

**Maritime and Underwater Cultural Heritage
in the Arab Region 9/2**

**THE ARCHAEOLOGY OF ZYGRIS/LADAMANTIA (MARSA
BAGOUSH): ILLUMINATING ANCIENT MARITIME NETWORKS
ON THE EGYPTIAN MEDITERRANEAN COAST**

Article 2

Emad Khalil

Professor of Maritime Archeology
Misr University for Science and Technology, Egypt
emad.helmy@must.edu.eg

ARTICLE INFO: Received 10-01-2024; revised 04-04-2024; accepted 18-04-2024.
Available Online 01-06-2024

RECOMMENDED CITATION

KHALIL, E.: «The Archaeology of Zygris/Ladamantia (Marsa Bagoush): Illuminating Ancient Maritime Networks on the Egyptian Mediterranean Coast», *Journal of the General Union of Arab Archaeologists* 9/2, 2024, 20-39. Doi: 10.21608/jguaa2.2024.261947.1165



THE ARCHAEOLOGY OF ZYGRIS/LADAMANTIA (MARSA BAGOUSH): ILLUMINATING ANCIENT MARITIME NETWORKS ON THE EGYPTIAN MEDITERRANEAN COAST

ABSTRACT

[AR] آثار زيغريس/لادامانتيا (مرسى باجوش): إلقاء الضوء علي العلاقات البحرية القديمة على الساحل المصري للبحر الأبيض المتوسط [AR] منطقة مرسى باجوش هي عبارة عن خليج كبير يقع على ساحل البحر الأبيض المتوسط في مصر، على بعد حوالي 250 كيلومتراً غرب الإسكندرية. في العصور القديمة، كان ذلك الخليج يضم مينائي (زيغريس) و(لادامانتيا) الرومانيين. وتم ذكرهما عند الجغرافي كلوديوس بطليموس. وفي الدليل البحري الروماني المعروف باسم (*Stadiasmus Maris Magni*)، حيث وجه ذلك الدليل البحارة إلى الرسو في هذين الميناءين لأمنهما، كما أن السفن يمكن أن تزود فيهما بالمياه العذبة. ويعتبر مينائي (زيغريس) و(لادامانتيا) من بين كثير من المراسي الطبيعية الممتدة على طول ساحل البحر الأبيض المتوسط بين الإسكندرية والحدود الليبية. ومنذ عام 2015، يخضع خليج مرسى باجوش لمشروع للبحث الأثري تحت الماء يقوم به مركز الإسكندرية للآثار البحرية والتراث الثقافي المغمور بالمياه بجامعة الإسكندرية، بدعم من مؤسسة أونور فروست البريطانية. وقد كشف مشروع المسح الأثري لمرسى باجوش عن ثروة من المعلومات حول النشاط البحري على طول الساحل الشمالي الغربي لمصر في العصور القديمة. ومن بين الاكتشافات الأثرية عدة شواهد على حطام لسفن من العصور الهلنستية والرومانية والعثمانية، بالإضافة إلى أكبر مجموعة من مراسي السفن القديمة التي تم اكتشافها حتى الآن على الساحل الشمالي الغربي لمصر. من ثم، سوف يتناول هذا البحث مشروع المسح الأثري لمرسى باجوش، وأهم النتائج التي تم التوصل إليها حتى الآن.

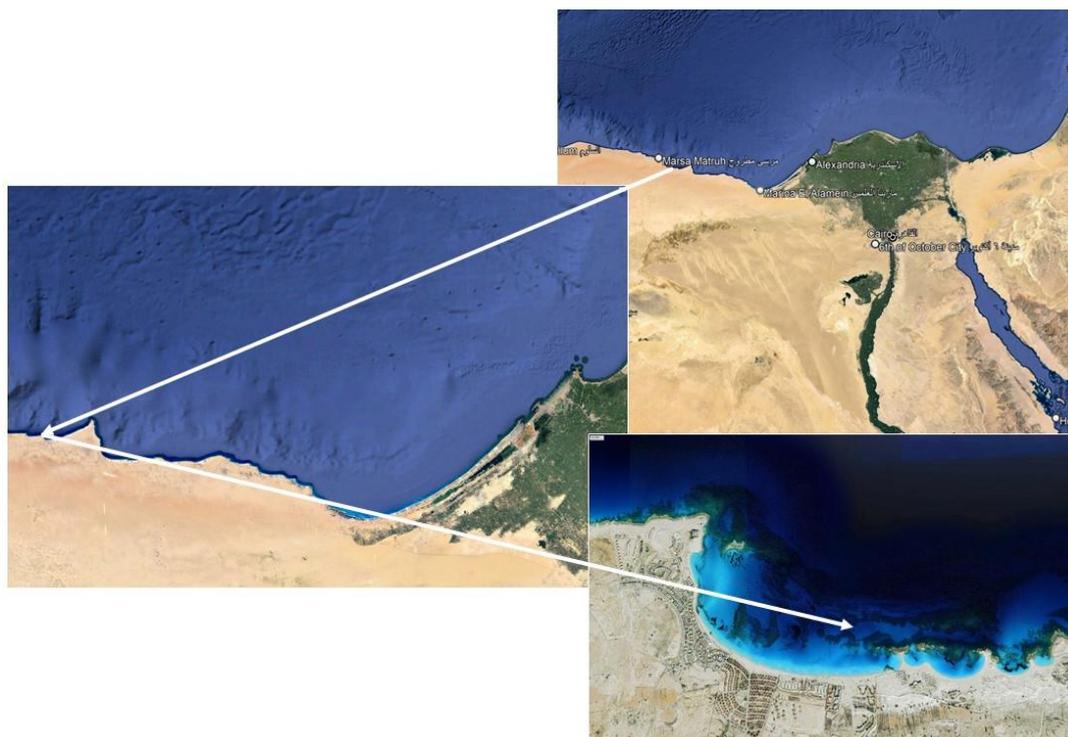
[EN] The site of *Marsa Bagoush* is a large bay located on the Mediterranean coast of Egypt, approximately 250 kilometers west of Alexandria. In antiquity, it comprised the Roman harbours of *Zygris* and *Ladamantia*. The harbours were mentioned by *Claudius Ptolemaeus*, and in the Roman guidebook, the *Stadiasmus Maris Magni*. Sailors were advised to anchor in those two harbours because they were safe and had access to fresh water. *Zygris* and *Ladamantia* are among several natural anchorages that extend along the Mediterranean coastline between Alexandria and the Libyan borders. Since 2015, the sites of *Zygris* and *Ladamantia* have been subject to an archaeological investigation conducted by the Alexandria University Centre for Maritime Archaeology and Underwater Cultural Heritage (CMAUCH), with kind support of the UK-based Honor Frost Foundation. The Marsa Bagoush Research Project (MBRP) revealed a wealth of information on ancient maritime activities along the northwest coast of Egypt. Archaeological finds include evidence of shipwrecks from the Hellenistic, Roman, and Ottoman periods, in addition to the largest collection of ancient anchors to be found on the northwest coast of Egypt. This paper will present the project, its context, goals, methods, and latest results.

