

Late Pleistocene small mammals from the Baikal region (Russia)

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Abstract. Micromammals from Paleolithic sites (10 070-35 845 years BP) in south central Siberia are discussed. The Paleolithic micromammal fauna of Prebaikalia consists of three lagomorph and 14 rodent species. The faunal composition indicates a tundra-steppe and forest-steppe biome. In Transbaikalian sites the micromammal fauna consists of one insectivore, two lagomorph and 10 rodent species. This fauna indicates the spread of different types of steppes (semi-arid, meadow-steppe, forest-steppe).

Key words: Mammals, late Paleolithic, paleoecology, Baikal region, Russia.

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I. INTRODUCTION

The study of small mammals from archeological sites provides valuable information towards the scientific reconstruction of the environment of ancient man (AGADZHANIAN 1982; KOWALSKI 1966; MARKOVA 1982; NADACHOWSKI 1982; REKOVETS 1985 and others).

In this paper, original material of micromammals from Paleolithic sites (10 070-35 845 years BP) in Prebaikalia and Transbaikalia is reported. These localities are from different stratigraphic levels of the river terrasses (Fig. 1). Here, large mammal faunas of the "Mammoth complex" have been recovered. The large mammal fauna of the Malta site includes *Mammuthus primigenius* BLUM., *Coelodonta antiquitatis* BLUM., *Equus caballus* L., *Rangifer tarandus* L., *Cervus elaphus* L., *Bison priscus* BOJ., *Ovis nivicola* ESCH., *Ovis* sp., *Felis spelaea* GOLDF., *Canis lupus* L., *Vulpes vulpes* L., *Alopex lagopus* L., *Gulo gulo* L., and *Ursus arctos* L. (ERMOLOVA 1978). From the Bolshoi Jakor site the remains of *Alces alces* L., *Rangifer tarandus* L., *Cervus elaphus*, *Bison priscus*, *Equus caballus*, *Capreolus capreolus* L., *Canis lupus*, *Alopex lagopus*, *Meles meles* L., and *Ursus arctos* have been found, while the large mammal fauna of Kamenka-1 includes *Megaloceros* sp., *Ovis nivicola*, *Spirocerus kiakhtensis*, *Equus* sp., *Bison* sp., *Coelodonta* sp., and *Artiodactyla* gen. (LBOVA 1992). The Kunalei site has yielded material of *Equus* sp., *Coelodonta* sp., ?*Saiga* sp., *Bison* sp., and *Cervus elaphus* (BAZAROV et al., 1982) and the site Ust-Kyakhta-17 has provided remains of *Rangifer tarandus*, *Cervus* cf. *elaphus*, *Bison* sp., *Spirocerus kiakhtensis*, and *Equus* sp. (TASHAK 1993).

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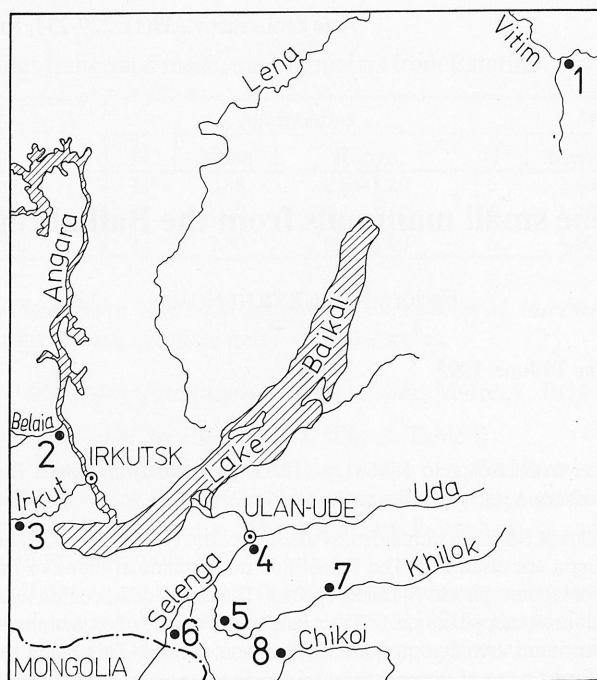


Fig. 1. Distribution of Paleolithic sites in south central Siberia. Prebaikalia: 1 – Bolshoi Jakor, 2 – Malta. Transbaikalia: 3 – M. Zangisan, 4 – Kamenka, 5 – Kunalei, 6 – Ust-Kyakhta-17, 7 – Cheremushki, 8 – Studenoe-2.

