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Alticola stoliczkanus.

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Alticola Blanford, 1881

Alticola Blanford, 1881:96. Type species *Arvicola stoliczkanus* Blanford, 1875.

Aschizomys Miller, 1898:369. Type species *Aschizomys lemminus* Miller, 1898.

Platycranius Kashchenko, 1901:201. Type species *Microtus strelzovi* Kashchenko, 1899.

CONTEXT AND CONTENT. Order Rodentia, Family Muridae, Subfamily Arvicolinae, Tribe Clethrionomyini (Gromov and Polyakov, 1977; Hooper and Hart, 1962; Musser and Carleton, 1993). Most Russian authors have distinguished three subgenera within the genus *Alticola*: *Alticola*, *Aschizomys*, and *Platycranius* (Pavlinov and Rossolimo, 1987). The type species of *Aschizomys*, *Aschizomys lemminus* Miller, 1898, was transferred to the genus *Eothenomys* by Corbet (1978); however, Russian authors refer the species to the genus *Alticola* (Gromov and Polyakov, 1977; Ognev, 1964; Pavlinov and Rossolimo, 1987). *Alticola* is partly reviewed by Heptner and Rossolimo (1968), Rossolimo (1989*a*, 1989*b*), Rossolimo and Pavlinov (1992), and Rossolimo et al. (1988).

Between 4 and 12 species are recognized in the genus (Corbet, 1978; Honacki et al., 1982; Musser and Carleton, 1993; Pavlinov and Rossolimo, 1987). The following context is for the genus *Alticola*: (*Aschizomys*) *lemminus*; (*Alticola*) *albicauda*, *argentatus*, *barakshin*, *macrotis*, *montosa*, *roylei*, *semicanus*, *stoliczkanus*, *stracheyi*, *tuvinicus*; (*Platycranius*) *strelzovi* (Musser and Carleton, 1993). *Alticola barakshin* Bannikov, 1947 was initially allied with *A. stoliczkanus* (Corbet, 1978; Gromov and Baranova, 1981; Gromov and Polyakov, 1977; Pavlinov and Rossolimo, 1987). However, a principal component analysis of 32 metrical features of the body, skull, and dentition suggests specific status of *A. barakshin* (Rossolimo, 1989*b*; Rossolimo and Pavlinov, 1992; Rossolimo et al., 1988). Eight species are recognized by Rossolimo and Pavlinov (1992) and Rossolimo et al. (1994) within the subgenus *Alticola* sensu stricto (omitting *A. macrotis* and *A. stracheyi*). *A. stracheyi* has been included with *A. stoliczkanus* by Corbet (1978) and Rossolimo and Pavlinov (1992), but is kept distinct by Musser and Carleton (1993), which follows Feng et al. (1986). *A. s. stracheyi* is a distinct species according to Hinton (1926), Honacki et al. (1982), and Mitchell (1975), but Heptner and Rossolimo (1968) place it within *A. roylei*. Revision of the subgenus by Rossolimo (1989*b*) may have confirmed the subspecific status of this form. However, re-examination of Mitchell's (1975) material shows that *A. s. stracheyi* belongs to *Cricetulus alticola* Thomas, 1917 (Lim and Ross, 1992). *A. macrotis* has been placed within the subgenus *Aschizomys*; however, its phylogenetic placement is in need of revision, as is the genus and its subgenera. Thus, a key to species is not herein provided. A key to species of subgenus *Alticola* from China is available (Rossolimo et al., 1994).

Alticola stoliczkanus (Blanford, 1875)

Stoliczka's Mountain Vole

Arvicola stoliczkanus Blanford, 1875:107. Type locality as originally given "Nubra Valley, Ladák" and Kuen Lun (Kunlun) Mts., India (see below for restriction by Rossolimo and Pavlinov, 1992).

Arvicola stracheyi Thomas, 1880:323. Type locality as originally given "Kumaon," India (see below).

Microtus cricetulus Miller, 1899:294. Type locality "Tso-Kyun, Ladák (altitude 16,000 feet [4,877 m])," India.

