

**RADOVI BIOARHEOLOŠKE SEKCIJE  
SRPSKOG ARHEOLOŠKOG DRUŠTVA**

# **BIOARHEOLOGIJA NA BALKANU**

Studije iz antropologije  
i zooarheologije

**Urednici**

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**Beograd . Sremska Mitrovica**

**2023**

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STUDIJE IZ ANTROPOLOGIJE I ZOOARHEOLOGIJE.**



PAPERS OF THE BIOARCHAEOLOGICAL SECTION  
OF THE SERBIAN ARCHAEOLOGICAL SOCIETY

# **BIOARCHAEOLOGY IN THE BALKANS.**

**STUDIES IN ANTHROPOLOGY  
AND ZOOARCHAEOLOGY.**

**Editors:**

Nataša Miladinović-Radmilović  
Dragana Vulović  
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*Izdavač / Published by*

Srpsko arheološko društvo, Beograd, Čika-Ljubina 18-20  
Blago Sirmiuma, Sremska Mitrovica, Ilariona Ruvarca bb

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*Štampa / Printed by*

Štamparija: Propaganda Jovanović

*Tiraž / Print-run*

200

ISBN 978-86-80094-23-6

ISBN 978-86-84457-21-1

Ova knjiga je štampana sredstvima Ministarstva nauke, tehnološkog razvoja i inovacija Republike Srbije.

This book is published with the financial support of the Ministry of Science, Technological Development and Innovations of the Republic of Serbia.

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## BONE SKATES FROM THE MEDIEVAL SITE OF CRKVENO BRDO (SERBIA)

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*Abstract:* The paper presents the results of the analysis of six worked bones discovered during archaeological excavations of the medieval settlement at the site of Crkveno Brdo. The site is located in the municipality of Senta, in the vicinity of the village of Gornji Breg, at a distance of about 1.5 km to the south-west of the village centre. During the archaeological excavations in 2019, part of the settlement dated from the 11<sup>th</sup> to the 13<sup>th</sup> century was excavated. Additionally, the existence of cultural layers, dated in a wider chronological range between the 11th and the 15th century, was revealed. The results of the analysis of the worked bones indicate that bones of the most important economic species, mainly horse and cattle, were used as a raw material between the 11<sup>th</sup> and the 13<sup>th</sup> century. Out of the total number of finds, five specimens represent skates with identical macro and micro traces of manufacturing and use, while the sixth finding can be interpreted as a pointed tool with rough production traces.

*Keywords:* zooarchaeology, traceology, skates, medieval period, Carpathian Basin

*Apstrakt:* U radu su predstavljeni rezultati analize šest obrađenih životinjskih kostiju koje su otkrivene tokom arheoloških iskopavanja srednjovekovnog naselja na lokalitetu Crkveno Brdo. Lokalitet se nalazi na području opštine Senta, u ataru sela Gornji Breg, na udaljenosti od oko 1,5 km u pravcu jugozapada. Tokom arheoloških iskopavanja 2019. godine, istražen je deo naselja koje se datuje u raspon od XI do XIII veka, a na pojedinim delovima lokaliteta utvrđeno je i postojanje slojeva koji se okvirno datuju u širi hronološki raspon od XI do XV veka. Rezultati analize obrađenih predmeta ukazuju da su kao glavne sirovine korišćene kosti ekonomski najznačajnijih vrsta, i to konja i govečeta u periodu od XI do XIII veka. Od ukupnog broja nalaza pet primera ka predstavljaju klizaljke sa identičnim makro i mikrotragovima obrade i upotrebe, dok se šesti nalaz može interpretirati kao probojac grublje izrade.

*Ključne reči:* zooarheologija, traseologija, klizaljke, srednji vek, Karpatski basen

## INTRODUCTION

The site of Crkveno Brdo is situated in the northern part of Serbia, 1.5 km to the southwest of the village of Gornji Breg, in the Senta Municipality. The site was discovered as early as the late 19<sup>th</sup> century by A. Dudaš, a local antiquity and history enthusiast (Dudaš 1890) (Figure 1a). The information he collected on that occasion was presented to the scholarly public considerably later in a short report, which contained data about the position of the site with the remains of a stone church and a necropolis (Korek 1944: 324–325). Several more decades passed before Crkveno Brdo came to the attention of archaeologists. It was primarily recorded in 2018 within the project Archaeological Map of the Northern Bačka Region, and, in 2019, the settlement was also surveyed, during activities performed as part of the building of the gas pipeline, by experts from the Intermunicipal Institute for the Protection of Cultural Monuments in Subotica (Figure 1a). The geophysical survey that followed enabled an insight into the precise position of the church (Шпехар, Марковић и Јовић 2021: 83, 95). During archaeological excavations of the Crkveno Brdo, six worked bones were discovered.

The paper describes these finds of worked bones. By applying several different methods, the finds were first examined macroscopically, in order to determine the animal species and to describe taphonomic changes. With the application of microscopy, an attempt was made to identify natural, manufacturing, and use-wear traces at the micro level. The goal was the identification of the source of the raw materials, a typological determination of the worked bones, and the manufacturing techniques employed, along with a further interpretation and consideration of the role and significance of the finds in the wider archaeological context of the medieval settlement of the site of Crkveno Brdo.

