

SURVEY OF THE DANUBE BANK AT THE ROMAN MILITARY CAMP IN IŽA¹

Klaudia Daňová – Miroslava Daňová – Igor Murín

DOI: <https://doi.org/10.31577/szausav.2025.suppl.3.21>

Keywords: Iža, Brigetio, Danube, Roman period, military camp, bridge, non-destructive survey, fishing, geophysical survey

Abstract: Sonar researches near the Roman camp in Iža carried out in 2019 and 2021 confirmed the presence of a linear structure that was interpreted as a bridge. The sonar captured four pillars. Pillars 1–3 are located on the Slovak side of the Danube. In 2022, several activities were carried out in the area of the linear structure, which led to the dating of the bridge and resulted in obtaining a first picture of the material composition of individual pillars. Absolute data obtained from wooden stakes from Pillar 2 dated the structure to the 3rd–4th century AD. The low level of the river in the summer months allowed to carry out a GPR survey of Pillar 1, which is located closest to the bank. The research confirmed the presence of a 20 × 10 m solid anomaly buried beneath approximately one metre of gravel and sand deposit. The surface survey revealed four fishing net weights made of stone and Roman building ceramics. Based on analogies from other sites, these finds may represent activities associated with Roman activity in the area.

In 2018, a team for archaeological research below the water surface was established. In the first phase, the research focused on the rivers Váh and Nitra. The goal of these activities was to supplement knowledge of the potential for archaeological sites below the water surface. The team focused mainly on immovable monuments of a technical nature such as bridges and harbours (Daňová/Daňová 2019). With the “revival” of the research at the Roman military camp at Iža near Komárno, interest has shifted to the Danube River and the exploration of the coastal zone in front of the southern entrance to the camp. At the beginning of the research, attention was focused on the comparison of map documents and archival records with the archaeological research carried out during the years (1906–1909; 1912; 1913; 1978–present). In an earlier

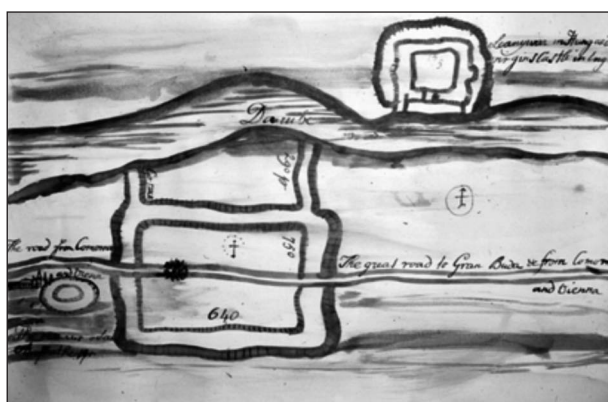


Fig. 1. Drawing of Brigetio and the Roman fort on the north bank by J. Milles from 1737 (Kubitschek 1931, 203).

For this reason, it was important to intensively investigate the river bed in the section in question. However, this was not the first attempt to look below the water surface on the Danube. Already in 1978, the first survey of the river bottom was carried out, at that time with the active participation of our jubilant Jan Rajtár (Fig. 3). The divers managed to discover a larger stone block that could be related to the presence of the

depiction of an 18th-century Roman stone fort (Fig. 1), two lines pointing towards the Danube bank are visible (Kubitschek 1931, 203; Pococke 1743, 245). In 1907 J. Tóth Kurucz documented the western line of this “fortification” and called it *cloaca* (1908, 45, 46, fig. III), but he did not examine the eastern line and did not provide information about its possible existence (Fig. 2). This was later confirmed in further research by K. Kuzmová and J. Rajtár, who identified only wolf pits in the foreland destroyed by military interventions in the 1970s (Kuzmová/Rajtár 1985, 143). By comparing the line at the SW corner of the Roman fort with known examples on the Danube (Drobeta) and the Rhine (Colonia Agrippina and its bridgehead Divitia), we concluded that it could be a fortification related to harbour protection.

¹ The paper was supported by the VEGA grant projects 1/0051/22 and 2/0025/22.

Romans in the area. The activities of the Romans on the Danube are indicated by the finds of iron anchors, votive stone and two stone *cippi* excavated during the modification of the riverbed (Kolník 1977, 170, 171; 1978, 165–171). This information became the basis for the 2019–2021 sonar survey (Daňová *et al.* 2022, 219–228). The result is a bathymetric image² of the river bottom, where four structures were subsequently identified, forming a line crossing the river in the S – N direction. These are directed towards the southern gate of the Roman military camp at Iža on the Slovak side and on the Hungarian side the outcrop is directed east of the Roman legionary camp of Brigetio. After careful analysis of the shape and dimensions of the preserved structures, the team members concluded that these were the pillars of a bridge connecting the two Roman camps. Three of the four identified structures (No. 1; 2; 3) are located on the Slovak side of the border and one on the Hungarian side. As part of the bathymetry of the bed, we also discovered a distinctive structure in the fairway, about 200 m downstream, which we tentatively consider to have been destroyed by one or more pillars from

