

Case of the Wounded Beast: a Red Deer Tibia with Projectile Trauma from *Viminacium*

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Abstract: During the excavations of *Viminacium* in 2016, a red deer tibia, with what seemed like a trauma caused by a weapon, was found in the vicinity of the amphitheatre. Consequently, the aim of this research was to determine whether that was the case and to attempt to reconstruct the potential hunting moment. The analysis of the wound suggested that the animal was hit from its right side with a deltoid or leaf-type long-range weapon, such as throwing spears or arrows. The irregular shape of the trauma on the lateral side of the bone was due to the socket that went through it along with the tip of the weapon. Since this wound is located just beneath the knee of the deer, it would not have been enough to kill the animal instantly, but there are no indications of any bone healing, which leads to an assumption of multiple hits, and thus multiple huntsmen involved in the hunt, which was a common practice. There is also a possibility that this particular animal took part in a *venatio*, that is, the beast hunt in the arena, since it was found in a trench related to the amphitheatre, alongside a large number of other wild animals, which undoubtedly participated in the spectacles.

Key words: *Viminacium* amphitheatre, red deer, trauma, projectile, Roman hunting, *venatio*.

INTRODUCTION

Hunting was not an important economic aspect during the Roman Empire since the diet was mainly based on domestic animals and cereals. However, it was practised by both the civilian population and the army, which used it as training to practice certain skills (bow and arrow shooting, slingshot, javelin throwing, horseback riding, etc.); as suggested by the written sources (Toynbee 1973; Epplett 2001, 211; MacKinnon 2006, 7). This is evident by the monument dating to AD 147 found in Montana. It was dedicated by *Tiberius Claudius Ulpianus*, the tribune of the *I Cilicum* cohort, who successfully participated in the hunting of wild animals (Ferjančić 2018, 168).

The most commonly hunted species on the majority of Roman sites in today's Serbia were red deer (*Cervus elaphus*), wild boar (*Sus scrofa*) and brown bear (*Ursus arctos*), with a smaller portion of roe deer (*Capreolus capreolus*), wolf (*Canis lupus*), European hare (*Lepus europeus*) and other animals (Blažić 1995; 2006; Nedeljković 1997; 2009; Vuković 2015; 2020; Vuković-Bogdanović 2017). This situation is similar to most other Roman period sites across Europe (Cool 2006; King 1999; Lauwerier 1988). This is expected, given that these are autochthonous species that were widespread throughout the continent. Aside from the meat, other parts of the animal, such as the skin, cervid antlers and wild boar canines, were used for the production of various objects.

However, apart from sporadic mosaics (Dunbabin 1999), stelae (Mirković 1986), fresco scenes (Bergmann et al. 2018, 305) and literary sources (Toynbee 1973; Anderson 1985), there is little archaeozoological evidence about actual ways these animals were hunted. Therefore,



Fig. 1. Location of *Viminacium* within the map of the Roman provinces (I. Bogdanović)

