



# ISTRAŽIVANJE I VAĐENJE OSTATAKA DVAJU SREDNJOVJEKOVNIH BRODOVA U RABU

Research and extraction  
of the remains of two medieval  
ships in Rab

U jugoistočnom uglu građevinskog iskopa na k. č. 140/3, k. o. Rab – Mundanije, u gradu Rabu, tijekom arheološkog nadzora koji je u svibnju 2022. provela tvrtka Kaducej d. o. o., otkriveni su ostatci dvaju brodova, na međusobnoj udaljenosti od oko 4 m. Tijekom lipnja 2022. pod istim je vodstvom provedeno i probno arheološko istraživanje s ciljem provjere orijentacije, dimenzija i stanja očuvanosti nalaza. Tada je utvrđeno da su ostatci broda Rab 1 položeni u smjeru sjeveroistok-jugozapad, u dužini od oko 7 m i širini od oko 2,5 m, a sa sjeveroistočne se strane podvlače pod profil građevinskog iskopa. Ostatci broda Rab 2 zatečeni su u daleko lošijem stanju, a očuvali su se na površini od oko 3 m<sup>2</sup>. Radiokarbonske analize izdvojenih uzoraka (uzorci su analizirani u laboratoriju Beta Analytic Testing Laboratory, pod oznakama Beta – 630201 i Beta – 630202), rezultirale su datiranjem ulomka rebra broda Rab 1 u 14. stoljeće (1300 – 1370 cal AD), a ulomka platice broda Rab 2 u

  
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Remains of two ships were discovered, at a distance of about 4 m from each other in the southeast corner of the construction trench at cadastral parcel 140/3, of the cadastral municipality Rab - Mundanije, in the city of Rab, during the archaeological inspection carried out in May 2022 by the company Kaducej Ltd. In June 2022, the same company conducted archaeological trial excavation with the aim of checking the orientation, dimensions and state of preservation of the finds. It was determined that the remains of ship Rab 1 were laid in a north-east-southwest direction, with a length of about 7 m and a width of about 2.5 m, and on the northeast side they were under the profile of the construction trench. The remains of ship Rab 2 were found in a much worse condition, and were preserved in an area of about 3 m<sup>2</sup>. Radiocarbon analyses of the collected samples (the samples were analyzed in the Beta Analytic Testing Laboratory, under desig-



Pogled s jugoistoka na gradilište na k. č. 140/3, k. o. Rab – Mundanije (foto: I. Radić Rossi)  
View from the southeast of the construction site at cadastral parcel 140/3, Rab – Mundanije (photo: I. Radić Rossi)



Izvadak iz austrougarskog katastarskog plana iz 1828. godine, s označenom lukom na sjeveroistočnom kraju (<https://maps.arcanum.com/en/map/cadastral>)  
Segment of the Austro-Hungarian cadastral map from 1828, with the port marked at the north-eastern end (<https://maps.arcanum.com/en/map/cadastral>)





Ostatci broda Rab 2 (foto: A. Mitrović)  
Remains of ship Rab 2 (photo: A. Mitrović)

15. stoljeće (1407 – 1456 cal AD), što je istraživače uputilo na zaključak da je prvi brod korišten tijekom 15. stoljeća, a drugi nešto kasnije. Po završetku probnog istraživanja ostatci brodova pokriveni su geotekstilom i zasuti sedimentom (Tresić Pavičić 2022).

Na tom mjestu tijekom druge polovice 20. stoljeća izgrađen je hotel Istra, koji je nedavno srušen kako bi se na njegovu mjestu izgradio hotel Mareta. Riječ je o prostoru nekadašnje rapske luke koja je još postojala tijekom prve polovice 19. stoljeća. Na karti Habsburške Monarhije, izrađenoj tijekom vojnog snimanja 1869. – 1887., vidi se već izgrađena obala, a prostor nekadašnje luke potpuno je zatrpan (<https://maps.arcanum.com/en/map/thirdsurvey25000/>).

Istraživanje i vađenje ostataka brodova provedeno je u vremenu od 1. do 21. prosinca 2022., u prilično nepovoljnim vremenskim uvjetima. No, iako su kišna razdoblja ometala rad na terenu, vlažni su uvjeti pogodovali stanju brodova, a istraživačka akcija s uspjehom je privedena kraju. Istraživanje je započelo uklanjanjem površinskog sloja zemlje, istovremeno na prostoru obaju brodova. Brod Rab 2 tijekom prvog je tjedna u cijelosti očišćen. Očuvani drveni elementi obilježeni su oznakama

nations Beta - 630201 and Beta - 630202), resulted in the dating of the frame fragment of ship Rab 1 to the 14th century (1300 - 1370 cal AD), and the fragment of the plank of ship Rab 2 to the 15th century (1407 – 1456 cal AD), which led the researchers to conclude that the first ship was used during the 15th century, and the second somewhat later. At the end of the trial excavation, the remains of the ships were covered with geotextile and backfilled with sediment (Tresić Pavičić 2022).