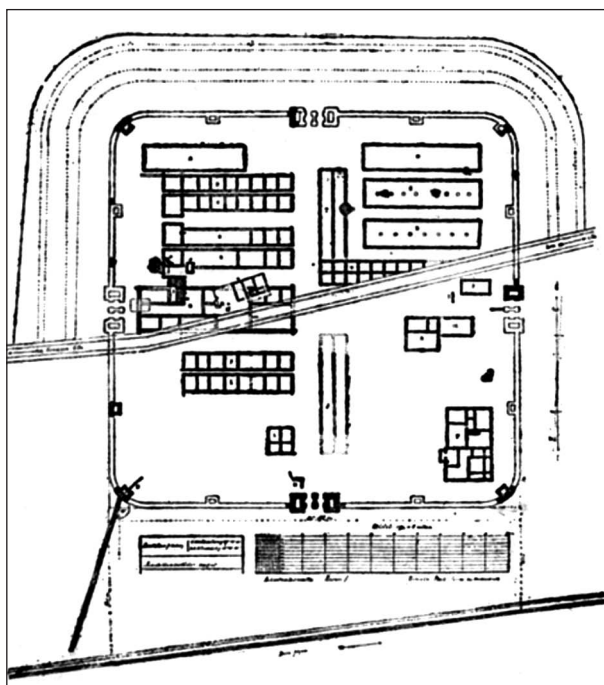


Fig. 2. Ground plan of the Roman fort at Iža based on the archaeological excavations of J. Tóth-Kurucz (Tóth-Kurucz 1908, 45, 46, fig. III).

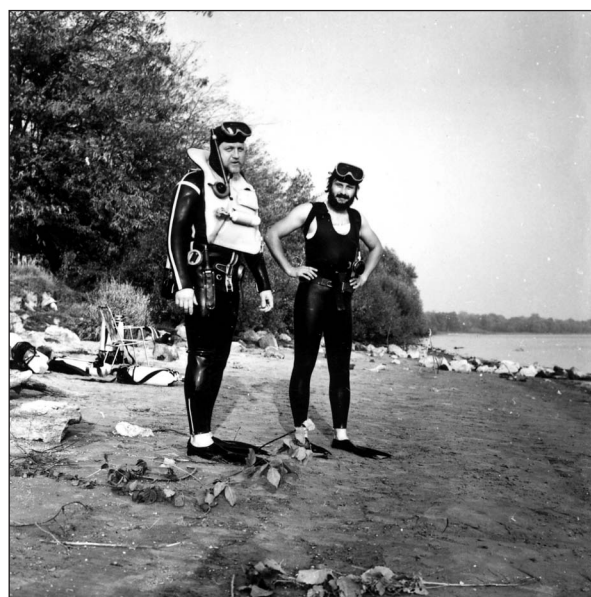


Fig. 3. Ján Rajtár during the first explorations of the Danube in 1978 (photo Archive AŮ SAV).

the bridge line; hence the rubble has been given a separate designation (No. 4) and the pillar in the bridge line, near the Hungarian bank, has been designated as No. 5. In 2022 a dive was successfully carried out to Pillar 2 and a wood sample was taken, which confirmed the dating to the 3rd–4th century AD (Daňová/Daňová/Rajtár, *in print*). From this point on, a team composed of archaeologists, professional divers, and

² The author of the bathymetric plan is the company Helicop, s. r. o.

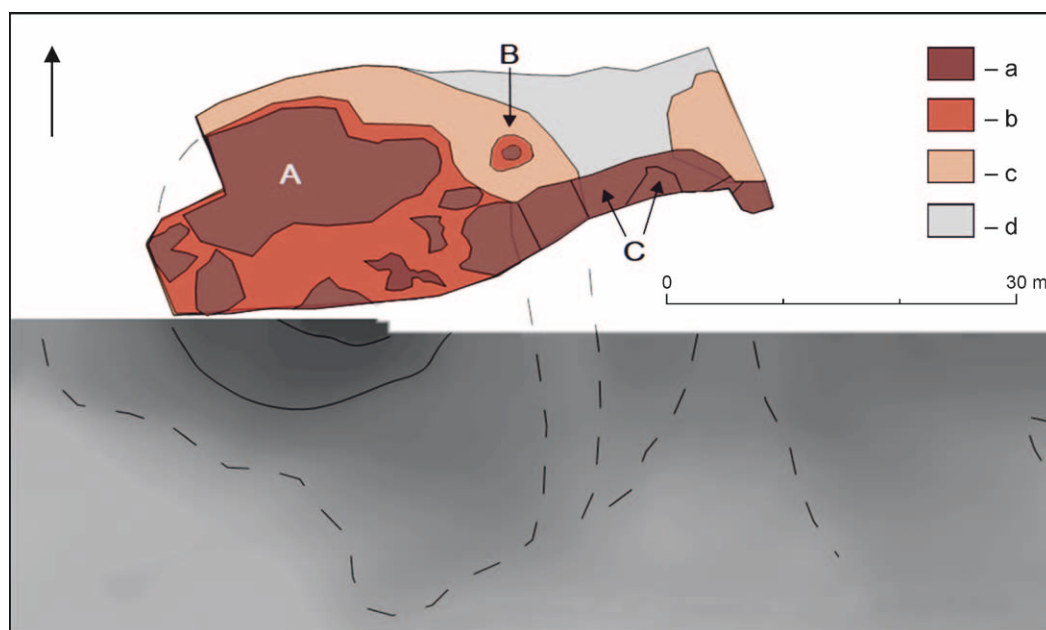


Fig. 4. The dashed line indicates the possible extension of the anomalous areas or their connections with structures visible in the sonar survey (author I. Murín). Legend: a – more compact fill, stone; b – unconsolidated fill, stone, rubble; c – unconsolidated material, gravel, stones; d – finer sediment, sand.

geophysicists focused on developing a methodology for the survey of the individual pillars of the bridge. The pillars are located at different depths and their location requires a modified methodological approach not only due to the depth but also to the conditions of the survey.

