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Rodent Fauna from the Middle Paleolithic Site of Karabi Tamchin

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The sample of small mammal remains that is the focus of this study was obtained during excavations at the site of Karabi Tamchin conducted in 1999 and 2000 by Dr. A. Yevtushenko and Dr. A. Burke. Karabi Tamchin is located in the first range of the Crimean Mountains, on the Karabi Tamchin plateau, in the Tamchin River basin (44°55'N; 34°27'E). The altitude of the Karabi Tamchin rockshelter is about 800 m, and the elevation of the site above the Tamchin River water level is about 100 m. The site includes five cultural levels: Levels II/2 and III are Western Crimean Mousterian, while Levels IV and V are Crimean Micoquian. The available ^{14}C dates indicate only the minimum ages of Level III and Level IV. They are OxA-10883 (2000-L3-8/1), bone, $\delta^{13}C$ = −19.8‰, age > 42,400 uncalibrated years BP and OxA-10884 (2000-L4-10/6), bone, $\delta^{13}C$ = −20.1‰, age > 41,200 uncalibrated years BP.

Material and Taphonomy

Small mammal bones were collected during the screening and washing of sediments from the cultural levels. The bone remains from the 1999 and 2000 field seasons were given to the author in 2001 for identification.

Microfaunal bones in Karabi Tamchin are rather well preserved, but their concentrations in all of the cultural levels are very low, which may be the result of the deposits' coarse composition. Bone accumulations in sites of this type are connected to the hunting activities of owls, which nest on crags above sites and in rockshelters (Gromov 1955, 1961). These birds tend to hunt small mammals found mainly in open areas. The small mammal composition of the Karabi Tamchin fauna represents this kind of owl activity. Since the hunting ranges of owls can encompass several kilometers, the microfauna identified in the site of Karabi Tamchin reflects the natural conditions of a wide area around the site, not just the local environs inside the rockshelter.

The small mammal fauna in Karabi Tamchin is limited to rodent species (Rodentia). Remains of Insectivora, Chiroptera, and Lagomorpha were not found in this site.

Species Composition and Ecology of the Fauna

The sample sizes and contents of the small mammal material from this analysis of Karabi Tamchin is presented in Table 17-1.

Level V

The oldest fauna was found in cultural Level V. Two species were identified in this level: the northern mole-vole *Ellobius* and the "obscurus" vole *Microtus obscurus* (Table 17-1).

Microtus lower first molars from Level V have a complicated structure with additional angles on the posterior loop of the anteroconid complex (Figure 17-1: *1, 2*). Such morphology is characteristic of *Microtus obscurus* (Markova 1999).

The morphology of the first lower molar of *Ellobius* from Level V of Karabi Tamchin has one primitive feature (Figure 17-1: *3, 4*): the so-called "prismatic" fold located on the anteroconid complex, which is rarely found in modern and Late Valdai-age *Ellobius talpinus* teeth. In addition, *Ellobius* remains that have been analyzed from other Crimean Paleolithic sites do not have this particular feature (Markova 1999). This feature is also not characteristic for the modern mole-vole *Ellobius talpinus* that now inhabits the Crimean Peninsula (Figure 17-2). The lower first molar of *Ellobius* from Level V is small (length = 2.80 mm, width = 1.20 mm). The sizes of the m1 of modern *Ellobius talpinus* from the Crimean Peninsula are larger, with a length minimum, mean, and maximum of 2.90 mm, 3.20 mm, 3.30 mm (n = 10) and width of 1.35 mm, 1.39 mm, 1.45 mm (n = 10). It is possible that the archaic characteristics seen in the Karabi Tamchin *Ellobius* material indicate a relatively ancient age for Level V. The lower first molar of *Ellobius* from Level V has some similarities to the m1 of the subspecies *Ellobius talpinus tanaiticus* (which now inhabits regions of

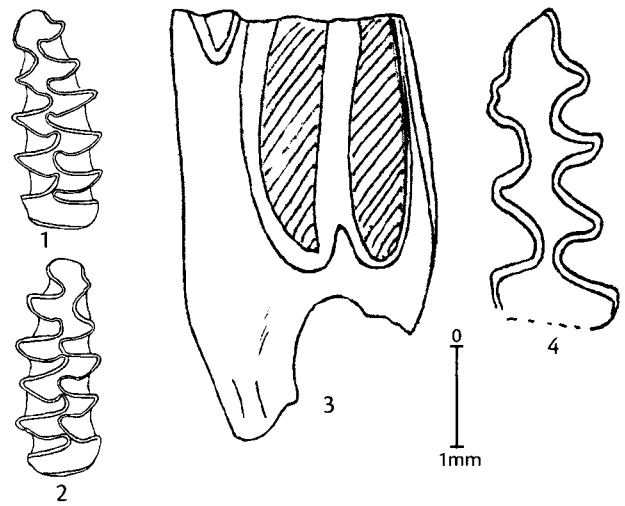

Figure 17-1—Karabi Tamchin Level V: *1, 2*–m1 of *Microtus obscurus*; *3*–m1 of *Ellobius* cf. *talpinus* (lateral side); *4*–m1 of *Ellobius* cf. *talpinus* (occlusal surface).