## ARCHAEOLOGICAL BACKGROUND

The medieval settlement at the site of Crkveno Brdo is on a slope on the left side of, what is today, the valley of an almost completely dried up river. During the excavation, a 0.20–0.40 m thick layer of plough land was initially mechanically removed. The difference in thickness is the consequence of erosion, since the southern part of the researched area is on a lower elevation. This was followed by the removal of a 0.70 m thick cultural layer in the northern and 1.00 m thick layer in the southern part of the researched area, which rested on a layer of loess. Within this layer, sherds of pottery and animal bones were discovered, as well as fragmented finds of corroded iron objects and sporadic fragments of glass. The structures that were dug into the loess were excavated at the end. Several dozen structures were documented, among them five houses, nine kilns, forty-one pits, a water well, and thirteen trenches of different shapes and sizes (Шпехар, Марковић и Јовић 2021: 85).

Among the researched houses, four are dugouts and one is a semi-recessed dugout. Unfortunately, none of the dugout houses were completely researched, but it can be concluded that they were most probably rectangular or oval in shape, with maximal dimensions of the excavated part of 4.6 m along the N–S and 3.60 m along the E–W axis, as noticed in House 5. The depths to which the houses were dug vary and are from 0.40 to 1.30 m, as in the case of House 2. This suggested that they did not necessarily have an even floor. The houses were entered via some steps, 0.40 m high, while a domical-vaulted niche was cut in some walls of the dugouts, as in Houses 2 and 5. No traces or remains of a construction that carried the roof were detected either around the dugouts, or within their floors, although a flattened area was discovered in front of House 2 with three circular holes with the diameters between 0.20 to 0.25 m and placed 2 m apart from each other. Those holes formed an equilateral triangle and, therefore, it was concluded that poles that



carried a wooden canopy were placed in them. The houses were heated by earthen furnaces that had diameters between 1.30 and 1.50 m, situated either in their vicinity or within the house itself, as was noticed in House 5. When considering the semi-recessed dugout house, it was completely excavated and labelled as House 4. Its inner dimensions are 7.25 m along the N–S and 5.00 m along the E–W axis, while it was buried into the loess to a maximal depth of 0.45 m. Along all the edges of the house, at the floor level, there is a shallow ditch, up to 10 cm wide, which was the base for the wall made of wood and mud. The house had a gable roof, carried by three large poles placed along the N–S axis, with the diameters of the lateral poles being around 0.40 m and of the central pole – 0.85 m. The latter pole was buried somewhat deeper, to a depth of 1.20 m (Шпехар, Марковић и Јовић 2021: 85–88) (Figure 1c, d).

Other researched structures include a water well of an irregular shape with a diameter of around 2.20 m, as well as pits, which were the most numerous. They also had different shapes: some were circular, with diameters from 0.70 to 1.20 m, some oval, with a maximal length of 1.20 m, while some had irregular shapes and various dimensions. Their cross-sections were pear-shaped or with straight or obliquely shaped walls. The depths of the excavated pits also vary between 0.40 to 1.00 m. Most of the pits were used as waste disposals or silos. The discovered trenches were of diverse shapes and dimensions, and they were mostly used for fences or silos (Шпехар, Марковић и Јовић 2021: 89–90).

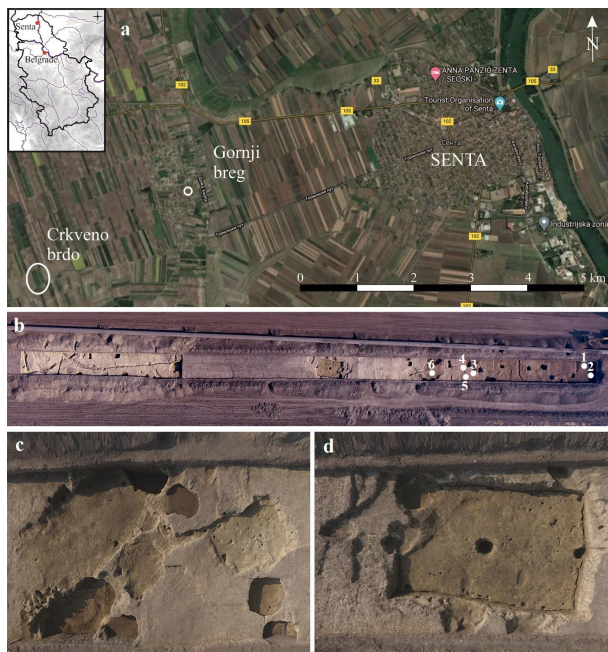
The settlement in Crkveno Brdo belongs to the open-concept medieval settlements that, from the 11<sup>th</sup> to the 13<sup>th</sup> century, were small self-contained communities (Vágner 2002: 310). The discovered finds, primarily pottery (Шпехар, Марковић и Јовић 2021: 90–92), suggest that it was occupied from the 11<sup>th</sup> to 15<sup>th</sup> century, which is confirmed by the radiocarbon dating of animal bones (Шпехар, Марковић и Јовић 2021: 95, Графикон 1). It is necessary to emphasise that the finds that predate the 13<sup>th</sup>

century were primarily discovered within the horizon formed above the dugout structures, while ceramics dating from the 11<sup>th</sup> to the 13<sup>th</sup> century predominate within them. Those are, mostly, pottery cauldrons belonging to the “mid-Tisa region type”, i.e. to the regional group typical for northern Bačka and northern Banat (Takács 1986; Takács 1996: 135; Takács 2010: 139, 141, 148, 153; Takács 2012: 229; Takács 2021: 51–52). One bottle, from the floor of House 4, stands out by virtue of its appearance and is dated, according to analogies, to the 12<sup>th</sup> or the first half of the 13<sup>th</sup> century (Takács 1996: 172, Abb. 8/8–9, Abb. 17).