NON-DESTRUCTIVE SURVEY OF PILLAR 1

In 2022, a non-destructive survey of the area near the structure identified as Pillar 1 was commenced. It is located closest to the bank almost opposite the southern gate of the Roman camp of Iža-Leanyvár. Unlike Pillars 2 and 3, whose wooden and stone structures extend into the river, Pillar 1 is completely covered by a deposit of sand and gravel. In drier months, such as August and early September in 2022, the level of the Danube dropped. Upon visual inspection of the surrounding area, the presence of the structure was evident. The presumed site was distinguished from the surrounding area by a higher deposit, which was formed by the accumulation of gravel and sand on a solid structure. Favourable conditions allowed GPR surveys of the area, which is submerged for most of the year.

The GPR survey was conducted using the RAMAC X3M, GEOSCIENE MALA (Sweden) system with a shielded antenna operating at a central frequency of 250MHz. Geophysical surveying is beneficial because it is non-invasive, time-efficient and effective. The GPR method is one of the most widely used geophysical methods for screening shallow subsurface structures. At this site it proved to be the most suitable for identifying buried building structures. The method uses the measurement of reflections from transmitted electromagnetic (EM) waves into the subsurface to create an image of the investigated structure of the environment below the surface. One of the main advantages of GPR is the ability to display measured results three-dimensionally.

Geophysical GPR survey was carried out in August 2022 on the left bank of the Danube, in front of the southern entrance to the Roman camp near the village of Iža. The survey was carried out in accessible areas on the bank and exposed bottom of the Danube River at times of low water level. The GPR survey focused on the area of the presumed location of Bridge Pillar 1 (Fig. 4). The survey was made on a relatively flat surface sloping towards the river. The coordinate system was designed with the x-axis running approximately parallel to the river edge. The survey was conducted in one direction in parallel profiles. The density of the GPR record was 0.05 m in the profile direction (x-axis) and the profiles were measured with 0.5 m spacing between

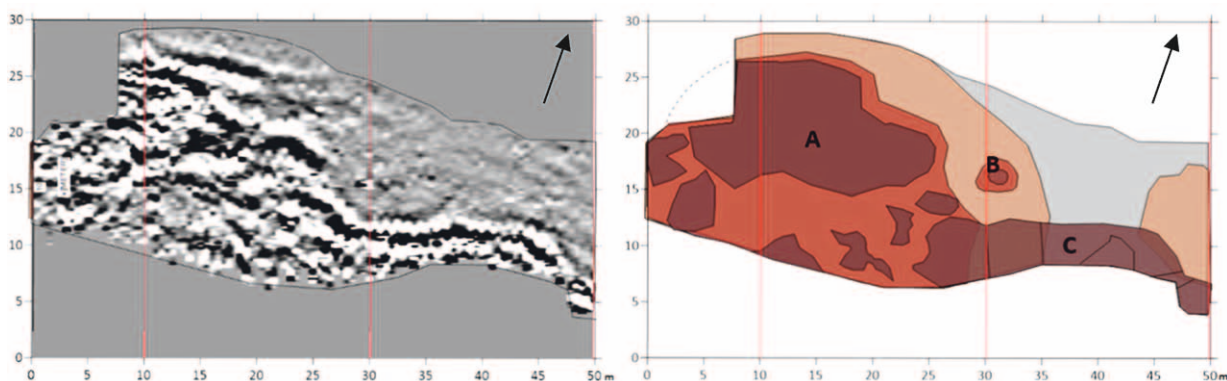


Fig. 5. Survey results divided into several groups (marked in brown, red, orange and grey). The anomalous area formed by less homogeneous fill such as smaller stone and larger gravel is marked in red. The blue-grey colour indicates a homogeneous fill probably composed of silty clay, sand and finer gravel (author I. Murín).

each other (y-axis). The measured area was divided into two main parts, with the two measured areas joining at a length level of 15 m on the y-axis. The first area was on the outer side and extended to the level of vegetation (trees and shrubs) located on the raised bank measuring approximately 15×50 m. The second surveyed area covered the accessible lower part towards the river surface measuring approximately 8×50 m. In total, an area of approximately 1150 m^2 was surveyed. The measured GPR data in the form of vertical profiles (radargrams) were processed using a standard procedure to improve their visual quality: their lengths and zero level were adjusted, a gain function was applied to highlight the signal, a filter was applied to remove noise and procedures were applied to suppress unwanted signal. The processed data were further interpolated and converted to depth. This resulted in amplitude horizontal depth slices (Fig. 4). They record the progression of reflexes (reflected waves) depending on the depth; different character of these reflexes expresses a change in the structure of the bedrock.