Table 17-1
Species composition of rodents from Karabi Tamchin and their sample content

Species	*Ecological group*	*Level II/2 (1999)*	*Level III (2000)*	*Level IV (1999)*	*Level V (2000)*
Ellobius cf. *talpinus* Pallas, northern mole-vole	open landscapes	—	—	—	1 m1
Ellobius talpinus Pallas, northern mole-vole	open landscapes (steppes, forest-steppes)	mandible with m1–m3, 1 M3, 2 incisors	—	—	—
Cricetulus migratorius Pallas, grey hamster	open landscapes (steppes)	1 m1	—	—	—
Eolagurus luteus Eversmann, yellow steppe lemming	semi-deserts, deserts, dry steppes	—	1 m1	—	—
Microtus obscurus Eversmann, "obscurus" vole	steppes, meadows	3 m1, mandible with m1–m2, maxilla with M3, 12 molars, 20 incisors	5 m1, 1 m2, 3 M2,1 M1, 10 incisors	incisor	2 m1, incisor
Total N of species		3	2	1	2

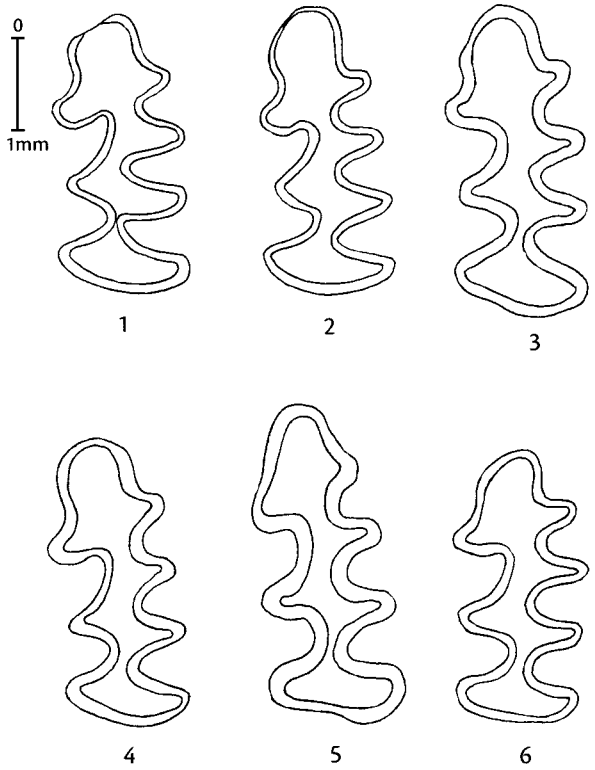

Figure 17-2—Lower first molars (m1) of modern *Ellobius talpinus* from the southern Russian Plain and Crimea. (Zoological Institute RAS, St. Petersburg collection.)

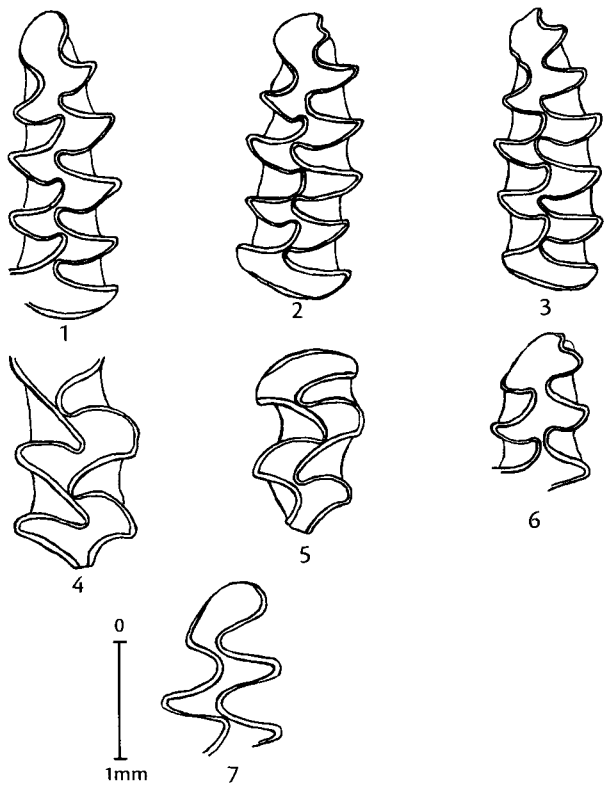

Figure 17-3—Karabi Tamchin Level III: 1-3, 6–m1 *Microtus obscurus*; 4–M1; 5–M2 *Microtus obscurus*; 7–m1 *Eolagurus luteus*.

southern Ukraine and the northern Caucasus) and also to *Ellobius talpinus transcaspiae* (whose range is far to the east of Crimea, in Turkmenistan). The find also resembles the Early Pleistocene Crimean *Ellobius* remains described by Prof. W. Topachevski (1973). The single molar of northern mole-vole in this level seems best identified as *Ellobius* cf. *talpinus*.

