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Mammoth and associated mammal fossils from the Lake Baikal region

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The Lake Baikal region consists of two subregions belonging to different natural zones: periglacial Siberian (Fore-Baikal area) and non-glacial arid Central Asian one (Transbaikalia). Different natural conditions of these subregions are reflected in species composition of their mammal faunas dated to Middle-Late Pleistocene. The Late Pleistocene faunal assemblages of the Fore-Baikal region include mammal species whose present ranges are entirely separated. They have been recorded in the series attributable to cold periods in many regions of Eurasia (Markova 1988; Nadakhowski 1982; Smirnov 1994, Khenzykhenova 1999 etc.), North America (Graham 2005; Lundelius 1989; Semken 1988; Semken *et al.* 2010; Stafford *et al.* 1999 etc.) and Australia (Lundelius 1983). Such faunas have no recent analogues being ecologically mixed and periglacial. The main importance of this type of faunas is that they are particularly good source of information on past climatic and environmental changes. Animal that inhabited the Lake Baikal region during 2nd second half of Late Pleistocene are typical elements of the Mammoth faunal complex (Gromov 1948). Data on small mammal fauna are given in Table 1.

Mega fauna attributed to **OIS 2 (23 000 – 10 000 yr BP) in the Fore-Baikal area** was known from archaeological sites: Shiskino, Makarovo, Bol'shoi Yakor', Mal'ta, Buret', Krasnyi Yar, Lisikha, Fedyaev, Verkhenskaya Gora and others, and represented by the following mammal species: *Mammuthus primigenius*, *Coelodonta antiquitatis*, *Equus caballus*, *Rangifer tarandus*, *Cervus elaphus*, *Megaloceros giganteus*, *Megaloceros* sp., *Bison priscus*, *Ovis nivicola*, *Ovis* sp., *Felis* sp., *Canis lupus*, *Cuon* cf. *alpinus*, *Vulpes vulpes*, *Alopex lagopus*, *Gulo gulo*, *Ursus arctos*. The **Transbaikalian** mega fauna from archaeological sites: Kunalei, Studenoe-2, Sannyi Mys, Cheremushki, Ust'-Kyakhta-17, and Mel'nichnoe-2 included *M. primigenius*, *C. antiquitatis*, *E. caballus*, *B. priscus*, *R. tarandus*, *C. elaphus*, *Spirocetus kiakhtensis*, and ?*Saiga* sp.

Large mammal fauna from **Transbaikalian OIS 3 (55 000 – 23 000 yr BP)** sites: Varvarina Gora, Sukhotino-4, Tolbaga, Kamenka, Podzvonkaya, Zangisan consisted of *M. primigenius*, *C. antiquitatis*, *E. caballus*, *E. hemionus*, *C. lupus*, *V. vulpes*, *V. corsak*, *U. arctos*, *Lynx lynx*, *Panthera leo*, *Crocota crocota spelea*, *Camelus* sp., *M. giganteus*, *Capreolus pygargus*, *C. elaphus*, *Alces alces*, *R. tarandus*, *P. gutturosa*, *S. kiakhtensis*, *Saiga* cf. *tatarica*, *Capra sibirica*, *Ovis ammon*, *B. priscus*, and *Poephagus baikalensis*.

Joint investigations of Japanese-Russian team helped determine the first representative fauna in the Fore-Baikal area at the sites: Bol'shoi Naryn and Gerasimov's (Sato *et al.* 2008, Sato & Khenzykhenova 2010), with large mammal fauna includes *A. lagopus*, *Martes zibellina*, *Mammuthus* sp., *Equus* sp., *Cervus* sp., *R. tarandus*, *Bos* sp., and *B. priscus*.

Comparative analysis of fauna recovered from both areas in the Baikal region revealed noticeable regional differences in the mammal species composition and paleoenvironment during OIS 3-2. Thus, the fauna of the Fore-Baikal area was ecologically mixed, its species composition suggested the existence of a) tundra-forest-steppes during OIS 3 and in the final interval of OIS 2 and b) tundra-steppes during the first two-thirds of the OIS 2 stage. A Transbaikalian species composition indicated a) a high degree of special variability in landscape with

dominance of steppes during OIS 3, and b) prevalence of dry steppes during OIS 2. Climate was temperate cold and dry during OIS 2 and more humid during OIS 3.

Table 1 Small mammal fauna of the Lake Baikal region during the 2nd half of Late Pleistocene

Taxa	Fore-Baikal area		Transbaikalian area	
	OIS 3	OIS 2	OIS 3	OIS 2
1. <i>Sorex</i> sp.	+			
2. <i>Chiroptera</i> gen.indet.	+			
3. <i>Lepus timidus</i> L.	+	+	+	
4. <i>L. tolai</i> Pall.			+	
5. <i>Ochotona hyperborea</i> Pall.	+	+		
6. <i>Ochotona daurica</i> Pall.			+	+
7. <i>O. cf. pusilla</i> Pall.	+	+		
8. <i>Eutamias sibiricus</i> Laxm.		+		+
9. <i>Marmota sibirica</i> Radde			+	+
10. <i>Marmota</i> sp.	+	+		
11. <i>Spermophilus undulatus</i> Pall.	+	+	+	+
12. <i>S. cf. parryi</i> Rich.		+		
13. <i>Cricetulus barabensis</i> Pall.	+		+	
14. <i>Clethrionomys rutilus</i> Pall.	+	+		
15. <i>C. rufocanus</i> Sundev.	+	+		
16. <i>Ellobius cf. tancrei</i> Blasius				+
17. <i>Lemmus sibiricus</i> Kerr.		+		
18. <i>L. amurensis</i> Vinogradov	+	+		
19. <i>Myopus schisticolor</i> Lill.	+	+		+
20. <i>Dicrostonyx cf. guilielmi</i> Sanford	+	+		
21. <i>Alticola</i> sp.		+		+
22. <i>Lagurus lagurus</i> Pall.	+	+		
23. <i>Lasiopodomys brandti</i> Radde			+	+
24. <i>Microtus gregalis</i> Pall.	+	+	+	+
25. <i>M. middendorffi</i> Poljak.	+	+		
26. <i>M. hyperboreus</i> Vinogr.	+	+		
27. <i>M. ex gr. middendorffi-hyperboreus</i>	+	+		
28. <i>M. fortis</i> Buchn.			+	+
29. <i>M. oeconomus</i> Pall.	+	+	+	+