Microtus acrophilus Miller, 1899:296. Type locality "Ladák side of Kara Korum [Karakorum] Pass, (altitude 17,000 feet [5,182 m])," India.

Microtus (*Alticola*) *lama* Barrett-Hamilton, 1900:196. Type locality Western Tibet, "25 miles [40 km] south-east of Lake Arucho," 16,000 feet [4,877 m], China.

Microtus nanschanicus Satunin, 1903:575. Type locality Scharagoldschin, Nan Shan, North Western Kansu, China.

Microtus kaznakovi Satunin, 1903:581. Type locality Chi-tschuji River, upper parts of Blue River drainage, south Tibet, China.

Alticola bhatnagari Biswas and Khajuria, 1955:29. Type locality Mingbo, Khumbu, east Nepal.

Samiran Chakrabarati (Zoological Survey of India) provided exact localities of syntypes of *A. stoliczkanus* kept by the Survey (O. L. Rossolimo and I. Y. Pavlinov, in litt.). As the two localities are on opposite sides of the Kuen Lun Mountains, Rossolimo and Pavlinov (1992) have selected specimen No. 15707 (Zoological Survey of India) as the lectotype, thereby indicating the type locality as Nubra Valley, Ladák, India.

CONTEXT AND CONTENT. Context same as for genus. The species belongs to subgenus *Alticola* (sensu stricto). Six subspecies are recognized as follows (Ellerman and Morrison-Scott, 1951; Gromov and Polyakov, 1977):

A. s. acrophilus (Miller, 1899:296), see above.
A. s. kaznakovi (Satunin, 1903:581), see above.
A. s. lama (Barrett-Hamilton, 1900:196), see above.
A. s. nanschanicus (Satunin, 1903:575), see above.
A. s. stoliczkanus (Blanford, 1875:107). Type locality "Nubra Valley, Ladák," India.
A. s. stracheyi (Thomas, 1880:322). Type locality Ladák (see Hinton, 1926:322; *cricetulus* and *bhatnagari* are synonyms).

Alticola bhatnagari was described as a distinct species but was included by Weigel (1969) and Gregori and Petrov (1976) as a subspecies in *A. stoliczkanus* and by Gromov and Polyakov (1977) in *A. roylei*. It is here synonymized under *A. s. stracheyi* because the original description was based on juvenile specimens (Daniel and Hanzak, 1985; Mitchell, 1975). *A. s. kaznakovi* was assigned by Bobrinskii et al. (1944) to *Pitymys majori* as a race (Ellerman and Morrison-Scott, 1951:672), however, Gromov and Polyakov (1977) and Rossolimo (1989*b*) included it in *A. stoliczkanus*. Rossolimo and Pavlinov (1992) distinguish only three subspecies of *A. stoliczkanus*: *A. s. stoliczkanus*, *A. s. bhatnagari*, and *A. s. lama*.

DIAGNOSIS. A precise diagnosis of the various species, including *A. stoliczkanus*, within the subgenus *Alticola* is difficult. An adequate diagnosis will result only from a thorough generic revision. The skull of *A. stoliczkanus* is normal for the subgenus (not dorsoventrally compressed as in *A.* (*Platycranius*) *strelzovi*); its height (measured on the anterior edge of M1) is equal to or greater than the upper toothrow length (Fig. 1). The brain case is narrow and short in comparison with other members of subgenus *Alticola* (length of brain case 33–36% of condylobasal length). The M3 has two lingual triangles, which is the simplest configuration within the genus, in 33% of specimens. The second buccal salient angle is "very wide" (Rossolimo et al., 1994:96). The M3 is the shortest among *Alticola* and is nearly equal in length to M2; the length of M3 talon is only 36–41% of total tooth length (Rossolimo and Pavlinov, 1992; Fig. 2). Reduction of the tympanum accessorium (26–27% of skull length, which is the least in any clethrionomyine vole; Fig. 1) results in only the manubrium mallei being observed on the lateral side of the bulla and is considered a diagnostic character (Rossolimo and Pavlinov, 1992; Rossolimo et al., 1994). This character needs additional examination, however, as not all specimens exhibit the shortened feature.