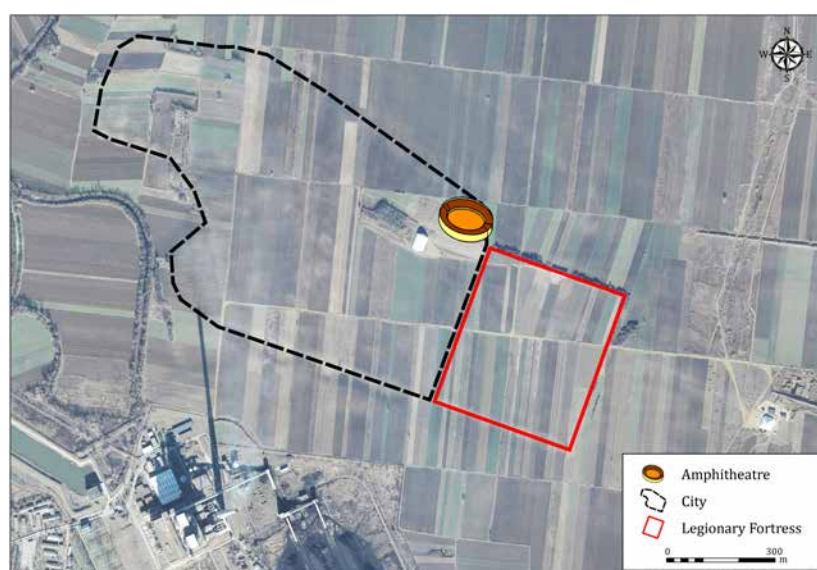


Fig. 2. The position of the amphitheatre in relation to the city of *Viminacium* and the legionary camp (I. Bogdanović)

a fragmented red deer tibia with potential projectile trauma that has been discovered in *Viminacium* during the 2016 archaeological campaign, could give us new information about the hunting techniques.

Consequently, this research aims to determine, first of all, whether this was a weapon-made trauma, and then to try and reconstruct a possible hunting moment. Finally, since the specimen was found in a context related to the amphitheatre, alongside a large number of other wild animal remains, a question of potential *venatio*, that is, a beast hunt in the arena will be raised.

ARCHAEOLOGICAL BACKGROUND

Viminacium is a Roman period site located in today's eastern Serbia, at the confluence of the rivers Mlava and the Danube (fig. 1). Once, there was a border of the Roman Empire, so the legionary fortress was established in the course of the first century AD. From the second part of the mentioned century, the *VII Claudia* legion was stationed there throughout Antiquity (Mirković 1986). In the second century AD, a

settlement of c. 50 ha developed to the west of the *castrum* (fig. 2). It quickly grew in importance, thus becoming the capital of the entire province, eventually even gaining the status of a colony by the mid-third century AD (Mirković 1968, 63-65). Consequently, it became the military, economic and commercial centre of the entire region.

One of the largest and most important features excavated in *Viminacium* is the amphitheatre, representing the only unearthed amphitheatre on the territory of today's Serbia. It has been the subject of archaeological research for 10 years, between 2007 and 2017, under the direction of the Institute of Archaeology in Belgrade (Bogdanović et al. 2018, 45). These excavations showed the existence of two separate phases of construction. At the beginning of the second century AD, c. 60 m north-west of the *castrum*, a wooden amphitheatre was built by the army, with a capacity of some 5.000-6.000 spectators (Nikolić / Bogdanović 2015; Bogdanović / Nikolić 2017, 92). It can be considered a typical military amphitheatre; these are known to be erected close to army camps in the provinces. By the mid-second century AD, it was replaced by a masonry amphitheatre with wooden stands and an expanded capacity for about 7000 seats (Bogdanović et al. 2018, 47). Later, the amphitheatre became a part of the city since its walls were used as a north-eastern corner of the city's fortification.

The arena was used as a place for spectacles until the middle of the fourth century AD when it was abandoned and turned into a city dump, while it subsequently became a burial place by the end of the fourth century AD (Nikolić / Bogdanović 2015, 254; Bogdanović et al. 2018, 47).

Viminacium represents one of the best documented sites in Serbia, in terms of archaeozoological analysis, with the majority of animal remains coming from the Amphitheatre. Over 20,000 bones have been analysed so far, with the material being divided into two phases – second/third century and fourth century AD. Both phases were dominated by domestic animals, that is, cattle, pig and sheep/goat respectively, while the wild animals comprise around 2.3% and 3% (Vuković 2018). This represents what is considered to be a “typical Roman” food pattern (King 1999).

The most common wild animals are red and roe deer, wild pig and hare, but there were also findings of brown bear and exotic big cats which most probably represent animals captured for the spectacles in the *Viminacium* amphitheatre (Vuković 2020).