#### THE CRKVENO BRDO FAUNAL ASSEMBLAGE

During the archaeological excavations at the site of Crkveno Brdo, a total of 3,656 whole and fragmented animal remains were collected. Zooarchaeological material was collected by hand and originates from 48 medieval units, out of the total of 69. Among the 48 units, animal remains are most numerous in pits and ditches, while they are represented in smaller numbers in residential buildings and one oven. Out of the total number of identified specimens in the faunal collection, the most represented are the remains of mammals (55.6%), molluscs (41.3%), birds (2%), then amphibians (1%), while the remains of fish are represented by only three specimens (0.1%). A total of nine mammal species were identified, seven domestic and two wild, four species of birds, two species of fish, one species of amphibian and three species of molluscs (Шпехар, Марковић и Јовић 2021: 91–92, Табела 1).

Anthropogenic activities on the bones are present in the form of butchery marks on 11% of the specimens. Traces of butchering were found on the bones of cattle, horses, sheep, goats, pigs and one dog bone. Out of the total number of animal remains, 14.5% represent whole bones. Slightly more than half of these specimens (53%) are short bones, such as phalanges, carpal and tarsal bones, then metapodials

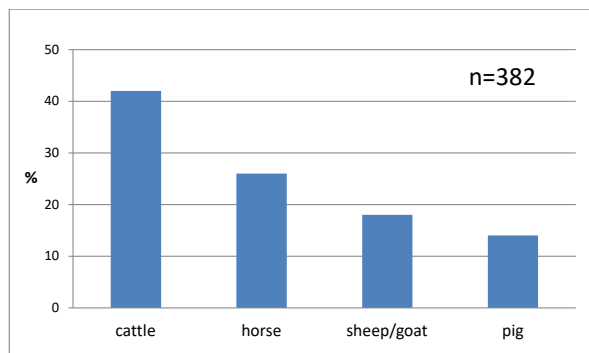


**Figure 1.** The site of Crkveno Brdo: a. position of the site (drawn by P. Špehar, based on Google Maps);

b. excavated part of the settlement – orthophoto: dots show the distribution of the worked bones – 1. corresponds to figure 3, 2. corresponds to figure 4, 3. corresponds to figure 5a, 4. corresponds to figure 5d, 5. corresponds to figure 6, and 6. corresponds to figure 7; c. central part of the settlement – orthophoto (after Шпехар, Марковић и Јовић 2021, сл. 5); d. house 4 – orthophoto (after Шпехар, Марковић и Јовић 2021, сл. 7)

**Slika 1.** Lokalitet Crkveno brdo: a. položaj lokaliteta (nacrtao P. Špehar na osnovu podloge preuzete sa Google maps); b. istraženi deo naselja – ortofoto: tačke predstavljaju distribuciju koštanih alatki – 1. odgovara slici 3, 2. odgovara slici 4, 3. odgovara slici 5a, 4. odgovara slici 5d, 5. odgovara slici 6 i 6. odgovara slici 7; c. centralni deo naselja – ortofoto (prema Шпехар, Марковић и Јовић 2021, сл. 5); d. kuća 4 – ortofoto (prema Шпехар, Марковић и Јовић 2021, сл. 7)

make up about 15%, while cranial, upper limb bones and vertebrae are mostly fragmented. Although fragmented, the bones are well preserved. Traces of decay caused by the physical and chemical conditions to which the bone was exposed are found in 6.6% of the specimens. Such a low percentage leads to the conclusion that the largest number of bones was very quickly covered by sediment, whose chemical properties did not have a destructive effect on the material. Bones burned at high temperatures



**Figure 2.** Relative frequency of the most important economic species of the medieval settlement at the site of Crkveno Brdo during the 11<sup>th</sup>–13<sup>th</sup> centuries

**Slika 2.** Relativna zastupljenost najznačajnijih ekonomskih vrsta u naselju na lokalitetu Crkveno Brdo tokom XI–XIII veka

on a direct or open fire are present with only 1.8%. Burnt ends, indicating food preparation (baking), were observed on four (0.4%) specimens. Gnaw marks were observed on 30.5% of the identified specimens, and rodent teeth marks on only one (0.1%) specimen.

The percentage ratio of different mammalian species points to the fact that the most important economic species at the medieval settlement at Crkveno Brdo were cattle and horses, while a smaller percentage of sheep, goat, and pig were bred. Of the other domestic species, skeletal remains of dog and cat are represented in the fauna collection. The percentage ratios and the distribution of butchering marks indicate that the inhabitants of this settlement used cattle, horse, sheep, goat and pig meat in their diet. Out of the total number of identified specimens from the part of the faunal collection dated from the 11<sup>th</sup> to the 13<sup>th</sup> century, 382 (97%) remains originate from the most important economic species. Based on the number of identified specimens, cattle are the most frequent taxa (42%), followed by horse (26%), sheep/goat (18%) and pig (14%) (Figure 2). Hunting was of less importance in the animal exploitation strategy of this settlement, as indicated by the small range of wild species, as well as the percentage ratio between wild (1%) and domestic (99%) mammals. Out of the total number of game remains, only

six skeletal remains of rabbits and four of red deer have been identified. Out of the remains of birds, the most numerous are those of domestic chicken, while the remains of ducks and geese are represented in small numbers. As with hunting, fishing was also of less importance, judging by the two specimens originating from carp (*Cyprinus carpio*) and one of sterlet sturgeon (*Acipenser ruthenus*) (Шпехар, Марковић и Јовић 2021: 94).