GENERAL CHARACTERS. *Alticola stoliczkanus* is one of

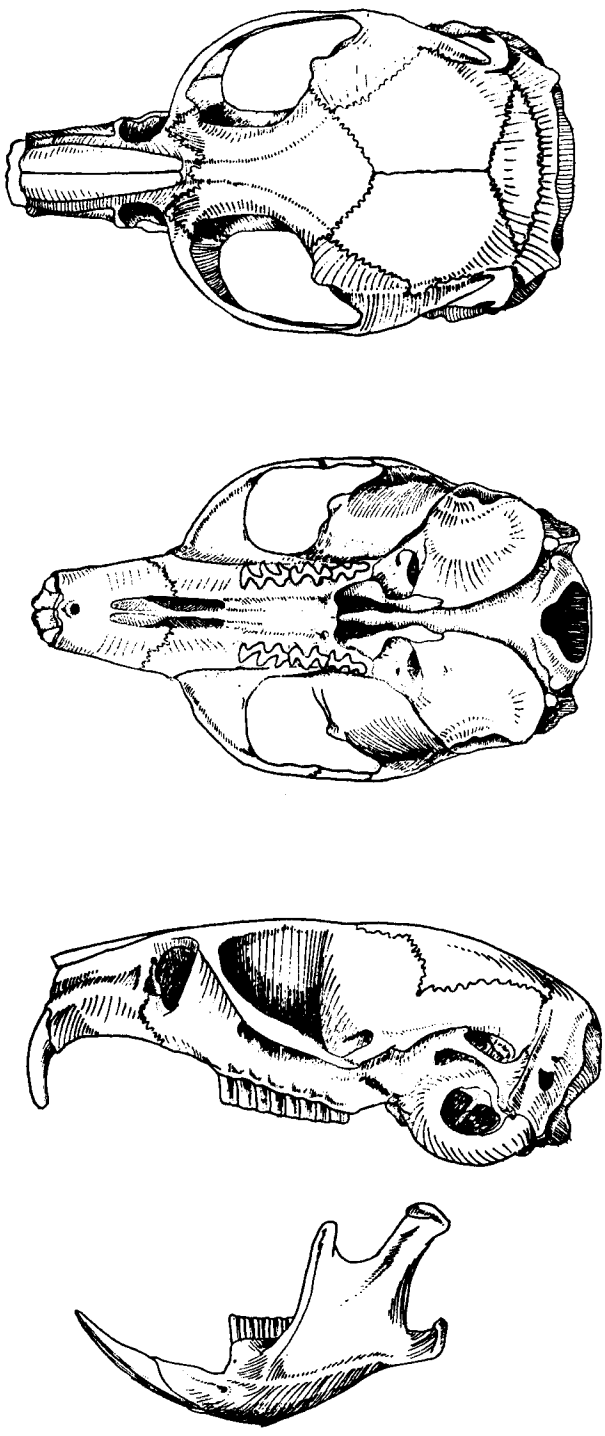

FIG. 1. Dorsal, ventral, and lateral views of the cranium and lateral view of mandible of *Alticola stoliczkanus* from Makalu (base camp), 4,900 m, Nepal, (male, Slovene Museum of Natural History, 4566). Greatest length of cranium is 26.5 mm.