The GPR survey results (Fig. 3; 5) show anomalies located almost throughout the entire survey area, predominantly concentrated in the centre of the western part of the survey area, which is associated with a slight terrain elevation. These anomalies occur at multiple depth levels and follow a similar pattern. Based on the survey results, it was possible to identify more pronounced anomalies – structures A, B and C. Anomalous area “A” is approximately oval in shape, located at the upper edge of the anomalous zone, identical to the terrain elevation. It is a more compact layer at a depth of approximately 1 to 2 m, measuring about 20×10 m, and probably consisting of a more compact fill containing stone or brick. This structure lies in the line of the original bridge and most probably represents the remains of the original bridge pillar on the bank of the Danube. Anomaly “B” indicates a smaller circular structure located at the right edge of the anomalous zone at a depth

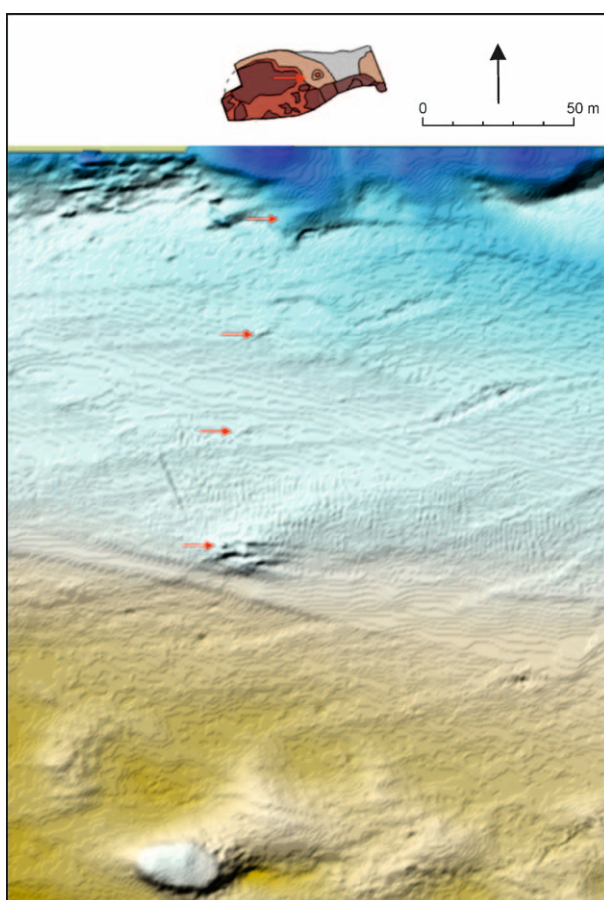


Fig. 6. The results of the GPR survey are shown for comparison along with sonar survey of the Danube riverbed showing the remains of the bridge pillars (© author Helicop/I. Murín).

of approximately 1.5 to 2 m, which lies in a line of dimensionally similar anomalies identified in the sonar survey made by HELICOP in 2021 (Fig. 6). These structures are approximately 30 m apart and may represent yet unidentified structural elements of the original bridge or other contemporary structure. Anomalous zone “C” represents a band of more prominent anomalies at the edge of the survey area at a depth of approximately 1 m, which is only partially captured in the measurements and is composed of a compact, more solid material, probably a rock component.

SURFACE SURVEY OF THE PILLAR 1 AREA

A survey of the area around Pillar 1 was carried out on land and in water almost at the same time. Four fishing weights made of stone and clay were found in the immediate vicinity of the pillar. These were located upstream of the pillar.

Weight 1 – irregular shape (Pl. I: 1). Dimensions max. $11.4 \times 9.8 \times 3.1$ cm, hole diameter 0.7 cm, ground down to 1.8 cm on one side, hole at top of weight. Weight 359.2 g. Material – clay (reused building ceramics – *tegula*).

Weight 2 – irregular shape (Pl. I: 2). Dimensions max. $10.8 \times 8.7 \times 2.7$ cm, hole diameter 0.7 cm, ground down to 1.5 cm on one side, hole at the top of the weight. Weight 265.7 g. Material – stone (sandstone).

Weight 3 – trapezoidal shape (Pl. I: 3). Dimensions max. $5.2/7.8 \times 8.8 \times 2.9$ cm, hole diameter 0.7 cm, ground down to 1.7 cm on one side, hole at the top of the weight. Weight 196.9 g. Material – clay (reused building ceramics).

Weight 4 – trapezoidal shape (Pl. I: 4). Dimensions $7.8/5.5 \times 8.2 \times 3.3$ cm, hole diameter 0.9 cm, ground to 1.5 cm on one side, hole in the top of the weight, weight 198.9 g. Material – clay (reused building ceramics).

Weights 1, 3 and 4 were made of Roman building ceramics, Weight 2 of sandstone³. The material from which finds 1, 3 and 4 were made is related to Roman activity in the area. Weight 1 was made of Roman roofing material – *tegula*. This is evidenced by the smoothed exterior of the brick, the thickness of the preserved shard and the fine consistency of the clay. Weights 3 and 4 are also made of Roman building ceramics, but of a different type to Weight 1. The coarse admixture of pebbles and shards, the numerous air bubbles and the thickness of the shard indicate that they were made of bricks that were mass-produced and used in large numbers (*pedales*, *besales*, or larger types). Today they are found in greater numbers at both the Brigetia and Iža excavations. Due to the surface grinding of Weights 3 and 4, it is not possible to determine the original thickness of the shard, which was greater than that of the previous pieces.

