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**"Stratigraphy, paleontology and paleoenvironment
of Pliocene-Pleistocene of Transbaikalia
and interregional correlations"**

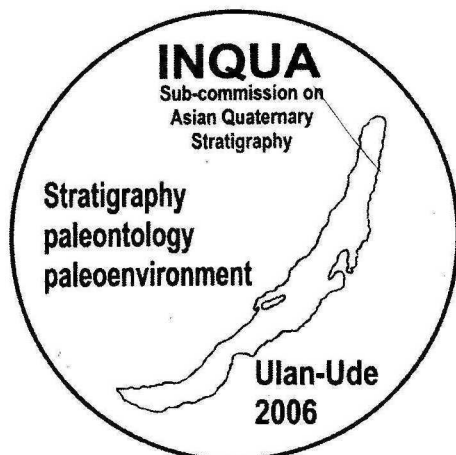
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N.V. Alexeeva, M.A. Erbajeva, A.G. Mironov



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PLEISTOCENE SMALL MAMMAL FAUNAS OF SOUTHERN TRANS-URALS

A.V. BORODIN, T.V. STRUKOVA, E.A. MARKOVA

Institute of Plant and Animal ecology UB RAS, 620144 Yekaterinburg,

Ibor@ipae.uran.ru

The data on Pleistocene small mammals of Southern Trans-Urals (Stefanovskii, Borodin, 2002; Stefanovskii et al., 2003) permit to identify complexes of small mammals that may be correlated with those of Eastern Europe (Vangengeim et al., 2001; Markova A.K., 2004).

1. Early Pleistocene

1.1. Chumlakian small mammal complex

Early Chumlakian small mammal assemblage. The earliest mammal fauna with remains of rootless voles (*Allophaiomys deucalion*) is known in the Southern Trans-Urals from the lower part of Chumlakian suite (bed 9, Baturino locality (Stefanovskiy, Borodin, 2002)). Along with *A. deucalion*, the mammal assemblage comprises cementless voles with rooted molars of *Borsodia newtoni* F. Major 1902. Genus *Mimomys* is represented by *M. ex gr. hintoni-reidi*. Small mammal assemblage also includes remains of *Sorex* sp. and *Sicista* sp. The early Chumlakian small mammal fauna is similar to the early phase of the Odessian complex in Eastern Europe (Markova A.K., 2004) and may be correlated with MQR11—zone of Vangengeim (Vangengeim et al., 2001).

Late Chumlakian small mammal assemblage. The upper part of Chumlakian suite (Baturino locality, bed 8) (Stefanovskiy, Borodin, 2002) has yielded small mammal assemblage comprising *Allophaiomys deucalion* and *Mimomys* remains along with the first findings of cementless rootless voles of genus *Prolagurus*. This fauna may be correlated with the late phase of Odessian small mammal complex (Markova A.K., 2004) or with MQR10—zone (Vangengeim, 2001) which are known in the Eastern Europe.

1.2. Sarykulian small mammal complex

Early Sarykulian small mammal assemblage. In the lower part of Sarykulian suite (Baturino locality, bed 6a (Stefanovskiy, Borodin, 2002)), the remains of later *Mimomys ex gr. savini-intermedius* have been found along with *M. pusillus*. Voles of genus *Clethrionomys* are scarce and represented by *Cl. ex. gr. socolovi*. The cementless rootless voles are represented by *Prolagurus ternopolitanus* (= *praepannonicus*). Voles of genus *Allophaiomys* are relatively abundant and represented by advanced *A. pliocaenicus* along with archaic *A. deucalion*. Small mammal fauna also includes genera of *Desmana* sp., *Sorex* sp. and *Mustelidae ex gr. nivalis—erminea*. The early Sarykulian small mammal assemblage may be correlated with earliest Tanagerian (Nogaiskian) small mammal fauna (Markova A.K., 2004) and MQR8—zone of Eastern Europe (Vangengeim, 2001).

Late Sarykulian small mammal assemblage has been found in the upper part of Sarykulian suite of Baturino deposits (bed 6, Stefanovskii, Borodin, 2002). Assemblage does not include *A. deucalion*. Relatively abundant advanced forms of *Allophaiomys* may be attributed to *A. pliocaenicus*. Rootless cementless voles are represented by *Prolagurus pannonicus*. *Mimomys* species are still present including *M. ex gr. savini—intermedius* and *M. pusillus*. Remains of *Cl. ex. gr. socolovi* are represented by single molars. Assemblage also comprises *Desmana cf. moschata*, *Sorex cf. araneus*, *S. ex gr. minutus*, *Sorex aff. drepanosorex*, *Ochotona* sp., *Spermophilus* sp., *Marmota* sp., *Sicista cf. vinogradovi*, *Allactaga ex gr. jaculus*, *Cricetus ex gr. cricetus*, *Prosiphneus* sp. The Late Sarykulian small mammal assemblage may be correlated with Kairian (or Morosovkian) small mammal fauna of Tanagerian faunistic complex (Markova A.K., 2004) or with lower part of MQR7—zone (Vangengeim, 2001) of Eastern Europe.