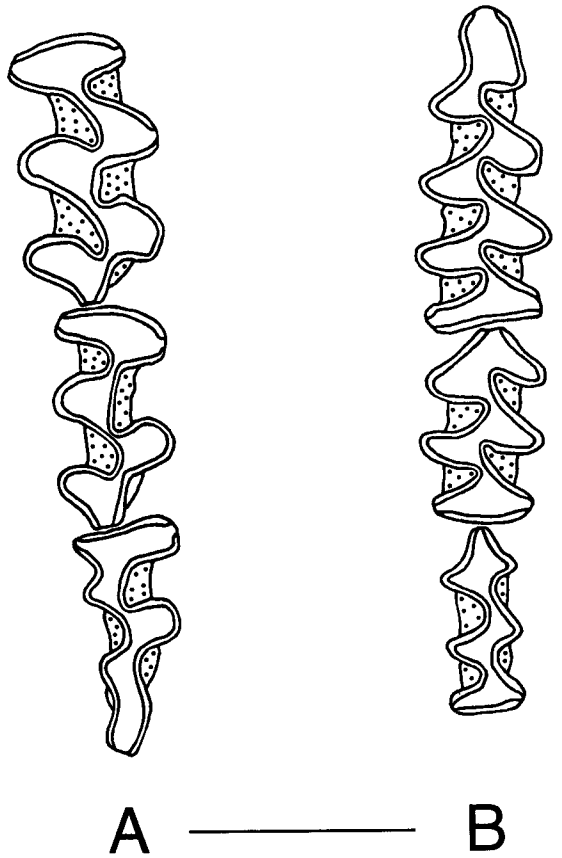

FIG. 2. Occlusal views of upper right (A) and lower right (B) molars of adult *Alticola stoliczkanus* (specimen as illustrated and described in Fig. 1). Bar equals 2.0 mm.

the smallest species within the genus. Its pelage, considered to be the palest in the subgenus, is typically light gray with an ochre tinge near the tips of the hair (Rossolimo and Pavlinov, 1992). Underparts are gray-white to white. Winter coat is soft and long. Tail is well covered with hairs, usually white below and sandy brown above. External measurements (in mm) for 28 adults from Nepal are as follows: length of head and body, 93–127; length of tail, 14.5–23.0; length of hind foot 16–20; length of ear, 10.5–12.0 (n = 5 for tail—Gregori and Petrov, 1976). Length of head and body is 101.5–112.8 mm in People's Republic of China (Rossolimo et al., 1994) and average length of tail ranges from 19.7 to 27.2 mm (18–26% length of body—Rossolimo and Pavlinov, 1992). Body mass range is 26.5–34.0 g (n = 10—Daniel and Hanzak, 1985).

The skull is robust and sharply sculptured with crests especially well developed in the interorbital and parietal regions (orbits 22–23% of skull length—Rossolimo and Pavlinov, 1992). Range of condylobasal length is 23.5–25.1 mm for *A. stoliczkanus bhatnagari* (n = 10—Gregori and Petrov, 1976). Hinton (1926: 445) lists the cotype as having a condylobasal length of "29±" mm, but does not provide dental measurements. Occipitonasal is 25.62–27.38 mm (Rossolimo et al., 1994). Specimens from the populations on the southern slopes of the Himalayan Mountains are smaller than those from Ladák (Hinton, 1926).

DISTRIBUTION. Five of the six subspecies currently recognized (*stoliczkanus, acrophilus, lama, nanschanicus, kaznakovi*) are known only from type localities. The remaining one (*A. s. stracheyi*) was described from several localities, mainly in east Nepal. Geographic range of the species extends from Kunlun (*stoliczkanus*), Karakorum (*acrophilus*), Himalayas at least to Nepal (*stracheyi*), and Tibet Plateau (*lama, kaznakovi*) to Nan Shan (*nanschanicus*—Rossolimo et al., 1994; Fig. 3). *A. s. lama* is endemic to the Tibetan Plateau. Vertical distribution in the Himalayan Mountains range from 3,900 to 5,450 m (Daniel and Hanzak, 1985; Gruber, 1969). The taxon is the most widely distributed species of *Alticola* in the People's Republic of China (Rossolimo et al., 1994).