The Romans were no strangers to the use of damaged building and other ceramics. These were used for compacting concrete, filling some layers of roads or harbours. The finds from the Danube show considerable similarity to fishing weights discovered at the sites of Spijk on the Rhine, Wijchense Meer (Lake Wijchen) and Eiland van Maurik (Island of Maurik; *Kuijpers 2023a*, 17; *2023b*, 21). Like the weights in the Danube, those from the Netherlands are made mostly of Roman building ceramics. Kuijpers clearly considers some of the specimens to be weights made in Roman times, a secondary use of an earlier roofing material from the 1st century.

The typology of Roman weights was developed on the basis of finds from Israel and the surrounding area by the researchers E. Galili, B. Rosen and J. Sharvit (*Galili/Rosen/Sharvit 2002*). It refers only to weights made of stone and lead; ceramic equivalents are not known from the area (*Galili/Rosen/Sharvit 2002*, 183; *Chavane 1975*, 109–114). The finds from Europe correspond in shape to the typology made. Weights 1 and 2 can be assigned in shape to type S1.2.1 (*Galili/Rosen/Sharvit 2002*, 183, fig. 2), with the difference that the first of the weights is made of clay. Weights 3 and 4 can be assigned to type S1.2.2 (*Galili/Rosen/Sharvit 2002*, fig. 2). In this case, however, it is also true that the weights from Iža are made of Roman building ceramics.

The weights must meet certain criteria in order to fulfil their function. In addition to the shape, which indicates their placement on the net, weight is also an important criterion. The weight of the weights from Iža ranges around 197–359 g. Similarly, at the Wijchen site, the weight ranges from 200–500 g. The average weight of the weights in Spijk was 500–700 g. The difference in weight may be related to keeping the net in a taut state in open water. In a lake like Wijchen, where no large ballast is needed, smaller and lighter weights

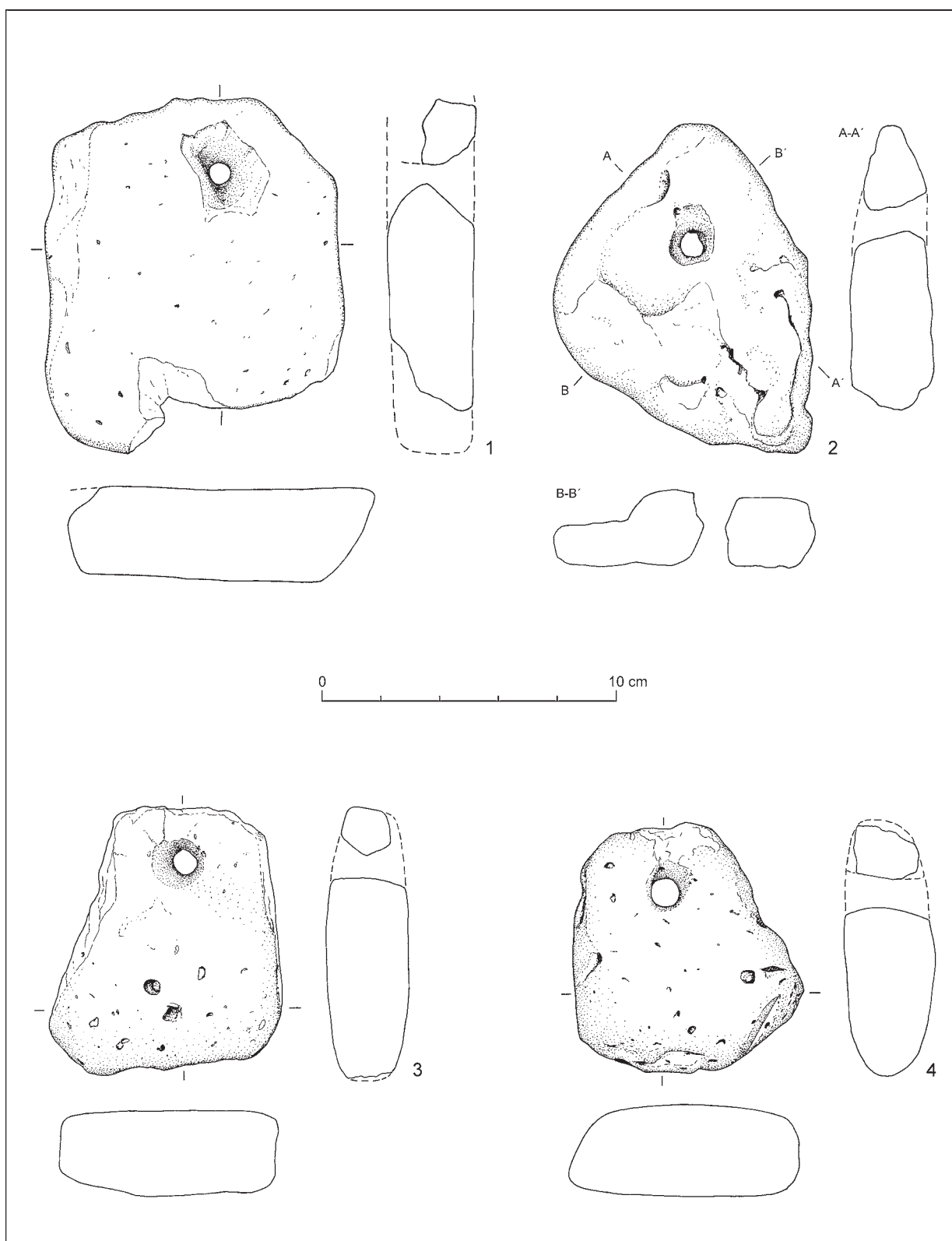
³ For the identification we thank Mgr. M. Cheben, PhD. from the Institute of Archaeology of the Slovak Academy of Sciences, Public Research Institution.

