

## **Pleistocene small mammals of Tologoi (western Transbaikalia, Siberia)**

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**Abstract.** Extensive excavations at Tologoi (western Transbaikalia) in 1993 have led to the recovery of new faunal data. Five faunistic horizons of the middle part of this locality (Tologoi 2) have been recognized. All of them contain of lagomorphs and rodents belonging to both extinct and extant taxa. These five faunal assemblages are composed of inhabitants of steppe and semidesert biomes, and indicate rather arid climatic conditions during the Early to Middle Pleistocene.

**Key words:** Mammalia, Lagomorpha, Rodentia, Pleistocene, western Transbaikalia.

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### **I. INTRODUCTION**

The Tologoi locality (western Transbaikalia) is a key section in eastern Siberia and is the stratotype of the Tologoi faunistic complex. Despite decades of research, little is known about the faunal sequence of small mammals at this locality. Mammalian remains are known from four different faunistic horizons at Tologoi, but rich faunas of both small and large mammals have been collected from only one of these. This horizon, the third from the bottom, includes the fauna of the Tologoi faunistic complex. Extensive excavations at the site in 1993 resulted in the recovery of five faunistic horizons with lagomorph and rodent remains in the middle part of this locality. Although abundant fossils have been previously recovered from this section, this deposit contains the first coherent Early-Middle Pleistocene fauna from any site in western Transbaikalia.

**A c k n o w l e d g m e n t s.** The excavations at Tologoi in 1993 were carried out with the support of Raleigh International.

### **II. LOCATION, GEOLOGY AND AGE**

**B a c k g r o u n d.** Tologoi is situated on the left bank of the Selenga river in a concave meander 15 km southwest of Ulan-Ude. The sedimentary sequence extends from the Middle Pliocene to the Upper Pleistocene.

The sediments of this site have been described in detail by RAVSKY et al. (1964) and consist of three units. The lower part of the sequence (Tologoi 1), which is about 3m high, consists of red

and reddish-brown clays with carbonate concretions, yielding a *Hipparion* fauna. It has been referred to the early Villafranchian. The middle unit (Tologoi 2), which is about 18m high, is silty-sandy and contains three fossil soil horizons. Sediments between the second and third paleosols from the bottom include mammalian remains belonging to the Tologoi faunistic complex and corresponds to the Middle Pleistocene. The third unit (Tologoi 3), which is about 12m high, consists of sand with lenses of coarser sand and contains few fossils. Previous publications provide mammalian faunal lists for all three parts (VANGENGIM 1977; AGADZHANIAN & ERBAJEVA 1983).

The magnetic polarity sequence and evolutionary stage of the small mammals constrain the placement of the middle part of the Tologoi section to the interval of the Matuyama magnetic Chron and the lower part of the Brunhes Chron (GNIBIDENKO et al. 1976). The magnetic polarity sequence published by ZUDIN (1980) included a short normal magnetozone in the lower part of the sequence, interpreted as the Jaramillo Subchron (0.89-0.95 Ma) of the Matuyama Chron.

**N e w d a t a.** A new profile, 1.5-2.0 m wide and about 10m high, was cut in the middle part of the meander bank. The whole deposit is sandy with some silty-sand or coarse sand lenses and ice-wedge casts. Fairly abundant remains of small mammals have been excavated from five horizons (Fig. 1):

- a sandy-loam under the first fossil soil (from the bottom) (Tologoi 2.1);
- a pink-brownish silty sand of the first paleosol (Tologoi 2.2);
- a second fossil soil (Tologoi 2.3);
- a horizon overlying the second paleosol (Tologoi 2.4);
- a horizon underlying the third paleosol (Tologoi 2.5).

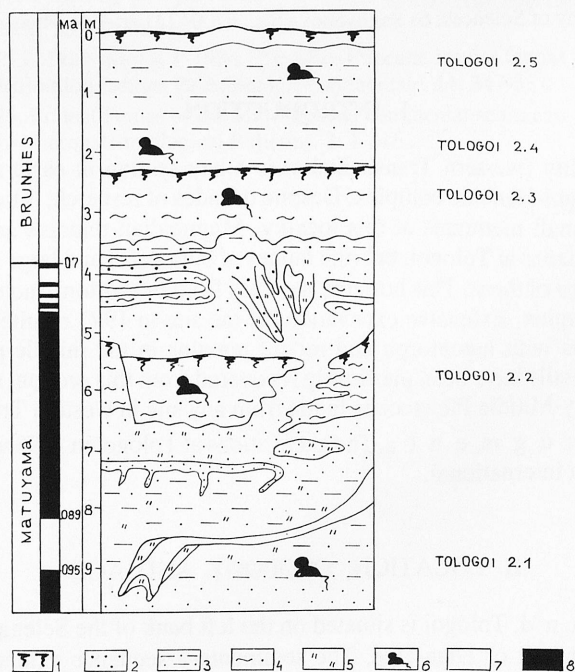


Fig. 1. Tologoi 2. Scheme of section, showing geological structures and faunal sequence. 1 – soil; 2 – sand; 3 – sandy loam; 4 – sandy clay; 5 – calcium carbonate; 6 – fossils; 7 – normal polarity; 8 – reversed polarity.