From the class of amphibians, 39 skeletal remains of frogs were found, originating from a minimum of five individuals. All the remains were retrieved from pit 12. Considering the fact that anthropogenic activities were not observed on them in the form of butchering and burning marks, which would have occurred during food preparation, it can be concluded that this is a natural deposit, most likely formed during winter hibernation. As in the case of frogs, the natural agglomeration consists of mollusc shells without anthropogenic activity. Among the molluscs, the most numerous are the remains of White Snail (*Cerznuella virgata*), represented with 1,506 whole and fragmented shells. The highest concentration of shells, 1,258 specimens, was discovered in the cultural layer from square D. One whole shell of Great Ramshorn (*Planorbis cornutus*) and three fragmented specimens of river shell (*Unio sp.*) have been identified.

#### MATERIAL AND METHODS

During the excavations of the medieval settlement at the site of Crkveno Brdo, among the large amount of animal remains, five fragmented and one complete bone tool were collected. Worked bone tools originate from the southern part of the excavated area, in the cultural layers between houses and layers above pits (Figure 1b). All worked bone finds are dated, according to the stratigraphic relationship and the typology of pottery, to the period between the 11<sup>th</sup> and the 13<sup>th</sup> century. The chronology was confirmed by radiocarbon dating (Шпехар, Марковић и Јовић 2021: 95, Графикон 1).

The finds were first subjected to taphonomic observation, taxonomic determination and metric analyses. The taxonomic determination was performed using morphological criteria according to Schmid (1972) and comparative collections of the Laboratory of Bioarchaeology, Department of Archaeology, at the Faculty of Philosophy in Belgrade. The second stage of analysis of the artefacts involved microscopic observations to identify natural, manufacture, and use-wear traces. This was performed using a stereoscopic microscope with up to 40× magnification. Microscopic images were captured using the RisingCam microscope camera (E3ISPM 6300). Measurements were made using a calibration slide and the RisingCam software.

#### RESULTS

Out of the total number of bone artefacts, five are made of horse long bones, i.e. four of the radius and one of the metatarsal bone, while one artefact originates from a cattle radius. All worked bones of the assemblage from the medieval settlement at the site of Crkveno Brdo, based on their morphological and use-wear features, can be classified into two main types: skates and point tool. The skates can be divided into two subtypes, the first represents those made of the horse and cattle radii, and the second is represented with one made of horse metatarsal bone.

The skates are made of bones of adult individuals and all were found fragmented. All bone skates from the Crkveno Brdo assemblage made of horse and cattle radii exhibit identical manufacturing patterns, and use-wear traces. In the case of horse radii, the ulna was removed by simple breakage. The proximal and distal epiphyses were cut with a massive metal tool on the anterior side, e.g. an axe or some other chopping tool. The cutting marks are at an angle of approximately 45 degrees. In cutting the anterior part of the epiphysis, the anterior part of the diaphysis becomes arched, forming a convex profile, important for the contact with



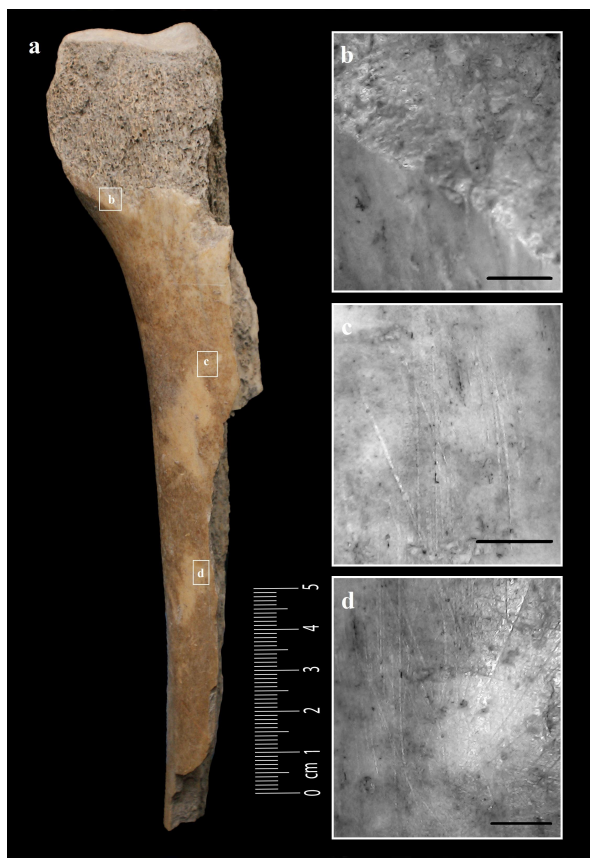


**Figure 3.** Left radius of a horse, with a preserved proximal epiphysis and more than half of the diaphysis: a. anterior side; b. lateral side; c. manufacturing traces; d. and e. use-wear traces (scale bar: 1 mm)

**Slika 3.** Levi radijus konja sa očuvanom proksimalnom epifizom i više od pola dijafize: a. anteriorna strana; b. lateralna strana; c. tragovi obrade; d. i e. tragovi upotrebe (razmernik: 1 mm)

the ice. No manufacturing traces on the anterior part of the diaphyses have been found. If there were any traces, they were destroyed by subsequent use-wear. All the examples of bone skates exhibit an almost identical pattern of use-wear, which are visible from the anterior and posterior side of the diaphyses. Use-wear on the anterior of the diaphyses produces a facet of varying width, tending to become broader as the skate was used. In all four cases from Crkveno Brdo, under 20x magnification, the facet exhibits long, parallel stretch marks in different directions and a highly polished surface. Use-wear traces in the form of mild polishing is also present on the posterior surface where the foot was in contact with the bone (Figure 3, 4, and 5).