II. LATE PLEISTOCENE SMALL MAMMALS FROM PREBAIKALIA

New excavations at the Malta site undertaken by G. I. MEDVEDEV and E. A. LIPNINA from Irkutsk University have made it possible to identify faunistic horizons I-V on the basis of the small mammals (one faunistic horizon was established on the basis of previous studies of large mammals). Studies at Bolshoi Jakor by E. M. INESHIN have led to the recovery of remains from cultural horizons IV-IX. A list of the micromammal species of these sites is given in Table I.

It is known that, today, *Ochotona pusilla*, *Spermophilus undulatus*, *Cricetulus barabensis*, and *Lagurus lagurus* are steppe forms, *Dicrostonyx*, *Lemmus*, *Microtus hyperboreus*, and *M. middendorffii* tundra forms, and *Ochotona hyperborea*, *Clethrionomys*, and *Myopus* forest inhabitants.

The fauna of horizons I-III of the Malta site (Figs. 2, 3) indicates a cold steppe environment with tundra biotopes. This fauna dates to the interval $20\,700 \pm 150$ (GIN-7709) to $21\,000 \pm 140$ (GIN-7706) years BP. The few faunistic remains from horizon IV suggest a meadow-steppe biotope. The fauna from horizon V (Fig. 3) differs significantly from the others and indicates a forest-steppe environment. The sediments in which it was found date to the end of the Pleistocene.

A fauna contemporaneous with that from Malta horizon V is the fauna of Bolshoi Jakor (Fig. 3). The absolute age (C^{14} dated) of horizon IV at this site is $10\,320 \pm 150$ (SO AN-968) and $10\,070 \pm 540$ (LE-4173A) years BP, while that of horizon VI is $10\,400 \pm 650$ (LE-4172) and $12\,400 \pm 150$ (LE-4172A) years BP (BELOUSOV et al. 1990). The micromammal fauna of this locality indicates a tundra-forest-steppe environment.

Table I

List of micromammal species of Prebaikalian Paleolithic sites

Species	Malta					Bolshoi Jakor					
	Horizons										
	I	II	III	IV	V	IV	V	VI	VII	VIII	IX
Lagomorpha											
<i>Lepus timidus</i> L.	—	—	—	—	—	—	2	47	4	4	—
<i>Ochotona pusilla</i> PALL.	3	—	10	—	—	—	—	—	—	—	—
<i>O. hyperborea</i> PALL.	—	—	—	—	3	—	—	3	2	—	3
Rodentia											
<i>Marmota</i> sp.	—	—	—	—	—	—	—	1	—	—	—
<i>Spermophilus</i> cf. <i>parryi</i> RICH.	—	—	—	—	—	—	—	31	—	5	200
<i>Spermophilus undulatus</i> PALL.	1	—	4	17	—	—	—	—	—	—	—
<i>Clethrionomys rutilus</i> PALL.	—	—	—	—	7	—	—	—	7	—	—
<i>C. rufocanus</i> SUNDEV.	—	—	—	—	—	—	—	—	2	—	—
<i>Lagurus lagurus</i> PALL.	25	44	126	—	4	—	—	—	—	—	—
<i>Dicrostonyx</i> cf. <i>henseli</i> HINT.	2	—	14	—	—	—	—	—	—	—	—
<i>Myopus schisticolor</i> LILL.	—	—	—	—	4	—	—	—	6	—	—
<i>Microtus gregalis</i> PALL.	—	3	19	—	36	—	—	5	—	—	—
<i>M. oeconomus</i> PALL.	—	4	—	—	—	—	—	—	—	—	—
<i>M. hyperboreus</i> VIN.	—	—	20	—	—	—	—	—	—	—	—
<i>M. middendorffii</i> POL.	—	—	—	—	6	—	—	—	—	—	—
<i>M. ex gr. middendorffii-hyperboreus</i>	—	—	—	—	—	3	6	11	44	1	4
<i>Microtus</i> sp.	—	—	2	—	—	27	3	5	10	—	3

