

The Phoenician shipwreck off Xlendi Bay, Gozo – initial observations, size and shipbuilding technologies used

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Abstract: In 2007, during an offshore remote sensing survey aimed at mapping Malta's Underwater Cultural Heritage, a small anomaly was noted in the sonar data. Since then, a team led by the University of Malta has been studying what turned out to be an extremely important discovery.

Found at a depth of 110 m off Xlendi Bay in Gozo (Malta), the Phoenician shipwreck consists of an intact and well-preserved mixed cargo of amphoras, saddle querns and grinding stones datable to the 7th century BC. The paper focuses on a particular aspect of the site – the ship itself. Using the limited evidence available so far, the authors present aspects related to the site's size, the wood used for its construction as well as construction techniques.

Keywords: Phoenicians, Shipwreck, Trade, Amphora, Malta

1. The discovery

In 2007, the University of Malta was conducting a systematic survey off Xlendi Bay in Gozo. The main aim of this survey was to delineate archaeological deposits situated close to a reef under Xlendi tower. During this survey, a small anomaly was noted at a depth of -110m (Fig. 1). The anomaly measure twelve by five meters with an outline proportions that resembled the remains of an ancient ship. Moreover, some of the 'objects' seemed to be of anthropogenic origin.

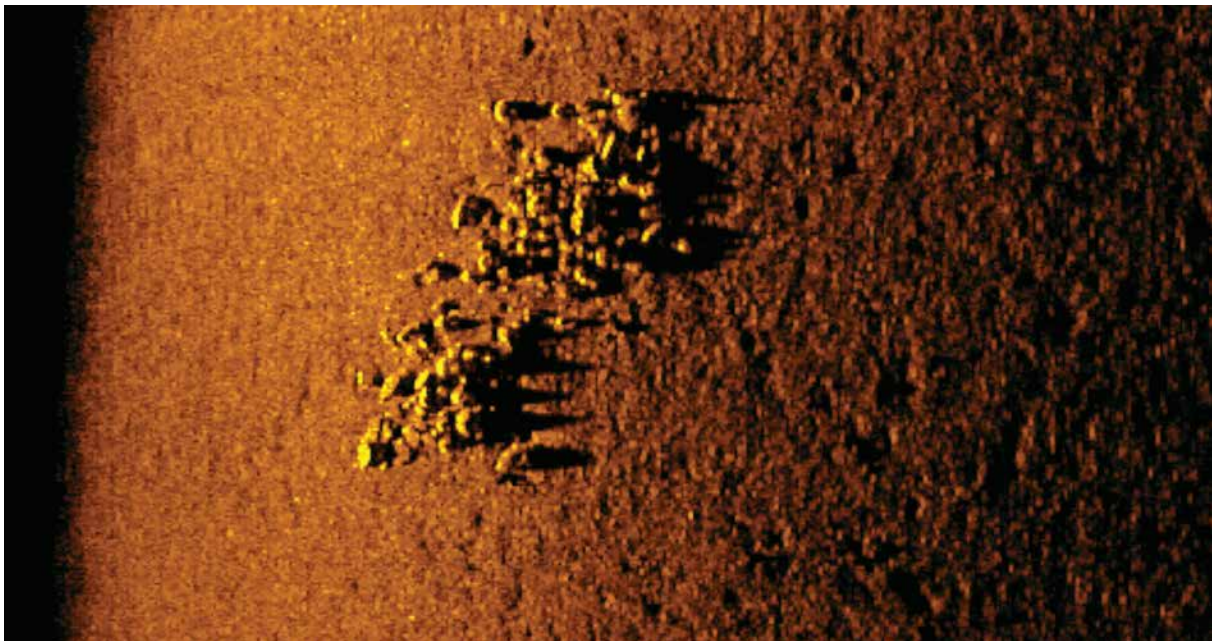


Fig. 1 First SSS image of the site (author: University of Malta)

2. The first visual inspections

In 2009, the site was explored using a remotely operated vehicle (ROV). This ROV survey confirmed that the anomaly was indeed an ancient shipwreck with a mixed cargo of stone blocks and ceramic containers. Using an ROV, the team was able to produce a photomosaic of the entire site which in turn facilitated a better understanding of the site, its age and state of preservation. The site was identified as a 7th century BC shipwreck, with a well-preserved cargo of various types of amphoras and urns as well as numerous saddle querns, found in a concentration of 12 × 8 m.

In 2014, an international team consisting of personnel from the University of Malta, the CNRS (*Centre National de recherche Scientifique*), and Comex returned to the site to acquire high resolution imagery, create a detailed 3D photogrammetric model and to recover some objects. To achieve these objectives, dives were made with a small, manned submersible. This approach permitted the team to inspect the site at proximity as well as to make the first close observations (Fig. 2). The photogrammetric documentation produced on these inspections permitted the planning for object recovery.