MATERIAL AND METHODS

During the 2016 campaign, in the trench associated with the amphitheatre and extending west of it (fig. 3), a fragmented red deer tibia was discovered, with, as it was supposed, a projectile trauma (fig. 4). Taxon determination was conducted at the site itself, using the existing comparative collection and Schmidt's Atlas of animal bones (Schmidt 1972), while the age of the individual was suggested based on the epiphyseal fusion (Heinrich 1991). It represents a unique red deer finding related to the amphitheatre, while similar wild animal bones with projectile-type fractures are extremely rare in the territory of *Viminacium*.

The length and width of the trauma were measured using a Vernier calliper. The shape of it was later drawn using the Adobe Photoshop CS6 software. Based on the trauma aspect, a possible shape

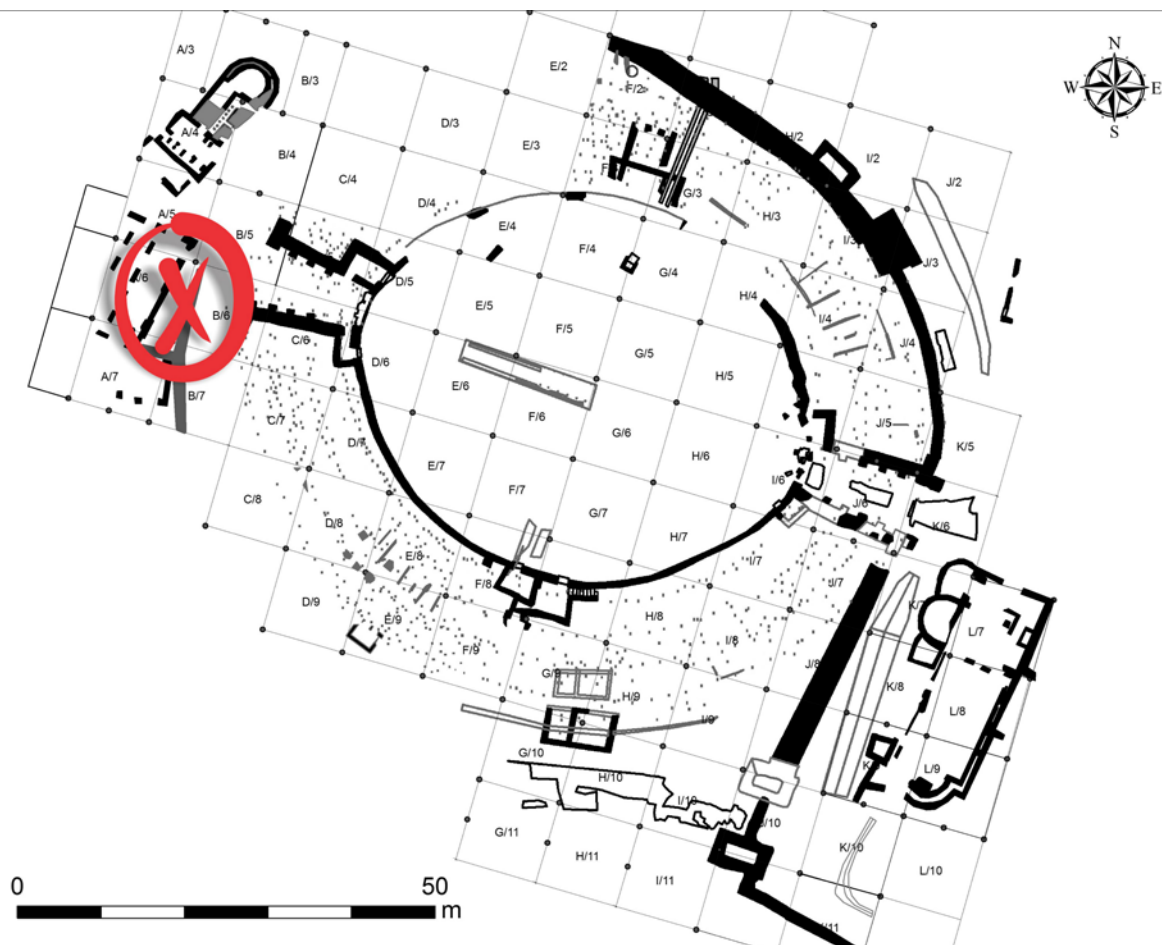


Fig. 3. The location of discovery of the red deer tibia, in relation to the position of the amphitheatre (I. Bogdanović)

