



# Seventh wreck found on the coast in Kadriorg, Tallinn

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## INTRODUCTION

The site of the archaeological excavations carried out in 2020, which revealed a wreck of a wooden ship, is located in the protection zone of the heritage conservation area of the Tallinn Old Town, on the north side of the Kiiikri street at Kiiikri 6 (Fig. 1). The area of the monitored construction site was 5430 m<sup>2</sup>. The study area was the basement pit of the building at Kiiikri 6, bordering with Pikksilma street in the west and Reidi road in the north, and with an empty plot at Kiiikri 4 in the east. The monitored site is situated in the protection zone of the wreck ‘Tver’, which since 2007 is monument no 27886 in the National Register of Cultural Monuments. The construction site was situated on dry land, 80 to 180 metres SW from the wreck in the sea.

Another recently scheduled monument (no 30952) – an uncertain facility comprised of several wrecks – is located 65 metres eastward from the border of the study area. Within the radius of 300 metres of ‘Tver’ this was the seventh timber wreck discovered in the course of five years during the development of the area (Fig. 2). Previously several papers in the present journal have introduced the discoveries (Roio *et al.* 2016; Kraut & Mäss 2018; Kraut 2019; Läänelaid *et al.* 2020; Bernotas *et al.* 2020).

Research results and map data confirm that the area had been a seabed in the beginning of the 20th century, filled in the 1930ies when Tallinn City Government commissioned filling part of the coastal sea in order to plan a beach in Kadriorg (Fig. 3). Ash, construction and household waste was used as infill, which formed a 1.5 to 4 metres thick layer that covered the historic wrecks. Based on the preceding discoveries, the area was considered as a possible find spot of wrecks and the municipal planning department prescribed that all earth removing work at the site should be monitored by archaeologists.



**Fig. 1.** Location of the Kiiikri 6 wreck.

**Jn 1.** Kiiikri tn 6 vraki leiukoha asukohaskeem.

Map / Kaart: Geo-portal of the Land Board / Maa-ameti geoportaal



**Fig. 2.** Location of the wreck sites in Kadriorg. Protected wreck 'Tver' in the sea. The so-called Tivoli wrecks at Pikksilma St. 2 and Tuukri St. 23, discovered in 2015 marked in green, wrecks at Kiiikri St. 2 found in 2017 in purple, the wreck at Petrooleumi St. 12 found in 2019 in orange, the study area at Tuukri St. 25 without finds marked in yellow, the wreck at Kiiikri St. 6 found in 2020 in red.

**Jn 2.** Asendiskeem vrakileiuohtadega Kadriorus. Meres kaitsealune laevavrakk Tver. Rohelisega 2015 avastatud nn Tivoli vrakid Pikksilma 2 ja Tuukri 23, lillaga Kiiikri 2 vrakid 2017, oranžiga Petrooleumi 12 vrakk 2019, kollasega Tuukri 25 leidudeta uuringuala, punasega Kiiikri 6 vrakk 2020.

Map / Kaart: Relief map of Estonian Land Board / Maa-ameti reljefkaart



**Fig. 3.** Location of the study area. The border of the cadastral unit under real-estate development is marked with a yellow line.

**Jn 3.** Uuringuala asukoht. Katastriüksuse piir on markeritud kollase joonega.

Map / Kaart: Geo Portal of the Land Board, historical maps, Topographical map of Estonia 1:25000 (1929), projected by M. Roio 2019 / Maa-ameti geoportaal, ajaloolised kaardid, Eesti topograafiline kaart 1:25000 (1929), töötlus M. Roio 2019

## FINDING AND INVESTIGATING THE NEW WRECK

As a preliminary step, the area was studied with georadar surveys (Roio 2020; Tõnisson *et al.* 2019). This research included five test pits that were made to check the nature of the anomalies. It appeared that attention in this area should be concentrated on those anomalies that lay at the depth of ca. three metres or deeper.

