

New localities of Quaternary fossil Bears (*Ursus* sp. L.) (Mammalia: Carnivora: Ursidae)

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Abstract. Bear bones were reported for first time in four Bulgarian caves: Mazata (near Hristo Danovo village, Stara Planina Mnt.) - *Ursus* cf *ingressus*, *Ursus* sp., Kokalenata (near Bulgarka hut, Stara Planina Mnt.) - *Ursus* cf *ingressus*, Kilykite (near Stanchov Han village, Stara Planina Mnt.) - *Ursus* sp. and Vodnata Modarska (near the Lilkovo village, Western Rhodopes Mnt.) - *Ursus spelaeus* species complex.

Key words: cave, bear, bones.

Introduction

The cave bears became extinct some 12,000 years ago (Lazzaro 2002) at the end of Pleistocene and left abundant bone remains in many caves of Eurasia. Being the most abundant large Quaternary fossil mammal taxa reported for more than 22 cave localities of Bulgaria (Beron *et al.* 2006) they are still with unclear taxonomical statute in our country. The only species to which the Bulgarian cave bears were referred was *Ursus spelaeus* Rosenmüller et Heinroth, 1794.

Using mitochondrial DNA sequencing, metrical and morphological examinations of teeth and limb bones of Pleistocene bears from the Alps Rabeder *et al.* (2004) found that currently known species as *U. spelaeus* consists of four independent species originated from two main evolution lineages. They were: the true *Ursus spelaeus*-lineage (including *U. spelaeus*, *Ursus ladinicus* Rabeder *et al.* 2004 and *U. eremus* Rabeder *et al.* 2004), and the *Ursus ingressus* Rabeder *et al.* 2004-lineage. The two morphologically similar species (*U. spelaeus* and *U. ingressus*) standing on tops of the two branches of two lineages of the evolution tree survived till the Late Pleistocene. The findings of the Rabeder's team in Austria and excavations in other countries (Rabeder *et al.* 2004, Nagel *et al.* 2005, Rabeder *et al.* 2006) showed that *U. ingressus* was the more wide spread cave bear species from both and survived until later.

Except the report of four caves as new localities of quaternary fossil bears in this paper, we want to emphasize also the need to clarify the taxonomic statute of the Bulgarian Late Pleistocene bears.

Material and Methods

During the period 2005-2009 bone material was collected from the following Bulgarian caves: Mazata (near Hristo Danovo village, Stara Planina Mnt.), Kokalenata (near Bulgarka hut, Stara Planina Mnt.), Kilykite (near Stanchov Han village, Stara Planina Mnt.) and Vodnata Modarska (near the Lilkovo village, Western Rhodopes Mnt.). Only in Mazata cave the excavations were performed at depths up to 50 cm in a layer of brown clay (Fig. 1).

In other localities the bones were collected from the floor of caves. Due to the fact that two of the caves (Mazata and Kokalenata) were located within the National park "Central Balkan" and the Natural Park "Balgarka" respectively, studies were consistent with the relevant Directorates of the protected territories.

The bone material was firstly washed by water and after its drying was consolidated using translucent liquid paper glue. The bone material collected on 11.03.2006 from Mazata cave was deposited in the National Natural History Museum, Bulgarian Academy of Sciences (Sofia; NMNHS-BAS; curator of mammals Dr Nikolay Spassov). Two fragments of juvenile cave bears collected from Kokalenata cave were sent to Dr Martina Pacher (Institute of Paleontology, Vienna) for DNA sequencing. The rest of the material was stored in the collection of the first author in the faculty of Biology of Plovdiv University.

Identification of bones followed mainly Erdbrink (1982), Aristov & Baryshnikov (2001), Santi & Rossi (2005), Kurten (2007).

Results

Mazata cave: *Ursus cf ingressus*, *Ursus* sp. An abundant bone material collected mainly from bears, consisted almost all parts of the skeleton from a minimum 15 bear specimens (Fig. 2).

For associated fauna: see Table 1.

Kokalenata cave: *Ursus cf ingressus*. Skull fragments with teeth, teeth and leg bones of at least four individuals of ursids. Two of them were juveniles in an age of changing the milk teeth.

Kiliykite cave: *Ursus* sp. We collected one lower incisor: length - 39.1 mm, crown width - 9.8 mm, crown length - 12.4 mm .

Associated fauna: Mammalia: *Bos/Bison* sp. (one molar tooth).

Modarskata cave: *Ursus spelaeus* species complex. A complete humerus (total length - 39 cm, which considering Erdbrink (1982) could belong to a specimen from the cave bear species group, or to a very large male brown bear (*Ursus arctos* Linnaeus, 1766).

Table 1. Taxonomical composition of the mammalian fauna from the Mazata Cave (Stara Planina Mts.), **U** – *Ursus cf. ingressus* stratum, **F** – cave floor.

Species	Type of the remains	Stratum	Locality in the cave	Age
Lagomorpha				
<i>Lepus</i> sp.	carbonized feet bones	U	middle cave parts	Pleistocene
Rodentia				
<i>Nannospalax leucodon</i> (Nordmann, 1840)	lower jaws with teeth	F	first 30 meters	unknown
<i>Glis glis</i> (Linnaeus, 1766)	lower jaws with teeth	F	first 30 meters	unknown
<i>Microtinae</i> sp.	teeth	F	first 30 meters	
Artiodactyla				
<i>Bos/Bison</i> sp.	upper molar	F	middle cave parts	unknown
<i>Cervidae</i> sp.	fragment of upper dexter jaw	F	first 30 meters	unknown
<i>Ovis/Capra</i> sp.	lower dexter jaw	F	first 30 meters	unknown
Carnivora				
<i>Vulpes vulpes</i> (Linnaeus, 1758)	fragment of lower M1 dex	U	middle cave parts	Pleistocene
<i>Mustela nivalis</i> Linnaeus, 1766	lower jaw with teeth	U	middle cave parts	Pleistocene
<i>Ursus cf ingressus</i> Rabeder et al. 2004	all types of bones	U	middle cave parts	Pleistocene
<i>Ursus</i> sp.	all types of undetermined bones	U	middle cave parts	Pleistocene
Primates				
<i>Homo</i> sp.	remains of a fire place with carbonized feet bones of hares	U	middle cave parts	Pleistocene



Fig. 1. Mazata cave: the cave floor and the area of excavations (left) and the top of the gallery (right), 11.03.2006. Photographs: S. Stoycheva, D. Georgiev.



Fig. 2. (see text to the figure in the next page).

▲ **Fig. 2.** Part of the collected remains of Quaternary bears. Mazata Cave: 1 – upper second molar M^2 , 2 – lower second molar M_2 , 3 – lower left canine, 4, 5 – left mandible, labial view, and lingual view; Kokalenata Cave: 6 – fragment of right mandible; Modarskata Cave: 7 – left humerus.

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