

MARITIME TRANSPORT CONTAINERS IN THE LATE RENAISSANCE: BARRELS AND CASKS FROM THE GNALIĆ SHIPWRECK



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The Gnalić shipwreck is one of the most important post-medieval underwater sites in the Mediterranean. According to archival research, the ship *Gagliana grossa* headed from Venice to Constantinople in late 1583, loaded with cargo of various provenance (Radić Rossi *et al.*, 2013). The merchant goods, intended for market in the Eastern Mediterranean, were packed in a wide range of barrels, casks, boxes and baskets. Unfortunately, not long after its departure from the port of Venice, the *Gagliana grossa* sunk along the central Adriatic coast, next to Gnalić island. Nowadays, this site is an important source of information on the maritime transport containers in the Late Renaissance period.

The aim of this poster is to present the current state of research on the barrels and casks that have been recorded from the site. So far, research has been done on the documentation from the excavation campaigns from 1967 to 1973, and on the archaeological material recovered during underwater excavations conducted from 2012 to 2016.



Fig. 1 – Barrels at the Gnalić site excavated in 2014 (orthomosaic: K. Yamafune, R. Torres, S. Govorčin)



Fig. 2 – Hoops connected with binding material (photo: K. Batur)



Fig. 3 – Hoops on the outer side of the barrel stave (photo: K. Batur)

THE STATE OF THE ART

In the Modern period, wooden barrels have been used for the transport of liquids, food and various merchant goods. Although it is not rare to find them in the cargo of shipwrecks, there are not many barrel collections that have been studied systematically. Researching transport containers such as casks and barrels of various types can yield valuable data, such as information about maritime cooperage, technology of production, provenience and species of the wood, and – most importantly – can provide precise information to calculate ship's tonnage. Also, analyzing the *in situ* position of barrels in the shipwreck can help to analyze the original disposition of the cargo. Great work has been done studying collections from the 1565 shipwreck of *San Juan*, a Basque whaler sunk in Red Bay, Canada, and in the recently published collection of the barrels from the 1686 shipwreck of *La Belle*, sunk in Matagorda Bay in Texas, USA.

The Gnalić shipwreck contains a wealth of information about maritime transport containers. Due to the limitations of the poster, it was decided to focus the research on the barrels and casks which began to be recorded in the 2014 excavation campaign. In total, the database contains 47 casks and 10 barrels, which were folded into the hold of the ship. When the ship sunk, it came to rest on its starboard side, along the underwater slope of the sea bed. As the ship's hull buckled over the centuries and put pressure onto the cargo, the barrels collapsed in the parts where the wood was not supported by the contents of the barrel. Therefore, in most of the cases the barrels are only partly preserved, but studying the surviving sections can help us to understand the nature of the barrels. The barrels consisted of wooden staves, held in place with wooden hoops. These wooden hoops were made of fragile material, and locked into place with bindings made of unidentified vegetable material. Some of the barrel heads are marked with initials, but it is not yet clear whether these initials denote the cooperage workshop, or the colorseller (*vendecolore*) who filled the barrels with coloring materials from his shop. The mark most often appearing on the heads is a monogram with the letters S, Z and a cross (Mileusnić (ed.), 2006), typically found on the heads of barrels filled with lead ingots; it is not yet clear to whom this monogram belonged.

METHODOLOGY OF THE WORK

After cleaning the sediment and removing the ballast stones, the contours of the barrels became more visible. Progressive numbers were assigned to the barrels and casks. Staves and heads of the barrels that were not well-preserved were recorded *in situ*, recovered and stored in the laboratory of the Institute of Maritime Heritage in Tkon – Island of Pašman. Recovered barrel parts included only those found in the surface layer, as it was necessary to remove them in order to reach the hull. More detailed measurements were taken when the barrel parts reached the laboratory. Xylology samples were taken in order to identify the wood used in cooperage production. If a particular stave had enough rings in the section of the wood, a dendrochronology sample was taken.



Fig. 4 - Staves of barrel 1 (photo: K. Batur)



Fig. 4 – Barrels and casks in the Local Heritage Museum of Biograd na Moru (photo: I. Asić)



Fig. 5 – Mark on the cask head, consisting of the letters S, Z and cross (Z. Mileusnić (ed.), 2006)

FUTURE PLANS

First of all, in order to complete the database, the barrels from the Local Heritage Museum of Biograd na Moru will be studied. These barrels were conserved during the 1970s, and although there are just several of them in the exhibition, they can serve as a starting point in establishing the typology of the Gnalić barrels.

The plans for the next excavation season include recovery of one completely preserved cask filled with its original content, calculation of its volume and comparison of its dimensions to the parts of the barrels kept in the laboratory.

This research is still in progress, so it is not possible to draw strong conclusions. However, future plans include detailed study of the typology, tool marks, and cooperage production, along with identification of the contents and the wood that the barrels and casks were made of, following the methodology of the work previously done on the shipwrecks of Red Bay, Canada, and Matagorda Bay, Texas, USA.

Although very often neglected, barrels and casks provide valuable information on the available materials for production of transport containers, including evidence of their technology of production as well as many useful data about the transport of goods. Recent studies have shown that enhancing the methodology for barrel analysis will provide crucial data to scholars, bringing yet another area of fruitful results from sunken ships to the surface. Finally, the goal of the author is to make this unique Gnalić collection into a reference collection, collating results in order to contribute to historical studies of packing and transport containers.

LIMITATIONS

As the conservation facilities available for this project have insufficient space to allow conservation and storage of all the barrels, only the partially preserved barrels were recovered, measured, photographed and stored in the laboratory with future plans for conservation. However, these recovered staves, hoops and heads do not provide sufficient data to obtain a clear picture about their barrel typology, and the incomplete barrel remains do not allow us to calculate the volume of the barrels in the way suggested by Ross and later Loewen (Loewen, 2007; Loewen 2017).

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