KEYWORDS: Alexandria, amphorae, anchors, maritime, Roman, shipwreck.

I. INTRODUCTION

Ships have travelled along the northern coast of Egypt at least as early as the Bronze Age. During the Hellenistic and Roman periods, in particular, Egypt witnessed a surge in maritime activities in response to the expansion of trade and transport networks¹.

As a result, several coastal villages and settlements developed at natural anchorage sites along the northwest coast of Egypt. They played significant roles in sheltering and serving boats and ships travelling along the coast. This has left a wealth of evidence in the archaeological record [FIGURE 1]².



[FIGURE 1]: Marsa Bagoush C. 250 kilometers west of Alexandria. Ancient natural anchorages of *Zygris* and *Ladamantia* © Google Earth Pro 7.3.6.9345. Accessed on 08 /11/ 2023.

Among those settlements were *Zygris* (*Marsa Bagoush*) (31°10'45.33"N, 27°40'6.01"E) and *Ladamantia* (*Marsa Abu Hashafa*) (31°11'14.60"N, 27°38'28.16"E), c. 250 kilometers west of Alexandria. The two sites are c. 3 kilometers apart, yet presently, the whole area is commonly known as Marsa Bagoush³.

Zygris was mentioned by *Claudius Ptolemaeus* in the 2nd century AD. It was described as a village on the coast of the Libyan Nomos in Marmarica⁴. In the 3rd century AD, both *Zygris* and *Ladamantia* were listed in the *Stadiasmus Maris Magni* as harbours of the Egyptian coast. The document stated that «From *Leuce Acte*⁵ to *Zygris* 90 stadia; there is an islet; put it into the place with it on your left; there is water in the sand. From

¹ DASZEWSKI 1990: 15-51; MAJCHEREK & EL-SHENNAWI 1992: 129-136; WHITE & WHITE 1996: 11-30.

² «Ancient Ports in Egypt & Libya». <https://www.ancientportsantiques.com/the-catalogue/egypt-libya/>. Accessed on (15/12/2023).

³ *Marsa* is the Arabic word for (anchorage). It is also often written (*Mersa*).

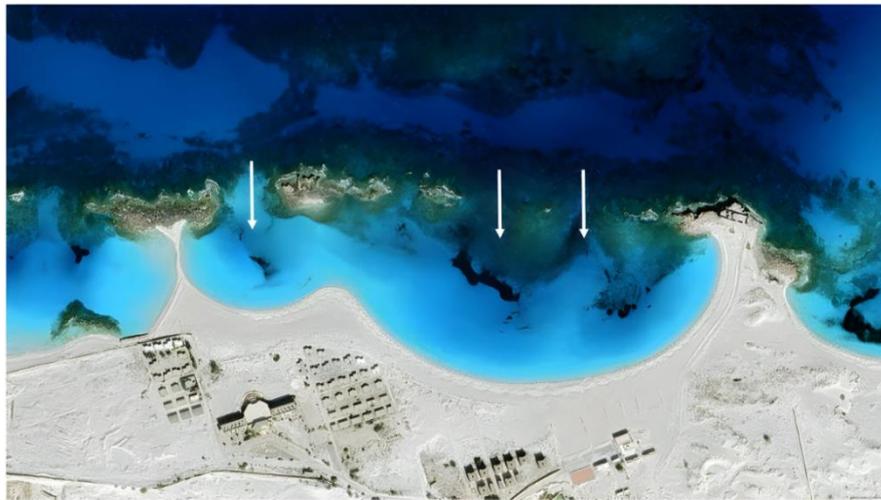
⁴ BALL 1942: 104-105, 131-136.

⁵ *Leuce Acte*, is the present town of Ras Al-Hekma, c. 15 kilometres east of Marsa Bagoush.

Zygris to Ladamantia 20 stadia, close by lies a rather large island: put in with this on your right. There is a harbour accessible with any wind, water is to be found»⁶. Accordingly, it is believed that both harbours had rather safe anchorages and access to fresh water.

II. ZYGRIS AND LADAMANTIA

The site of *Zygris* takes the form of a relatively small bay that measures c.950 meters EW X c.320 meters NS, with a maximum depth of 8 meters. The bay covers an area of c. 0.19 square kilometers, and its coastline extends for c. 1.3 kilometers. The bay is well protected from the east and west by two rocky headlands, and from the north by a small islet and a series of submerged and protruding reefs that reduce wave action, leaving a few narrow passages through which boats could enter and exit [FIGURE 2].



[FIGURE 2]: The Bay of *Zygris* was protected by two rocky headlands and a series of reefs; leaving limited clear passages for vessels to enter. Hence, getting into the bay during rough weather conditions would have been quite hazardous © Google Earth Pro 7.3.6.9345. Accessed on (08/12/2023).

However, the existence of reefs at the entrance of the bay, close to the water's surface, also presented a hazard for ships entering the bay, particularly during turbulent seas. Moreover, given that the average rate of relative sea-level rise in the Mediterranean during the past two millennia was 0.1-0.2mm/year⁷, shallow reefs boarding the bay from the north would have been closer to the surface in antiquity, making the bay more difficult to enter.

On the other hand, the bay of *Ladamantia* is much larger than *Zygris*. It extends for c. 2.7 kilometers NW-SE, with a maximum depth of c.20m. It has an area of c. 1.8 square kilometers and a coastline that extends for c. 3.8km. The bay is protected from the west by a rocky headland (*Abu Hashafa* headland), and an offshore islet (*Abu Hashafa* islet), which shelter the bay from predominant N-NW winds. The bay is mostly clear of dangerous rocks and shoals, which makes it easy and safe to access in any wind [FIGURE 3].