were sufficient for fishing, whereas in Spijk, which was on the Rhine, a larger ballast is needed in the current (*Kuijpers 2023b*, 25). If we proceed on this theory then the weights from Iža should be similar in weight to their equivalents from the Spijk site and not from Wijchen, provided that the same fishing technique was used. The current in the Danube varies throughout the year. Water and its flow significantly impact the integrity and preservation of artefacts. Additionally, in the case of the finds from Iža, one has to take into account that their original weight was greater than their current state. However, the weight of the net itself may also have been affected by the amount and placement of the weights used.

Fishing in the Danube is evidenced not only by net weights but especially by fish bones. The processing of archaeozoological material from the Iža survey confirmed the occurrence of fish bones as evidence of fish consumption, which belonged to the diet of the Roman garrison (more details *Bielichová/Šimunková 2025*; *Hajnalová/Rajtár 2009*, 194–208).

CONCLUSION

In 2021, thanks to a bathymetric survey of the Danube riverbed, it was possible to identify a linear structure consisting of four structures. Based on the spatial analysis of the position and direction, these structures were identified as the four pillars of a bridge. In 2022, by taking samples of the wood from the construction of Pillar 2, it was possible to date the building to the Roman period. Pillar 1 is closest to the bank, and is located beneath a layer of alluvial deposits. Due to the drier period, it was possible to carry out a GPR survey, which confirmed the presence of a solid component of the structure over a 20 × 10 m area. The working anomaly, labelled A, is located below 1 m of alluvial deposits and continues to a depth of 2 m. The survey also revealed other anomalies, labelled B and C (Fig. 4; 5). These may be related to the bridging, the connection of the bridge to the Roman camp or harbour, or other use of the bank. They may also represent modern interventions and alterations, modifications to the shoreline. The information obtained by non-destructive GPR survey is the first step towards a thorough planning of archaeological research in challenging flow conditions such as the Danube. A non-destructive survey of the vicinity of Pillar 1 also yielded other unexpected finds in the form of net weights. Their dating is, however, questionable for the time being. The collected information on the typological similarity of the finds from Iža and other sites and the localization of the finds suggests that the weights for fishing nets could be the result of Roman activity in this area.



Pl. I. Fishing weights made from Roman roof tiles (1, 3, 4) and sandstone (2) were all found in the area of Pillar 1 (source AÚ SAV).

BIBLIOGRAPHY

- Bielichová/Šimunková 2025 Z. Bielichová/K. Šimunková: Roman Fort in Iža: First Summary of the Archaeozoological Knowledge. In: *RAITARIVS LXX. Proceedings in Honour of Ján Rajtár*. Študijné zvesti Archeologického ústavu SAV – Supplementum 3, 2025, 251–274.
DOI: <https://doi.org/10.31577/szausav.2025.suppl.3.18>
- Daňová/Daňová 2019 K. Daňová/M. Daňová: Significant Crossroads at the Lower Reaches of the River Váh. *ŠWIATOWIT Supplement Series U: Underwater Archaeology II*, 2019, 133–152.
- Daňová/Daňová/Rajtár, in print K. Daňová/M. Daňová/J. Rajtár: *The Danube Riverbed near the Roman Fort in Iža-Leányvár. The Results of Research in 2019–2022*. Dissertationes Archaeologicae ex Instituto Archaeologico Universitatis de Rolando Eötvös nominatae. Budapest, in print.
- Daňová et al. 2022 M. Daňová/K. Daňová/M. Halinár/M. Hoffman/T. Lieskovský/A. Koprivňanský/V. Sočuvka. Hľadanie rímskeho prístavu. O počiatkoch systematického prieskumu riečného dna Dunaja pri Iži. *Zborník SNM* 116. *Archeológia* 32, 2022, 319–328.
- Galili/Rosen/Sharvit 2002 E. Galili/B. Rosen/J. Sharvit: Fishing-gear sinkers recovered from an underwater wreckage site, off the Carmel coast, Israel. *The International Journal of Nautical Archaeology* 31, 2002, 182–201.
- Hajnalová/Rajtár 2009 M. Hajnalová/J. Rajtár: Supply and subsistence: the Roman Fort at Iža. In: W. S. Hanson (ed.): *The Army and Frontiers of Rome. Papers offered to David Breeze on the occasion of his sixty-fifth birthdays and his retirement from Historic Scotland*. Journal of Roman Archaeology. Supplementary series 74. Portsmouth – Rhode Island 2009, 194–208.
- Chavane 1975 M.-J. Chavane: *Salamine de Chypre VI: Les Petits objets*. Paris 1975, 109–114.
- Kolník 1977 T. Kolník: Rímske nálezy z Dunaja pri Iži. *AVANS* 1976, 1977, 170, 171.
- Kolník 1978 T. Kolník: Nález rímskych predmetov v Dunaji pri Iži. *Archeologické rozhledy* 30, 1978, 165–171.
- Kubitschek 1931 W. Kubitschek: *Ältere Berichte über den römischen Limes in Pannonien*. Sitzungsberichte 209, Band 1. Wien – Leipzig 1931.
- Kuzmová/Rajtár 1985 K. Kuzmová/J. Rajtár: Siedma sezóna revízieho výskumu rímskeho kastela v Iži. *AVANS* 1984, 1985, 142–145.
- Kuijpers 2023a W. Kuijpers: Romeinse visloden en netgewichten. *Detector magazine* 190, 2023, 14–20.
- Kuijpers 2023b W. Kuijpers: Romeinse visloden en netgewichten. *Detector magazine* 20, 2023, 20–26.
- Pococke 1743 R. Pococke: *Description of the East and Some Other Countries*. Vol. I. London 1743.
- Tóth-Kurutz 1908 J. Tóth-Kurucz: *A leányvári ásatások folytatása 1907-ben*. A komáromvármegyei és városlaki múzeum-egyesület 1907-évi értesítője. 21 (13). Komárom 1908, 42–56.

