Acta zool. cracov., **39**(1): 117-120, Kraków, 15 Aug., 1996

Upper Pleistocene mammals from cave deposits in Serbia

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Accepted for publication: 5 Jan., 1995

DIMITRIJEVIĆ V. 1996. Upper Pleistocene mammals from cave deposits in Serbia. Acta zool. cracov., **39**(1): 117-120.

Abstract. Caves and other karst phenomena related to the wide distribution of carbonate rocks affected by karstification processes are numerous in Serbia. In caves with open entrances, in which the deposition of sediments is more or less still in course, Upper Pleistocene sediments containing faunal remains are often present. In the last decade, Quaternary research is intensified in Serbia. Large mountain areas have been prospected and the remains of Quaternary mammals found in the sediments of 20 caves. At several localities excavations have been carried out. As a result, more than 50 Upper Pleistocene mammal species have so far been identified.

Key words: Mammalia, Upper Pleistocene, cave deposits, Serbia.

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I. INTRODUCTION

The territory of Serbia, which covers the central part of the Balkan peninsula, is one of the least studied regions of Europe with regard to the Quaternary vertebrate fauna. Because of its geographical position this is undoubtedly an important region in any attempt to obtain a complete picture of Quaternary faunal development, if only because the distributional limits of many species passed through it. The expectation of finding important remains of Quaternary mammals in Serbia is justified by the fact that this region is one of the classic karst areas, and is thus rich in caves and other karst formations suitable for preserving Quaternary deposits containing fossil bones and teeth.

II. DISTRIBUTION AND STATE OF INVESTIGATION OF CAVE LOCALITIES WITH FOSSIL MAMMAL REMAINS IN SERBIA

Carbonate rocks affected by karstification processes are mainly present in the so-called Carpatho-Balkan arch and Dinaric mountain belt. Smaller, isolated areas of such rocks are also found in the vicinity of Belgrade and elsewhere in central Serbia (Fig. 1).

Pleistocene mammal remains from cave deposits in Serbia have been known since the end of the last century (CVIJIĆ 1891), but not until the 1950's did the first large scale excavation take place, in the cave Risovača near Arandjelovac (GAVELA 1968). Extensive data on the mammals from Risovača were published by RAKOVEC (1965). The excavations at Risovača were initiated by finds of paleolithic origin and most later excavations have also been motivated by archaeological finds.

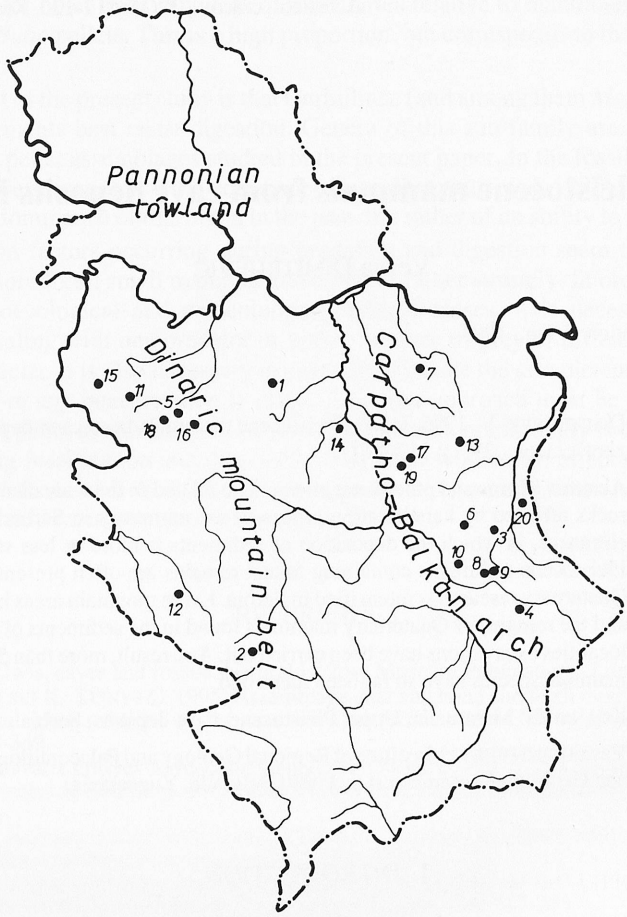

Fig. 1. Upper Pleistocene cave localities in Serbia: 1. Risovača, 2. Smolućka pećina, 3. Vasiljska p., 4. Vrelska p., 5. Petnička p., 6. Pećurski kamen, 7. Ceremošnja, 8. Prekonoška p., 9. Golema duvka, 10. Popšićka p., 11. P. pod crvenim stenama, 12. Ušačka p., 13. Lazareva p., 14. Jerinina p., 15. Kovačevića p., 16. Šalitrena p., 17. Ravanička p., 18. Visoka p., 19. P. kod Senja, 20. Ošljarska p.