In the second half of the 20th century, Hotel Istra was built on that site, but it was recently demolished to make way for Hotel Mareta. It is the area of the former port of Rab, which still existed during the first half of the 19th century. On the map of the Habsburg Monarchy, made during a military survey in 1869 - 1887, one can see the coast already built, and the area of the former port completely buried (<https://maps.arcanum.com/en/map/thirdsurvey25000/>).

Research and extraction of the remains of the ships was carried out between December 1 and 21, 2022, in rather unfavorable weather conditions. However, even though rainy periods hindered work in the field, the wet conditions favored the condition of the ships, and the research campaign was



Čišćenje broda Rab 1 (foto: I. Radić Rossi)  
Cleaning of ship Rab 1 (photo: I. Radić Rossi)

RAB.2\_2022\_T01 – RAB.2\_2022\_T035,<sup>1</sup> nakon čega je konstrukcija zaštićena geotekstilom u očekivanju dokumentiranja i vađenja. Ono što se na osnovi oskudnih ostataka moglo primijetiti činjenica je da je brod vjerojatno izgrađen bez središnje kobilice koja je zamijenjena kobilicom platicom, a nakon izrade brodske oplata s donje su strane pričvršćene dvije bočne grede koje su služile za stabilizaciju broda na plitkim pješčanim obalama otoka Raba.

Tijekom čišćenja konstrukcije broda Rab 1 u kremenom je dijelu pronađena jedna dobro očuvana drvena žlica, a dio manje žlice pronađen je i u skupini granja iza oštećene krme. Nešto dalje prema pramcu pronađen je i drveni kolotur promjera desetak centimetara. Osim toga, vrijedi istaknuti i pronalazak nekoliko skupina koštica maslina tik uz brodsku konstrukciju, koje najrječitije svjedoče o korištenju broda u svakodnevnom životu srednjovjekovnih stanovnika Raba. Konstrukcija je očuvana od krme do devetnaestog rebra prema provi, gdje je, nažalost, prekinuta betonskom ispunom koja podržava betonsku ogradnu gredu. S njezine

brought to an end successfully. The research began with the removal of the surface layer of earth, simultaneously in the area of both ships. During the first week, ship Rab 2 was completely cleaned. The preserved wooden elements are marked with the marks RAB.2\_2022\_T01 – RAB.2\_2022\_T035<sup>1</sup>, after which the structure is protected with geotextile pending documentation and extraction. What could be noticed on the basis of the scarce remains is the fact that the ship was probably built without a central keel, which was replaced by a keel plank, and after the construction of the ship's planking, two side beams were attached to the bottom, which served to stabilize the ship on the shallow sandy shores of the island of Rab.

During the cleaning of the structure of ship Rab 1, one well-preserved wooden spoon was found in the stern part, and part of a smaller spoon was also found in a cluster of branches behind the damaged stern. A little further towards the bow, a wooden pulley with a diameter of ten centimeters was also found. Furthermore, it is worth highlighting the

<sup>1</sup> Oznaka T iskorištena je kao kratica za englesku riječ *timber* u značenju drvenog elementa brodske konstrukcije. Oznaka je odabrana s obzirom na stanje brodske konstrukcije i nemogućnost determiniranja svih njezinih dijelova.

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Istraživačka ekipa na terenu; gore, slijeva nadesno: Robert Kordić, Branimir Cvrtila, Davor Matešić, Paulo Škibola, Ana Mitrović i dolje, slijeva nadesno: Nikolina Čuk, Irena Radić Rossi, Ivana Matković i Renata Zorkić (foto: V. Perić)  
 Research team at the site; above, from left to right: Robert Kordić, Branimir Cvrtila, Davor Matešić, Paulo Škibola, Ana Mitrović and below, from left to right: Nikolina Čuk, Irena Radić Rossi, Ivana Matković and Renata Zorkić (photo: V. Perić)

južne strane, oko sredine broda, nalazi se veliko oštećenje uzrokovano djelovanjem bagera. Čitava je konstrukcija izrađena pomoću rebrenica i rebrenih nastavaka koji su u stražnjem dijelu broda pričvršćeni uz dijelove rebrenica prema krmu, a u njegovu prednjem dijelu uz dijelove rebrenica prema provi. I u slučaju broda Rab 1 utvrđeno je kako je pri njegovoj izgradnji centralna kobilica zamijenjena kobiličnom daskom, a dvije bočne gredice poslužile su za stabilizaciju brodske konstrukcije.