On 19 November 2020 the central part of a large wooden ship came to light in the NE part of the basement pit, approximately at the depth of 3.5 to 4 metres from the present ground underneath the former concrete basement, which was demolished prior to the excavation work (Fig. 4). Construction work was suspended, and the Heritage Conservation department of Tallinn Town Planning Board was notified of the find. Archaeologists of OÜ Muinasprojekt cleaned out part of a large wooden ship, assisted with heavy machinery of AS Temir. The wreck was cleaned out manually using spades and shovels, occasionally the wreck was washed with water to remove soil. In a later stage, when the wreck got covered with falling snow and iced water, it was coated with plastic covers and heaters were used to warm the workspace in order to enable 3D measuring of the wreck. Survey with a metal detector displayed three metal items: a spike, a forged nail and a fragment of a fastening item that requires further verification. No archaeological finds, including stray finds that may have been connected with the ship, were discovered during the excavations. The bottom of the central part of the ship had survived in the length of 11.5 metres and 4 metres in width, with cut-off frames at the above-described depth, covered by an up to 70 cm thick layer of sea sand. Some parts of frames and outer and inner planking were preserved. The cleaned-out part of the wreck was the bottom part of a ship and no indications about the stern or the stem were discovered. Half of the cleaned-out wreck stood on

the site that was required for construction, the rest was located outside the construction area, reaching also to the neighbouring plot. In the surrounding sand layer three one to two metres long frame fragments were found that may have been broken off from the hull.

On-site consultations between the construction company OÜ Kiiikri Kodu, the Expert Council of Archaeology, the Heritage Conservation department of the Tallinn Town Planning Board, the Maritime Museum and OÜ Muinasprojekt led to mutual understanding that it was necessary to specify the scope of the wreck both in the construction area and also further, if possible. The final decision about the future of the wreck was to be based on the results of the continued excavation, which would cast light on the historical value of the wreck, its required preservation conditions and technical possibilities.

The westernmost part of the wreck was excavated in the length of five metres until the preserved end. The construction company visually marked the part of the wreck that according to the construction design would reach two metres into the building – the basement wall was to cross the wreck diagonally (Fig. 5). Consultations about the future of the wreck involved full study of the entire wreck and its preservation either *in situ* or by removing the wreck and sinking it into the sea. Archaeologist in charge and the construction company suggested to cut off crosswise eight metres of the wreck that interfered with the construction and to place this part at an angle of 90 degrees next to the basement of the building. This allowed to additionally clean the floortimbers of the wreck that had earlier been covered with soil, also the eastern side could be partially cleaned in the length of up to 3.4 metres. This indicated that the wreck still continued towards the east, the total length of the preserved part could not be determined since the unearthed part stretched to the neighbouring plot at Kiiikri 4.

A 5 × 4 meters wide ditch reaching the depth of 4.7 metres from the surrounding ground level, was made to the neighbouring site at Kiiikri 4, east of Kiiikri 6. No signs of timbers or other items that could be connected with ships or any digs in the soil were detected, hence it was concluded that the wreck at Kiiikri 6 did not reach as far as the neighbouring building to be erected in the future.

The National Heritage Board, considering the fact that the wreck which was unearthed near the border of the Kiiikri 6 plot did not reach the planned building at Kiiikri 4, decided that



Fig. 4. General view of the wreck from the east.

Jn 4. Vraki üldvaade ida poolt.

Photo / Foto: Ants Kraut

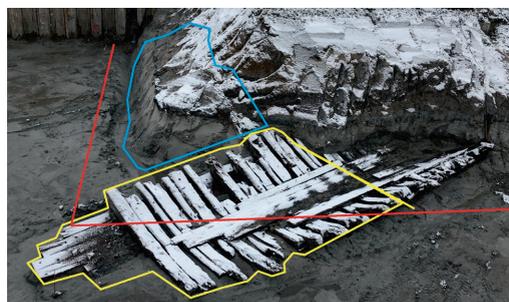


Fig. 5. Relocation plan of the western part of the wreck.

The yellow line designates the cut-off part, the blue line marks the new location and the red line marks the border of the foundation.

Jn 5. Vraki lääneosa ümberpaigutamise skeem. Kollase joonega markeeritud lahtilõigatav osa, sinisega selle uus asend, punasega hoone vundamendi joon.