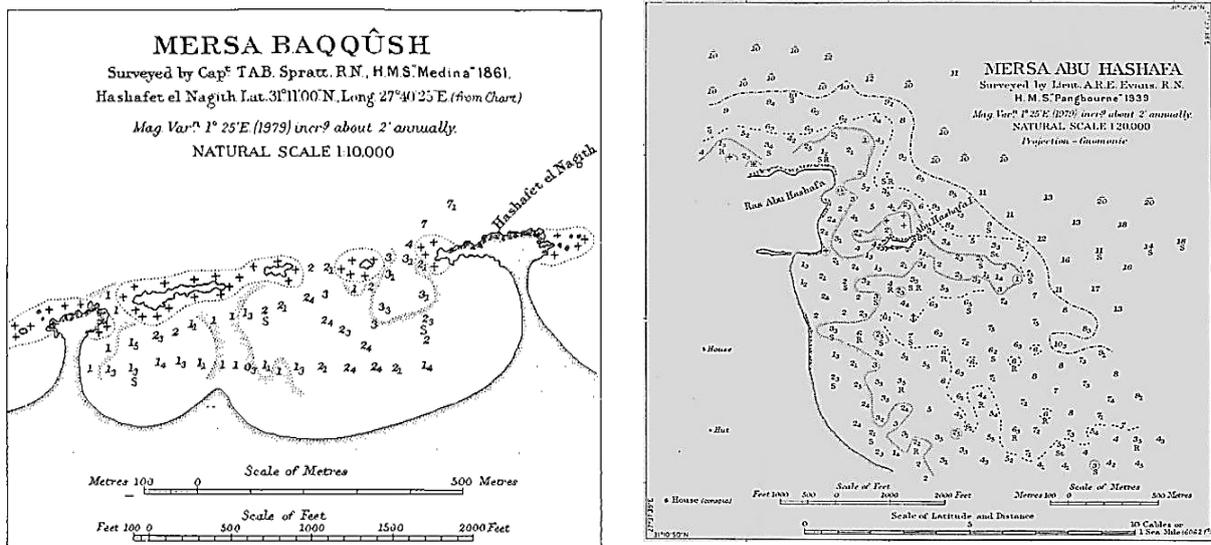
⁶ BERESFORD 2013: 193.

⁷ CHURCH & GREGORY 2001: 641.



[FIGURE 3]: *Ladamantia* easily accessible, well-protected bay and clear of hazardous reefs
© Google Earth Pro 7.3.6.9345. Accessed on (25/12/2023).

As part of a coastal survey of North Africa, the British Royal Navy surveyed the bay of *Zygris* in 1861, and the bay of *Ladamantia* in 1939. These surveys produced the first hydrographic maps of both sites, which clearly show the reefs that protect both sites and them to be used as natural anchorages [FIGURE 4]⁸.



[FIGURE 4]: Left: A hydrographic survey of Marsa Bagoush (*Zygris*) by the Royal Navy vessel HMS Medina in 1861. Right: A hydrographic survey of *Mersa Abu Hashafa* (*Ladamantia*)
© The Royal Navy Vessel HSM Pangbourne in 1939.

Moreover, there is ample evidence that indicates the use of the site of Marsa Bagoush⁹ as a major transit camp for the Royal Air Force during WWII¹⁰. The first mention of archaeological remains in Marsa Bagoush appeared in a publication in 1996, in which

⁸ WHITE & WHITE 1996: 11-30.

⁹ Alternative names mentioned in WWII documents include Bagush, Baqush, Ma`atin Baqqush, Maaten Bagush.

¹⁰ SHORES et al. 2012: 171; «Back To The Desert ». [Http://113squadron.com/id73.htm](http://113squadron.com/id73.htm). Accessed on (01/12/2023); «N^o.113 Squadron (RAF): Second World War».

[Http://www.historyofwar.org/air/units/RAF/113_wwII.html](http://www.historyofwar.org/air/units/RAF/113_wwII.html) Accessed on (15/12/2023).

the author mentions discovering, in the early sixties, several amphorae underwater.

Some amphorae were intact and exposed, while others were greatly adhered to the rocks. The author believed that the amphorae belonged to an ancient shipwreck from Graeco-Roman times¹¹.

In 1996, the Institute of Nautical Archaeology-Egypt conducted a limited survey of Marsa Bagoush, where a few intact Early Roman amphorae were located. However, no further investigation was carried out at the site until 2015, when the CMAUCH started an underwater archaeological survey of *Zygris* and subsequently extended it to *Ladamantia*.

III. OBJECTIVES AND METHODOLOGY

Archaeological evidence for maritime activities along the Egyptian Mediterranean coastline is scarce. Except for Alexandria, archaeological investigation of harbours and anchorages on the northwest coast of Egypt is quite limited. Hence, the primary goal of the MBRP is to assess the extent and nature of ancient maritime activities along this stretch of the Egyptian coastline. This is done by conducting a systematic underwater survey of the site, which includes locating, recording, mapping, and dating submerged archaeological remains.

Accordingly, between 2015 and 2017, the bay of *Zygris* was thoroughly investigated. Satellite imagery of the site was utilized to create a base-map on which the location and distribution of archaeological material would be defined. Hence, diving teams conducted a systematic visual survey of the seabed. Once archaeological material was identified, it was tagged and photographed. In areas with significant material concentration, a 10-meter by 10-meter grid was established on the seabed, marked at its corners with SMBs (Surface Marker Buoys), and precisely located using GPS readings from the surface. Subsequently, the contents of the grid were documented using photogrammetry. The survey aimed to identify and document diagnostic archaeological material. Moreover, ceramic samples were collected and raised for documentation, and dating preposes and then redeposited underwater.

Since 2018, the bay of *Ladamantia* has been under investigation. A high resolution georeferenced satellite image of the area was used to define the site's main features. The image was added into a GIS platform and used to create a base map of the site. A virtual grid of 100-meter x100-meters squares was created to cover the entire survey site. The grid is the reference on which survey work is conducted. Consequently, diving teams visually surveyed each square after defining its exact location and limits using a GPS. The survey was carried out using a 50-meter search line held by 4-5 divers with overlapping visibility. Each team was equipped with a DSLR camera, measuring tapes, tags, scale bars, SMBs, and a GPS device. The GPS device was attached to a buoy floating on the surface and connected to a rope held by one of the divers.

Moreover, at the beginning of each dive, the GPS live tracking function was activated with an interval log every 30 seconds throughout the dive; hence, the GPS records the entire track of the dive. When archaeological material was located, the

¹¹ ABDEL ALEEM 1996: 140.

diving team pauses the survey and moves towards the object for tagging, measuring, and photographing. This process normally takes 5-10 minutes, depending on the type and extent of the archaeological material. During that time, the GPS device makes several records at the same point, determining its location. Once this process is accomplished, the survey is resumed.

