

Nalazište Stambedar. Foto J. Macura, arhiva HRZ-a, 2019.
 Stambedar site. Photo J. Macura, HRZ archives, 2019.

REKOGNOSCIRANJA I ISTRAŽIVANJA U HVARSKOM ARHIPELAGU 2018. – 2019. G.

Hrvatski restauratorski zavod - Odjel za podvodnu arheologiju započeo je 2018. godine, podmorska arheološka istraživanja na dva zanimljiva brodoloma u vodama otoka Hvara. Istraživanja su financirana sredstvima Ministarstva kulture RH.

U uvali Dugi na sjevernoj strani otoka Hvara nalazi se antički brodolom iz 4. stoljeća. Nalazište je pronađeno 2018. godine temeljem informacije koju je zaprimio Konzervatorski odjel u Splitu. Iako je istraživanje ovog nalazišta tek počelo, mogu se konstatirati neke informacije. Riječ je o kasnoantičkom brodolomu s teretom sjevernoafričkih amfora i keramičkog posuda. Brodolom se nalazi na dubini od 32 metra, ispod manje kamene stepenice. Na nalazištu je vidljiv veći broj keramičkih tanjura i ulomaka amfora. Na vrhu kulturnih ostataka nalazi se veća količina balastnog kamena. Što pretpostavlja da se brod prevrnuo prilikom potonuća prevrnuo. U 2018. i 2019. godini s nalazišta je prikupljeno deset arheoloških nalaza: pet cjelovitih keramičkih tanjura crvene boje, tri primjerka *tubi fittili* i dva grla s ručkama i dijelom trbuha sjevernoafričkih amfora. Grlo jedne amfore možemo identificirati kao dio sjevernoafričke amfore Keay 25. Ove, na Jadranu iznimno česte amfore imaju cilindrično tijelo, šiljastu nogu te konični vrat s ovalnim ručkama. U istraživanjima diljem Mediterana primijećene su brojne razlike u proizvodnji, tako da je Keay još prije 30-tak godina klasificirao ovaj tip u četiri potkategorije i čak 31 varijantu. Najčešći sadržaj ovog tipa bilo je sjevernoafričko maslinovo ulje. U periodu kasne antike sjevernoafričke provincije izvozile su razne poljoprivredne, ali i keramičke proizvode. Od poljoprivrednih proizvoda svakako treba istaknuti masline i maslinovo ulje. Na brodolomu u uvali Duga pronađeno je i još nekoliko zanimljivih nalaza. Riječ je o *tubi fittili*, keramičkim cijevima manjih dimenzija, dužine uglavnom između 11 i 19 cm. Korištene su za izgradnju svodova i drugih arhitektonskih elemenata. Ovaj brodolom možemo usporediti s nekoliko brodoloma u vodama Sicilije. Kod talijanskog otoka Giglio, u uvali Campese i kod Femine Morte nedaleko Camerina *tubi fittili* se pojavljuju zajedno s sjevernoafričkim amforama. Daljnja arheološka istraživanja zasigurno će donijeti nove spoznaje o ovom brodolomu i njegovom teretu.

Drugi brodolom, odnosno nalazište smješteno je u vodama Paklenih otoka na dubini između 40 i 45 metara. Iako je taj novovjekovni brodolom poznat još od 1986. godine, do sada nije bio istraživ. Tijekom 2018. godine preveden je stručni uvidaj na nalazištu i tada je prikupljeno nekoliko primjeraka keramičkog posuda. S obzirom da su na nalazištu bili vidljivi tragovi devastacije odlučeno je da se u 2019. godine započne manje zaštitno istraživanje. Tijekom kampanje 2019. godine dokumentiran je inventar karakterističan za brodolome iz 17. stoljeća: tri velika željezna silda, od kojih je najveće duljine 3,4 m, šest željeznih topova, ulomci staklenih čaša, više primjeraka keramičkog posuda tipa majolika te brojni predmeti povezani s naoružanjem broda. U arheološkim sondama dokumentirana su četiri keramička predmeta, od kojih treba izdvojiti cjeloviti tanjur s prstenastom nogom. Tanjur tipa majolika s unutarnje strane ukrašen je heraldičkim motivom krunice u žutoj i oker boji. Komparativni primjeri pronađeni su prilikom istraživanja u palači Jakša u Hvaru. Pripada tipu majolike compendiarie i klasičan je primjer radionice Castellu u Abruzzu s kraja 16. i iz prve polovine 17. stoljeća, a osim u Hvaru slični primjeri pronađeni su u Zadru, Splitu i Dubrovniku.

