

## **New records of the Snow Vole *Chionomys nivalis* (Rodentia: Arvicolinae) from the Binaloud and Elburz Mountains of Iran**

Jamshid DARVISH, Roohollah SIAHSARVIE, Mohammad JAVIDKAR and Omid MIRSHAMSI

Received: 12 Jan., 2005

Accepted for publication: 13 May, 2005

DARVISH J., SIAHSARVIE R., JAVIDKAR M., MIRSHAMSI O. 2005. New records of the Snow Vole *Chionomys nivalis* (Rodentia: Arvicolinae) from the Binaloud and Elburz Mountains of Iran. *Acta zoologica cracoviensia*, **48A**(1-2): 67-70.

**Abstract.** The Snow Vole *Chionomys nivalis* was recorded for the first time from the Central Elburz and Binaloud Mountains, Iran. The Binaloud Mts. population extends the distribution of the Snow Vole because it is the most eastern record of this species in Asia.

**Key words:** *Chionomys nivalis*, Arvicolinae, Binaloud Mts, Elburz Mts.

Jamshid DARVISH, Roohollah SIAHSARVIE, Mohammad JAVIDKAR, Omid MIRSHAMSI, Rodentology Research Department, Faculty of Sciences, Ferdowsi University, Mashhad, Iran.

E-mail: r\_siahsarvie@yahoo.fr

### I. INTRODUCTION

The Snow Vole is a relatively large-sized Arvicoline, generally found in high mountain rocky biotopes and is discontinuously distributed from south-west Europe to Iran (KRAPP 1982). Some authors included *Chionomys* as a subgenus in *Microtus* (MILLER 1912; CORBET 1978; KRAPP 1982) while others treated it as a separate genus (GROMOV and POLYAKOV 1977; PAVLINOV and ROSSO-LIMO 1987; CHALINE and GRAF 1988; NADACHOWSKI 1991; KRYŠTUFEK 1999). The latter opinion has been confirmed by biochemical (GRAF 1982) and recent molecular studies (JAAROLA et al. 2004).

The genus *Chionomys* is represented by the following three species which exclusively inhabit mountainous regions of Europe, Asia Minor and parts of western Asia (NADACHOWSKI 1991, 1992): *Chionomys gud* (SATUNIN, 1909), *Chionomys roberti* (THOMAS, 1906) and *Chionomys nivalis* (MARTINS, 1842). *Chionomys nivalis* is invariably associated with alpine areas where it inhabits different types of rocky habitats (e.g., karst or limestone cliffs). It is widely distributed in mountainous regions of Europe from Spain through the Alps to the Tatras, the Carpathians, the Balkans, Mount Olympus and Pindus Range, Turkey, West Caucasus, Lebanon, Syria, Transcaucasia, the Kopet-Dag Mountains and northwestern Arabic Peninsula (KRAPP 1982; HARRISON and BATES 1991; MUSSER and CARLETON 1993; KRYŠTUFEK 1999). In Iran *Ch. nivalis* has been previously recorded from Zard-Kouh of Bakhtiyari in the Zagros Mountains and Deu-Ab of Dizin in the Elburz Mountains (KRAPP 1982).

## II. MATERIAL AND METHODS

In this survey three specimens from Binaloud and one from central Elburz were captured using snap-traps (Fig. 1). Sampling was conducted in high elevations (over 2500 m asl) of Nehel-Zoshk (Binaloud Mts.  $36^{\circ} 16' 19\frac{1}{2}''$  N;  $59^{\circ} 07' 01\frac{1}{2}''$  E) and Tar Lake-Damavand (Elburz Mts.  $35^{\circ} 43' 55\frac{1}{2}''$  N;  $52^{\circ} 14' 06\frac{1}{2}''$  E). Identification was carried out by external, dental and cranial characters. Standard voucher specimens (skins, skulls) were deposited in the Zoology Museum of Ferdowsi University of Mashhad, Iran.

External standard measurements were available only for Binaloud specimens, and cranial characters for only one of those and also for the Elburz individual. Skeletal measurements were made using vernier calipers to the nearest 0.05 mm, whereas all dental measurements were carried out with a measuring microscope to 0.001 mm.