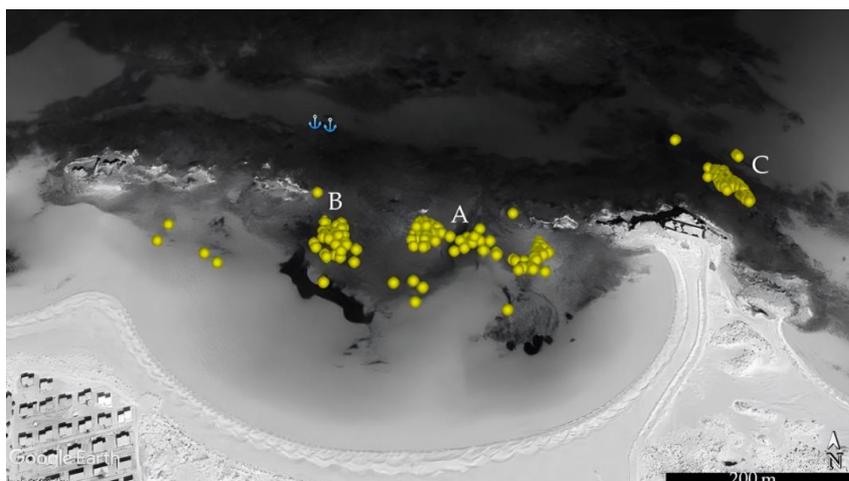
Utilizing such a method in surveying and recording archaeological materials proved to be the most effective given logistical and budgetary limitations. For specific areas and archaeological finds, photogrammetry was utilized. This was used for producing 3D documentation of the finds, developing a digital elevation model (DEM), and producing georeferenced orthoimages of the area.

The orthoimages were then exported to GIS software, which enabled the positioning of the surveyed area on the base map. This setup facilitated an understanding of the distribution of archaeological material and the spatial correlation between them¹².

IV. RESULTS OF THE SURVEY

A. Zygris

In *Zygris*, the underwater survey revealed that the bulk of archaeological material is located on the north side of the bay, adjacent to the series of reefs. The survey resulted in the discovery of three different ceramic assemblages [FIGURE 5].



[FIGURE 5]: Three distinctive assemblages of archaeological material [A, B & C] found at the bay of *Zygris* © Google Earth Pro 7.3.6.9345. Accessed on (02/01/2024).

Two of them (A-B) are located at the southern edge of the reefs, which delimit the bay from the north, at a depth of c.1 meter - 4 meters. The third assemblage (C) is located outside the bay, to the northeast of the eastern headland, at a depth of c. 8 meters – 10 meters. These assemblages consist mainly of concreted broken amphorae, in addition to fragments of glass, wood, and other materials.

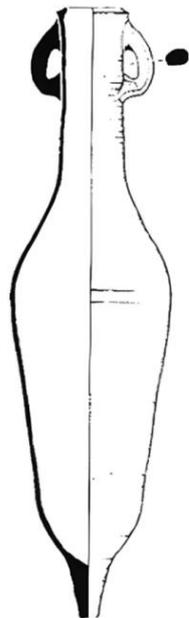
1. Assemblage (A) covers an area of c. 5000 square meters, extending for c.180 meters in a NW-SE orientation. It consists mainly of concreted sherds of two particular types of Egyptian amphorae: the Egyptian Amphora type 3 (AE3) and the Egyptian Amphora type 4 (AE4) [FIGURE 6].

¹² SALAMA & KHALIL 2022: 953-958.



[FIGURE 6]: The remains of AE3 and AE4 amphorae represent the bulk of material in assemblage (A) at Zygris © CMAUCH

The AE3, known as the Biconical Amphora, developed as the first Roman wine amphora produced exclusively in Egypt from the late 1st century BC until the 3rd century AD [FIGURE 7]. This type has several variations; however, it is generally up to 140 centimeters long, with two small looped handles, a long neck, and a broad ribbed body ending in a solid spike¹³.



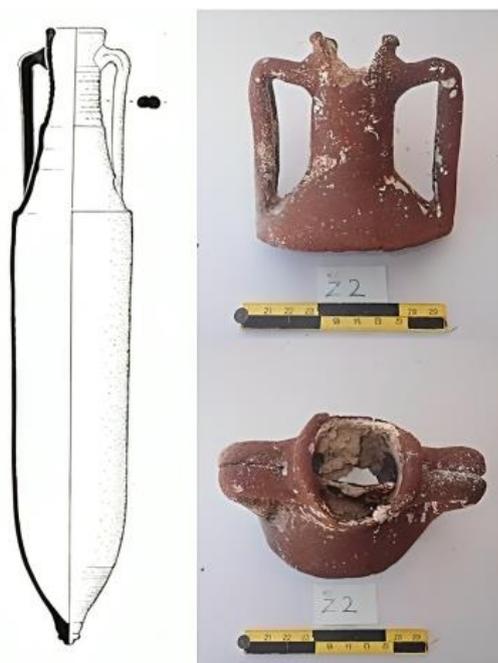
[FIGURE 7]: Left: Illustration of the Egyptian Amphora type 3 (AE3). Right: Diagnostic neck sherds of AE3 amphorae from Zygris © CMAUCH

¹³ Le Centre Alexandrin d'Étude des Amphores.

The AE3 is known to have been manufactured intensively in the Mareotic region west of Alexandria¹⁴. However, AE3 was also produced at sites on the northwest coast of Egypt¹⁵, as well as in the Nile Valley, where evidence for its production is abundant in El-Faiyum and Hermopolis Magna¹⁶.

The AE3 started to appear throughout the Mediterranean from the 1st century AD onward. Several individual samples were identified in the eastern and western Mediterranean, such as on the Amalfi coast, in Puteoli, and the Athenian agora¹⁷. Moreover, a number of AE3 found were associated with shipwrecks, specifically. For example, among the scattered amphorae that were visible around the deep-water Roman shipwreck of the 1st century AD found near Skerki Bank, three AE3 amphorae were recovered¹⁸.

Also, about 30 Egyptian amphorae of Mareotic production, currently in the Museum of Istres, were recovered from a wreck in the Golfe de Foss in France¹⁹. However, in addition to AE3 amphorae, this collection contains a number of Egyptian Amphora type 4 (AE4). The Egyptian Amphora type 4 (AE4) is the second type that forms assemblage (A) in *Zygris* [FIGURE 8].