Photo / Foto: Reimo Ranniku

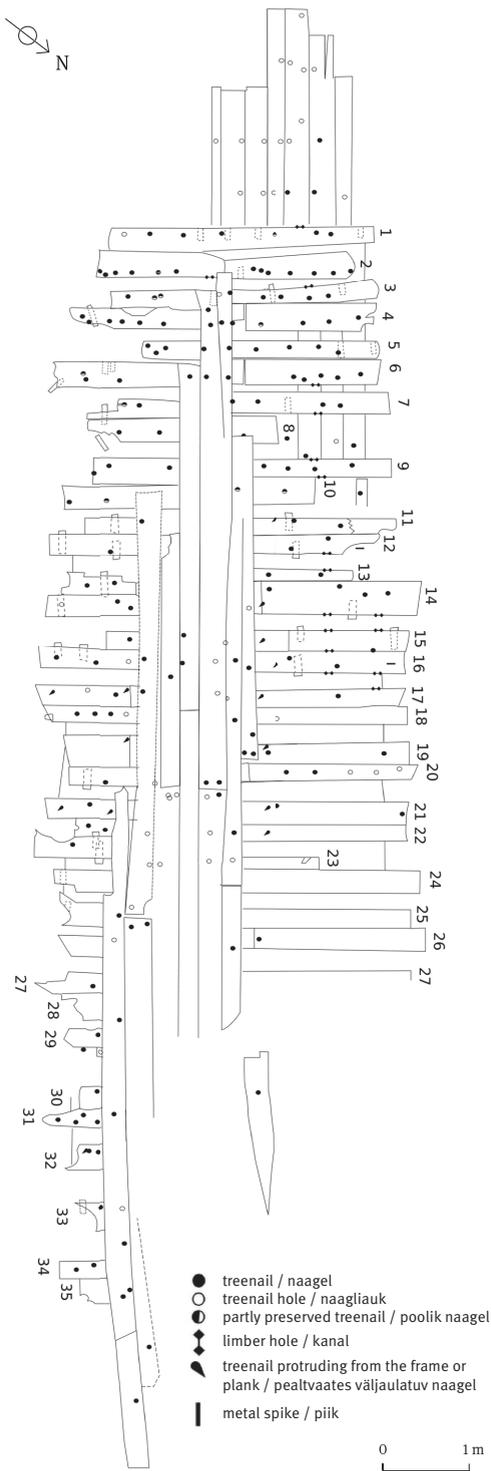


Fig. 7. 2D drawing of the wreck.

Jn 7. Vraki 2D joonis.

Drawing / Joonis: Priit Lätti, Liisa Randmaa

the wreck could be dismantled and the cut-off west part moved intact next to its east part as suggested (Fig. 6). The decision was not to dig out the entire wreck, but rather leave the part which was not affected by the construction in the soil as a scheduled archaeological monument. The cleaned-out section was documented by 3D measuring and precise 2D drawings (Fig. 7). In the process of measuring, cutting and removing, samples for dendrochronological dating were taken from five frames and five inner and outside planks to be analysed in the laboratory of the University of Tartu (Fig. 8).



Fig. 6. Relocating the western part of the wreck.

Jn 6. Vraki lääneosa ümberpaigutamine.

Photo / Foto: Ants Kraut

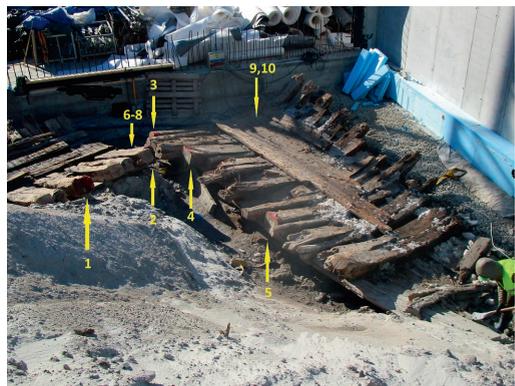


Fig. 8. Locations of the dendrochronological samples analysed in the laboratory of the University of Tartu.