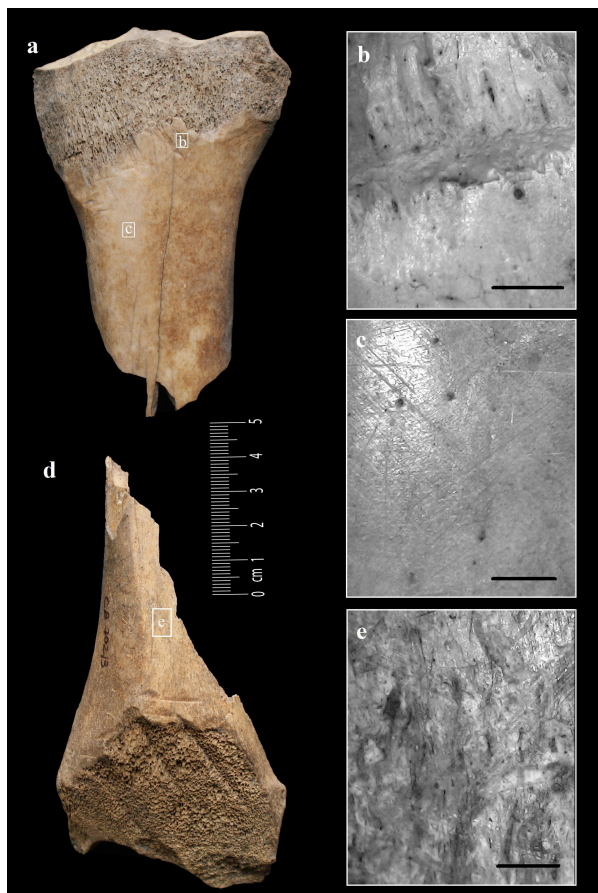
The second subtype is represented with a skate made of horse metatarsal bone, most likely from an adult individual, based on its



**Figure 4.** Right radius of a horse, with a fragmented proximal epiphysis and a fragmented diaphysis: a. anterior side; b. manufacturing traces; c. and d. use-wear traces (scale bar: 1 mm)

**Slika 4.** Desni radijus konja sa fragmentovanom proksimalnom epifizom i fragmentovanom dijafizom: a. anteriorna strana; b. tragovi obrade; c. i d. tragovi upotrebe (razmernik: 1 mm)

size. The specimen has a preserved proximal epiphysis and more than half of the diaphysis. The whole specimen is covered with root traces and vertical cracks. Manufacturing traces are visible on all four sides of the proximal epiphysis. These traces are in the form of cutting marks and are approximately parallel to the axis of the bone. On the anterior side, there is a slight curvature. Use-wear is visible on the anterior side of the diaphyses and, under 20x magnification, exhibit long, vertical, and parallel stretch marks, and short, transversal, and parallel stretch marks, as well as a polished surface. The cutting marks on the anterior side exhibit polished surfaces. Without facets on



**Figure 5.** a. Left radius of a horse, with a preserved proximal epiphysis and less than half of the diaphysis, anterior side; b. manufacturing traces; c. use-wear traces; d. cattle right radius, with a preserved distal epiphysis and less than half of the diaphysis, anterior side; e. use-wear traces (scale bar: 1 mm)

**Slika 5.** a. Levi radijus konja sa očuvanom proksimalnom epifizom i manje od pola dijafize, anteriorna strana; b. tragovi obrade, c. tragovi upotrebe; d. desni radijus govečeta sa očuvanom distalnom epifizom i manje od pola dijafize, anteriorna strana; e. tragovi upotrebe (razmernik: 1 mm)

the anterior and a polished surface on the posterior side, it can be concluded that the specimen was used for a short time before breaking (Figure 6).

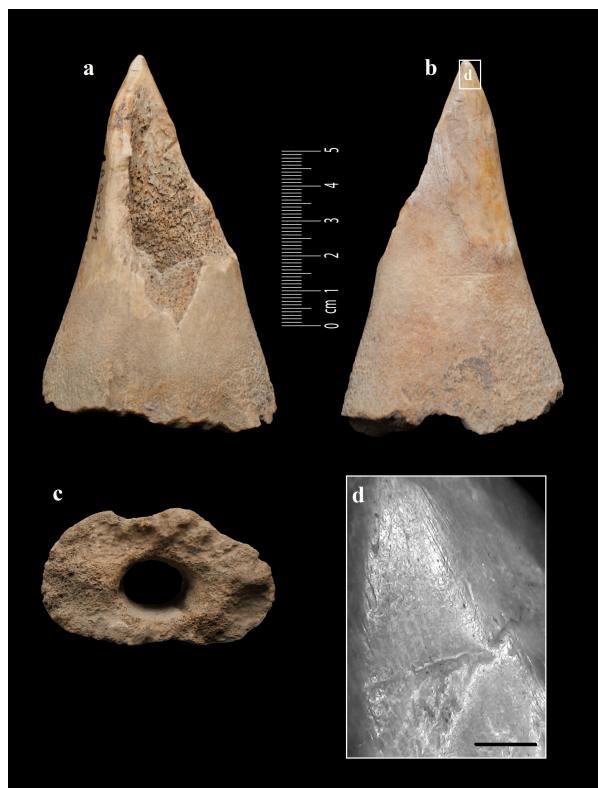
The point tool is made from the distal part of a horse radius, of a subadult individual. It has a regular shaped perforation drilled through the distal metaphysis in a proximal-distal direction, which probably served to insert a handle. The perforation, with an inner diameter of 21.6