[FIGURE 8]: Left: Egyptian Amphora type 4 (AE3) © CEAlex.
Right: Diagnostic sherds of AE4 amphorae from *Zygris* © CMAUCH

It is believed that the AE4 was an imitation of the western Mediterranean Dressel 2-4 amphorae, which are among the most common western Mediterranean wine amphorae of the early Roman Empire. They appeared in the Aegean by the end of the 1st century BC, and from there, their manufacture spread in different regions,

¹⁴ EMPEREUR & PICON 1998: 75-88.

¹⁵ DASZEWSKI 1990: 15-51.

¹⁶ TOMBER & WILLIAMS 2000: 41-54.

¹⁷ LAWALL 2003: 157-191.

¹⁸ MCCANN & OLESON 2004: 183-194.

¹⁹ EMPEREUR 1993: 39-47.

particularly in the western Mediterranean, such as Italy, Spain, and France where they were produced until the end of the 2nd century AD²⁰. However, in Egypt, their manufacture extended until the 3rd century AD²¹.

The Mareotic region, west of Alexandria produced large quantities of AE4, mostly along with AE3, which together formed the bulk of amphorae produced in the region. No other production centres for the AE4 were discovered in Egypt, which suggests that its production has been, by and large, concentrated in the Mareotic region.

The AE4 amphorae of the Mareotic origin were exported to the western and eastern Mediterranean as early as the 1st century AD. Several examples were found in Italy, France, Greece, Tunisia, and Turkey²². In addition to the ceramics, assemblage (A) also included a few wooded fragments, and several roof tiles [FIGURE 9].



[FIGURE 9]: Left: A fragment of ancient ship timber from assemblage (A) © CMAUCH
Right: Ceramic roof tiles from assemblage (A) © CMAUCH.

The location, extent, and nature of this assemblage indicate that they are the remains of an Early Roman shipwreck. The vessel was likely carrying a cargo of Egyptian AE3 and AE4 amphorae and sailing westwards. Possibly the vessel tried to enter the bay of *Zygris* during rough seas, but it ended up hitting the reef, scattering its cargo on the sea floor at the southern base of the reef. Because of the shallow depth in this area (0m-4m) and its violent waves, especially during winter, the ship's timber likely would not have survived intact. Consequently, the amphorae broke into clusters of sherds.

In that context, it is worth mentioning that in 1996, INA-Egypt retrieved an intact AE3 amphora from the bay of *Zygris* which was lying in the middle of the bay on a sandy seabed at a depth of c.8 meters. This might mean it is possible to find more remains beneath the sand in the deeper part of *Zygris* bay.

²⁰ PEACOCK & WILLIAMS 1991: 105-106.

²¹ SENOL 2003: 191-211.

²² TOMBER & WILLIAMS 2000: 46-52.

2. **Assemblage (B)** is located c. 100 meters west of assemblage (A), at a depth of 5m-8m. It covers an area of c.2500 square kilometers, extending for c. 60 meters in a N-S orientation. This assemblage is a composite deposit that contains mixed-up materials from different periods. The earliest ceramic sherd discovered within this assemblage belongs to a Knidian *Zenon* amphora that dates to the 3rd century BC [FIGURE 10]²³.



[FIGURE 10]: Left: A *Zenon* amphora from Knidos dating to the period from 234 - 220 BC © CMAUCH. Right: The maker's stamp on the *Zenon* amphora from assemblage (B) © CMAUCH.

However, it was possible to identify many Hellenistic, Early Roman and Late Roman amphora sherds, in addition to coarse ware, roof tiles, a couple of large flat-based amphora, Ottoman glazed ceramic sherds, an Ottoman chamber pot, porcelain sherds, several wooden and iron fragments, and a double wooden block and tackle pulley [FIGURE 11].



[FIGURE 11]: Upper left an Ottoman chamber pot, lower left an Ottoman glazed ceramic plate, and right a double wooden block and tackle pulley from assemblage (B) in *Zygris* © CMAUCH.

²³ CANKARDES-SENOLO 2015: 168-192.

Archaeological material in this area can be seen starting from a depth of c. 5 meters, at a distance of c.60 meters south of the reefs and extending southwards to deeper water in the middle of the bay. The archaeological material is mostly trapped between the rocks on the seabed. Therefore, it is likely that the material belongs to several ships that have sunk during successive periods. Nevertheless, the bulk of archaeological remains seem to date to the early modern period.

It is worth mentioning, however, that outside the bay, to the north of the reefs c. 150 meters to the NW of the ceramic assemblage (B), two, 2-meter-long, iron, four-armed grapnel anchors, were discovered [FIGURE 12]. One of them was on a sandy stretch of the seabed, and the other was caught in the rocky bottom. The location of the anchors suggests that they were cast on the same ship before its wreckage. It seems that N-NW gale was too powerful, so the anchors did not hold, or the ropes snapped, and the ship hit the reef.



[FIGURE 12]: The two grapnel anchors outside the Zygris bay, to the NW of assemblage (B).
© CMAUCH

Based on the above, at least two shipwreck sites were identified within the bay of Zygris, an Early Roman wreck, and an Ottoman 17th – 18th century wreck. It is important to note the possibility of site contamination from archaeological material originating from several other wrecks.

3. Assemblage (C) in Zygris was discovered outside the bay at a depth of 8 meters -12 meters, c.70 meters NE of the eastern rocky headland. The assemblage covers an area of c.750 square kilometers extending for c.60 meters in a NW-SE orientation. This assemblage consists mostly of concreted amphora sherds. However, diagnostic sherds indicate the existence of Egyptian Amphorae type 2 (AE2), which dates to the 2nd BC. Furthermore, in 1996, INA-Egypt retrieved, from the same area, an intact amphora that was described as a Knidian amphora from the 2nd BC. Accordingly, it is evident that assemblage (C) belongs to a Hellenistic shipwreck.

Items of interest that were discovered in association with the ceramic assemblage (C) are two millstones, which comprise the upper and lower parts of a grain mill [FIGURE 13]. The upper millstone measures 38 centimeters in diameter and has a dove-tail-shaped slot, which would have been used for attaching the mill's wooden handle. The lower millstone measures 32 centimeters.



[FIGURE 13]: The upper and lower stones of a grain mill which were found within assemblage (C). Note the dove-tail-shaped slot in the upper millstone which would have been used for attaching a wooden handle © CMAUCH

4. Water in the Sand

As stated earlier, the *Stadiasmus Maris Magni* account of *Zygris* included an obscure reference to «water in the sand», a statement whose meaning was unclear. Therefore, during MBRP a pedestrian survey was conducted in the vicinity of *Zygris* Bay. At approximately 250 meters south of the coastline, a 2-meter-wide shaft leading to an underground cistern complex was identified. Subsequent investigation revealed 12 similar shafts, leading to a network of interconnected rock-cut cisterns at a depth of c. 4 meters, in addition to several deeper wells [FIGURE 14].



