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Rodent (Rodentia) Fauna from Chokurcha I Unit IV

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The rock shelter Chokurcha I is situated in the basin of the Malyi Salgir River, on the second ridge of the Crimean Mountains, within the city of Simferopol (44'58°N; 34'08°E). The site is located 8 m above the present-day water level. Chokurcha I was discovered by N.Ernst in 1927. He recognized four cultural layers: Layer 1, of Holocene age, and Layers 2 through 4, all of Middle Paleolithic age. Recently (1996–2000), Chokurcha I has been re-excavated by Dr. V.P. Chabai, who collected the small mammal bones from the archeological levels correlated with Layer 4 of Ernst's excavations (Unit IV according to the new nomenclature), which contains Crimean Micoquian.

The significant small mammal materials from the earlier excavations (1930 and 1940) of Layer 4 in Chokurcha I were described by I.Gromov (1961). Eight species of rodents were recovered from Chokurcha I in those years: Bobak marmot (*Marmota* conf. *bobak*), ground squirrel (*Spermophilus* conf. *citeloides*), great jerboa (*Allactaga major*), little earth hare (*Pygeretmus (Alactagulus) pumilio*), yellow steppe lemming (*Eolagurus luteus*), steppe lemming (*Lagurus lagurus*), water vole (*Arvicola terrestris*), and root vole (*Microtus oeconomus*). Yellow steppe lemming and ground squirrel remains were predominant in the collection described by Gromov.

Material

The microfaunal material was recovered during the recent excavations by screening and washing sediments. The preservation of the bones is rather good. There are many mandibles with teeth, including molars and incisors. The remains have a homogeneous pale yellow color. All these characteristics indicate that the bones, which were accumulated in the site as owl pellets, were not redeposited. This taphonomical type of small mammal locality provides information about the environments up to several kilometers around the site, representing the hunting area of owls.

Only rodents have been discovered at Chokurcha I. Seven species of Rodentia were identified in all of the levels (Table 23-1). The number of species identified from Unit IV in earlier excavations included eight species (Gromov 1961). The species found in Ernst's excavations and the more recent Chabai excavations include, as well as the same species, some different ones. In the new collection, there are no remains of *Marmota bobak*, *Allactaga major*, *Pygeretmus (Alactagulus) pumilio*, or *Microtus oeconomus*. On the other hand, in newer collection, we have an additional three species: *Cricetulus migratorius*, *Microtus obscurus*, and *Microtus gregalis*. Thus, eleven species altogether of rodents have been found in Unit IV.

The number of bones identified from the new excavations to special taxonomic level is 306. The dominant species in all of the levels is the ground

squirrel, or little suslik, *Spermophilus pygmaeus*. The second most frequent is the "obscurus" vole *Microtus obscurus*. The concentration of the bone material is very uneven across the levels. The remains of small mammals were found in Levels IV-B, IV-F, IV-I, IV-K, IV-L, IV-M, IV-O, IV-Q, IV-S, and IV-U.

Rodent Assemblages and Their Ecological Features

The levels of Chokurcha vary in the number of Rodentia remains they contain (Table 23-1). The upper levels in particular have extremely small assemblages. The most abundant fauna was recovered from Levels IV-O, IV-Q, and IV-U (Table 23-1; Figures 23-1, 23-4, 23-8) and it is their description on which this report is concentrated.

Levels IV-B, IV-F, IV-I, IV-K, IV-L, IV-M

The upper levels of Chokurcha I Unit IV—Levels IV-B, IV-F, IV-I, IV-K, IV-L, and IV-M—contained very little microfauna, and was mostly restricted to *Spermophilus pygmaeus* and *Microtus* sp. (Table 23-1). Little suslik (ground squirrel) is a typical species of open habitats (steppe, semi-desert, forest-steppes) (Gromov and Erbaeva 1995; Flint et al. 1970). *Microtus* is represented in these layers by remains that cannot be identified to species. Thus, it is not possible to assign them any particular ecological parameters.