RECONNAISSANCE AND RESEARCH IN THE HVAR ARCHIPELAGO 2018 - 2019

In 2018 the Croatian Conservation Institute – Department of Underwater Archaeology started underwater archaeological research on two interesting shipwrecks in the waters of the island of Hvar. The research was funded by the Ministry of Culture of the Republic of Croatia.

An ancient shipwreck from the 4th century is located in Duga cove on the northern side of the island of Hvar. The site was found in 2018 on the basis of information received by the Conservation Department in Split. Although the research of this site has only started, some information is available. It was a late antique shipwreck carrying a cargo of north African amphorae and ceramic vessels. Shipwreck is located at a depth of 32 meters, beneath a small stone step. A number of ceramic plates and amphora sherds were visible at the site. Cultural remains are topped by ballast stones suggesting that the ship capsized after sinking. Ten archaeological finds were collected from the site in 2018 and 2019: five complete red ceramic plates, three specimens of *tubi fittili*, two necks with handles and a part of a belly of north African amphorae. Neck of an amphora can be identified as a fragment of north African amphora Keay 25. These amphorae are very common in the Adriatic. They have a cylindrical body, pointed foot and conical neck with oval handles. Differences in production have been noticed in the research across the Mediterranean so that some 30 years ago Keay classified this type into four subcategories and as much as 31 variants. North African olive oil was usually kept in these containers. In late Antiquity north African provinces exported different agricultural, and ceramic products. Olives and olive oil definitely need to be mentioned in that context. Several more interesting finds have been found in the shipwreck in Duga cove such as *tubi fittili*, rather small ceramic tubes, measuring between 11 and 19 cm in length. They were used for building vaults and other architectural elements. This shipwreck can be compared to several shipwrecks in the Sicilian waters. *Tubi fittili* are found together with north African amphorae near the Italian island of Giglio, in Campese cove and near Femina Morta near Camerino. Further archaeological research will definitely shed more light on this shipwreck and its cargo.

The other shipwreck, i.e. site is located in the waters of Pakleni islands at a depth between 40 and 45 meters. Although this postmedieval shipwreck has been known from 1986, it has not been explored so far. Professional examination of the site was undertaken in 2018 when several pottery sherds had been collected. Since devastation traces were noticed at the site, a decision was made to start a small rescue excavation. In the 2019 campaign inventory that was characteristic of the 17th century shipwrecks was documented: three big iron anchors (the biggest 3.4m long), six iron cannons, fragments of glass beakers, several examples of ceramic vessels of maiolica type and a number of objects associated with ship armament. Four ceramic objects were documented in archaeological probes, including a complete plate on a ring base. Maiolica plate was decorated on the inner side with a heraldic motif of a crown in yellow and ochre. Comparable examples were found in the research of Jakša Palace in Hvar. It belongs to the maiolica type compendiarie and it is a classical example of the Castell workshop in Abruzzo from the end of the 16th and first half of the 17th century. Similar examples were also found in Zadar, Split and Dubrovnik.



Nalazište Stambedar. Foto J. Macura, arhiva HRZ-a, 2019.
 Stambedar site. Photo J. Macura, HRZ archives, 2019.



Nalazište u uvali Duga, sjevernoafrička amfora. Foto J. Macura / crtež P. Lacković, arhiva HRZ-a, 2019.
 Duga cove site, North african amphora. Photo J. Macura / drawing P. Lacković, HRZ archives, 2019.



Nalazište u uvali Duga. Foto J. Macura, arhiva HRZ-a, 2019.
 Duga cove site. Photo J. Macura, HRZ archives, 2019.



Nalazište Stambedar, brončano brodsko zvonu. Foto J. Macura, arhiva HRZ-a, 2019.
 Stambedar site, bronze ship's bell. Photo J. Macura, HRZ archives, 2019.



Foto: E. Visković, 2018.
Photo: E. Visković, 2018.



Članovi stručnog tima. Foto: E. Visković, 2019.
Members of the professional team. Photo: E. Visković, 2019.



Foto: E. Visković, 2018.
Photo: E. Visković, 2018.