[FIGURE 14]: The location of the underground rock-cut cisterns and wells that were found to the south of *Zygris* bay © Google Earth Pro 7.3.6.9345. Accessed on (23/11/2023).

Preliminary analysis suggests the complex comprises of at least three distinct cisterns, each featuring rock-cut interconnected tunnels [FIGURE 15]. In antiquity, these cisterns would have been used for storing rainfall runoff and groundwater. However, no evidence of red plaster (*opus signinum*), a common waterproofing material employed in Roman cisterns, and other water-exposed structures, was observed within the accessible tunnels. Therefore, it is suggested that the cisterns could date to the Hellenistic or early Roman periods.

The existence of this underground water system clearly explains the above-mentioned statements, «there is water in the sand». Moreover, given the evident challenges of accessing the bay, it is likely that the extensive cistern complex at *Zygris* served as a primary attraction for vessels to the harbour.



[FIGURE 15]: Above: The entrance to one of the cisterns in *Zygris*. Below: An underground rock-cut tunnel from the cisterns in *Zygris* © CMAUCH

It is worth mentioning that, at present, several of the tunnels still retain water, which is used by the locals for irrigation purposes. However, additional research is necessary to fully understand the structure, dating, and development of this remarkable underground water system.

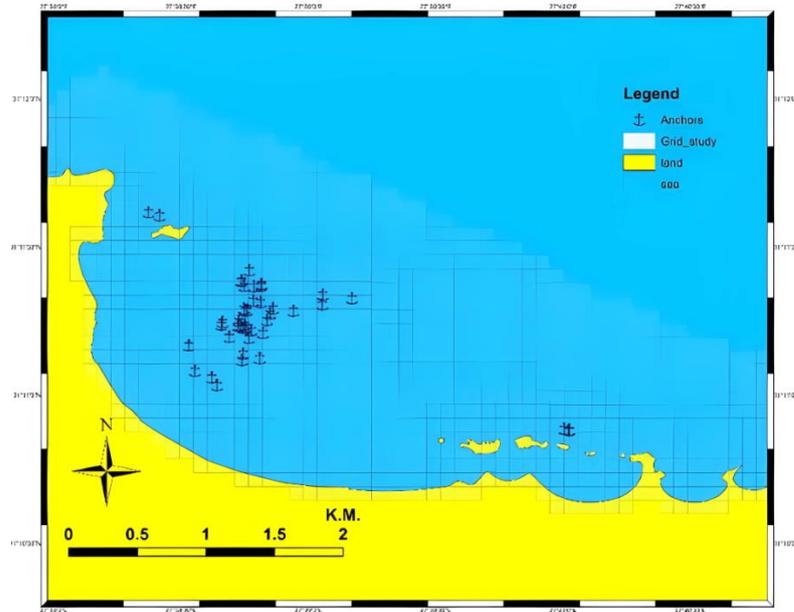
B. Ladamantia

As mentioned earlier, the bay of *Ladamantia* is different from *Zygris*. Its size, depth, and the absence of dangerous reefs made it easier to access and relatively safer to use by ancient vessels. The survey conducted in *Ladamantia* resulted in the discovery of a few intact amphorae of different types. Five Roman amphorae were recorded, raised, and transferred to a conservation laboratory in Alexandria. Those were AE3 (late 1st BC - 3rd AD), AE4 (1st - 3rd AD), LR4 (4th - 6th AD), Spatheian (4th - 5th AD), and Agora K109 (3rd - 4th AD) [FIGURE 16]. Moreover, several clusters of undiagnostic concreted sherds were found within the bay.



[FIGURE 16]: A Spatheion Amphora from North Africa, 4th - 5th AD, was one of the few intact amphorae found in *Ladamantiana* © CMAUCH

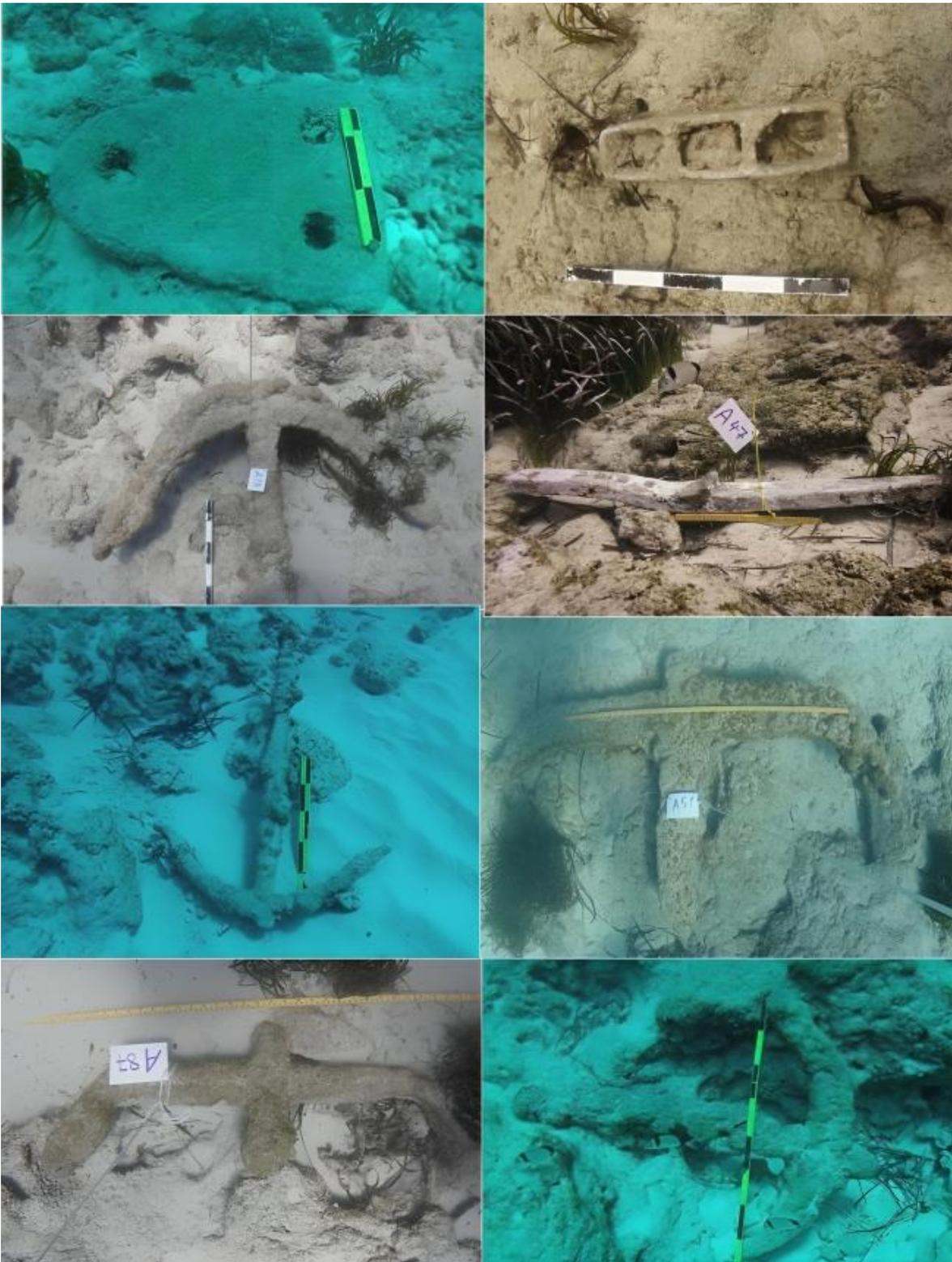
However, the most significant find in *Ladamantia* is a group of 54 ancient anchors and anchor parts of different types, dates, and materials. This collection is spread over an area of c. 60,000 square meters on the leeward side of the headland, and the offshore islet that bounds the bay from the west. This is the area most protected from the prevailing northwestern wind; hence, it would have been the preferable spot for ancient vessels to anchor. It is noticeable that the anchors were found at a depth between 8 -15 meters and at a distance of c. 800 meters from the current shoreline [FIGURE 17].