Jn 8. Võetud puiduproovide asukohad. Proovid määrati Tartu Ülikooli dendrokronoloogia laboris.

Photo / Foto: Ants Kraut

## DESCRIPTION OF THE WRECK

The total length of the preserved wreck could not be determined as it remained unexcavated in the soil; the total length of the cleaned-out part was, as noted above, 11.5 metres and the width 4 metres. The survived parts included frames and parts of the inner and outside planking (Fig. 4). All in all 35 frame stations had preserved (Fig. 7), which generally consisted of a floortimber and futtocks. In some cases, the futtocks were made from a smaller, much less worked roundwood. The distance between the frames was ca. 15–20 cm. The width of the hewn details was 28–30 cm, the thickness 22–25 cm. The roundwood futtocks placed next to the hewn ones were 15–20 cm wide and up to 20 cm thick. It is possible that the roundwood details are indicating later repairs or reconstructions of the vessel. The floortimbers and futtocks were fastened to each other by horizontal treenails.

The best-preserved part was the NE part of the wreck, where also the butt-joints between floortimbers and futtocks could be seen. The angle of the floortimbers and the futtocks refers to the ship's waterline i.e. the area where the bottom of the ship converges to the ship's side (Fig. 9). Beneath the floortimbers, directly against the outer planking 9 cm wide and 5 cm high channels were cut into the frames, running longitudinal with the ship (Fig. 9). These were facilitating pumping out bilge water from the ship.

The frames were sawn at the ends, which suggests the ship had been demolished soon after having run ashore or after deliberate beaching. The keel was not preserved, but some frames displayed signs of notches, which may refer to the location of the keel – hence it is possible that the ship had been demolished from more or less the centre.

The bottom planks could only be inspected briefly since the outer side of the ship was not cleaned out during the excavation. Two test pits were made to study the outer planking and it could also be inspected during re-locating the wreck. The surviving outer planks were massive, up to 24 cm wide and 8 cm thick. The planks were fastened to the frames with treenails, the plank seams were smooth, and the planks were placed as carvel planking. No traces of caulking were discovered. The scarf joints were simple butt-joints, placed on top of the frames. No metal nails or other metal units were documented in the planking.

From the internal planking, seven 20–23 cm wide and 5–6 cm thick planks had survived. The planks were tightly placed next to each other and were fastened to the frames by means of wooden pegs. The joints of the planks were smooth, their locations overlapped with the frames. Since large parts of the wreck are not preserved, it is hard to decide if the internal planks are parts of the lower deck of the ship or served as longitudinal strengthening details in the bilge area.

Treenails had survived in almost all frames and both inner and outer planking. The treenails were 3 cm in diameter. In some cases, the treenails had split lengthwise, occasionally they were missing. Some treenails protruded from the frames and were either twisted or



Fig. 9. View on the floortimbers and outer planking from the bottom of the central part.

Jn 9. Vaade laeva kaartele ja välisplangutusele vraki keskosa põhjaservast.

Photo / Foto: Priit Lätti

broken at the ends. These must have been the treenails that were used to fasten the internal planking and suffered in the process of removing the planks. Neither the keel nor the keelson or any other elements have survived. The saw marks on the frames suggest that these details were removed while demolishing the ship soon after the ship had run ashore. Only two metal spikes were discovered during the excavation, which must have been used to connect the keel with the keelson.

### MEASURING THE WRECK

Supplementary to the 3D documentation also a plan (Fig. 7) and cross-section drawings were made of the wreck. For the plan the centreline of the preserved part of the wreck was determined and marked with measuring tape. The centreline provided the longitudinal measurement, and every detail (frame, planking etc.) was measured from the centreline. To map the frames, two measurements were taken from every frame (the sides of the frames), also the distance between frames were verified.

With that method, lengths and thicknesses of the frames were marked on the plan, also the location of the inner and outer planking, the locations of the treenails, the locations of the joints of the frames, the locations of the treenails that connected the frames and also the locations of the limber holes.

