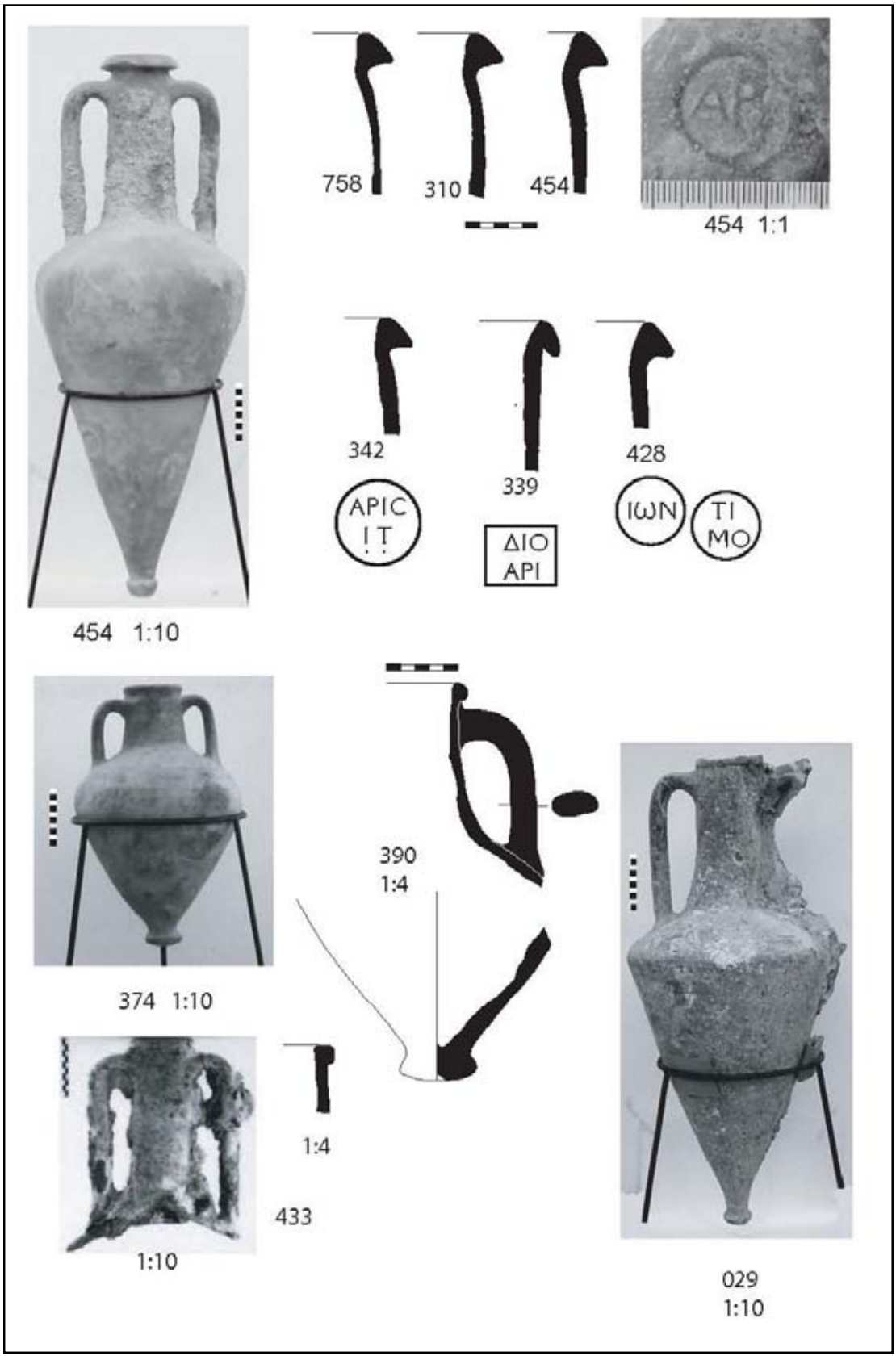
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Fig. 3