**Figure 6.** Right metatarsus of a horse, with a preserved proximal epiphysis and more than half of the diaphysis: a. anterior side; b. lateral side; c. manufacturing traces; d. and e. use-wear traces (scale bar: 1 mm)

**Slika 6.** Desni metatarzus konja sa očuvanom proksimalnom epifizom i više od pola dijafize: a. anteriorna strana; b. lateralna strana; c. tragovi obrade; d. i e. tragovi upotrebe (razmernik: 1 mm)

mm, and a depth of 43.2 mm, has visible vertical stretch marks, while the diaphysis above the metaphysis is obliquely broken and turned into a blunt point by cutting and rough sanding. The total length of the artefact is 109.4 mm, it is 66.7 mm wide at the distal part, and 44.2 mm thick. The microscopic observations of the blunt point indicate long, vertical, parallel stretch marks and highly polished surfaces (Figure 7). Based on the artefact's morphology, manufacturing, and use-wear traces, it can be interpreted as a planter (?) tool, of rough production.



**Figure 7.** Right radius of a horse with a preserved distal metaphysis and less than half of the diaphysis:

a. anterior side; b. posterior side; c. distal side; d. manufacturing and use-wear traces (scale bar: 1 mm)

**Slika 7.** Desni radijus konja sa očuvanom distalnom metafizom i manje od pola dijafize: a. anteriorna strana; b. posteriorna strana; c. distalna strana; d. tragovi obrade i upotrebe (razmernik: 1 mm)

## DISCUSSION AND CONCLUSION

Animal skeletal remains represent important raw materials that have been used as one of the primary sources since prehistory. Various utilitarian objects were most often found at medieval sites of southern parts of the Carpathian Basin and in the area of the Serbian part of the Danube. Special attention was given to decorated examples, such as combs, personal ornaments, various plates, occasional musical instruments, and other items of specific use. The manufacturing techniques used on bones and antlers are very similar to those used in woodworking. Similar tools and procedures were used, which included cutting,

sawing, notching, ironing, and polishing. The preparation of the raw materials implies boiling bones to remove soft tissue debris and softening the bone structure, while the antlers were immersed in water to increase their elasticity (Манојловић 1996; Манојловић-Николић 1997а, 1999, 2003, 2007, 2012; Манојловић-Николић 2016). However, in the case of skates and sled runners, further processing such as boiling was most likely not practiced, considering bone grease would actually enhance the quality of skates (Choyke 1999).

The worked bones assemblages from medieval contexts occasionally contain artefacts made of metacarpal and metatarsal bones of horses and cattle, which were used to produce skates and sled runners. These forms of bone artefacts have been found at archaeological sites across Europe from the early Bronze Age to the early modern period. In many parts of Europe, they were used even until the end of the 19<sup>th</sup> century (Becker 1990; Choyke and Bartosiewicz 2005; Gál and Bartosiewicz 2016; Küchelmann and Zidarov 2005). Based on the contexts of the findings and analogies, the earliest dated skates in southern parts of the Carpathian Basin and in the area of the Serbian part of the Danube are from the site of Botra near Bečej (8<sup>th</sup>–9<sup>th</sup> century), then from Crvenka (10<sup>th</sup>–13<sup>th</sup> century), and the most recent finds come from Sapaja, Perlek near Bečej and settlements on the southern bank of the watercourse Crna Bara, near Vrbas (14<sup>th</sup>–15<sup>th</sup> century) (Манојловић-Николић 1997б).

Skates and runners, as special types of bone tools, are a reflection of a specific interaction between environment, sources of raw materials, and cultural characteristics (Choyke and Bartosiewicz 2005). Skates are primarily for use on ice, while sled runners can also be used on snow and, according to ethnographic data, were used on mud, grass, or stubble for transporting hay and other products harvested during the summer (Gál 2016). Although both types of bone tools are basically for the same purpose, skating or sledging, they can be distinguished according to specific manufac-



turing details or, more reliably, by use-wear traces. These types of tools are often mistakenly interpreted as other similar bone artefacts manufactured from metapodial bones of large ungulates, most commonly with beamers for leather scraping, primarily in prehistoric contexts. Artefacts used for fishing net weights/stiffeners between the early medieval period and the early modern period in the Carpathian Basin are often mistakenly interpreted as skates and runners (Choyke and Bartosiewicz 2005).

The characteristic perforations for the proximal and distal parts of some skate examples, which served for the fixing of leather straps or thinner ropes, are not present on any specimen from Crkveno Brdo. The possible places for fastening straps or ropes in the case of these examples are spaces below the proximal and above the distal epiphyses. Considering the fact that those parts of the bone are wider than the tubular (diaphysis) part, they do not allow straps or ropes to slip off. In that method of setting up straps or ropes, they also have a function of controls, especially for slowing down by pressing the back of the skates.