For determining the cross-section of the wreck and cross-check the precision of the drawings with 3D scans, a plummet was placed above the best-preserved frame (frame 14) and it was used to measure the convexity of the frame. The measurements were taken in every 5 cm. Similar cross-sections were made of the frame 18. The handmade drawings were digitized using the Inkscape software.

### THE TYPE AND DATE OF THE WRECK

The position of the wreck, the preserved structural parts and the traceable demolition marks suggest that the wreck consisted of the bottom part of the midship section, which is laying on its side. The ship had been demolished for the most part. Some frames displayed visible notches that may indicate the location of the keel, hence it is possible that the frames had been cut directly by the keel.

It is probable, considering the measurements of the wreck and the massiveness of the preserved elements, that it had been a large sailing ship. Since the external features of the ship were similar with the large 18th century wreck found at Kiikri 2, it was assumed, that the ship also dates back to the 18th century. Archival records from that period indicate the beaching of several Russian military transport ships (Veselago 1872, 10, 30). However, the initial dendrochronological results suggest that the ship may have been younger than assumed and built of pine trees that were felled in 1873.<sup>1</sup>

### SUMMARY

In 2020 the central part of a large wooden ship was discovered at the depth of 3.5 to 4 metres while digging the foundation pit of a building at Kiikri 6. The discovered part of the wreck was 11.5 metres long and four metres wide. The hull of the ship had been demolished, the bow and the stern were missing. Apart from an iron spike and a forged nail no other stray finds that could be connected with the ship were discovered. In the surrounding sand layer some frame fragments were found that may have been broken off from the hull. To facilitate

<sup>1</sup> Pers. comm. Alar Läänelaid (TÜ).

construction work at the site the western part of the ship was separated and relocated at the same level at a 90-degree angle next to the eastern part. Both the *in situ* part and the removed part were buried in the former sea bed and covered with the same sand where the wreck had been buried so far. The wreck was covered with up to 3 metres of sea sand. Expert advice about ground water levels, compiled in 2017, assured that after the construction activities stop, the level of groundwater that spreads in the quaternary sea sands recovers, thus leaving the wreck below the groundwater level which should safeguard future preservation of the wreck. Archaeological surveillance at the foundation pit and the underground parking lot at Kiikri 6 continued until May 2021. No more archaeological finds were discovered at the site.

Archaeological Expert Council advised the National Heritage Board to initiate the procedure to schedule both the *in situ* part of the wreck and the adjacent part as an archaeological monument.

## ACKNOWLEDGEMENTS

The discovery, study and preservation of the seventh wreck found at the coast in Kadriorg was a smooth cooperation between several experts. The authors are grateful to Reimo Ranniku, Margus Piispea and Erik Vahemäe (OÜ Kiikri Kodu), Hannes Tõnisson, Kaarel Orviku, Tiit Vaasma (TLÜ Ökoloogia keskus), Maili Roio, Ulla Kadakas (MA), Ragnar Nurk, Boris Dubovik (Heritage Conservation department of Tallinn City Government), Kristjan Kirotam, Angelina Jerjomina, Siim Kingisepp, Lauri Solvak (OÜ Hades Geodeesia), Reet Maldre (TLÜ AT), Liisa Randmaa, Andres Eero, Isabella Glušauskaite (MM), Helle-Silvia Solnask (OÜ Muinasprojekt), Jegor Klimov, Vello Mäss, Alar Läänelaid (TÜ).

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## SEITSMES LAEVAVRAKK KADRIORU RANNAST

Ants Kraut ja Priit Lätti

2020. a tuli Kiikri tänaval 5430 m<sup>2</sup> suuruse Kiikri 6 kinnistu (jn 1) ehitustööde arheoloogilisel jälgimisel päevavalgele järjekordne laevavrakk, mis on viimase viie aasta jooksul seitsmes Kadriorust avastatud puidust laevajäänus (jn 2). Uuringuala oli 20. saj alguseni mere all ning täideti 1930. aastatel (jn 3) kuni 4 m paksuse tuha, ehitus- ja olmeprahi täitekihiga.