FOSSIL RECORD. Young (1934) identified *Alticola* from Pleistocene Locality 1 of Choukoutien, while Pei (1936, 1940) described *Alticola* cf. *stracheyi* from Locality 3 and Upper Cave of Choukoutien. Identifications from Choukoutein may not be reliable, and may represent juvenile *Clethrionomys* (Gromov and Polyakov, 1977). Listed materials from the cave belong partly to *A. stoliczkanus* (Zheng and Li, 1990). *Alticola* is not found today in the area of the cave. Specimens from Sjara-Ossol-Gol described as *Alticola* cf. *stracheyi* (Qi, 1975) should be referred to *Eolagurus* (Zheng and Li, 1990). Knyazev and Savinetsky (1987, 1988) and Knyazev

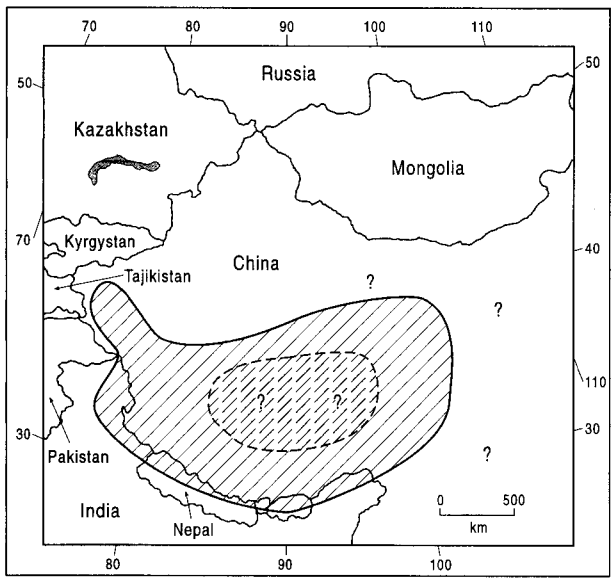

FIG. 3. Distribution of *Alticola stoliczkanus* in Asia (Rossolimo et al., 1994). Question marks are unverified locations.

et al. (1986) discuss Holocene changes in structure of small mammal and bird communities (including *Alticola* sp. and *A. stoliczkanus*) based on owl pellet remains from cave sediments in the Gobi Altai Mountains of Mongolia.

FORM AND FUNCTION. Dental formula of *A. stoliczkanus* is i 1/1, c 0/0, p 0/0, m 3/3, total 16 (Gromov and Polyakov, 1977). Molars are hypsodont with little cement in the re-entrant angles. Enamel is relatively thin (Hinton, 1926; Fig. 2).

The baculum has not been well described. The baculum of one specimen had a maximum length of shaft of 1.9 mm and a width of 0.7 mm (Gregori and Petrov, 1976).

ECOLOGY. Preferred habitats of *A. stoliczkanus* are higher regions of mountain valleys, above timber line. The occurrence of *A. stoliczkanus* today at high altitudes is influenced by the presence of climbers; stored foodstuffs and concentrated garbage attract the voles (Daniel and Hanzak, 1985; Gregori and Petrov, 1976). *A. stoliczkanus* nests in heaps of stones and boulders of glacial moraines, but also in places entirely covered by grass. *A. stoliczkanus* is predominantly nocturnal, even at temperatures of −15°C (Gregori and Petrov, 1976).

GENETICS. Karyotypic data are not available for *A. stoliczkanus*. Nevertheless, other species within the subgenus *Alticola* have a diploid number of 56 (Heilscher et al., 1992).

REMARKS. The physiology, ontogeny, reproduction, and behavior of this species have not been described. The etymology of the generic name is *altus* (Latin meaning high) and *colo* or *incola* (Latin meaning to inhabit or an inhabitant), therefore, *Alticola* refers to an inhabitant of high elevations. The specific epithet *stoliczkanus* is named for Dr. Stoliczka, who was attached to the British embassy under Sir D. Forsyth in Kashmir, Ladák, and eastern Turkestan in the 1870s (Blanford, 1875). Illustrations of cranium in Fig. 1 and teeth in Fig. 2 are by A. Nadachowski. Editing suggestions were supplied by I. Y. Pavlinov, B. Krystufek, O. Rossolimo, and P. Ross. Interlibrary Loan, Cline Library, Northern Arizona University helped with obtaining Russian articles. Drafting was provided by the Bilby Research Center, Northern Arizona University.

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