A faunal list of insectivores, lagomorphs and rodents from these horizons is given in Table I.

The geological age of the two lower horizons according to the evolutionary stage of *Spermophilus tologoicus* ERBAJEVA & POKATILOV and the presence of *Prosiphneus* cf. *youngi* together with paleomagnetic data, can be determined as the end of the Early Pleistocene. All species of the fourth and fifth horizons are representatives of the Tologoi faunistic complex which was placed in the beginning of the Middle Pleistocene.

Table I

## List of small mammals from Tologoi 2

Faunistic horizons	Taxa	Number of specimens
Tologoi 2.1	Order Insectivora	
	<i>Crocidura</i> sp.	
	Order Lagomorpha	1
	<i>Ochotona</i> sp. (large form)	1
Tologoi 2.2	Order Rodentia	
	<i>Spermophilus</i> cf. <i>tologoicus</i> ERB. & POKAT.	11
	Order Lagomorpha	
	<i>Ochotona</i> sp. (large form)	2
	<i>Ochotona</i> sp. (small form)	1
	Order Rodentia	
	<i>Spermophilus</i> cf. <i>tologoicus</i> ERB. & POKAT.	2
Tologoi 2.3	<i>Allactaga</i> sp.	2
	<i>Prosiphneus</i> cf. <i>youngi</i> TEILHARD	5
	Order Lagomorpha	
	<i>Ochotona</i> sp.	3
	Order Rodentia	
Tologoi 2.4	<i>Ellobius</i> sp.	1
	Order Lagomorpha	
	<i>Lepus</i> sp.	4
	<i>Ochotona</i> sp.	66
Tologoi 2.5	Order Rodentia	
	<i>Spermophilus undulatus gromovi</i> ERB.	36
	<i>Allactaga</i> sp.	29
	<i>Cricetulus barabensis</i> (PALL.)	273
	<i>Microtus</i> sp.	4
	<i>Ellobius</i> cf. <i>tancrei</i> BLASIUS	29
	<i>Myospalax</i> sp.	1
	Order Lagomorpha	
	<i>Ochotona gureevi</i> (ERB.)	43
	Order Rodentia	
	<i>Spermophilus undulatus gromovi</i> (ERB.)	5
	<i>Cricetulus</i> cf. <i>barabensis</i> (PALL.)	3
	<i>Allactaga saltator transbaikalicus</i> ERB.	2
	<i>Eolagurus simplicidens</i> (YOUNG)	11
	<i>Lasiopodomys brandti</i> (RADDE)	4
	<i>Microtus</i> cf. <i>gregalis</i> (PALL.)	2
	Microtinae gen.	4
	<i>Ellobius</i> sp.	1

### III. ENVIRONMENTAL INTERPRETATION

Palynological data from the middle part of Tologoi points to a steppe and "cold steppe" depositional environment with or without some trees. The plant species list given by GOLUBEVA (in RAVSKY et al. 1964) contains mainly xerophytic plants.

Cryogenic deformations between Tologoi 2.2 and 2.3 demonstrate that during the first cold cycle at the end of the Early Pleistocene permafrost existed in this part of Transbaikalia.

The fossils from the middle part of Tologoi provide information on the environmental conditions at the end of the Early and the beginning of the Middle Pleistocene.

The faunal composition of Tologoi 2.1 suggests a combination of steppe and forest-steppe landscapes. *Crociodura* is an inhabitant of the forest-steppe and its recent range is China, Korea, Russian Altai and the southern parts of the Far East. In Transbaikalia its range is limited to the valley of the Dzhida river (250 km south of Tologoi). The faunas of Tologoi 2.2 and Tologoi 2.3 include representatives of steppe and dry steppe landscapes and reflect warmer periods before and after the first cold cycle. A consideration of the distribution of the extant species of the Tologoi complex (Tologoi 2.4 and Tologoi 2.5) is informative. At least four of the extant species found in these horizons are absent from the Tologoi area today. These are: *Ellobius tancrei*, *Allactaga saltator*, *Lasiopodomys brandti*, *Eolagurus simplicidens* and *Myospalax* sp. These species today live south of Tologoi, in areas with more arid climates. Their presence indicates a relatively dry environment similar to the recent dry steppe of northern Mongolia and more arid climatic conditions at this locality in the past than today.

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