of the weapon was suggested in accordance with the available literature. Finally, the representations of Roman hunting on mosaics, grave-stones and frescoes were analysed in order to compare the potential reconstruction of the hunt with the known depictions of this activity.

RESULTS AND DISCUSSION

The fragment in question is the proximal part of the right tibia, that is, the part that makes a knee together with the femur and patella. Based on the fully fused proximal epiphysis, it can be assessed that the bone belonged to an adult animal since this epiphysis closes around 36 months of age (Heinrich 1991, 29). The sex of the animal could not have been suggested based on this element alone.

The shape of the trauma is irregular, and one small part is additionally broken recently, probably during the excavation (fig. 5). The length of both openings is about 3 cm, and the width of the opening on the medial side is about 1.2 cm. A proper narrowing on both sides indicates that this trauma was indeed caused by the projectile, possibly a weapon intended for long-range combat, such as arrowheads or throwing spears. Also, along the trauma edges, there is bone beveling visible, that is, bone breakage in the form of small flakes, which is often present when the bone is pierced by a sharp object, as demonstrated by experimental research carried out in England (Forsom / Smith 2017, 281-282).



Fig. 4. Fragmented red deer tibia with projectile trauma, views from lateral and medial side (M. Savić)

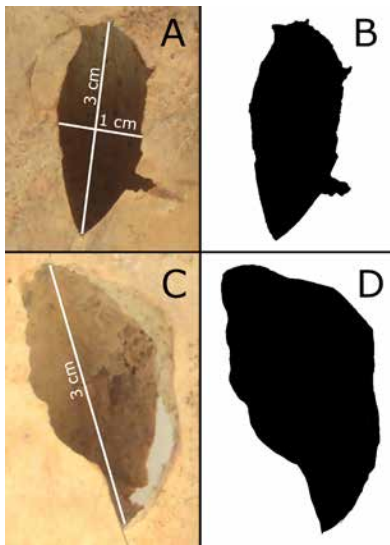


Fig. 5. Shape of the trauma (scale in cm): **A, B** medial side view; **C, D** lateral side view (M. Savić)

The wound on the inside or medial side of the bone is positioned somewhat lower, indicating a certain parabola, further suggesting that the shot didn't come from immediate proximity, as is usually shown in the mosaic scenes where animals are often stabbed with spears (Lavin 1963, fig. 21, 87, 94, 130). Since the entry wound is located on the lateral side, it is evident that the projectile was thrown by a hunter standing to the right of the red deer.

Although the sharp edges of the wound point to some kind of a leaf-type projectile, the irregular shape of the entry wound does not refer to any known form. However, the experiment conducted by Forsom and Smith (2017), which involved the firing of various types of arrows into the cattle shoulder blade, resulted in one trauma very similar to the one from *Viminacium*. Here, the wound was narrowing towards the edges as well, while the middle part was irregularly broken (Forsom / Smith 2017, 281, fig. 6C). This breakage was the result of the socket that went through the bone together with the arrowhead and was made by firing a leaf-type arrow, which confirmed our original assumption.

The findings of the deltoid and leaf-type tips of arrows and spears have been attested throughout the Empire (Bishop / Coulston 2006), while such projectiles were also discovered in *Viminacium* as well as on the territory of today's Serbia in large numbers. They are found in the area of the *limes* (Belgrade, Čezava, Kostol, Boljetin, Tekija, Ritopek, Rtkovo-Glamija), but also the interior of the province (Ravna, Guberevac). These are specimens widely dated to the period between the first and fourth centuries AD (Vujović 1998, 84-99, 100-120, T. XXVII, XXVIII, XXIX, XXXV, XXXIV). Unfortunately, this type of weapon was used by both the army and the civilian population and thus was very common.