A simpler way of using the skates would be by skilfully balancing, without any sort of fastening, using the sheer pressure of the foot on the posterior side of the diaphysis. This technique could keep the skates under the foot with the help of manipulating long wooden sticks (Choyke and Bartosiewicz 2005).

The main feature of the findings from Crkveno Brdo that classifies them as bone skates are the use-wear traces on the posterior side of the diaphysis. These traces are in the form of highly polished smooth surfaces obtained by the friction of leather footwear on the bone. In the case of sled runners, these traces are considerably rougher, considering the fact that wooden parts of the sledge rubbed against the bone. Based on production process and use-we-

ar traces, the finds from Crkveno Brdo can be considered to be simply manufactured bone skates.

Regarding the procurement of raw materials in the medieval settlement of Crkveno Brdo, the analysis of the animal remains suggests that the most important economic species were cattle, followed by horse, sheep/goat and pig (Шпехар, Марковић и Јовић 2021: 96). It should be stressed that horses were very important to the economy and to nutrition, something which is also detected in other settlements dating from the 11<sup>th</sup> to the 13<sup>th</sup> century in the central part of the Carpathian Basin (Bartosiewicz *et al.* 2018; Gál 2010; Mladenović and Mladenović 2020: 171, 184).

Previous research has revealed that cattle were available from as early as the Neolithic; however, the skeletal parts of this species were rarely used, even in later periods, for manufacturing skates and sled runners. Bone skates and runners occur more frequently in the Carpathian Basin with the spread of domestic horses from the Bronze Age, and bones of this species represented the main raw material until the end of the 19<sup>th</sup> century, with sporadic use of cattle and red deer bones (Choyke and Bartosiewicz 2005; Gál 2016; Küchelmann and Zidarov 2005). The same pattern of raw material procurement is visible in the medieval settlement at the site of Crkveno Brdo between the 11<sup>th</sup> and the 13<sup>th</sup> century. Although the most important economic species was cattle, the main raw materials for bone tool production were horse bones.

#### ACKNOWLEDGMENTS

This research is funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

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## REZIME

## KOŠTANE KLIZALJKE SA SREDNJOVEKOVNOG NALAZIŠTA CRKVENO BRDO (SRBIJA)

NEMANJA MARKOVIĆ i PERICA ŠPEHAR

Na području opštine Senta, u ataru sela Gornji breg, na udaljenosti od oko 1,5 km u pravcu jugozapada, smešten je lokalitet Crkveno Brdo, koji je još krajem XIX veka zabeležio A. Dudaš, lokalni ljubitelj starina i prošlosti. Podaci koje je tom prilikom sakupio su stručno-naučnoj javnosti prezentovani znatno kasnije, kada su u kraćem izveštaju izneti podaci o položaju lokaliteta, na kome su se nalazili ostaci kamene crkve, kao i nekropola. Prošlo je još nekoliko decenija pre nego što je Crkveno Brdo postalo predmet istraživanja arheologa. Tako je ovo nalazište najpre 2018. godine evidentirano u okviru projekta Arheološka mapa severne Bačke, da bi naredne, 2019. godine, stručnjaci Međuopštinskog zavoda za zaštitu spomenika kulture Subotica prilikom rekognosciranja u sklopu aktivnosti vezanih za izgradnju gasovoda konstatovali i naselje, dok je naknadnim geofizičkim snimanjima utvrđen i tačan položaj crkve. Srednjovekovno naselje nalazi se u dolini danas gotovo presahle rečice, na padini sa njene leve strane. Prilikom iskopavanja najpre je mašinski uklonjen sloj oranice debljine 0,20–0,40 m. Razlika u debljini je posledica erozije, budući da je južni deo istraživane zone na nižoj nadmorskoj visini. Potom je usledilo uklanjanje kulturnog sloja debljine između 0,70 m u severnom i 1,00 m u južnom delu istraživane zone, koji je nalegao na sloj lesa. U ovom sloju otkriveni su ulomci keramike i životinjskih kostiju, fragmentovani nalazi gvozdениh korodiranih predmeta, kao i sporadični fragmenti stakla. Na kraju su iskopavane celine koje su bile ukopane u les u različitim dubinama. Dokumentovano je više desetina celina, koje čini pet kuća, devet peći, 41 jama, bunar, kao i 13 rovova različitih dimenzija i oblika.

Naselje u Crkvenom Brdu pripada otvorenom tipu srednjovekovnih naselja, koja su

u razdoblju XI–XIII veka mogla predstavljati male samoodržive zajednice. Otkriveni nalazi, pre svega keramički, ukazuju da su se na pomenutom prostoru aktivnosti odvijale u razdoblju od XI–XV veka, što potvrđuje i radiokarbonsko datovanje životinjskih kostiju. Neophodno je napomenuti da su nalazi mlađi od XIII veka prvenstveno otkriveni u naseobinskom sloju koji se formirao iznad ukopa, dok u ukopima dominira keramika XI–XIII veka.