Level IV-O

The fauna material of Level IV-O included the remains of six species (Figure 23-1). Little suslik, yellow steppe lemming, and steppe lemming indicate the presence of dry open landscapes (dry steppes). The yellow steppe lemming *Eolagurus luteus* was very common in Late Pleistocene periglacial steppe communities and also in Pleistocene interglacial steppe faunas (Figure 23-2: *1*) (Markova 1992). The range of *Eolagurus luteus* has since decreased very significantly and this species no longer inhabits Eastern Europe. The steppe lemming (*Lagurus lagurus*) is a typical inhabitant of steppe landscapes and was widely distributed during Pleistocene glacial epochs (Figure 23-2: *2*). It was a member of periglacial non-analog mammal assemblages, together with tundra species. The remains of *Lagurus lagurus* and its ancestral forms were also found in nearly all Pleistocene interglacial faunas of the steppe zone (Markova 1982, 1992; Markova et al. 1995). Thus, both the steppe

Table 23-1
Small mammal remains from Chokurcha I Unit IV

Species	Ecological group	*IV-B*	*IV-F*	*IV-I*	*IV-K*
Spermophilus pygmaeus Pallas (little suslik)	open landscapes	1 mandible with m1; m3; 2 incisors	1 incisor	1 mandible with teeth; 1 maxilla; 2 molars; 2 incisors	1 incisor
Cricetulus migratorius Pallas (grey hamster)	open landscapes	—	—	—	—
Arvicola ex gr. *terrestris* Linnaeus (water vole)	hydromorphic biotopes	—	—	—	—
Eolagurus luteus Eversmann (yellow steppe lemming)	desert, semi-desert, dry steppes	—	—	—	—
Lagurus lagurus Pallas (steppe lemming)	steppes, forest-steppes	—	—	—	—
Microtus obscurus Eversmann (M. arvalis group) (obscurus vole)	steppes, meadows	—	—	—	—
Microtus (Stenocranius) gregalis Pallas (narrow-skulled vole)	steppes: periglacial and common	—	—	—	—
Microtus sp. (vole)	—	1 incisor	—	1 incisor	—
Total number of species		2	1	2	1

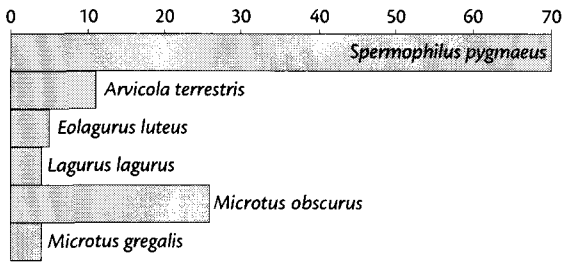

Figure 23-1—Species composition of small mammals in Chokurcha I Level IV-O (number of remains).

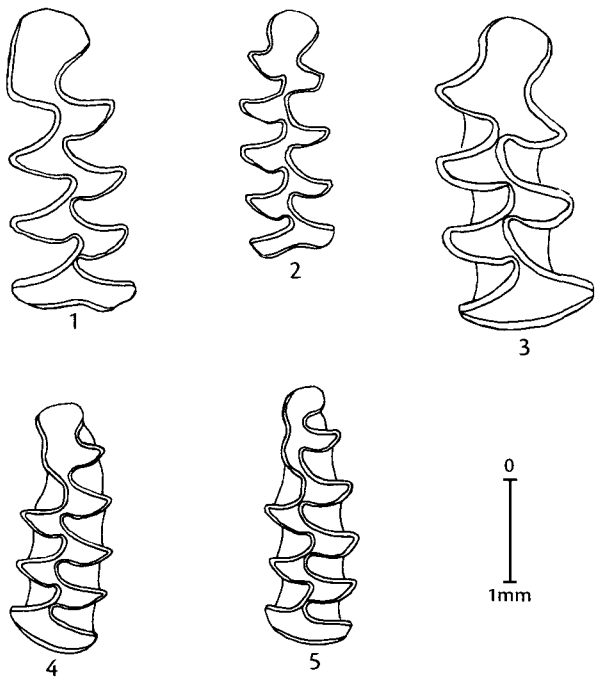

Figure 23-2—Chokurcha I Level IV-O: 1–m1 of *Eolagurus luteus*; 2–m1 of *Lagurus lagurus*; 3–m1 *Arvicola* ex gr. *terrestris*; 4, 5–m1 *Microtus gregalis*.

lemming and the yellow steppe lemming were rather indifferent to temperature parameters, but indicate, principally, open steppe-like landscapes.