Fig. 1. Geographic distribution of the populations of *Chionomys nivalis* in Iran. Black dots denote positions of new records examined by the authors; asterisk – localities known from earlier studies. 1 – Zard-kuh of Bakhtiyari, Zagros Mts.; 2 – Deu-Ab of Dizin, Elburz Mts.; 3 – Tar Lake-Damavand, Elburz Mts.; 4 – Nehel-Zoshk, Binaloud Mts.

## III. RESULTS AND DISCUSSION

Size rather large; tail is about half of total head and body length. Dorsal pelage is light brown; underparts almost white with grayish tint; tail is pale and monochromatic.  $M_1$  in two individuals from Binaloud and the specimen from Elburz have distinct T5 and T6, well developed BSA4 and LSA5 and do not have BRA4 and LRA5 (morphotype “*aquitanius*” based on NADACHOWSKI 1991, but the anterior cap is short); in the third specimen from Binaloud, the BRA4 is incipient. Two specimens from Binaloud and the one from Elburz have  $M^3$  with separated T4 and T5 and lack BSA4 and LSA5 (morphotype “*nivalis*” based on NADACHOWSKI 1991), but the last specimen from

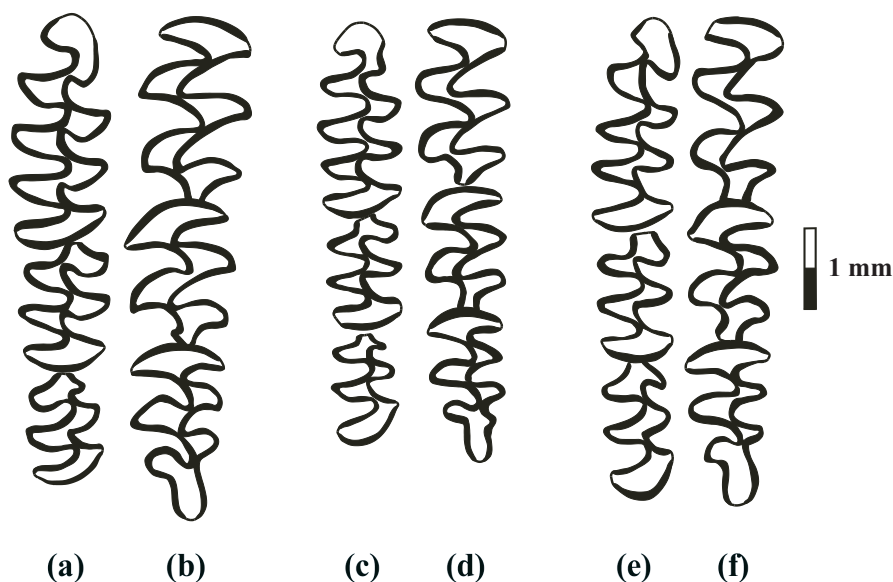


Fig. 2. Right lower (a, c, e) and left upper (b, d, f) molar tooth rows in *Chionomys nivalis* from the Binaloud (a, b and c, d) and Elburz Mountains (e, f).

Binaloud has an extra triangle as an incipient BSA4 (Fig. 2, terminology after VAN DER MEULEN 1973).

In examined specimens from Binaloud, the length of head and body is 104-116 mm; tail length, 58-60 mm; ear length, 12-13 mm; hind foot length, 18-19 mm; condylobasal length, 26.40 mm; zygomatic width, 14.90 mm; interorbital width, 4.30 mm; nasal length, 7.55 mm; length of tympanic bulla, 7.25 mm; width of tympanic bulla, 6.00 mm; cranium width, 12.45mm; upper molar tooth row length, 6.084-6.846 mm; and lower molar tooth row length, 6.043-6.407 mm. Measurements (in mm) for Elburz specimen are as follows: condylobasal length, 28.60; zygomatic width, 16.25; interorbital width, 4.35; nasal length, 8.30; length of tympanic bulla, 7.90; width of tympanic bulla, 6.80; cranium width, 12.50; upper molar tooth row length, 6.606; and lower molar tooth row length 6.460.