In the last decade Quaternary research has intensified in this region. Larger mountain areas were prospected, and at several localities excavations were carried out (Petnička pećina, Visoka p., Šalitrena p., Ceremošnja, Pećurinski kamen, Prekonoška p., Smolućka p., Vrelska p.) (MILOŠEVIĆ 1984; JEŽ & KALUDJEROVIĆ 1986; LAZAREVIĆ et al. 1988; MALEZ & SALKOVIĆ 1988; MARKOVIĆ & PAVLOVIĆ 1991; KALUDJEROVIĆ 1991; DIMITRIJEVIĆ 1991; DIMITRIJEVIĆ 1994).

In caves with open entrances, in which the deposition of sediments is more or less still taking place, the Upper Pleistocene age of the sediments containing faunal remains has generally been confirmed.

Unfortunately, the exploration of almost all caves was limited to trial excavations, and usually stopped before providing complete profiles of the Quaternary deposits. Absolute dating methods were rarely applied. The sole relevant absolute date is from Risovača. It originates from the stalagmitic layer above the fossiliferous strata and gives an age of 36400 ± 6000 years B.P. (IRB Z-1296, documentation of the National Museum in Arandjelovac).

On the other hand, fossil bones and teeth were carefully collected in the course of excavations, and wet-screening of sediments was carried out at several localities (Smolućka, Vrelska, Vasiljska and Petnička pećina). As a result, more than 50 mammal species originating from cave deposits of the Upper Pleistocene age have thus far been identified (Table I).

Table I

Upper Pleistocene mammals from cave deposits in Serbia

Species		Locality*													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15-20
Insectivora	*Erinaceus europaeus*	+														
	Talpa europaea		+	+		+										
	Sorex araneus		+		+											
	Sorex minutus		+	+												
	Crocidura leucodon			+	+											
Chiroptera			+	+	+	+					+					
Lagomorpha	*Lepus* sp.	+	+	+	+	+			+	+	+					
	Ochotona pusilla		+	+	+											
Rodentia	*Sciurus vulgaris*			+												
	Citellus citellus		+		+											
	Castor fiber	+													+	
	Glis glis		+	+	+	+										
	Muscardinus avellanarius		+	+		+										
	Dryomys nitedula		+	+		+										
	Sicista subtilis		+		+											
	Spalax leucodon	+	+		+											
	Apodemus sylvaticus		+	+	+	+			+		+					
	Cricetus cricetus				+											
	Mesocricetus newtoni		+	+												
	Cricetulus migratorius		+	+	+											
	Clethrionomys glareolus		+	+	+	+										
	Arvicola terrestris		+	+	+	+										
	Pitymys subterraneus		+	+	+											
	Microtus arvalis/agrestis		+	+	+	+										
	Chionomys nivalis		+	+	+											
	Lagurus lagurus				+											
	Hystrix sp.		+													
Carnivora	*Canis lupus*	+	+	+	+							+			+	
	Vulpes vulpes	+	+	+	+	+	+			+					+	
	Ursus arctos	+	+	+			+	+								
	Ursus spelaeus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Mustela nivalis			+												
	Mustela erminea		+	+												
	Meles meles	+	+													
	Crocuta spelaea	+	+			+	+	+		+			+		+	
	Panthera spelaea	+							+			+		+	+	
	Panthera pardus		+													
	Felis silvestris				+		+									
Proboscidea	*Mammuthus primigenius*	+													+	
Perissodactyla	*Dicerorhinus* sp.	+													+	
	Equus caballus	+			+										+	
	Equus hydruntinus	+														
Artiodactyla	*Sus scrofa*	+					+								+	
	Cervus elaphus	+	+				+						+		+	
	Megaceros sp.	+	+												+	
	Capreolus capreolus			+	+											
	Bos primigenius	+													+	
	Bison sp.	+														
	Bos/Bison		+		+			+								
	Rupicapra rupicapra		+				+									
	Capra ibex		+	+			+		+	+						

*numbers of localities as in Fig. 1.

III. COMPOSITION AND FEATURES OF THE FOSSIL MAMMAL FAUNA FROM CAVE DEPOSITS IN SERBIA

As in other karstic regions in Europe, the cave bear is regularly present and highly dominant member of the large mammal fauna. It is a cave bear with distinct speleoid features, approaching in size the largest cave bears of Europe, with accentuated sex dimorphism, and usually a high percentage of juvenile specimens at most localities.

Other carnivore species are usually present in small numbers, while the presence and frequency distribution of herbivores at particular sites are mostly controlled by the geographical position of the sites, their palaeoecology or the interference of man during the deposition of cave sediments.

Numerous remains of small mammals have been found at several localities. The prevalence of wood or steppe elements can be observed and related to the stratigraphic position within the Upper Pleistocene, the palaeoecological conditions in various cave surroundings or the agent of accumulation of the small mammal remains.

Among rodents and lagomorphs, as well as among large mammals, an absence of most arctic and tundra species is observed, which differentiates this region from adjacent areas. On the other hand, it seems that the territory of Serbia is on the border zone of the distribution of several, mainly steppe species [e. g., *Ochotona pusilla* (PALLAS, 1769), *Sicista subtilis* (PALLAS, 1773)], [*Mesocricetus newtoni* (NEHRING, 1898)] in the Upper Pleistocene.

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