The presence of the narrow-skulled vole (*Microtus gregalis*) in Level IV-O could possibly indicate some cooling. The modern representatives of this species inhabit tundra landscapes, as well as steppes. During the Late Pleistocene, this mammal was very typical among periglacial faunas. For example, it was very abundant in the Paleolithic site of Iudinovo, where it was one of the dominant forms, together with such typical tundra species as pied lemming (*Dicrostonyx gulielmi*) and Siberian lemming (*Lemmus sibiricus*) (Markova 1995). It is important to mention that

TABLE 23-1 CONTINUED
Small mammal remains from Chokurcha I Unit IV

IV-L	*IV-M*	*IV-O*	*IV-Q*	*IV-S*	*IV-U*
—	2 incisors	70 remains: mandibles, molars, incisors	—	maxilla with teeth; 2 molars; 10 incisors	1 mandible; 1 molar; 3 incisors
—	—	—	—	—	maxilla with M1–M3; 2 incisors
—	—	1 mandible with m1–m3; 10 incisors	2 m1; 5 incisors	—	2 mandibles; 2 m1; 2 m2; 10 incisors
—	—	2 mandibles with m1–m2; 1 m2;	—	—	—
—	—	2m1	—	—	—
—	—	6 mandibles with teeth; 3 m1; 3 m2; 1 m3; 1 m2; 10 incisors	5 m1	2 m1; 2 m2; 1 M2; 1 M3; 5 mandibles with teeth; 1 maxilla; 20 incisors	5 mandibles with teeth; 15 incisors
—	—	2m1	—	—	—
1 incisor	2 incisors	7 mandibles without teeth; 40 incisors	—	—	—
1	2	6	3	2	4

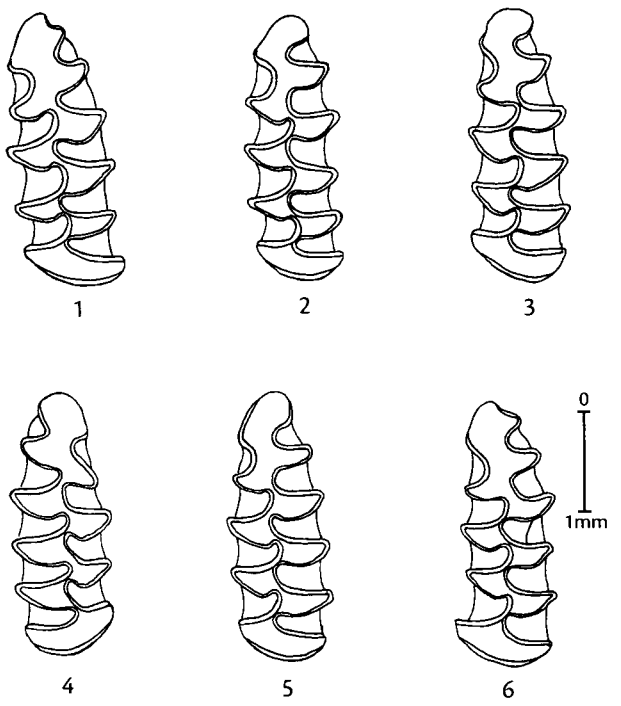

Figure 23-3—Chokurcha I Level IV-O: *1-5*–m1 *Microtus obscurus*.

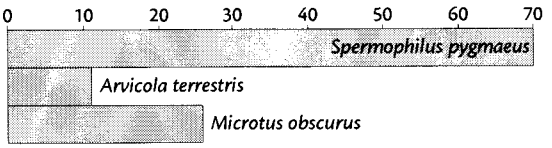

Figure 23-4—Species composition of small mammals in Chokurcha I Level IV-Q (number of remains).

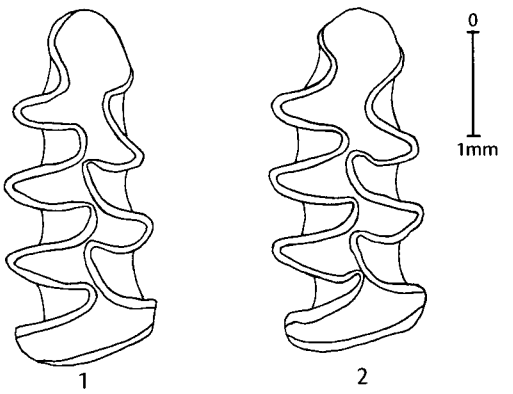

Figure 23-5—Chokurcha I Level IV-Q: *1,2*–m1 *Arvicola* ex gr. *terrestris*.