Since the red deer is a very large and powerful animal, such a wound could not have killed it immediately. However, as there are no indications of bone healing, it is evident that the animal did not survive this hunt. Also, it is unlikely that it escaped and died in the forest later on since the death caused by such an injury would not have occurred soon, so there would be signs of new bone growth visible. It is then likely that there were other shots fired, suggesting group hunting. This activity was common practice in the Roman period, which is evident in a large number of mosaics. On them, hunters are portrayed in various dresses, presented both as pedestrians and horsemen. They are armed with bows and arrows, close combat spears or throwing spears (Dunbabin 1999, 183, fig. 196; Belis 2016, 24, fig. 14). In some representations, in addition to hunters, dogs played a role in tracking down wildlife and pursuing it towards hunters (Dunbabin 1999, 96, fig. 95). One of the more famous examples comes from the fourth century AD villa Romana del Casale located in the vicinity of Piazza Armerina, Sicily. There are two mosaics depicting red deer hunts. The first one, known as "The Small Hunt" shows several scenes involving hunters against the countryside setting, with a sacrifice to Diana as a central picture (fig. 6) (Dunbabin 1999, 133-135). On the lowest segment of this mosaic, a hunter is piercing a boar with a spear, alongside a scene of two huntsmen on horses, chasing several deer into a large net. This is interesting since it shows a need for keeping these animals alive, which will be discussed later.



Fig. 6. The “Small hunt” mosaic from Villa Romana del Casale de Piazza Armerina, Sicily (after Dunbabin 1999, 135, fig. 137)

Depictions of deer hunting have also been recorded on the territory of Upper Moesia province. Several gravestones with this type of scenery as the main motif have been found. Of particular importance for this work are the three tombstones found in *Viminacium* itself. The first one, now stored in the National Museum of Pančevo, is dated to the end of the second - beginning of the third century AD and belonged to a certain *M. Valerius Speratus* (fig. 7). Two separate deer were identified on the tombstone scene, one of which is shown being attacked by a knife-hunter (Mirković 1986, note 110). Another stele, belonging to *Aelius Victorinus* is dated to the third century AD. Its base is decorated with a hunting scene depicting a horseman with a dog hunting a deer (Mirković 1986, note 92). Finally, the third one belongs to *Sex. Valerius Valens* and features a hunting scene in the frieze area, as well. Although the animals presented cannot be recognized with utmost certainty, author M. Mirković assumes that two dogs are shown in the left corner, while a dog and fallow deer (*Dama dama*) are shown in the right corner (Mirković 1986, note 77; Pilipović 2006, 339, figs. 4, 4a).

On the other hand, at the site of *Felix Romuliana* an interesting brick dated to the fourth century AD was found with a lay-carved hunting scene where a red deer and the net are recognized (Christodolou 2006, 77-78, fig. 1; Цвјетићанин 2013, 208, fig. 115). Hunting with nets was often used by the army so that animals could later be transported for the needs of organizing spectacles (Epplett 2001; 2014; MacKinnon 2006). This whole process is depicted in “The Great Hunt” mosaic from the aforementioned villa in Piazza Armerina, where soldiers and their officials are shown catching various wild animals, and later transporting them overseas (Dunbabin 1999, 133). They would have then been kept in enclosures (*vivarii*) until ready to participate in arena spectacles. There is evidence that even within the framework of the legions there were units in charge of capturing different wild animals in such a manner, such as an example of the *legio I Minerva* stationed on the Rhine, which had units specializing in catching brown bears for the spectacle, or the men from Dura-Europus sent to hunt lions



Fig. 7. Detail from a tombstone from *Viminacium* with the representation of the deer hunt (M. Savić)

(Epplett 2001, 173, 176, 214-215). Apart from that, the inscriptions also point to military hunters in Britain and Africa (Epplett 2001, 171, 174-175, 181).