Before this study *Ch. nivalis* was never reported from the Binaloud Mountains, which are parallel with the Kopet-Dag Mountains, nor was it found in Tar Lake in Central Elburz. The presence of this species in northeastern Iran is of geographic and taxonomic importance because it extends the known range of the Snow Vole in this region.

#### REFERENCES

- CHALINE J., GRAF J. D. 1988. Phylogeny of the Arvicolidae (Rodentia): biological and paleontological evidence. *Journal of Mammalogy*, **69**: 22-33.
- CORBET G. B. 1978. The mammals of the Palaearctic region: a taxonomic review. British Museum of Natural History, Cornell University Press, London and Ithaca, 314 pp.
- GRAF J. D. 1982. Génétique, biochimique, zoogéographie et taxonomie des Arvicolidae (Mammalia, Rodentia). *Revue Suisse de Zoologie*, **89**: 749-787
- GROMOV I. M., POLYAKOV I. Ya. 1977. Polevki (Microtinae). Fauna SSSR. Mlekopitayushchie. **3, 8**: 4-504.
- HARRISON D. L., BATES P. J. J. 1991. The mammals of Arabia, 2nd ed. Sevenoaks: Harrison Zoological Museum, XVI + 354 pp.

- JAAROLA M., MARTÍNKOVÁ N., GÜNDÜZ I., BRUNHOFF C., ZIMA J., NADACHOWSKI A., AMORI G., BULATOV, N. S., CHONDROPOULOS B., FRAGUEDAKIS-TSOLIS S., GONZÁLEZ-ESTEBAN J., LÓPEZ-FUSTER M. L., KANDAUROV A. S., KEFALIOGLU H., DA LUZ MATHIAS M., VILLATE I., SEARLE J. B. 2004. Molecular phylogeny of voles of the speciose genus *Microtus* (Arvicolinae, Rodentia) inferred from mitochondrial DNA sequences. *Molecular Phylogenetics and Evolution*, **33**: 647-663.
- KRAPP F. 1982. *Microtus nivalis* (MARTINS, 1842) – Schneemaus. [In:] J. NIETHAMMER, F. KRAPP (eds) – *Handbuch der Säugetiere Europas*. Band 2/I, Nagetiere II, Akademische Verlagsgesellschaft, Wiesbaden, Pp. 261-283.
- KRYŠTUFEK B. 1999. Snow voles, genus *Chionomys*, of Turkey. *Mammalia*, **63**(3): 323-339.
- MILLER G. S. 1912. Catalogue of the mammals of western Europe in the collection of the British Museum. British Museum (Natural History), London, 1019 pp.
- MUSSER G. G., CARLETON M. D. 1993. Family Muridae. [In:] D. E. WILSON, D. M. REEDER (eds) – *Mammals species of the world. A taxonomic and geographic reference*. Smithsonian Institution Press, Washington. Pp: 501-755.
- NADACHOWSKI A. 1990. Comments on variation, evolution and phylogeny of *Chionomys* (Arvicolidae). International Symposium on Evolution Phylogeny and Biostratigraphy of Arvicolids, Praha, 353-368.
- NADACHOWSKI A. 1991. Systematics, geographic variation, and evolution of snow voles (*Chionomys*) based on dental characters. *Acta Theriologica*, **36**(1-2): 1-45.
- NADACHOWSKI A. 1992. Short-distance migration of Quaternary and recent mammals: a case study of *Chionomys* (Arvicolidae). *Courier Forschungsinstitut Senckenberg*, **153**: 212-223.
- PAVLINOV I. Ya., ROSSOLIMO O. L. 1987. Sistematika mlekopitayushchikh SSSR. *Archives Zoological Museum Moscow State University*, **25**: 3-284.
- VAN DER MEULEN A. 1973. Middle Pleistocene smaller mammals from the Monte Peglia (Orvieto, Italy) with special reference to the phylogeny of *Microtus* (Arvicolidae, Rodentia). *Quaternaria*, **17**: 1-144.