Microtus gregalis remains have been found among the Kabazi V (Level III/I) fauna (Markova 1999), in Level C of Buran-Kaya III (dated circa 32–36,000 BP), and also in Levels 6-2 and 6-1 of Buran-Kaya III with an Epi-Gravettian industry (Markova, Chapter 3). The remains of this mammal were also identified in archeological Level VI/6 at Kabazi II. All the Crimean *Microtus gregalis* remains from Middle Paleolithic sites have a rather simple tooth structure and small size, similar to the modern narrow-skulled voles that inhabit the steppes (Figure 23-2: *4, 5*). Thus, the remains of *Microtus gregalis* from Crimean sites most probably indicate open steppe environments.

There are neither forest nor cold-tolerant species in Level IV-O. The presence of water vole (*Arvicola* ex gr. *terrestris*) remains indicates a nearby stream (Figure 23-2: 3). All other rodents from Level IV-O indicate the presence of steppe landscape near the site.

Levels IV-Q, IV-S, IV-U

Levels IV-Q, IV-S, and IV-U are similar in their microfaunal composition to Level IV-O, but yellow steppe lemming (*Eolagurus luteus*), steppe lemming (*Lagurus lagurus*), and narrow-skulled vole (*Microtus gregalis*) are absent. Their absence suggests warmer and more humid conditions during the formation of these levels, perhaps in one of the early Valdai interstadials. On the other hand, the small sample sizes may be the cause of their absence; Levels IV-Q, IV-S, and IV-U have less abundant faunal remains than Level IV-O.

Two first lower molars of the water vole *Arvicola* ex gr. *terrestris* were found in Level IV-Q. These teeth are small (length = 3.03 and 3.05 mm; width = 1.82 and 1.80 mm) and have universal enamel. These features show some archaic morphology (Figure 23-5: *1, 2*).

A sizeable number of *Microtus obscurus* remains were also found in Levels IV-Q and IV-S. The first lower molars of this species are characterized by a complicated structure of the anteroconid complex and by their large sizes (length = 2.73, 2.80, 2.85 mm; width = 1.10, 1.20, 1.30 mm) (Figures 23-6: *1–5*; 23-7: *1–2*). The upper second molar of this species does not have the additional loop on the posterior loop, so these remains do not belong to *M. socialis* (Figure 23-7: 3).

The very disparate ratio of little suslik (ground squirrel) *Spermophilus pygmaeus* remains in the microfaunal composition of Level IV-O on the one hand, and Levels IV-Q, IV-S, and IV-U on the other, indicates that climatic conditions during the deposition of these lower levels were more moderate (Table 23-1; Figures 23-9, 23-10).

These are the preliminary reconstructions, which relate more to environments than to the age of the levels.

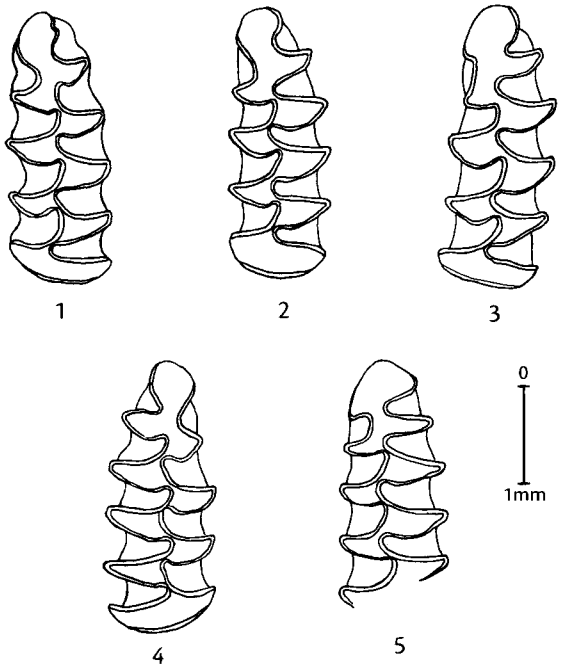

Figure 23-6—Chokurcha I Level IV-Q: 1-5–m1 *Microtus obscurus*.

