

## TAPHONOMIC RESULTS FROM PETRLAŠKA CAVE, EASTERN SERBIA

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**Abstract:** Taphonomy is a very important scientific discipline, not only for paleontologists, but for archeologists, especially for zooarcheologists. In Petrlaška Cave, in the central hall, 20 cm below the surface remains were found of a fireplace and fragments of pottery. In the lower cultural layer bone remains were found: two canines and a part of mandible of a cave bear. Recently revision of the cave brought new information about animals which lived during Pleistocene in this part of Eastern Serbia. In this paper are the preliminary taphonomic results. Unfortunately, the excavation was not done professionally-“treasure hunters” left bones on the surface of the cave. Because of that stratigraphic analysis is not possible.

**Key words:** *Ursus spelaeus*, Taphonomy, Eastern Serbia.

### INTRODUCTION

Petrlaška Cave is situated on the southwestern brim of the Odorovačko field, on the alluvial level, just 10 m from the last active stream-sink (fig. 1). The large entrance of the cave is entrenched at 686 m a.s.l. The total length of the surveyed galleries is 480 m (PETROVIĆ, 1976).

In 2005, there was a new revision of the Petrlaška Cave and new fossil remains from three species were found: *Ursus spelaeus* ROSSENMÜLLER, 1794, *Equus ferus* BODDARET, 1785, *Cervus elaphus* LINNAEUS, 1758 of Pleistocene age. Carnivores or man brought a metacarpal bone of a tarpan and part of a red deer skull into the cave.

Remains of cave bear originate from at least three animals: two animals around one and half years old and one six month old cub. One of the remains is a skull from a one and half year old cave bear with a big aperture (16 x 20 mm) on the left frontal bone. Also porosity of osseous tissue of a left mandible belonging the same animal shows it to be in a very bad health condition. As the edge of aperture is smooth it could not have happened from a hit or bite. It was caused by some serious pathological disorder or infection.

The abundance of the remains of cave bears in caves is the consequence of the fact that the cave bear used caves for winter hibernation. As for the high mortality rate among immature bears, some or perhaps most of the deaths can be attributed to simple inexperience and inadequate summer feeding (KURTÉN, 1978).

The most numerous group of underground karst phenomena on Vidlič Mt. are stream-sink caves and pits. There are 20 caves and 36 pits on the southwestern brim of Odorovačko Polje. Petrlaska Cave is one of them (fig. 2, 3). This was a human occupied cave and also shelter for Pleistocene mammals, especially for the cave bears. Most of the cave bears' remains in Pleistocene cave deposits of Serbia are found to be originating from animals hibernating in caves. The main question in this research is the reason of high mortality of immature bears, and the attempt to find out which pathological disorder caused the death of one of cubs.

Remains of other species, *Cervus elaphus* and *Equus ferus*, were brought into the cave as prey of carnivores or man.

### MATERIAL AND DESCRIPTION

A total of ten bear bones were found at Petrlaska cave: a skull (cranium) of a young animal, with well preserved posterior part; a cranium with a broken oral frontal part, aboral in the occipital part; fragments of frontal (sin and dex), parietal (sin and dex), supraoccipital and fragments of temporal (sin. and dex.) are well preserved. The skull belonged to a very young animal, which hadn't finished its growth. Also, the skull is small with open sutures. In the base of the left cheekbone there is a joint for process of right mandible.

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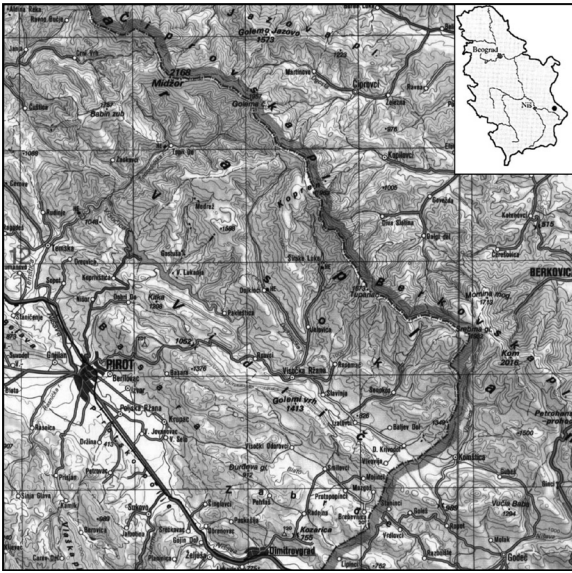


Figure 1. Map with the position of the Petraška Cave.

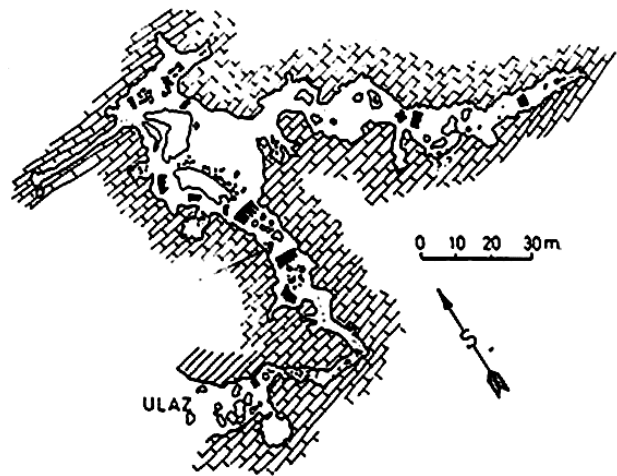


Figure 2. Scheme of the Petraška Cave.