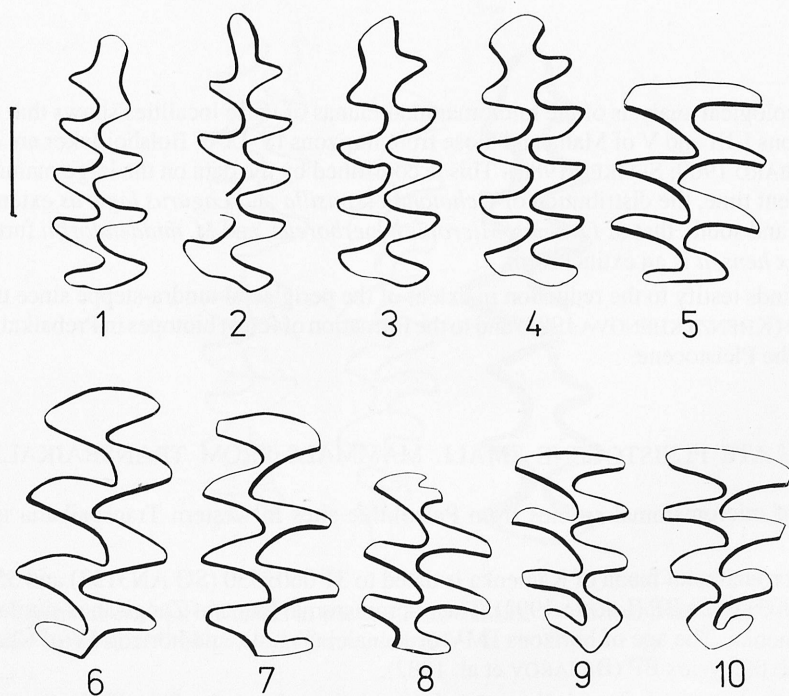


Fig. 2. Voles from the Malta site in Prebaikalia. 1-4: *Lagurus lagurus*, M₁; 5, 8 *Dicrostonyx* cf. *henseli*, M₁; 6-7: *Dicrostonyx* cf. *henseli*, M₂; 9-10: *Dicrostonyx* cf. *henseli*, M₃.

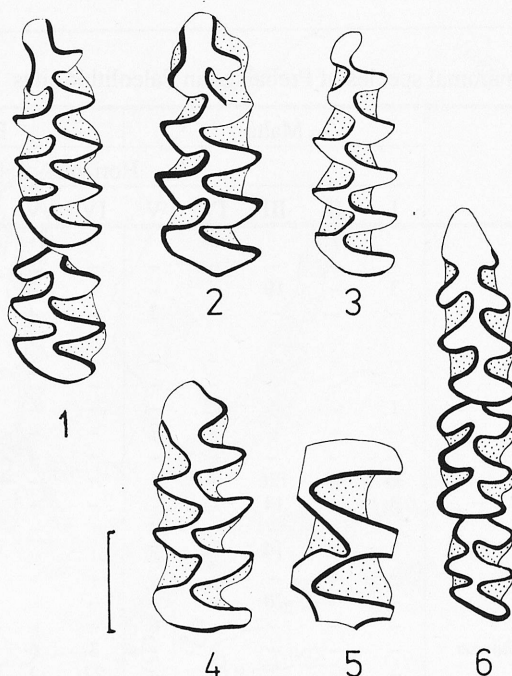


Fig. 3. Voles from the sites Malta and Bolshoi Jakor in Prebaikalia. 1 – *Microtus* cf. *hyperboreus* (Malta), M₁-M₂, 2 – *Microtus* cf. *hyperboreus* (Malta), M₁; 3 – *Microtus* cf. *hyperboreus* (Bolshoi Jakor), M₁, 4 – *Microtus oeconomus* (Malta) M₁; 5 – *Myopus schisticolor* (Malta), M⁺; 6 – *Clethrionomys rutilus* (Malta), M₁-M₃.

Paleoecological analysis of the micromammal faunas of these localities shows that the faunas from horizons I-III and V of Malta and those from horizons IV-IX of Bolshoi Jakor are disharmonious (HIBBARD 1960; SEMKEN 1988). This is confirmed by the data on the large mammal fauna. At the present time, the distribution of *Ochotona* cf. *pusilla* and *Lagurus lagurus* extends further to the west and south, that of *Lemmus*, *Microtus hyperboreus*, and *M. middendorffii* further north; *Dicrostonyx henseli* is an extinct form.

These finds testify to the reduction in extent of the periglacial tundra-steppe since the Middle Pleistocene (KHENZYKHENOVA 1994) and to the formation of forest biotopes in Prebaikalia towards the end of the Pleistocene.

II. LATE PLEISTOCENE SMALL MAMMALS FROM TRANSBAIKALIA

A list of micromammal species from Paleolithic sites in western Transbaikalia is given in Table II.

The micromammal fauna of Kamenka is dated to $31\,060 \pm 530$ (SO AN3133) and $35\,845 \pm 695$ (SO AN-2903) years BP (LBOVA 1992). The micromammal fauna of Zangisan is similar in age to that of Kamenka. The age of horizons II-IV of Kunalei (Fig. 4), and horizon IV of Cheremushki is 10 800-20 000 years BP (BAZAROV et al. 1982).