Esmalt ilmusid vundamendisüvendis ümbritsevast maapinnast 3,5 m kuni 4 m sügavusel nähtavale puust laevakaared. Väljapuhastamisel paljandus suure puitlaeva põhjaosa, kuid vrakiga seotud arheoloogilisi irdleide ei avastatud (v.a kolm detektoriseirega kogutud metallet). Kuni 70 cm paksuse mere-liivakihi alla mattunud vrakist on alles hävinud aluse

keskosa põhi 11,5 m pikkuses ja 4 m laiuses (jn 4). Säilinud olid laeva kaared, osa välis- ning siseplangutust, vrakk jätkus ahenemata laeva otste suunas. Ehituse alal asus pool vraki jäänustest, ülejäänud asus väljaspool ehitusala ja naaberkiinnistul.

Tööde käigus kaaluti kaasatud muinsuskaitseametnike ja -ekspertide osalusel kogu vraki terviklikku säilitamist kohapeal või uputamisalal meres. Arheoloogi ja ehitaja ettepanek oli vraki ehitusele ette jääv 8 m pikkune osa ristisuunas läbi lõigata ja paigutada 90 kraadi pöörates hoonevundamendi kõrval täiendavalt lahti kaevatavale alale (jn 5). Täiendavalt puhastati vraki põhjaosa kaared ida suunas 3,4 m pikkuselt, selgitades vraki jätkumise ida poole. Idapoolse naaberkrundi Kiikri tn 4 alale kaevatud šurfi põhjal tõdeti, et uuritud vrakijäänused ei ulatunud tulevase naaberhoone alale. Täiendavate uuringute põhjal otsustati vraki lääneosa demonteerida ja teisaldada vahetult idaosa kõrvale (jn 6). Vrakki dokumenteeriti 3D-möödistamise ja detailsete 2D-joonistega (jn 7), lisaks võeti viiest kaarest ning viiest sise- ja välisplangust dendroproovid (jn 8).

Välja puhastatud vrakk on ilmselt suure puitlaeva põhjaosa. Säilinud olid laeva kaared (32), osa välis- ning siseplangutust. Kõrvuti paiknevad tahutud puidust floortimber ning märksa vähem töödeldud, ümarpuidust jätkutimber. Floortimberite all, vahetult vastu välisplangutust on kaartesse lõigatud laevaga pikisuunalised kanalid laiusega 9 cm ning kõrgusega

5 cm, tõenäoliselt pilsivee voolukanalid, mis hõlbus-tavad pilsivee väljapumpamist laevast (jn 9). Kaared on otstest saetud, mõnel juhul ka murtud, mis viitab laeva lammutamisele pärast randa jooksmist. Mõne kaare osas on näha sälgud, mis võivad viidata kiilu paiknemisele ning seetõttu on võimalik, et laev on lammutatud enam-vähem keskjoonelt. Kiil, kiilson ja muud detailid pole säilinud. Saejälgede järgi võib oletada, et nimetatud detailid eemaldati laeva lammutamisel vahetult pärast randa jooksmist. Kaevamistel leiti vaid kaks metallpiiki, mis ilmselt ühendasid kiilu ja kiilsoni.

Laevavraki asendi, säilinud detailide ning laeval jälgitavate lammutusmärkide põhjal võib järeldada, et tegemist on küllali kaldunud laeva põhjadetailiga. Valdavalt on säilinud laeva põhjaosa, kuid osaliselt ka kimm. Laeva parras on lammutatud. Säilinud vraki-osa mõõtmeid ning keredetailide massiivsust arvestades on tegemist olnud suure purjelaevaga. Väliste tunnuste põhjal võiks laeva ehitusaja paigutada Kiikri 2 suure vrakiga samasse perioodi ehk 18. sajandisse. Teisalt viitavad dendroloogiliste uuringute esialgsed tulemused, et laev on tehtud pigem 19. sajandil kasvanud männipuust, mis on langetatud 1873. a.

TLPA ja Muinsuskaitseameti arheoloogia eksperdinõukogude otsuse kohaselt tuleks alustada *in situ* säiliva ja selle kõrvale paigutatud vraki osa mälestiseks tunnistamise menetlust.