Modern *Ellobius talpinus* prefers meadow-steppes and slopes of valleys with rich steppe vegetation and rather soft soils. It does not inhabit the feather grass steppes and wormwood feather grass steppes (Ognev 1950). *Microtus obscurus* likewise prefers open meadow-steppe landscapes.

The ecology of *Ellobius* cf. *talpinus* and *Microtus obscurus* suggests that during the deposition of Level V, the site environs were open meadow-steppe landscapes. Given the rarity of microfaunal remains in this level, however, they provide only a partial indication of the environment at this time.

Level III

Level III contained only the remains of *Microtus obscurus* ("obscurus" vole) and *Eolagurus luteus* (yellow steppe lemming).

The molars of *Microtus obscurus* have features typical of this species (Figure 17-3: *1-6*). The yellow steppe lemming lower first molar has a juvenile appearance and may belong to a young animal (Figure 17-3: *7*). Yellow steppe lemming is a typical open landscape animal, preferring semi-deserts, dry steppes, and even deserts. During the present time, *Eolagurus* exists only in Middle Asia, Mongolia, and China, but during the Last Glacial, its range was very wide and included the central and southern Russian Plain and Crimea. During historical times, the *Eolagurus luteus* range included the areas westwards, up to the Ural River. This species was typical for the so-called "mixed" periglacial faunas, not only of the Valdai glaciation, but also for earlier glaciations. Yellow steppe lemming was also found in the interglacial faunas of Eastern Europe. The modern *Eolagurus* prefers to inhabit desert steppes, sandy semi-deserts, and deserts (Gromov and Erbaeva 1995). During the deposition of Level III at Karabi Tamchin then, such areas were present near the site, and *Eolagurus* might have inhabited slopes with a southern exposure.

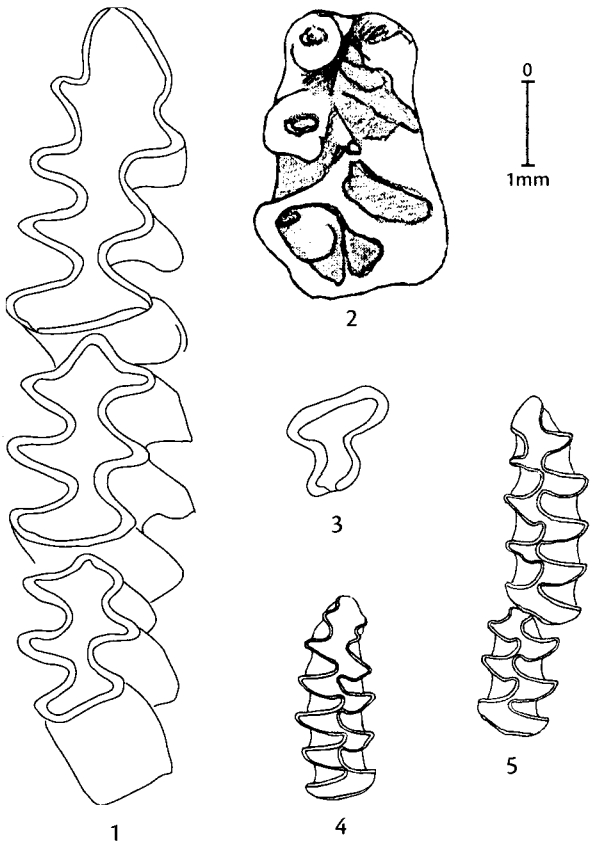

Figure 17-4—Karabi Tamchin Level II/2: 1–m1 to m3 *Ellobius talpinus*; 2–m1 *Cricetulus migratorius*; 3–M3 *Ellobius talpinus*; 4–m1 *Microtus obscurus*; 5–m1 and m2 *Microtus obscurus*.

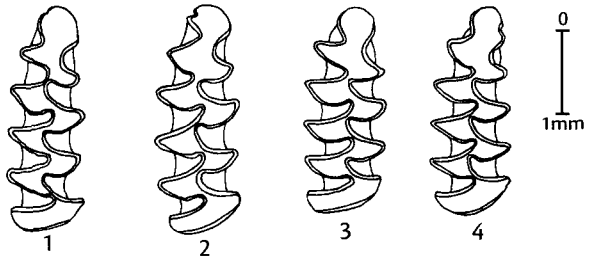

Figure 17-5—Lower first molars of modern *Microtus obscurus* from Crimea National Park (Zapovednik). (Zoological Museum, Moscow State University collection.)