Spomenuti željezni topovi mogu se podijeliti u dvije grupe. Prvoj grupi pripadaju dva lijevana željezna topa, duljine oko 2 m i kalibra oko 10 cm koji se pune s prednje strane. Četiri topa iz druge grupe izrađena su od kovanog željeza te imaju sustav punjenja sa stražnje strane. Ova zadnja grupa topova pripada vrsti okretnih topova koji su bili montirani na ogradu broda. Kombinacija različitih topova nije bila neobična. Naime, tijekom 16. i 17. stoljeća na trgovačkim brodovima mogu se pronaći topovi različitih veličina kalibara, materijala i tehnike izrade. Lijevani željezni topovi na Mediteranu pojavljuju se tek krajem 16. stoljeća posredstvom engleskih trgovaca i gusara. Topovi koji se pune s prednje strane mogu koristiti jače naboje i s obzirom da su izrađeni od jednog dijela u trenutku ispaljenja ne dolazi do gubitka barutnih plinova. S druge strane, punjenje je kompliciranije i znatno sporije od topova s punjenjem straga. Topovi koji se pune straga sastoje se od dva osnovna dijela, cijevi i komore za barut. U našem slučaju topovi imaju i vilicu i ručicu za okretanje i nišan. Njihova velika prednost potvrđena je činjenicom da se prije sukoba moglo pripremiti nekoliko komora s barutom i time ubrzati frekvenciju paljbe. Detalj na koji su topnici morali najviše paziti bilo je prijanjanje komore s barutom na stražnji dio cijevi. Prema arheološkim dokazima, u 16. i 17. stoljeću topovi su bili napunjeni tijekom plovidbe.

S nalazišta je prikupljen i jedan raritetan nalaz – brodsko zvono izrađeno od lijevane bronce. Pronalazak zvona na brodolomima je iznimno rijetko. U hrvatskom podmorju do sada su dokumentirana tek dva brodska zvona od kojih je jedno s godinom 1567. pronađeno na venecijanskom brodolomu iz kraja 16. stoljeća na plitini Sv. Pavao na Mljetu. Drugo zvono nalazi se u privatnoj kolekciji i potječe s brodoloma datiranog u 17. stoljeće koji se nalazi u uvali Saladinac na otoku Biševo. Možemo samo nagađati je li potonuo našeg broda povezano s borbenim aktivnostima ili je uzrok loše vrijeme i greška u navigaciji. Prema svim prikupljenim nalazima, brodolom, čija se lokacija nalazi točno na liniji komunikacije između Hvara i Visa, datiramo u 17. stoljeće.

Igor Mihajlović
Viši konzervator arheolog
Odjel za podvodnu arheologiju
Hrvatski restauratorski zavod