[FIGURE 17]: The location of the ancient anchors found in Ladamantia © CMAUCH

The collection of anchors recorded so far includes 1 stone anchor, 5 lead collars, 6 lead stocks, 12 iron shanks, 7 iron arms, and 24 iron anchors. These are average-size anchors, the largest of which has a shank that measures 220 centimeters and a sliding stock that measures 200 centimeters. The types of anchors discovered indicate that they mostly date from the Hellenistic to the Late Roman period, with a few examples that could predate that, including a lead anchor-stock core, which probably dates to the early 5th century BC²⁴ [FIGURE 18]. All the anchors were found without any corresponding wreck sites, which raises different possibilities about how they detached from their vessels. During rough weather conditions, anchor ropes might not withstand the strain of ship movements on the surface, hence, they could have been severed, rendering the anchors useless. Alternatively, in situations where anchors became entangled on underwater reefs, the ropes may have been deliberately cut to avoid jeopardizing the ships' safety. However, two isolated iron anchors were identified beyond the main cluster, situated at a depth of 7m between the headland and the islet northwest of the bay [FIGURE 19].

²⁴ TRETHERWEY 2001: 109-1 14.



[FIGURE 18]: The bay of *Ladamantia* has different types of ancient anchors including stone anchors, lead-stock anchors, and iron anchors © CMAUCH



[FIGURE 19]: One of two admiralty pattern iron anchors found between the headland and the islet northwest of the *Ladamantia* bay © CMAUCH

These anchors, featuring an admiralty pattern, were found with scattered metal debris, suggesting the presence of a shipwreck site. Notably, one anchor retains a portion of its attached chain. These anchors can be tentatively dated to the late 19th or early 20th centuries²⁵. The discovery of these isolated anchors serves as a compelling indicator that the *Ladamantia* harbour remained in active use for a significantly longer period than previously recognized, extending well into the modern era and spanning over two millennia.

Further underscoring the continued activity at *Ladamantia* beyond antiquity, the survey yielded another noteworthy discovery: an inscription on the *Abu Hashafa* islet carved in eleven English letters. The inscription identified as a misspelling of «HMS Pangbourne», a Royal Navy minesweeper launched in Renfrew, Scotland, in 1918²⁶. Notably, the initial "H" has eroded, a "U" is missing after the «O», and the «E» is written backwards [FIGURE 20].



[FIGURE 20]: The inscription found on the Abu Hashafa islet. It bears the name of the «HMS Pangbourne». However, the initial «H» has eroded, a «U» is missing after the «O», and the «E» is written backwards © CMAUCH

²⁵ CURRYER 1999: 73-95.

²⁶ «HMS Pangbourne (J 37)». <https://uboat.net/allies/warships/ship/6507.html>. Accessed on (28/12/2023);

«H.M.S. Pangbourne 1918». [http://www.dreadnoughtproject.org/tfs/index.php/H.M.S._Pangbourne_\(1918\)](http://www.dreadnoughtproject.org/tfs/index.php/H.M.S._Pangbourne_(1918)). Accessed on (28/12/2023).

Historical records place the HMS Pangbourne in the Mediterranean during the 1930s. In 1939, it conducted a hydrographic survey of *Marsa Abu Hashafa (Ladamantia)*²⁷. This inscription suggests that the HMS Pangbourne anchored at the bay, and one of its sailors likely carved the ship's name onto the islet's rocks. This finding not only offers tantalizing evidence of the *Ladamantia* harbour's continued use in the 20th century but also underscores the potential for further historical insights embedded within the surrounding landscape.

The underwater survey of *Ladamantia* is ongoing. Until present, less than 25% of the bay has been thoroughly explored. Therefore, it is expected that surveying the rest of the area will reveal more information about maritime activities along this stretch of coastline.

V. CONCLUSION

The archaeological survey of *Zygris* and *Ladamantia* has significantly reshaped our understanding of maritime activities along the northwest coast of Egypt. This research reveals the presence of previously undocumented anchorage sites dating back to the Hellenistic and Roman periods, providing valuable insights into ancient trade networks and communication routes.

The discovery of shipwreck sites, anchors, and other archaeological material sheds light on the types of vessels that frequented these harbours, the cargoes they transported, and the challenges they faced while navigating the region's coastline. The continued use of *Ladamantia* throughout history, demonstrated by the presence of both ancient and modern anchors, showcases the enduring importance of this natural harbour as a maritime haven.