Level II/2

Microfauna in Level II/2 includes remains of three species: *Ellobius talpinus*, *Microtus obscurus*, and *Cricetulus migratorius*. The *Ellobius talpinus* in this level (Figure 17-4: *1, 3*) differs morphologically from the *Ellobius* remains in Level V. *Ellobius talpinus* prefers open landscapes, mostly steppes and forest-steppes with rich soils. This species constructs deep burrows. *Microtus obscurus* (*M. arvalis* group) inhabits steppes and meadows (Figure 17-4: *4, 5*). *Cricetulus migratorius* (grey hamster) prefers open landscapes of different types, from forest-steppes to semi-deserts. Its most favorable habitats are plains and mountain steppes (Figure 17-4: *2*).

As a whole, the fauna of this level indicates open steppe and meadow landscapes. All of the species distinguished in Level II/2 presently inhabit Crimea.

Conclusions

The small mammal fauna from Karabi Tamchin unfortunately is quite limited: only four rodent species were identified from the site. Thus, it is difficult to use this information for the reconstruction of the exact ecological conditions during the deposition of the cultural levels. The morphological features of the remains from the oldest Level V suggest a significant age for this level.

The remains of forest and cold-tolerant species were not found in the cultural levels. Only rodents inhabiting open steppe and meadow landscapes have been identified in the site. Thus, such landscapes consistently existed near the site during human occupation. It should be taken into account, however, that the small mammal bone material in Karabi Tamchin was accumulated from the decomposition of bird pellets, mostly owl pellets. The hunting ranges of these predators include mostly open areas and extend several kilometers around the nest (Andrews 1990). Thus, the prevalence of animals of open landscapes in the deposits of Karabi Tamchin may be explained in part by this factor. However, previous studies of small mammal faunas from other Middle Paleolithic sites in Crimea have shown that remains of forest animals were found in several of them. This is the case in Kabazi V, in Starosele (Level 1), in Buran-Kaya III (Layer B and Level C), and in Kabazi II (Unit VI) (Markova 1999, Chapter 3 of this volume). Environmental changes are therefore reflected by the specific composition of the small mammal faunas, and during the extension of forested areas near the site, forest animal remains were also accumulated in the site.

The impressions gained from the mollusk data about environments near the Karabi Tamchin site (Mikhailesku, Chapter 19) differ from ours. This fact could be explained by the different ways in which mollusk and mammalian remains were accumulated in the cultural levels. If the mammalian fauna reflects an

extensive area around the site (several kilometers), the mollusk fauna reflects the conditions inside the rockshelter. The results of both analyses supplement each other, providing a picture of both local conditions in the site (mollusk fauna), as well as the surrounding landscapes (mammal fauna). The results of the large mammal faunal analysis play a very important part in these reconstructions (Burke, Chapter 16). A realistic picture of the environments and their changes during human occupations of the site may be obtained only after analyzing the results of all paleontological studies jointly.

The absence of cold-tolerant small mammals in the Middle Paleolithic sites of Crimea, including Karabi Tamchin, indicates moderate climatic conditions in Crimea during oxygen isotope stage 3 (65,000–25,000 BP). This absence may be explained by the southerly location of Crimea as well as by the rather moderate climate during stage 3 in general—the warmest period during the last glaciation. Recent climatic reconstructions have revealed a poor development of the ice sheet during this time, which was located only in Scandinavia (Arnold et al. 2002). The Russian Plain mammalian and floristic data gathered for the last part of the OIS-3 (Bryansk Interstadial, 33,000–24,000 BP) indicate that southward from 48°N, the influence of glaciation was weak and pronounced mostly in the species composition of large mammals, some of which have a wide range and plastic ecology (*Rangifer tarandus* and *Mammuthus primigenius,* for example) (Markova, Simakova, Puzachenko, and Kitaev 2002). The reconstruction of the range of permafrost on the Russian Plain during last Valdai glacial maximum also shows the absence of permafrost southward of 48°N (Nechaev 1985). Undoubtedly, the southern limit of permafrost had to have been more northerly during the warmer OIS-3. The Crimean Mountains, along with the Caucasus and Carpathians, were refugia for many warm-tolerant animals during late Valdai glacial maximum. This suggests that there were moderate climatic conditions and numerous localized biotopes in these mountains, which permitted plants and mammals adapted to mild conditions to exist there (Markova, Simakova, and Puzachenko 2002). The fairly stable and moderate climatic conditions were also comfortable for the Middle Paleolithic human inhabitants of the Crimean Mountains during the middle Valdai.