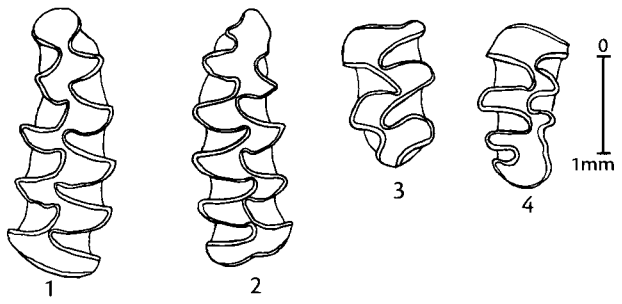

Figure 23-7—Chokurcha I Level IV-S: 1, 2–m1 *Microtus obscurus*; 2–M2 *Microtus* sp.; 3–M3 *Microtus* sp.

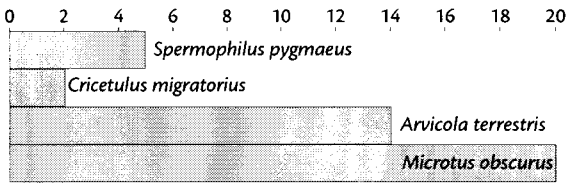

Figure 23-8—Species composition of small mammals in Chokurcha I Level IV-U (number of remains).

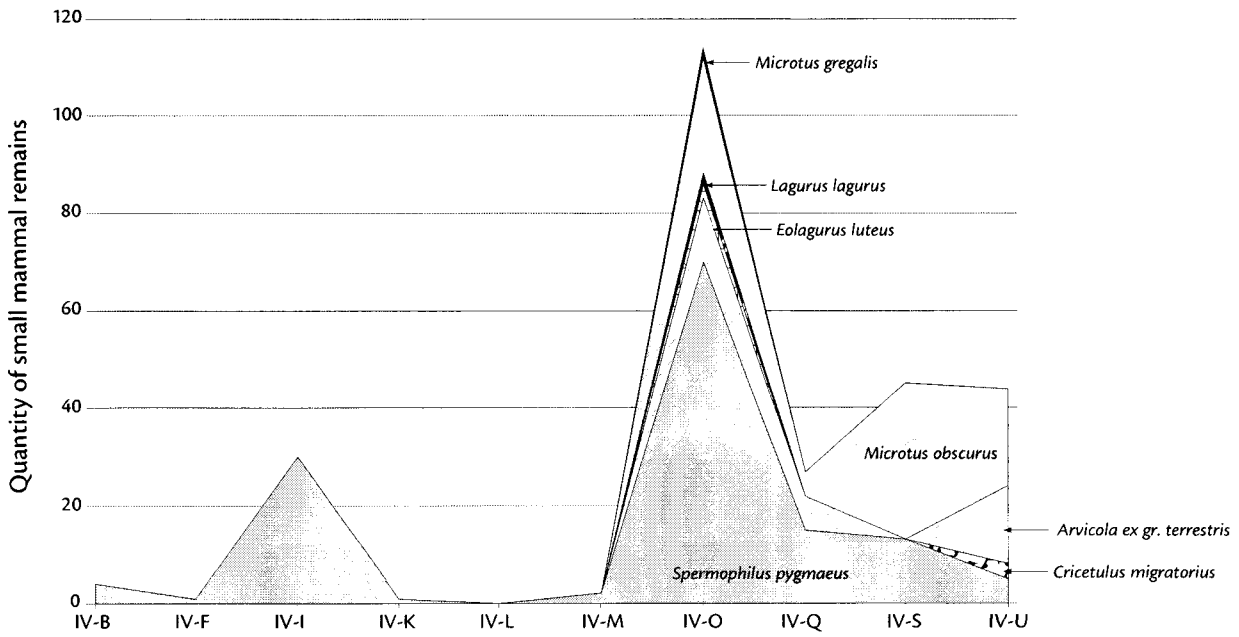

Figure 23-9—Species composition of small mammals from selected levels of Chokurcha I Unit IV.

Conclusions

Rodent fauna from the various levels of Unit IV of Chokurcha I share some general features: (1) none of the levels contains forest-dwelling microfauna; (2) none of the levels contains typical cold-tolerant species; and (3) the species compositions for all levels suggest that there was a steppe-like environment around the site (six species) and a nearby stream (one species).