PhDr. Klaudia Daňová, PhD.
Archeologický ústav SAV, v. v. i.
Akademická 2
SK – 949 21 Nitra
klaudia.danova@gmail.com
<https://orcid.org/0000-0002-5682-9518>

doc. Mgr. Miroslava Daňová, PhD.
Trnavská univerzita v Trnave
Katedra archeológie
Hornopotočná 23
SK – 918 43 Trnava
miroslava.danova@truni.sk
<https://orcid.org/0000-0002-1324-566X>

Mgr. Igor Murín, PhD.
Masarykova univerzita
Filozofická fakulta
Ústav archeologie a muzeologie
Arne Nováka 1/1
CZ – 602 00 Brno
murin@mail.muni.cz
<https://orcid.org/0000-0003-4311-5054>

Prieskum brehu Dunaja pri rímskom vojenskom tábore v Iži

K. Daňová – M. Daňová – I. Murín

Súhrn

S „oživením“ výskumu rímskeho vojenského tábora v Iži pri Komárne sa záujem preniesol aj na rieku Dunaj a skúmanie pobrežnej zóny pred južným vstupom do tábora. Na staršom vyobrazení rímskeho kamenného kastela z 18. storočia (obr. 1) sú viditeľné dve línie smerujúce k brehu Dunaja. V roku 1907 J. Tóth Kurucz zdokumentoval západnú líniu tohto „opevnenia“ a nazval ju *cloaca*, východnú líniu nepreskúmal a ani neuvádza informácie o jej prípadnej existencii (obr. 2). Toto sa neskôr potvrdilo aj pri ďalšom výskume K. Kuzmovej a J. Rajtára, ktorí v predpolí zničenom vojenskými zásahmi zo 70. rokov 20. stor. identifikovali len vlčie jamy. Na základe porovnania línie pri JZ nároží kastela so známymi príkladmi na Dunaji (Drobeta) a Rýne (Colonia Agrippina a jej predmostie Divitia) sme dospeli k názoru, že by mohlo ísť o opevnenie súvisiace s ochranou prístavu. Z tohto dôvodu bolo dôležité preskúmať aj dno rieky a nadviazať tak na prvý pokus z roku 1978, kedy sa uskutočnil prieskum, vtedy s aktívnou účasťou nášho jubilanta Jána Rajtára (obr. 3).

Na aktivity Rimanov na Dunaji poukazujú nálezy železných kotiev, votívneho kameňa a dvoch kamenných *cippi* vybágotovaných pri úprave koryty rieky. Tieto informácie sa stali základom pre sonarový prieskum v rokoch 2019–2021. Výsledkom je batymetrický snímok dna rieky (Autor HELICOP, s. r. o.), kde boli následne identifikované štruktúry pretínajúce v smere J – S rieku. Po dôkladnej analýze tvaru a rozmerov zachovaných štruktúr dospeli členovia tímu k názoru, že ide o piliere mosta, spájajúce oba rímske tábory. Tri zo štyroch identifikovaných štruktúr (č. 1; 2; 3) sa nachádzajú na slovenskej strane hranice a jeden pravdepodobne zničený a jeden zachovaný na strane Maďarska (č. 4; 5). V roku 2022 sa podarilo uskutočniť ponor k pilieru 2 a odobrať vzorku dreva, ktorá potvrdila datovanie do 3.–4. stor. n. l.

V roku 2022 sa začalo s nedeštruktívnym výskumom oblasti označenej ako pilier 1, ktorý je kompletne pokrytý nánosom piesku a štrku. Predpokladané miesto sa od okolia odlišovalo vyšším nánosom, ktorý vznikol kumulovaním štrku a piesku na pevnej štruktúre. Priaznivé podmienky umožnili georadarový výskum plochy, ktorá je väčšinu roka pod hladinou.

Geofyzikálne merania formou GPR merania (aparátúra RAMAC X3M, GEOSCIENCE MALA (Švédsko) systém s tienou anténou s centrálnou frekvenciou 250MHz) boli realizované v auguste 2022 na ľavom brehu Dunaja, pred južným vstupom do rímskeho tábora pri obci Iža. Prieskum sa realizoval v prístupných priestoroch na brehu a obnaženom dne rieky Dunaja v čase jeho nízkej hladiny. GPR prieskum bol lokalizovaný na predpokladanom mieste výskytu mostného piliera (obr. 4). Hustota GPR záznamu bola v smere profilu 0,05 m (os X) a profily boli merané s rozstupom 0,5 m medzi sebou (os Y). Prvá meraná plocha sa nachádzala na vyvýšenom brehu s rozmermi cca 15 × 50 m. Druhá plocha merania pokryla prístupnú spodnú časť smerom k hladine rieky s rozmermi cca 8 × 50 m. Celkovo bola zmeraná plocha o rozlohe cca 1150 m². Identifikované anomálie vo výsledkoch GPR merania (obr. 4; 5; štruktúry A–C) sa nachádzajú takmer po celej ploche merania, pričom sa prevažne koncentrujú v strede západnej časti meranej plochy, ktorá sa viaže na miernu terénnu vyvýšeninu.