Having that in mind, we should now turn back to the context in which the red deer tibia was discovered. It was found in a trench extending from the west side of the amphitheatre in a layer which was dated to the third century AD based on other small finds, that is, the period when the amphitheatre was still being used for spectacles. An atypically large amount of wild animal remains, primarily of red deer, brown bear and wild boar were discovered in the trench itself. Therefore, it is somewhat logical to consider the possibility of this being a disposal area for animals that participated in the spectacles¹.

Namely, in addition to the well-known gladiatorial fights, the standard part of the spectacle in the arena was the *venatio* or the use of animals for entertainment. Animals were usually part of the morning program within the spectacle (Nossov 2009, 48-54; Epplett 2014, 719), which included a mere showing of wild animals, animals carrying out tricks, but also the fighting between wild beasts themselves, above all bears, bulls and big cats, as well as the mid-day execution of prisoners, which were placed in the arena at the mercy of wild beasts (Köhne et al. 2000, 70; Nossov 2009, 48-54). *Venatio* often implied the re-enactment of hunting within the arena, with all of the elements of a real-life hunt (Kyle 1998, 189). For this purpose, benign animals such as rabbits, ostriches, donkeys and deer were the most commonly used (Köhne et al. 2000, 71).

There arises a possibility of the red deer in question being a participant in the spectacle, that is, its wound could have come from a projectile thrown by a hunter in the arena or even by piercing the animal with the spear while it was already injured and laying on the ground. The evidence to support this assumption is very scarce, and is limited to several premises that will be looked upon in greater detail: first, that red deer as autochthonous species regularly took part in the arena; second, that arena hunters did use a “regular” leaf of deltoid-type projectiles; and three, that some of the wild animals found in the said trench, probably were a part of the same context during their lifetime.

Venatio images are found on the territory close by, namely on the mosaic from the site of *Felix Romuliana* where two hunters, one armed

¹ The context of this trench is still being analysed and there are a few working hypotheses. There is a possibility that it could have served as a part of the drainage system that was later fulfilled, or less possible that trench was dug with the idea of being a waste pit. The main assumption is that the soil from here was used for setting the embankment that was supporting the stands. The ditch would be buried in the following period of the usage of the amphitheatre and its wider area.

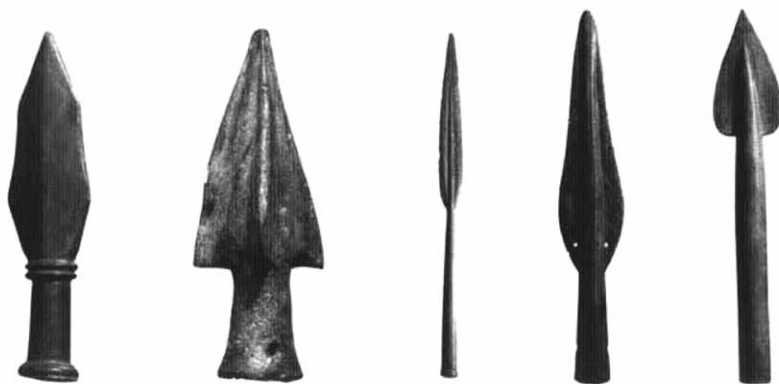


Fig. 8. Gladiatorial bronze spearheads from Pompeii (after Nossov 2009, 97)

with a spear and shield and the other one with a lasso, are represented (Живић 2010, 133, 137-138, fig. 96-97). Based on the preserved parts of the mosaic, it is possible to suggest that they hunted big cat(s). Apart from that, at the site of Magura where the emperor Galerius and his mother were buried, rim fragments of two silver plates with hunting scenes were found. On one of them, a hunter dressed in a tunic, armed with a spear and shield, is preparing to attack a panther (Поповић 2010, 146, 149, fig. 113a, b, 114a, b).