The disproportionate sample sizes from the Unit IV levels make it difficult to reconstruct the environmental changes that took place during the accumulation of this unit. Rodent remains were restricted to little suslik (ground squirrel) and the vole *Microtus* sp. in Levels IV-B, IV-F, IV-I, IV-K, IV-L, and IV-M. These indicate the presence of steppe environs around the site during the deposition of these levels.

More diverse faunal compositions were found in the older Levels IV-O, IV-Q, IV-S, and IV-U. Most of the species identified from these levels indicate open steppe-like landscapes. There are neither forest species nor cold-tolerant species in any of the Chokurcha I levels. There are only steppe and semi-desert species, which prevail in all of the horizons, as well as a few hydrogenous and meadow steppe species (Figure 23-10). However, the much higher proportion of *Spermophilus pygmaeus* (ground squirrel) remains in Level IV-O as compared to Levels IV-Q, IV-S, and IV-U shows that the climatic conditions of the lowest levels were more moderate (Figures 23-9, 23-10).

A very similar picture of the environments near Chokurcha I is evident from the rodent list published by Prof. Igor Gromov (1961) from the samples obtained during Ernst's excavations. The species composition of the fauna studied previously from Ernst's Layer 4 also includes only steppe and periaquatic species. Thus, all the data indicate steppe landscapes around the site and the proximity of a stream. The absence of cold-tolerant small mammal species could relate to a rather weak ice-sheet influence on the Crimean landscapes during oxygen isotope stage 3 (Markova et al. 1995). It seems that global cooling only resulted in an increase in dry conditions and a decrease of forested areas at these latitudes. Studies of small mammal remains have been carried out within the framework of the multidisciplinary investigations of the Middle Paleolithic of the Crimean Peninsula (e.g., Marks and Chabai, eds. 1998; Chabai and Monigal, eds. 1999). The results of microfaunal analyses from several Crimean Paleolithic-age sites can therefore now be compared. These studies suggest a rather weak manifestation of cooling at these latitudes (Markova 1999, Chapter 3). The rather stable environments in the Crimean Mountains during oxygen isotope stage 3 provided favorable conditions for Paleolithic inhabitants of this region.

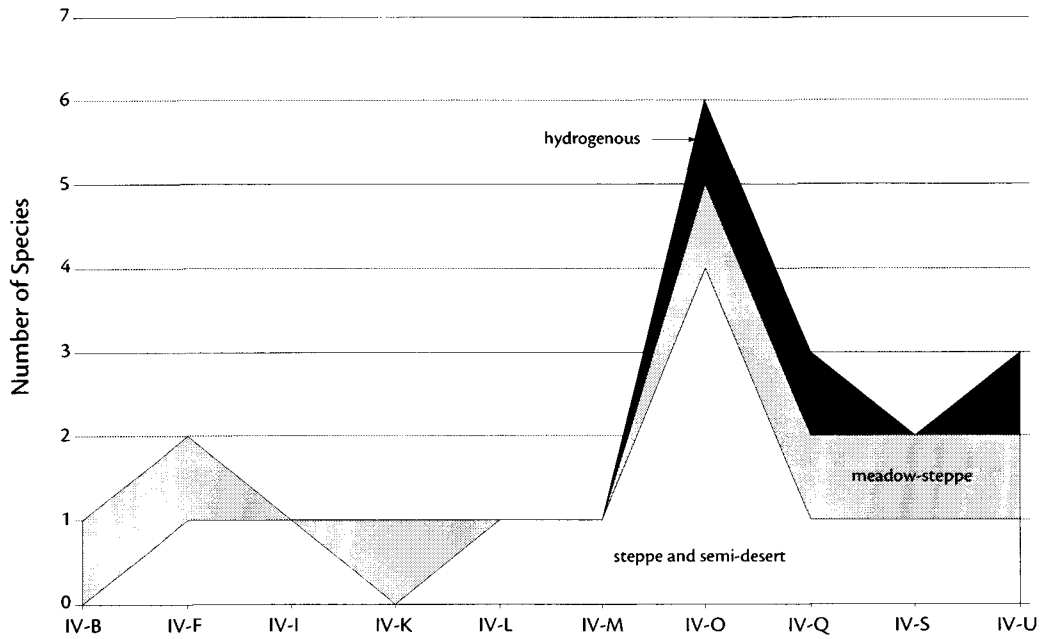

Figure 23-10—Ecological groups of small mammals from selected levels of Chokurcha I Unit IV.