2. Middle Pleistocene

2.1. Baturino small mammal complex

Baturino small mammal complex is known from lower (bed 4) and upper (bed 3) parts of Baturino suite (Stefanovskiy, Borodin, 2002). The lower part is more abundant in small mammal remains including *Sorex isodon*, *Mustelidea ex gr. nivalis—erminea*, *Spermophilus* sp., *Myospalax* sp.,

Lagurus transiens, *Eolagurus* cf. *luteus*, *M.* ex gr. *hintoni-gregaloides*, *M.* ex gr. *agrestis*. *Clethrionomys* and *Mimomys* remains are rare. In the upper part, there were found scarce remains of *Spermophilus* sp., *Allactaga* ex gr. *jaculus*, *Microtus* ex gr. *agrestis*, *Lagurus transiens* and *Eolagurus*. There are no evident differences in evolutionary levels of the faunas revealed in upper and lower parts of Baturino suite. According to species composition and their evolutionary level, the fauna of Baturino suite may be referred to MQR—6 zone (Vangengeim et al., 2001) or to Advanced — Late Tiraspolian small mammal complex of Eastern Europe (Markova A.K., 2004). Normal polarity is typical for Baturino suite showing the correspondence with Brunhes Chron. In normally magnetized deposits of upper strata, the reversed polarity interval has been found that may be correlated with Big Lost geomagnetic event (580 ka BP).

3. Late Pleistocene, first half

Small mammal complex that may be attributed to the first half of Late Pleistocene is known from Vvedenskoye locality, bed 7 (Stefanovskii et al., 2003). Small mammal complex comprises remains of *Chiroptera*, *Ochotona* cf. *pussila*, *Allactaga* ex gr. *jaculus*, *Allactaga* sp., *Cricetulus* ex gr. *migratorius*, *Lagurus lagurus*, *Eolagurus* cf. *luteus*, *Microtus oeoconomus*. The fauna may be correlated with MQR—2 or MQR—1 zone (Vangengeim et al., 2001) and Shkurlatian mammal complex of Eastern Europe (Markova A.K., 2004).

4. Late Pleistocene, second half

There are several localities yielding small mammal faunas characterizing the second half of Late Pleistocene: Streletskoe (beds 4—5), Vrkhnnyaya Alabuga (bed 5), Miasskoe (bed 5), Bol'shoye Balandino (bed 6), Yuzhnyj (beds 3—5) (Stefanovskii et al., 2003). Small mammal complex includes *Erinaceus* sp., *Desmana moshata*, *Sorex* sp., *Lepus* sp., *Ochotona* cf. *pussila*, *Spermophilus* sp., *Marmota bobac*, *Allactaga* ex gr. *jaculus*, *Allactagulus* sp., *Ellobius tancrei*, *Cricetulus* ex gr. *migratorius*, *Lagurus lagurus*, *Eolagurus* cf. *luteus*, *Lemmus* sp., *Arvicola* ex gr. *terrestris*, *Microtus gregalis*, *M. oeoconomus*, *M. arvalis*. Among voles, remains of *Lagurus lagurus* and *Eolagurus* cf. *luteus* are dominating. Summarized data from these localities allow to characterize the different stages of Khanmey glaciation (Stefanovskii et al., 2003). Small mammal faunas may be correlated with MQR—1 zone (Vangengeim et al., 2001) and Sungirian small mammal assemblage that is known in Eastern Europe (Markova A.K., 2004).

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DENTAL CHARACTERS IN RECENT AND LATE PLEISTOCENE MUROID RODENTS FROM URALS AND WEST-SIBERIAN PLAIN

A.V. BORODIN, E.A. MARKOVA, A.A. BELAYA, M.A. ELKINA, S.V. ZYKOV
 Institute of Plant and Animal ecology UB RAS, 620144 Yekaterinburg,
 lbor@ipae.uran.ru

In paleontological practice, dental characters of small mammals are commonly treated as a main object for species diagnostics and determination of evolutionary level of taxa that is crucial in biochronology, biostratigraphy and correlation. Definitions of dental variation patterns in modern taxa provide a way to increase interpretative power of morphological analysis of Late Pleistocene and Holocene small mammals.

We classify morphological characters of bunodont and hypsodont molars of mice, voles and lemmings according to their diagnostic value and patterns of variation in extant species. For taxa occurring in Urals and West-Siberia since Late Pleistocene and those recently introduced (*Ondatra zibethicus*, *Mus musculus*), we establish the range of molar variations using both original and published data.

In mice of genera *Mus*, *Apodemus* and *Sylvaemus*, the features of roots, presence and size of cusps and overall crown topography have been studied in order to reveal the most effective ways of species identification. In voles and lemmings, the presence or absence of roots, presence of cement in re-entrant angles and enamel differentiation may be used for identification of genera occurring in the faunas of Urals and West-Siberia since Late Pleistocene (Table 1), whereas species diagnostics is based on shape and size characters of grinding surface. We propose taxonomic keys and interactive version of digital handbook for species identification of voles and lemmings (Arvicolinae, Rodentia) in Late Pleistocene, Holocene and modern faunas of Urals and West-Siberian plain with special emphasis on inter- and intraspecies variation of dental characters.

Table 1. Classification of Arvicolinae genera of the Ural Mountains and West-Siberian plain based on molar teeth morphology

Roots are present	Cement is absent from re-entrant angles		Genus <i>Ellobius</i>	
	Cement occurs in re-entrant angles	Cement is porous	Genus <i>Ondatra</i>	
		Cement is compact	Genus <i>Clethrionomys</i>	
Roots are not present	Cement is absent from re-entrant angles		Enamel interruptions appear on all vertices of SA	Genus <i>Dicrostonyx</i>
			Enamel interruptions do not appear on all vertices of SA	Genus <i>Lagurus</i>
				Genus <i>Eolagurus</i>
	Cement occurs in re-entrant angles		Enamel interruptions appear on all vertices of SA	Genus <i>Lemmus</i>
				Genus <i>Myopus</i>
			Enamel interruptions do not appear on all vertices of SA	Genus <i>Arvicola</i>
Genus <i>Microtus</i>				