Fig. 2 Inspecting the site with the Comex manned submersible (photo: University of Malta / Comex)

Although the site was well-documented in 2014, it was clear that a substantial part of this important archaeological site was still buried in the sediments – a fact evidenced by the presence of objects barely proud of the seabed. Despite the fact that no wooden remains are visible on the seabed, the deposit is quite concentrated, pointing to a wrecking process that must have seen the ship sink in a relatively intact state. It is evident that the cargo is purposely laid out in three sections with the stone blocks at either extremity and the centre of the ship reserved for ceramic objects.

3. Diving the site

Following exploratory dives in 2016 and 2017, a decision was made to conduct diver-led excavations of the site. In order to plan the difficult logistics and conduct this challenging project, an international team of highly qualified technical divers was brought together. This case has the added complexity of being located at a depth of -110m. The fact that no scientific excavations had ever been conducted at this depth meant that certain established techniques for underwater archaeology had to be adapted.

Dives were conducted using rebreathers. It takes approximately 6 minutes to descend to the site leaving divers with a maximum of 14 minutes on the shipwreck, with a final ascent which takes over two hours. Normally, dives last a total of around 3 hours. Safety is paramount, and a series of redundancy measures were put in place to reduce risks. These measures included the carrying of bail-out cylinders by individual divers, the placing of extra bail-out cylinders, the presence of a fast emergency boat and the presence of a fully qualified doctor.

4. Excavating the site

The area chosen for excavation coincides with a part of the wreck that seemed to have been disturbed in the past. Due to earlier disturbance, there was less surface material to clear. An area of two 2 m² grids were installed, which allowed the divers to easily position themselves in a short time after arriving on the site. The grid also facilitated stabilisation; an important matter due to the amount of equipment carried by technical divers (Fig. 3).



Fig. 3 The excavation area (photo: University of Malta / D. Gration)

4.1. The Cargo

After seven seasons of diving at least seven amphora typologies have been identified. Petrographic studies of some of the ceramic containers indicate that some of the cargo originated in Tunisia, Malta and Sicily (Anastasi *et al.* 2021). The saddle querns were confirmed to have been quarried on the island of Pantelleria, situated to the northwest of Gozo (Renzulli *et al.* 2019). As with most ancient wrecks, the amphoras found on the Xlendi site were unsealed. Most of the necks of the containers were found broken or the seals were lost at some point after the ship came to rest on the seabed.



Fig. 4 Wooden stopper of one of the extracted amphoras (photo: University of Malta / A. Bravo-Morata Rodríguez)

Nevertheless, in 2021 a significant discovery was made. Amphoras are brought to the surface are raised with the sediments still inside. The thick and compacted sediment also contains other ceramic fragments, small pieces of wood and numerous molluscs. Contents are sieved in order to separate the sediments from the remains. Sub-samples are retained for further studies. Whilst sieving one of the amphoras, fragments of what turned out to be a large wooden amphora stopper was found. The object is broken in four pieces but is 96% complete, which will allow us to reconstruct its shape (Fig. 4).

4.2. The Vessel

Wooden fragments started to be uncovered during the first excavation season in 2018. These fragments were in secondary contexts and could not be matched to a part of the ship. However, one sample was sent for C-14 dating and a sub-sample was sent for the identification of wood species. The C-14 test was conducted by the Poznan Radiocarbon Laboratory and yielded a date of circa 770BC (2555 ± 35 BP - OxCal v4.4.2 Bronk Ramsey (2020); r:5 Atmospheric data from Reimer *et al* (2020)). The wood was identified by F. Guibal as Aleppo pine or Italian stone pine (*Pinus halepensis* Mill./*P. pinea* L.). This is a common tree found throughout the Mediterranean region in antiquity (Mauri *et al.* 2016: 122–123).

In 2020, the first diagnostic wooden piece was excavated. Among fragments of wood in secondary contexts, a mortise section with a fragment of tenon and a peg still *in situ* was recovered (Fig. 5). This important find was subsequently raised to the surface so further studies could be conducted. Although broken into three pieces, when placed together it is relatively straightforward to understand. It consists of a section with a mortise measuring approximately 4 cm wide but of unknown length made out of Aleppo pine. The tenon (which has been identified as Olive tree, *Olea europaea*) is partially preserved and has a thickness of 0.8 cm. Its exact width and length cannot be measured. The peg, also made from Olive tree, has a diameter of 1 cm with an unknown length. Further in-depth studies are being carried out on all the wooden fragments recovered from the wreck. Based on the current evidences of structural elements, we propose that the hull could have been made from Aleppo pine using a mortise and tenon construction method. This should be confirmed once more elements from the structure appear.



Fig. 5 Fragments of mortise and tenon found within the excavation area (photo: University of Malta)

5. Conclusion

Although the post-excavation phase of the project has only just started, early results are promising. The cargo is shedding light on the economic history and trade networks of the Central Mediterranean during the Archaic period. Previously unknown ceramic typologies, alongside more commonly known objects, are providing new information on how the Phoenicians moved consumables such as wine as well as other functional objects such as the saddle querns. A series of scientific analysis to determine the exact contents of the ceramic containers are currently underway. On the other hand, the wooden fragments are starting to shed light on ship construction methods from a period from which we know very little.

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