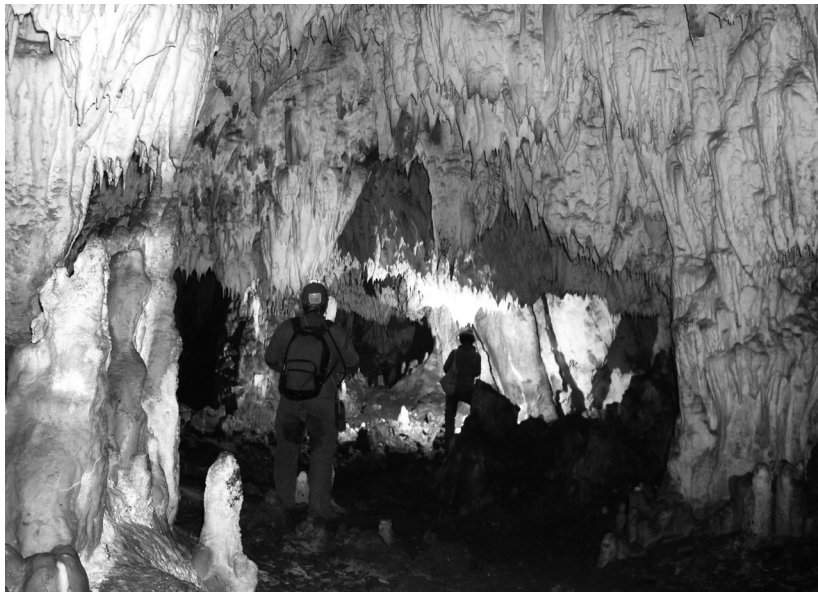


Figure 3. Inside of the Petraška Cave.

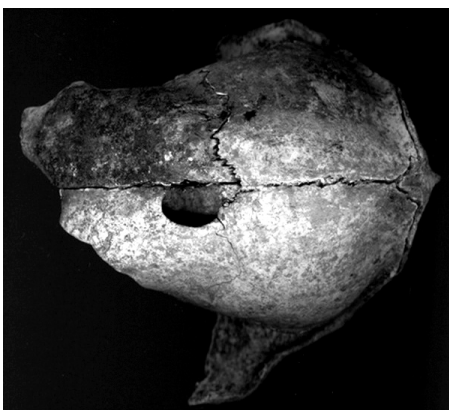


Figure 4. Petraška Cave: *Ursus spelaeus* ROSSENMÜLER, 1794. The skull of a one and half years old cub with a big aperture.

On the left frontal bone is a big aperture (16 x 20 mm). This was the cause of death of the cub (fig. 4).

The right mandible (mandibula dex) is oral broken at the level of the alveolus for the fourth premolar. The first and second molars are preserved and the alveolus for the third molar are preserved. The mandible belonged to the young animal, concluded from the size of the mandible, unworn tooth crowns and the alveolus for third molar which is placed in base of the coronoid.

Osseous tissue around the third molar shows porosity and indicates a bad health condition of the animal.

The skull and mandible belonged to the animals of the same age, around a year and a half. We can draw the conclusion that they are remains of the same animal, because the morphology and size of the processus articularis is suitable for skull cheekbone joint.

First lower, right molar ( $M_1$  inf. dex) has the same degree of wear of tooth crown as the first molar from the mandible, which shows that they belonged to animals of the same age, but not to the same cub, because both molars are from a right mandible.

Third, low, right molar ( $M_3$  inf. dex) belongs to an animal of the same age.

Fragment of left humerus (fr. humeri sin juv.) with preserved distal end is the bone of the remains of young animal.

Fragment of left femur (fr. femoris sin juv.) with a preserved parts of proximal and distal ends.

Fragment of left tibia (fr. tibiae sin juv.) of six months old cub.

Fragment of cranial vertebra (fr. vertebrae craniales juv.), then frag. vertebrae lumbalis and frag. costae; all are remains of very young animals.

## TAPHONOMY

Remains of cave bear from Petrlaška Cave belong to three individuals at least. Most of the remains (cranium, mandibula dex,  $M_1$  inf. dex,  $M_3$  inf. dex, humerus and femur) originate from one and half year old animals. The fragment of tibia is from a six months old cub. Material was not transported. Abrasion refers to the rounding of natural and broken edges of bones caused by rubbing against fine particles in a soil matrix. Abrasion may indicate the amount of traffic inside a site or geological rolling (STINER, 1994). There are marks of tooth of carnivores, but doesn't exclude that bones were gnawed postmortal.

Bones were not burnt and there were not tool cut marks which indicate that cave bear and man did not use the cave in the same time. On the skull are marks of

chemical corrosion process. All bones were covered by crystalline calcium carbonate which fell off easily.

Young bears used the cave for winter hibernation, after the feeding season. It could happen that winter was very long and deep and that cubs could not get enough fat for hibernation. Sometimes they did not have experience in feeding, sometimes they died from diseases, or from contact with hostile adults.

The aperture in the frontal bone of a young cave bear from Petrlaška Cave was not a result of brain tumor, because a tumor would make a whole net of channels in the cranial bones; similar channels would be caused by the making of a cyst. Some serious infection caused this aperture. Smooth edges of the aperture shows that it is not result of carnivore teeth or man tools. This is the effect of an inflammatory processes in the bone.

## CONCLUSIONS

The Petrlaška Cave has not been well explored, yet, like many other caves and pits in Serbia. A high percentage of young cave bears' remains are registered in all localities (including those which yielded single or few fossils). Sexual dimorphism is notable in the cave bear population in Serbia, like as in other European regions. Skeletal elements on which pathological deformations can be recognized are seldom found in Serbia. Several long bones with pathological deformations and only more or less progressive osteoporosis on cave bear remains from other localities are reported (DIMITRIJEVIĆ, 1997). This finding of a very young cub which died from serious diseases is unique in Serbia, for now. It is necessary to give more attention on paleopathology of mammals which can open new views for us.

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