

FINAL REPORT SUMMARY:

THE CONSERVATION OF FINDS FROM
UNDERWATER EXCAVATIONS AND SURVEYS -
CONTRACT FOR THE PROVISION OF SERVICES
FOR THE DEPARTMENT OF ANTIQUITIES,
CYPRUS

Funded by the Honor Frost Foundation

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April 2021

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1. Introduction

This report covers the conservation activities undertaken by freelance conservator, Constantina Hadjivasili, as part of her contract (Number: 13.25.007.006/4/2020) with the Department of Antiquities (DoA), Cyprus. The tasks of this project focused on the conservation treatments of ceramic, organic and metal finds that were lifted from underwater excavations and surveys between 2008 and 2019. Conservation activities included desalination, mechanical cleaning, physical and chemical stabilization, reassembly and storage of underwater finds. Throughout all conservation work, written and photographic documentation took place. The conservation works described in the present report were carried out from 3rd August 2020 to 2nd April 2021 in the Laboratory for the Conservation of Underwater Finds (LCUF) in Larnaca and were fully funded by the Honor Frost Foundation.

2. Conservation Activities

a) Ceramics

Treatment goals for ceramics included the completion of the desalination process of all ceramics excavated during 2019 and the cleaning, assembly and consolidation some of ceramics from 2018 and 2019 excavations.

i) Desalination process

This process included the desalination of finds (intact amphorae, parts of amphorae, groups of sherds) from 2019 excavations and surveys. At the time of commencement of the contract, these ceramics finds, which had been divided in more than 35 tanks, were in the last stages of desalination. Water baths were changed until conductivity levels were low and chlorides remained below 50 mg/l. The water was replaced 3 times, with the same water volume in each tank, with Reverse Osmosis water. When desalination was completed, the water was pumped out from the tanks and the ceramics finds were left inside the tanks to air-dry slowly (fig. 1).



Fig. 1: Pumping the water out of the tank. Amphorae during air-drying.

ii) Cleaning

The cleaning procedure involved the removal of the calcareous deposits covering the surface of the objects recovered from the Protaras shipwreck excavation in 2019 and from the Dreamer's Bay underwater surveys in 2018 and 2019 (fig. 2). The removal of calcareous crusts and hard marine particles is a big intervention, but essential because the encrustations could be covering significant decoration or manufacture details. The commonly adopted procedure was mainly based on mechanical cleaning (scalpel, pin, chisels), that was carried out in a very gentle and careful way, avoiding any surface damage. The level of cleaning for each ceramic object was dependent on the nature of both the pottery and deposits and also on the strength of their attachment to the pottery surface. Very hard deposits strongly adhered on unstable surfaces were removed to the extent possible without damaging the original surface.



Fig. 2 (a,b): Amphora (ESEA 19-19) and Jug (ESEA 30-19) before and after mechanical cleaning.

c) Reassembly

Reassembling broken ceramics (fragmented amphorae or parts of amphorae) from the Mazotos and Protaras shipwrecks 2019 excavations was also part of this contract. Finds were adhered with HMG Cellulose Nitrate adhesive.



Fig. 3 (a,b): Amphora (ESEA 221-19) and Upper part of an amphora (ESEA 34-19) before and after adhesion.

d) Consolidation

A total of 20 finds (intact amphorae, parts of amphorae), from 2018 Mazotos excavation, required consolidation. The observed damage phenomena concerning the surface of the amphorae can be characterised as exfoliation and flaking off of the original surface and formation of micro-cracks. Loose flakes or edges around losses and cracks required local or overall consolidation to prevent further damage. Flaking areas and micro-cracks were consolidated with the injection of 5%-20% solution of Paraloid B-72 dissolved in acetone. Edges around losses were strengthened with

HMG Cellulose Nitrate adhesive. Excess consolidant was removed with acetone applied on cotton wool swabs (fig.4).