Anomálna oblasť „A“ v hĺbke cca 1–2 m s rozmermi cca 20 × 10 m je tvorená pravdepodobne pevnejšou výplňou. Táto štruktúra leží v línii pôvodného premostenia a predstavuje najpravdepodobnejšie zvyšky pôvodného mostného piliera na brehu Dunaja. Anomália „B“ označuje menšiu kruhovú štruktúru nachádzajúcu sa na východnom okraji skúmanej zóny, v hĺbke približne 1,5–2 m, v línii rozmerovo podobných anomálií identifikovaných v sonarovom meraní vytvorenom HELICOP v roku 2021 (obr. 6). Tieto štruktúry sú vzdialené od seba približne 30 m a môžu predstavovať doposiaľ neidentifikované konštrukčné prvky pôvodného mostu alebo inej súdobej štruktúry. Anomálna zóna „C“ predstavuje pás výraznejších anomálií na okraji meranej plochy v hĺbke cca 1 m, ktorá je zachytená v meraniach len čiastočne a je tvorená kompaktným, pevnejším materiálom pravdepodobne kamennou zložkou. Tieto anomálie môžu súvisieť s premostením, prepojením mosta s rímskym táborom, alebo prístavom, či iným využívaním brehu. Taktiež môžu predstavovať aj moderné zásahy a zmeny, úpravy pobrežia. Informácie získané nedeštruktívnym georadarovým meraním sú prvým krokom k dôkladnému naplánovaniu archeologického výskumu v náročných podmienkach toku ako je Dunaj. Nedeštruktívny prieskum okolia piliera 1 priniesol aj ďalšie nečakané nálezy v podobe sieťových závaží. Ich datovanie je však nateraz otáznе.

Takmer v rovnakom čase sa uskutočnil aj prieskum okolia piliera 1 na súši ale aj vo vode. V bezprostrednej blízkosti piliera sa podarilo nájsť štyri rybárske závažia z pieskovca (tab. I: 2) a rímskej stavebnej keramiky (tab. I: 1, 3, 4). Tie sa nachádzali pred pilierom po prúde rieky. Sekundárne využívanie poškodenej stavebnej a inej keramiky nebolo Rimanom cudzie. Nálezy z Dunaja vykazujú značnú podobnosť s rybárskymi závažiami objavenými v lokalitách na rieke Rýn, jazere Wijchen alebo Island of Maurik. Niektoré z exemplárov sú považované za závažia vyrobené ešte v dobe rímskej, za sekundárneho využitia staršej strešnej krytiny z 1. storočia. Typológiu rímskych závaží vypracovali na základe nálezov z Izraela a blízkeho okolia bádatelia E. Galili, B. Rosen a J. Sharvit. Lov rýb v Dunaji v dobe rímskej dokladajú nielen sieťové závažia ale najmä rybie kosti. Pri spracovaní archeozoologického materiálu z výskumu v Iži sa potvrdil výskyt rybích kostí ako doklad konzumácie rýb.

Obr. 1. Kresba Brigetia a rímskeho tábora na severnom brehu od J. Millesa z roku 1737 (*Kubitschek 1931, 203*).

Obr. 2. Pódorys rímskej pevnosti v Iži na základe archeologických vykopávok J. Tótha-Kurucza (*Tóth-Kurucz 1908, 45, 46, obr. III*).

Obr. 3. Ján Rajtár počas prvých výskumov na Dunaji v roku 1978 (archív AÚ SAV).

Obr. 4. Prerušovanou čiarou je vyznačené možné rozšírenie oblastí anomálií alebo ich prepojenie so štruktúrami viditeľnými pri sonarovom prieskume (autor I. Murín). Legenda: a – kompaktnější výplň, kameň; b – nespevnená výplň, kameň, suť; c – nespevnený materiál, štrk, kamene; d – jemnejší sediment, piesok.

Obr. 5. Výsledky prieskumu rozdelené do niekoľkých skupín (vyznačené hnedou, červenou, oranžovou a sivou farbou). Oblasť anomálií je tvorená menej homogénnou výplňou, ako sú menšie kamene a väčšie štrky, je vyznačená červenou farbou. Modro-sivá farba označuje homogénnu výplň, ktorú pravdepodobne tvorí sprašová hlina, piesok a drobnejší štrk (autor I. Murín).

Obr. 6. Výsledky georadarového prieskumu sú zobrazené na porovnanie spolu so sonarovým prieskumom koryta Dunaja s vyznačením zvyškov mostných pilierov (autor Helicop/I. Murín).

Tab. I. Rybárske závažia vyrobené z rímskej strešnej krytiny (1, 3, 4) a pieskovca (2) všetky sa našli okolo piliera 1 (zdroj: AÚ SAV).