Postojeće su rebrenice obilježene oznakama RAB.1\_2022\_FT 01 – RAB.1\_2022\_FT 18, a otisci nepostojećih rebrenica obilježeni su oznakama RAB.1\_2022\_FTI 00 i RAB.1\_FTI 09. Očuvani rebreni nastavci obilježeni su oznakama RAB.1\_2022\_Fu i pripadajućim brojem. S lijeve strane broda obilježeno je sveukupno 19 platice ili dijelova platice (P), a s desne strane njih 15. Osim toga obilježena je i kobilična daska (KP), krmena statva (SP), bočne kobilice (BK), proveza (St), krmeno zrcalo (STERN) i neidentificirani elementi (UM).

Po završetku čišćenja i obilježavanja, brodovi su snimljeni fotogrametrijski i 3D laserskim skenerom, nakon čega se pristupilo vađenju pojedinih dijelova, ispiranju i dokumentiranju u mjerilu 1 : 1. Svi ele-

ment brodske konstrukcije uzorkovani su, a uzorci poslani na analizu kako bi se odredile vrste drvene građe iskoristene za izgradnju brodova. Istraživanje je privedeno kraju pohranom izvađenih dijelova na desalinizaciju u bazenu koji je osigurao Grad Rab.

discovery of several groups of olive pits right next to the ship's structure, which are most illustrative of the use of the ship in the daily life of the medieval inhabitants of Rab. The structure has been preserved from the stern to the nineteenth frame towards the bow, where, unfortunately, it was interrupted by a concrete fill that supports a concrete fence beam. Extensive damage caused by the action of the excavator was recorded around the middle of the ship on its southern side. The entire structure is made by using floor timbers and futtocks that are attached to the parts of the floor timbers towards the stern in the rear part of the ship, and to the parts of the floor timbers towards the bow in its front part. In the case of ship Rab 1 as well, it was established that during its construction, the central keel was replaced by a keel plank, and the two side beams were used to stabilize the ship's structure.

The existing floor timbers were marked with RAB.1\_2022\_FT 01 – RAB.1\_2022\_FT 18, and the imprints of the non-existing floor timbers were marked with RAB.1\_2022\_FTI 00 and RAB.1\_FTI 09. The preserved futtocks were marked with RAB.1\_2022\_Fu and a corresponding number. A to-



a) Drvena žlica pronađena u blizini rebra RAB.1-2022-F 01; b) Drveni kolotur pronađen u blizini rebrenog nastavka RAB.1-2022-Fu 02 S (foto: I. Radić Rossi)  
 a) Wooden spoon found near frame RAB.1-2022-F 01; b) Wooden pulley found near futtock RAB.1-2022-Fu 02 S (photo: I. Radić Rossi)

menti brodske konstrukcije uzorkovani su, a uzorci poslani na analizu kako bi se odredile vrste drvene građe iskoristene za izgradnju brodova. Istraživanje je privedeno kraju pohranom izvađenih dijelova na desalinizaciju u bazenu koji je osigurao Grad Rab.

Nalazi srednjovjekovnih brodova u Rabu pripadaju istoj brodograđevnoj tradiciji kao i nalazi dvaju srednjovjekovnih brodova iz Nina, koji su 1974. godine izvađeni iz mora, konzervirani i izloženi u Muzeju ninskih starina. S obzirom na to da se grafička dokumentacija koja je pratila vađenje ninskih brodova s vremenom zagubila, ostatci brodova iz Raba, a posebno ostatci broda Rab 1, odličan su izvor podataka za kvalitetnu rekonstrukciju njihova izvornog izgleda.

## LITERATURA / BIBLIOGRAPHY

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<https://maps.arcanum.com/en/map/cadastral>

tal of 19 planks or parts of planks (P) were marked on the left side of the ship, and 15 on the right side. In addition, there were also the keel plank (KP), sternpost (SP), bilge keels (BK), stringer (St), stern transom (STERN) and unidentified elements (UM).

Upon completion of cleaning and marking, the ships were documented via photogrammetry and 3D laser scanning, after which individual parts were removed, washed and documented at a 1:1 scale. All elements of the ship structures were sampled, and the samples were sent for analysis to determine the types of wood used to build the ships. The research was brought to an end by storing the extracted parts for desalination in a pool provided by the City of Rab.

The finds of medieval ships in Rab belong to the same shipbuilding tradition as the finds of two medieval ships from Nin, which were taken out of the sea in 1974, preserved and exhibited in the Museum of Nin Antiquities. Considering that the graphic documentation that accompanied the extraction of the Nin ships was lost over time, the remains of the ships from Rab, and especially the remains of ship Rab 1, are an excellent source of data for a high-quality reconstruction of their original appearance.