Fig. 4 (a,b,c): Amphorae (ESEA 262-18, 263-18, 271-18) before and after consolidation.

b) Organics

i) Photographic documentation

One of the main objectives of this contract was the photographic documentation of almost 370 organic objects (wood, olive pits, seeds), recovered from underwater excavations between 2008 and 2019. The organic objects were photographed to record their current condition and any possible visible change that may have occurred since their excavation (fig.5).



Fig. 5: Olive pits (ESEA 185-12) and wooden object (ESEA 364-18) during photographic documentation .

ii) Desalination

Part of the conservation of organics was the continuation of the desalination procedure of almost 280 organics objects, which were recovered from a marine environment during 2008 and 2019. The desalination of organic objects is an essential process before any other treatment can take place. Organics were divided in groups in plastic containers, which are currently stored on two fridges. The desalination process continued through a series of deionised water baths, with levels of conductivity and chlorides monitored monthly.

b) Metals

In September 2014 a cast iron cannon was lifted from the Nissia wreck. During the following years the cannon was mechanically deconcreted, desalinated and air-dried by the DoA. After these conservation steps, a thin layer of encrustations and localised corrosion products still remained on its surface. Removing these, completing the surface cleaning and applying a protective coating, in collaboration with DoA staff, was required in order to conclude the conservation treatment of the object.

A combination of mechanical techniques was carefully applied to clean the surface. Sandblasting with an abrasive aggregate proved useful in removing large areas of concretion and the superficial corrosion; Small hand-held tools such as a scalpel and chisel were effective in removing more dense areas of concretion.



Fig. 6 : Iron cannon (ESEA 62-14) before and after cleaning.

In order to provide a barrier against the atmosphere, thereby preventing further corrosion, the cannon had to be coated. The stabilization of the iron cannon was achieved by brushing it with two coats of 2.5% Tannic Acid solution (fig. 7,8). Tannic acid is an inhibitor that reacts with iron ions to form ferric tannate. The ferric tannate forms a passivation layer on the surface of the cannon, which will protect the underlying surface from corrosion.



Fig. 7: Application of Tannic Acid solution.



Fig. 8: Cannon after conservation treatments

3. Documentation

Documentation is part of every conservation assessment or treatment and photographic documentation is the core of the process. Throughout all activities, written and photographic documentation were carried out, which included the production of monthly reports. Before and after conservation treatment each object was photographed to record its condition and all visible damage and repairs. Additional photographs were taken during treatment, when necessary. All the data, including conservation treatment records, were recorded in the DoA's Conservation Treatment Database (digital Microsoft Access Database) and in Excel files.

4. Evaluation of the results and recommendations for future care and conservation needs

The conservation goals within this project have been fully achieved (Table 1). All ceramic finds from the 2019 underwater excavations and surveys have been desalinated, documented and stored. Part of them were reassembled and cleaned wherea samphorae, recovered from the Mazotos shipwrek in 2018, with varying levels of decay have been consolidated. The iron cannon has been cleaned and coated with a protective inhibitor. Lastly, organic finds from various excavations between 2008-2019 were documented and desalinated so that the next treatment step can follow.

<i>CONSERVATION ACTIVITIES ON THE FINDS</i>			
	<i>CERAMICS</i>	<i>ORGANICS</i>	<i>METALS</i>
<i>REASSEMBLY</i>	<i>11</i>	<i>/</i>	<i>/</i>
<i>CONSOLIDATION</i>	<i>20</i>	<i>/</i>	<i>/</i>
<i>CLEANING</i>	<i>46</i>	<i>/</i>	<i>1</i>
<i>LABELLING & MARKING FINDS</i>	<i>164</i>	<i>/</i>	<i>/</i>
<i>DESALINATION</i>	<i>164</i>	<i>280</i>	<i>/</i>
<i>DOCUMENTATION</i>	<i>195</i>	<i>370</i>	<i>1</i>

Table 1: This table shows the conservation activities

The significance of underwater finds as vulnerable and important culture heritage objects is well understood. Further conservation works on the finds can follow at the end of this project. It is suggested that finds are examined yearly for any changes in condition and that the conservation of some amphorae, recovered from the Mazotos 2019 excavation, which present exfoliation and flaking of the surface is completed.