Venatores, or hunters, could hunt prey on their feet, either alone or in a group, they often had dogs with them, they did not have special armour, they were dressed in a tunic, and were usually armed with a specially shaped spear called *venabulum* (fig. 8) (Nossov 2009, 52; Epplett 2014, 726-727). Depictions of the spectacles in the arena usually show them piercing wild animals with spears (Nossov 2009, 39-40). They are also known to have used ordinary, “every day”, throwing javelins and arrows since it was considered that in this way their skills can be most prominent (Köhne et al. 2000, 71).

However, although we have valid knowledge of what was happening during the shows, it is not quite clear what happened after the animals were killed, as S. Vuković discussed in her PhD thesis (Vuković 2015, 153-158). There is evidence that the meat, as well as hide and horns, were divided among the spectators after the hunt has been finished (Kyle 1998, 189-190; 2014, 311-312). On the other hand, parts of the skeleton with a small amount of meat were thrown into the nearby residue area. This is the case with bones found in the water canal beneath the Flavian amphitheatre, where the material mostly consisted of meatless parts of the skeleton as well as bones of large cats and ostriches (De Grossi Mazzorin et al. 2005). Red deer tibia from *Viminacium* is also such a bone since deer skeletons from the site were usually divided at the knee (Vuković 2015, 155-157).

The trench on the west side of the amphitheatre in *Viminacium*, from which the tibia in question comes, could, therefore, also represent the place of deposit of the animals that died in the amphitheatre, among other things. This is also suggested by a large amount of more common autochthonous and even exotic wild animal remains discovered within the same trench as well as similar finds from other nearby archaeological features related to the amphitheatre. According to the written sources and representations on ancient monuments, animals such as deer, bears, wild boars and exotic animals surely participated in the spectacle.

This information, alongside numerous depictions on the *terra sigillata* fragments from *Viminacium* (Bjelajac 1990, T. 15, # 151, T. 37, # 367, T. 51, # 556) and other hunting scenes from the territory of Serbia (Вујовић 2011), proves that *venatio* was carried out in the Upper Moesia province including in the amphitheatre of *Viminacium*.

CONCLUSIONS

It is safe to say that the trauma on the bone was indeed made by a projectile, most probably the leaf or deltoid-type throwing weapon. The entry wound on the lateral side suggests that even the socket went through, which points to the strength of the throw. However, this type of wound below the knee wouldn't be enough to kill the animal, but, based on the fact that there was no new bone formation, it is evident that the red deer didn't survive the hunt. That brings us to the possibility of multiple hunters involved, as shown in many different Roman period frescoes and mosaics.

Finally, the context of the finding suggests that the red deer might have been a part of a hunt in the arena, since the trench in which it was found had a large amount of wild animal remains, such as brown bear, wild boar, and, most importantly, exotic animal bones from nearby archaeological features. It is unavoidable that deer was used in amphitheatres. First of all, it is an autochthonous species in this part of the Empire, so it was easily accessible. After other wild animals from *Viminacium* died whether in the arena or for some other reason, they might have been deposited close by. Therefore, there is a possibility that the pierced red deer tibia from the same context, could also have come from an animal that participated in the *venatio*. However, there is not enough data on which we can conclude with certainty that the deer in question did indeed die in a spectacle, but this possibility certainly exists.

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Раненото животно: пищял на благороден елен с рана от метателно оръжие във Виминациум

Димитрие З. МАРКОВИЧ / Милан И. САВИЧ /
Иван С. БОГДАНОВИЧ

(резюме)

Костта е намерена при археологически разкопки през 2016 година край амфитеатъра на римския град Виминациум в Източна Сърбия. Раната била причинена от стрела или метателно копие. Ударът бил силен, защото даже втулката на острието преминала през костта. Пищялът е открит заедно с останки на други диви животни – мечка, глиган и дори леопард. Вероятно еленът бил убит на арената по време на ловно зрелище (venatio).

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