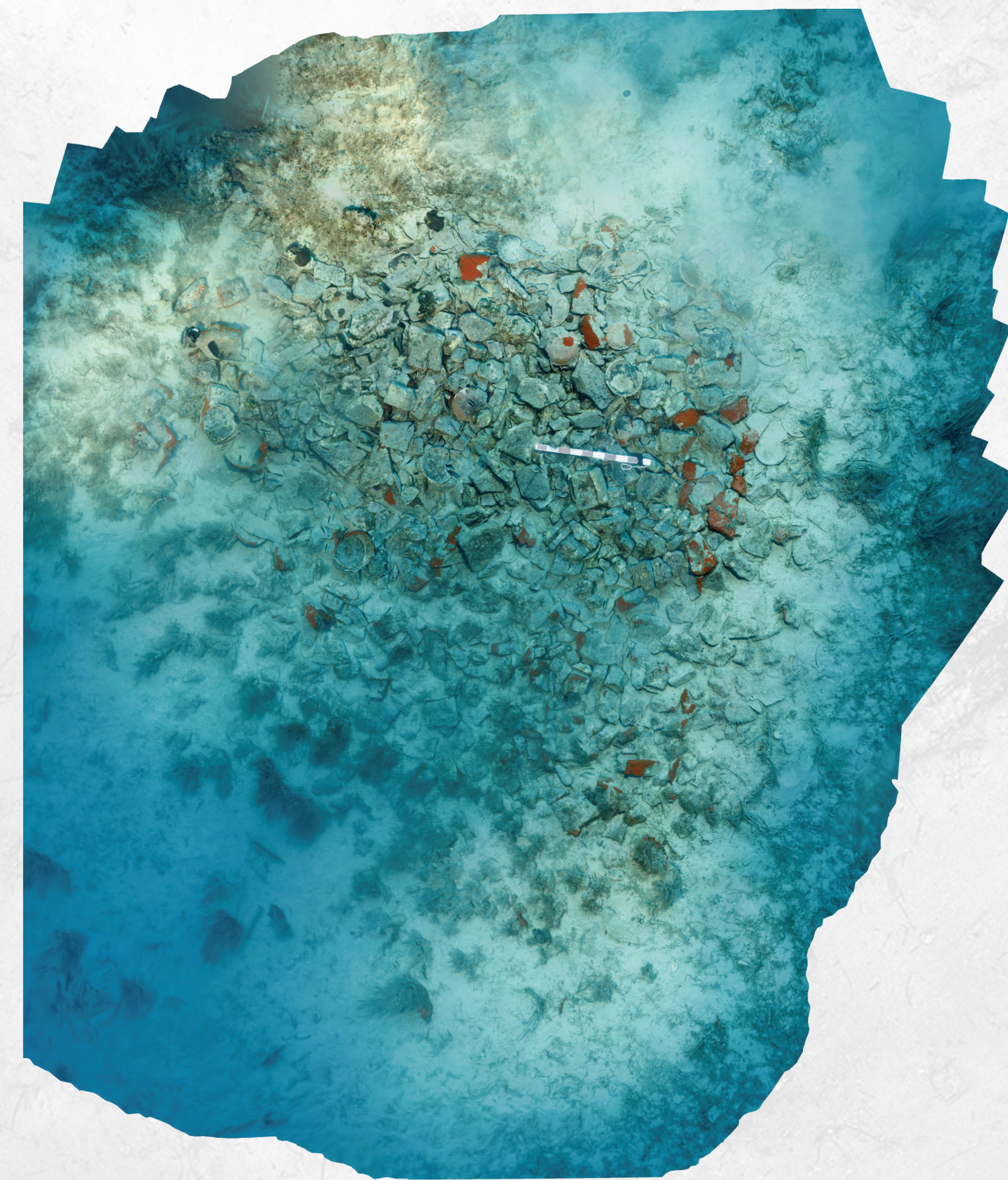
Mentioned iron cannons can be divided into two groups. The first group comprises two cast iron cannons, about 2 m long, with caliber of ca. 10 cm, loaded on the front side. Four cannons from the second group were made of cast iron and have loading system on the back side. The latter group of cannons belongs to pivot guns that were mounted on the ship railing. Combination of different guns was not unusual. Namely cannons of different calibers, materials and production techniques could be found on merchant ships in the 16th and 17th century. Cast iron cannons in the Mediterranean appeared only by the end of the 16th century through mediation of English traders and pirates. Cannons with front loading can use stronger charges and since they were made in one piece, in the moment of firing there is no loss of gunpowder gases. On the other hand, loading is more complicated and much slower than in the cannons with back loading as these cannons have two main parts, bore and gunpowder chamber. In our case they also have breech, lever and sight. Several gunpowder chambers could have been prepared before the fight accelerating firing frequency in that way and that was their biggest advantage. Gunners had to pay attention to adherence of the gunpowder chamber with the back part of the bore. Archaeological evidence suggests that cannons were loaded while sailing in the 16th and 17th centuries.

A rare find was found at this site – a ship's bell made of cast bronze. Bells are rarely found in shipwrecks. In Croatian waters only two ship bells have been documented, one of which (bearing the year 1567) was found in a Venetian shipwreck from the end of the 16th century in the shallow Sv. Pavao on Mljet. The second bell is kept in a private collection and it originates from a shipwreck dated to the 17th century located in Saladinac cove on the island of Biševo. We can only guess if sinking of our ship was related to combat activities, bad weather or a navigation mistake. On the basis of all finds collected, the shipwreck whose location is exactly on the line between Hvar and Vis, is dated to the 17th century.

Igor Mihajlović
Senior conservator archaeologist
Department of Underwater Archaeology
Croatian Conservation Institute



Nalazište Stambedar, olovna pušena zrna.
Foto: J. Macura, arhiva HRZ-a, 2019.
Stambedar site, lead gun bullets. Photo: J. Macura, HRZ archive, 2019.



Nalazište u uvali Duga. Foto: J. Macura, arhiva HRZ-a, 2019.
Duga cove site. Photo: J. Macura, HRZ archives 2019.



Nalazište Stambedar, majolički tanjur. Foto: P. Dugonjić, arhiva HRZ-a, 2019.
Stambedar site, majolica plate. Photo: P. Dugonjić, HRZ archives, 2019.