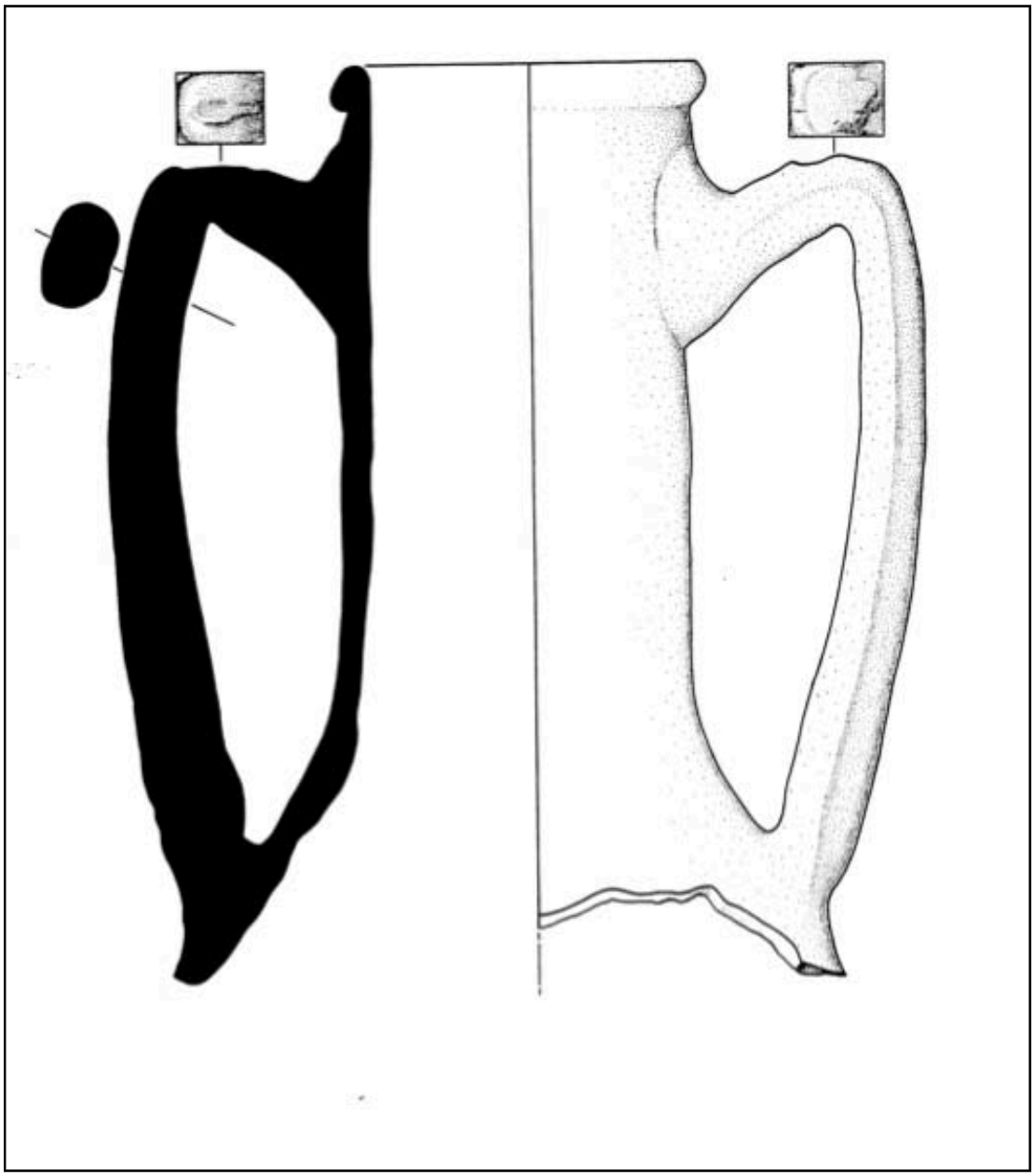

Fig. 4

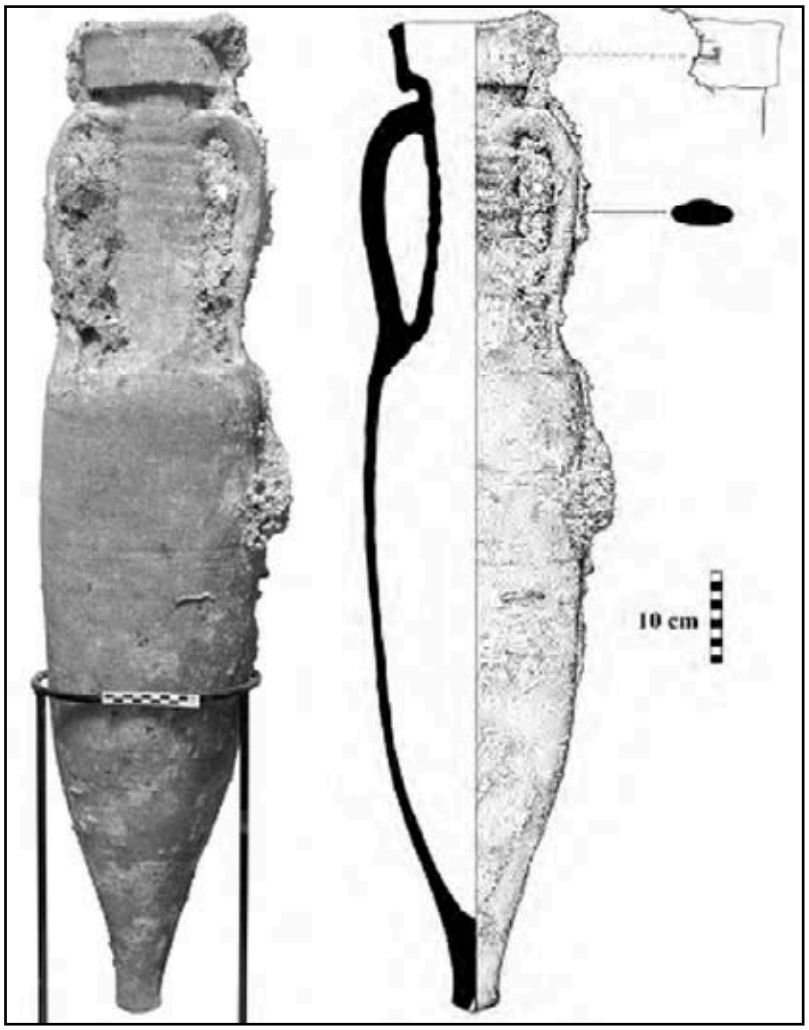

Fig. 5

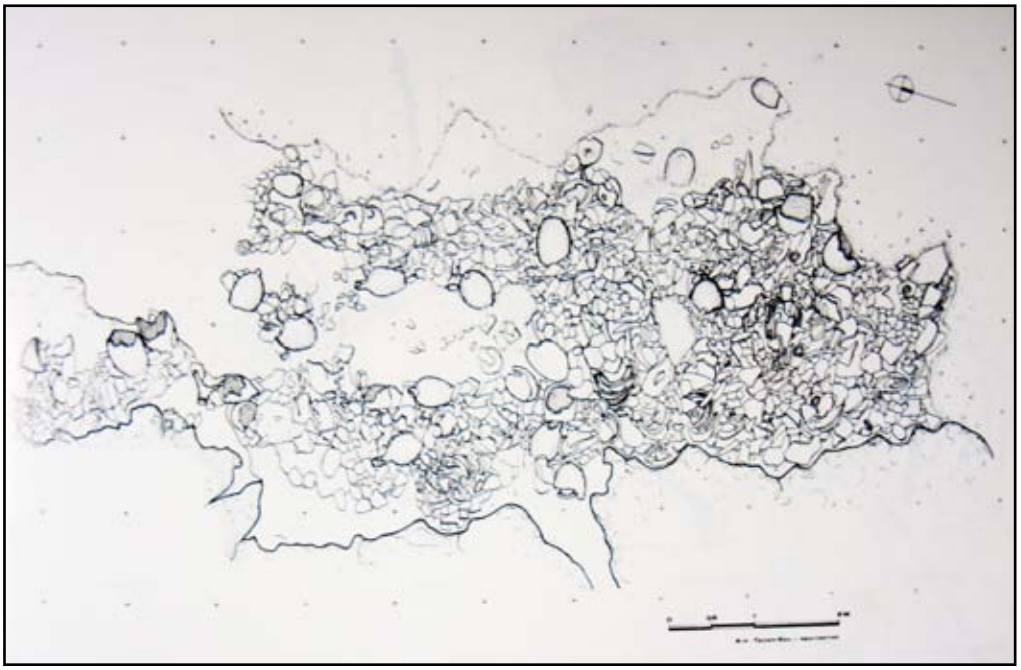

Fig. 6

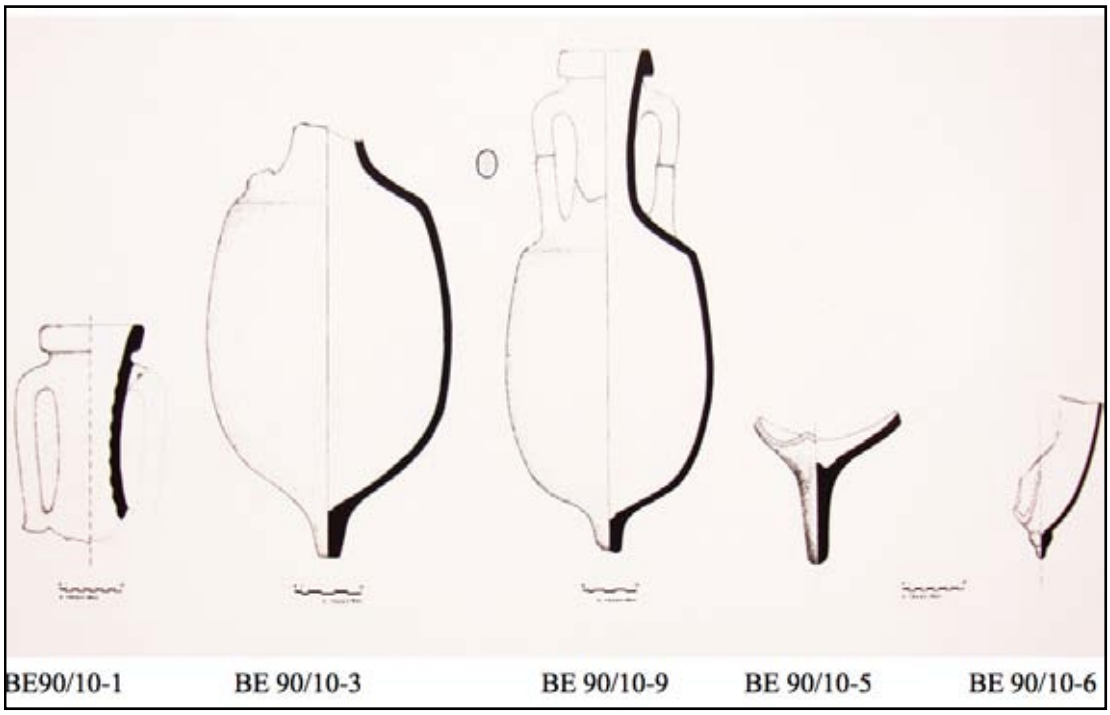

Fig. 7

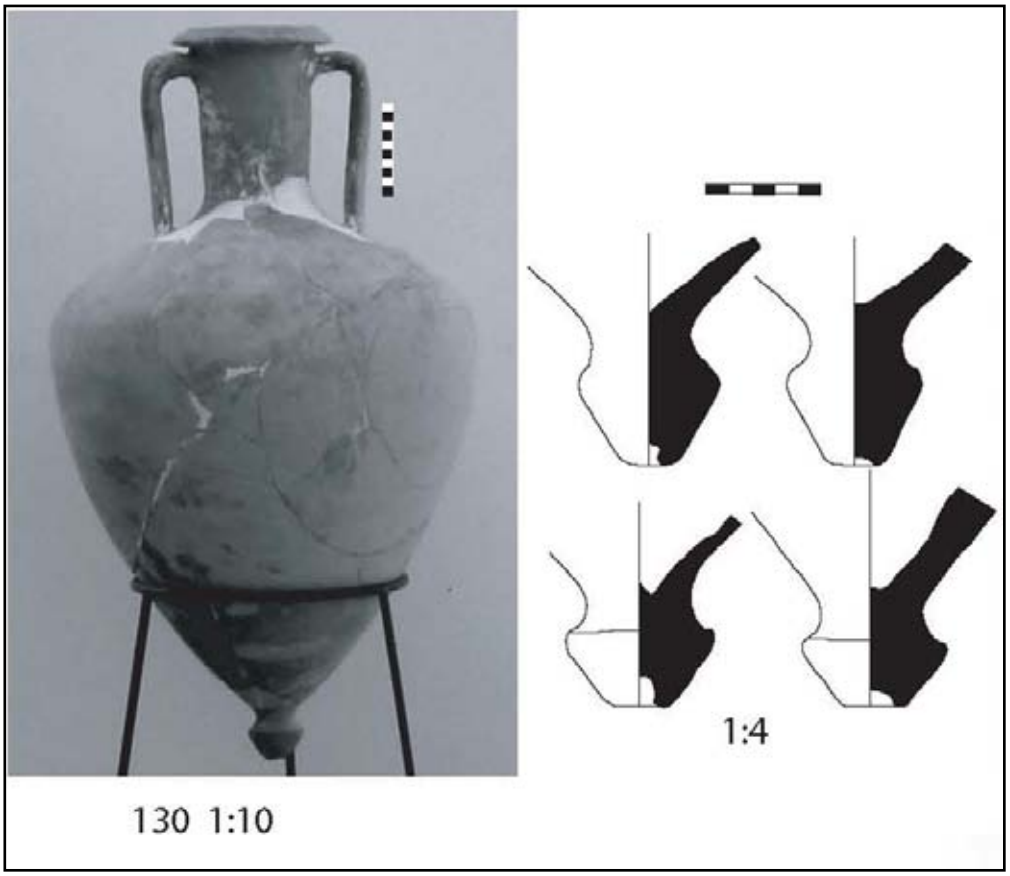

Fig. 8

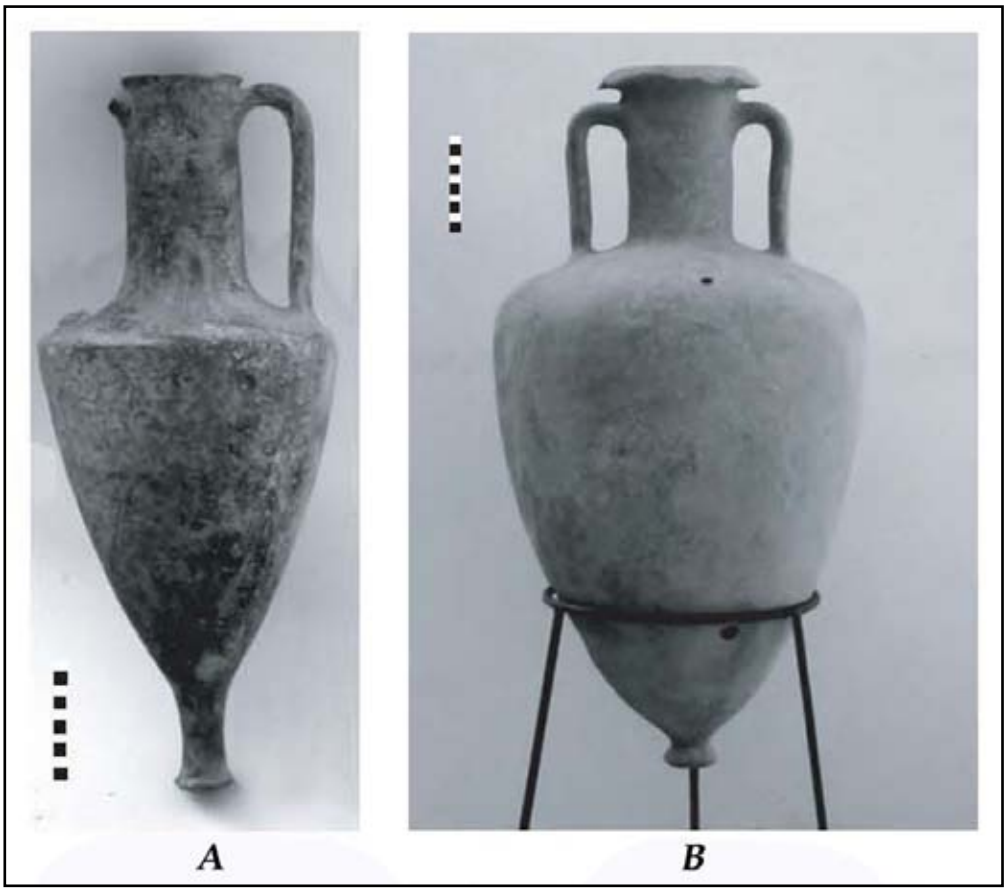

Fig. 9

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CAARI — http://www.caari.org/

Deltia Typou — http://www.yppo.gr/2/g20.jsp

Dyabola — http://www.dyabola.de/en/indexfrm.htm?page=http://www.dyabola.de/

EMMAF — http://www.emmaf.org/

HIMA — http://www.ienae.gr/EN/page.php?2 (English version)

INA — http://inadiscover.com/

JSTOR — http://www.jstor.org/

L’Année philologique — http://www.annee-philologique.com/aph/

* The links presented below represent selective Internet resources used in the present study as a source.

Nauticos	http://www.nauticos.com/
OREP	http://oxrep.classics.ox.ac.uk/
Pontos	http://www.pontos.dk/publications/books
PWSS	http://nautarch.tamu.edu/pwss/homepage/
RPM Nautical Foundation	http://www.rpmnautical.org/
Wiley InterScience	http://onlinelibrary.wiley.com/

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