Tokom arheoloških iskopavanja srednjovekovnog naselja na lokalitetu Crkveno Brdo prikupljeni su i životinjski ostaci. Faunalni materijal potiče iz 48 celina, od kojih su najbrojnije jame, rovovi, stambeni objekti i peći. Od ukupnog broja identifikovanih primeraka u faunalnoj zbirci, procentualno su najzastupljeniji ostaci sisara (92%), zatim ptica (7,5%), dok su ostaci riba zastupljeni sa svega tri primerka (0,5%). Identifikovano je ukupno devet sisarskih vrsta i to sedam domaćih i dve divlje. Na osnovu rezultata arheozoološke analize može se zaključiti da su u naselju na lokalitetu Crkveno Brdo ekonomski najznačajnije domaće vrste bile goveče i konj, dok su u manjem procentu gajene ovce, koze i svinje. Tokom analize životinjskih ostataka izdvojeno je pet fragmentovanih i jedna kompletna koštana alatka. Obradene koštane alatke potiču iz južnog dela istraženog prostora, iz kulturnih slojeva između stambenih objekata i slojeva tik iznad jama. Sve obradene koštane alatke datuju se prema stratigrafskom odnosu i tipologiji keramike u rasponu od XI do XIII veka. Nalazi su podvrgnuti analizi kroz koju su posmatrane morfološko-funkcionalne odlike na makro i mikronivou. Tokom analize korišćen je stereoskopski mikroskop sa uveličanjem do 40x, dok su mikrografski snimci dobijeni pomoću mikroskopske kamere *RisingCam* (E3ISPM 6300). Merenja su vr-

šena korišćenjem kalibracionog okulara, slajda i softvera *RisingCam*. Izvršena je taksonomska determinacija, dokumentovane su tafonomske promene, tragovi obrade i upotrebe.

Od ukupnog broja koštanih artefakata pet potiče od konjskih dugih kostiju, i to četiri od radijusa i jedan od metatarzalne kosti, dok jedan artefakt potiče od radijusa govečeta. Sve obrađene kosti iz srednjovekovnog naselja na lokalitetu Crkveno Brdo, na osnovu morfoloških odlika i tragova upotrebe, mogu se svrstati u dva glavna tipa: klizaljke i masivniji probojac sa zaobljenim vrhom, dok se klizaljke mogu podeliti na dva podtipa, one napravljene od radijusa konja i govečeta i jedna od metatarzalne kosti konja. Ovaj tip klizaljki široko je rasprostranjen u celoj Evropi i poznat je sa arheoloških nalazišta od ranog bronzanog doba do poznog srednjeg veka, a etnografski podaci upućuju na korišćenje veoma sličnih formi i tipova klizaljki na prostoru Karpatskog basena sve do kraja XIX veka.

Pored grupe nalaza koja se prema oblicima i tragovima obrade i upotrebe svrstava u klizaljke, otkrivena je i jedna alatka koja se prema obliku i upotrebi može šire opredeliti kao masivniji probojac. Alatka je napravljena od distalnog dela radijusa konja. Ima perforaciju pravilnog oblika, izbušenu kroz distalnu metafizu u proksimalno-distalnom pravcu, koja

je verovatno služila za umetanje drške, dok je dijafiza iznad metafize koso prelomljena i sečenjem i grubim brušenjem pretvorena u zaobljeni vrh. Mikrotragovi su u formi vertikalnih, dugačkih, paralelnih strija i intenzivno uglačanih površina. Na osnovu oblika i tragova upotrebe alatka se sa rezervom može interpretirati kao sadiljka grublje izrade.

Što se tiče strategije nabavke sirovina u srednjovekovnom naselju na lokalitetu Crkveno Brdo, goveče je ekonomski najznačajnija vrsta, međutim, glavni izvor sirovine za izradu alatki bile su kosti konja. Treba istaći značaj konja u privredi i ishrani, koji je vidljiv i u drugim naseljima od XI do XIII veka u centralnom delu Karpatskog basena. Domaće goveče je na prostoru Evrope bilo prisutno od neolita, međutim, skeletni delovi ove vrste retko su korišćeni čak i u kasnijim periodima za proizvodnju klizaljki i delova saonica. Učestalost koštanih klizaljki u Karpatskom basenu povećava se sa širenjem domaćih konja i to najviše od bronzanog doba. Kostii ove vrste predstavljaju glavnu sirovinu do kraja XIX veka, uz sporadičnu upotrebu kostiju govečeta i jelena. Isti obrazac nabavke sirovina vidljiv je i na primeru srednjovekovnog naselja na lokalitetu Crkveno Brdo između XI i XIII veka. Iako je najznačajnija privredna vrsta bila goveče, glavni izvor sirovine za proizvodnju koštanog alata bile su kosti konja.

CIP - Каталогизacija у публикацији  
Библиотеке Матице српске, Нови Сад

572:902(497)(082)

**BIOARHEOLOGIJA na Balkanu** : studije iz antropologije i zooarheologije / urednici  
Nataša Miladinović-Radmilović, Dragana Vulović, Selena Vitezović. - Beograd : Srpsko  
arheološko društvo ; Sremska Mitrovica : Blago Sirmijuma, 2023 (Beograd : Propaganda  
Jovanović). - 133 str. : ilustr. ; 30 cm. - (Radovi Bioarheološke sekcije Srpskog arheološkog  
društva)

Na spor. nasl. str.: Bioarchaeology in the Balkans. - Radovi na srp. i engl. jeziku. - Tekst  
štampan dvostubačno. - Tiraž 200. - Str. 1: Bioarheologija na Balkanu / Nataša Miladinović-  
Radmilović, Dragana Vulović, Selena Vitezović. - Napomene i bibliografske reference uz tekst. -  
Bibliografija uz svaki rad. - Rezime na engl. ili srp. jeziku uz svaki rad.

ISBN 978-86-80094-23-6 (SAD)

ISBN 978-86-84457-21-1 (BS)

a) Биоархеологија - Балкан - Зборници

COBISS.SR-ID 118278409

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