The findings from *Zygris* and *Ladamantia* contribute to a growing body of knowledge about maritime history in the Mediterranean, offering valuable insights into cultural exchange, technological advancements, and economic interactions between different regions. This exceptional discovery sheds light on the scale and intensity of maritime activities that once thrived along this stretch of coastline. It also underscores the pivotal role played by coastal settlements and natural anchorages in facilitating maritime networks and fostering economic prosperity, particularly during the Hellenistic and Roman eras. The ongoing Marsa Bagoush Research Project holds immense potential for future discoveries. Further investigation could reveal additional evidence of ancient maritime practices and the development of this coastal region.

ACKNOWLEDGEMENT

I wish to sincerely thank the Honor Frost Foundation for kindly supporting this project and the Egyptian Ministry of Tourism and Antiquities for permitting us to study this magnificent site. I am also indebted to all members of the CMAUCH team who have been working tirelessly on this project over the past years. Without their sincere efforts and dedication, this work would have never been achieved.

²⁷ WHITE & WHITE 1996: 11-30.

BIBLOGRAGHY

- ABDEL ALEEM, A.: «A New Record of a Ship-wreck from the Greco-Roman Period on the West Coast of Egypt», *the International Journal of Nautical Archaeology* 25/2, 1996, 140.
«Ancient Ports in Egypt & Libya». <https://www.ancientportsantiques.com/the-catalogue/egypt-libya/>. Accessed on (18/12 /2023).
- BALL, J.: *Egypt in the Classical Geographers*, Cairo (Government Press) 1942.
- BERESFORD, J.: *The Ancient Sailing Season: Mnemosyne Supplements History and Archaeology of Classical Antiquity*, 351, Leiden (Brill) 2013.
- CANKARDES-SENOLO, G.: «Early Cnidian Amphora Exports to Alexandria, Egypt», In *Recent Studies on the Archaeology of Anatolia*, edited by ERGÜN, L. & PATACI, S., BAR International Series 2750, Oxford (Archaeopress) 2015, 169-192.
- CEALEX, «Le Centre Alexandrin d'Étude des Amphores». <http://amphoralex.org/amphores/AE/AmphoresAE3.php>. Accessed on (28/12/2023).
- CHURCH, J.A. & GREGORY J.M.: «Changes in Sea Level», in *Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, edited by HOUGHTON, J.T., DING, Y., GRIGGS, D. J., NOGUER, M., VAN DER LINDEN, P.J. & DAL, X., Cambridge (Cambridge University Press) 2001, 639-694.
- CMAUCH, «Alexandria Centre for Maritime Archaeology and Underwater Cultural Heritage», www.cmauch.org. Accessed on (25/12/2023).
- CURRYER, B.N.: *Anchors: An Illustrated History*, Maryland (Naval Institute Press) 1999.
- DASZEWSKI, W.A.: «Excavations at Marina El-Alamein 1987-1988», *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo* 46, 1990.
- EMPEREUR, J.Y. & PICON, M.: «Les Ateliers d'Amphores du Lac Mariout», in *Commerce et Artisanat dans l'Alexandrie Hellénistique et Romaine*, edited by EMPEREUR, J.Y., *Bulletin de Correspondance Hellénique, Supplement* 33, 1998, 75-88.
- EMPEREUR, J.Y.: «La production viticole dans l'Égypte Ptolémaïque et Romaine», in *La production du vin et de l'huile en Méditerranée*, edited by AMOURETTI, M.C. & BRUN, J.P., *Bulletin de Correspondance Hellénique, Supplement* 26, 1993, 39-47.
- H.M.S. Pangbourne 1918. [http://www.dreadnoughtproject.org/tfs/index.php/H.M.S._Pangbourne_\(1918\)](http://www.dreadnoughtproject.org/tfs/index.php/H.M.S._Pangbourne_(1918)). Accessed on (28/12/2023)
- «HMS Pangbourne (J 37)». <https://uboat.net/allies/warships/ship/6507.html>. Accessed on (28/12 /2023).
- «Imperial War Museums». <https://www.iwm.org.uk/collections/item/object/205121332>. Accessed on (28/11/2023).
- LAWALL, M.: «Egyptian and Imported Transport Amphorae», In *Excavations at Coptos (Qift) in Upper Egypt, 1987-1992*, edited by HERBERT, S. & BERLIN, A., *Journal of Roman Archaeology* 53, 2003, 157-191.
- «Le Centre Alexandrin d'Étude des Amphores». <http://amphoralex.org/amphores/AE/AmphoreAE3.php>. Accessed on (11/11/ 2023).
- MAJCHEREK, G. & EL-SHENNAWI, A.: «Research on Amphorae Production on the Northwestern Coast of Egypt», *Cahiers de la Céramique Égyptienne* 3, 1992, 129-136.
- MCCANN, A.M. & OLESON, J.P.: «Deep-Water Shipwreck off Skerki Bank: The 1997 Survey», *Journal of Roman Archaeology, Suppl.* 58, 2004, 224.
- «N°.113 Squadron (RAF): Second World War». http://www.historyofwar.org/air/units/RAF/113_wwII.html. Accessed on (27/12/ 2023).
- «N°.113 Squadron». <http://113squadron.com/id73.htm>. Accessed on (17/12 /2023).
- PEACOCK, D. & WILLIAMS, D.: *Amphorae and the Roman Economy: An Introductory Guide*, London (Longman) 1991.
- SALAMA, M. & KHALIL, E.: «Integrating GIS and Photogrammetric Recording for Extended Seabed Archaeological Research, Marsa Bagoush, Egypt», *ISPRS Journal of Photogrammetry and Remote Sensing* 43/B2, 2022, 953-958.
- SENOLO, A. K.: «The Amphoras from the Bridge Excavation, Gabbari Sector 2», in *Nécropolis 2*, edited by EMPEREUR, J.Y. & NENNA, M.D., *Études Alexandrines* 7/1, 2003, 191-211.

The Archaeology of Zygris/Ladamantia (Marsa Bagoush)

- SHORES, C., MASSIMELLO, G., GUEST, R., OLYNYK, F. & BOCK, W.:** *A History of the Mediterranean Air War, 1940–1945*, vol.2, North African Desert, February 1942–March 1943, London (Grub Street) 2012.
- TOMBER, R. & WILLIAMS, D.:** *Egyptian Amphorae in Britain and the Western Provinces*, *Britannia* 31, 2000.
- TRETHERWEY, K.:** «Lead Anchor-stock Cores from Tektas Burnu, Turkey», *The International Journal of Nautical Archaeology*, 30/1, 2001, 109-114.
- WHITE, D. & WHITE, A.:** «Coastal Sites of Northeast Africa: The Case against Bronze Age Ports», *Journal of the American Research Center in Egypt* 33, 1996, 11-30.