The main feature of the small mammal associations from the Paleolithic sites Kamenka, Kunalei, M. Zangisan, and Cheremushki in western Transbaikalia during the Middle to Late Pleistocene is the abundance of *Lasiopodomys brandti*, indicating widespread, dry *Artemisia*-step-

Table II

Micromammal species, with no. of specimens from Transbaikalian Paleolithic sites. K – Kamenka; Z – Zangisan; Ch. – Cheremushki, U.-Kyak. – Ust-Kyakhta-17, Stud. – Studenoe-2

Species	K	Z	Kunalei			Ch.	U.-Kyak.			Stud.	
	Horizons										
	VI	V	II	III	IV	IV	III	IV	V	II	III
Insectivora											
<i>Sorex</i> sp.	—	—	—	—	—	—	—	—	—	1	—
Lagomorpha											
<i>Lepus timidus</i> L.	14	—	—	—	—	—	—	—	—	—	—
<i>Ochotona daurica</i> PALL.	7	—	—	—	—	—	4	2	11	—	—
Rodentia											
<i>Eutamias sibiricus</i> LAXM.	—	—	—	—	—	—	—	—	—	1	—
<i>Marmota sibirica</i> RADDE	—	—	—	—	—	—	21	—	11	—	—
<i>Spermophilus undulatus</i> PALL.	5	1	—	4	—	—	1	—	—	—	—
<i>Cricetulus barabensis</i> PALL.	2	—	—	—	—	—	—	—	—	—	—
<i>Alticola</i> sp.	—	—	—	—	—	—	4	—	—	—	—
<i>Microtus gregalis</i> PALL.	—	1	—	—	—	—	2	—	—	—	—
<i>M. fortis</i> BUCHN.	—	—	—	—	—	—	—	—	—	21	—
<i>Microtus</i> sp.	4	—	—	—	—	—	—	4	—	—	—
<i>Lasiopodomys brandti</i> RADDE	101	6	8	21	18	5	4	—	—	—	3
<i>Ellobius talpinus</i> BLAS.	—	—	—	3	—	—	—	—	—	—	—

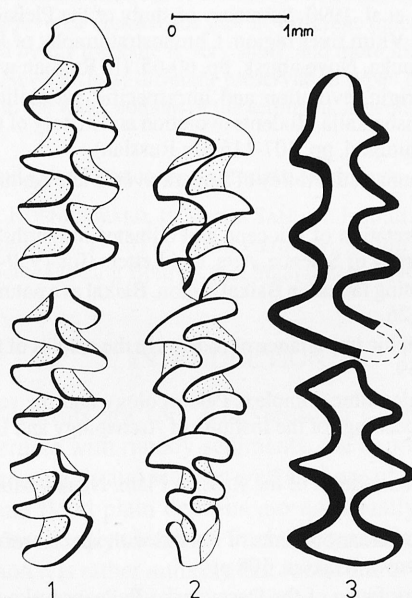


Fig. 4. Voles from the site Malyi Kunalei in western Transbaikalia. 1 – *Lasiopodomys brandti*, M₁-M₃; 2 – *Lasiopodomys brandti*, M₁¹-M₃¹; 3 – *Ellobius talpinus*, M₁-M₂.

pes (ERBAJEVA 1976). The existence of meadow-steppes is shown by the presence of *Spermophilus*, *Microtus fortis*, and *M. oeconomus*. At that time, some species, such as *Lasiopodomys brandti* and

Ellobius talpinus, were present further north than today. At present, these species live in Mongolia and China and *L. brandti* is present only in a small part of southeastern Transbaikalia.

Towards the end of the Pleistocene in Transbaikalia a reduction in the distribution of *Lasiopodomys brandti* and the formation of forest biomes along the river valleys and north facing mountain sides began. The fauna of Studenoe-2 testifies to this process. The age of horizon III at this site is 20 000-12 700 years BP, while horizon II is terminal Pleistocene (BAZAROV et al. 1982). *Sorex* and *Eutamias* are the forest forms found here.

At that time marmots were used as a food resource by humans at the Ust-Kyakhta site. The absolute age of horizon V at this site is $11\,500 \pm 100$ (SO AN-3092) years BP, while that of horizon III is $11\,600 \pm 155$ (SO AN-3091) years BP (TASHAK 1993).

Comparative analysis of the faunas of Prebaikalia and Transbaikalia shows that they consisted principally of species that are today absent from the area. The Prebaikalian disharmonious micromammal faunas from the end of Pleistocene differed in their species content from contemporaneous Transbaikalian ones. The only common species were *Lepus timidus*, *Marmota sibirica*, and *Microtus gregalis*.

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