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## The Acaroid Mites From the Nests of the Common Vole (*Microtus arvalis*) (Rodentia) of the Lesser Caucasus Within Azerbaijan

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**Abstract:** The results are given of a study on Acaroid mites collected in the summer (July-August) from the nests of the common vole (*Microtus arvalis*) in the subalpine zone in Shahbuz, Lachin, Keebajar and Kedabek regions of Azerbaijan. Under the specific conditions of the high mountain subalpine meadows of Azerbaijan, the fauna of acaroid mites in the nests of rodents is sufficiently diverse. The presented species list includes 19 species belonging to 2 families and 11 genera. In this region, with its extreme climatic conditions, the nests, with a stable microclimate, serve as a concentration and survival site for the acaroid mites.

**Key Words:** Acari, Acaridae, Glycyphagidae, nests, ecology.

### Azerbaycan'da Tarla Faresi (*Microtus arvalis*) (Rodentia) Yuvalarında Tespit Edilen Acaridae ve Glycyphagidae (Acari) Türleri Üzerine Bir Ara tırma

**Özet:** Bu çalışmada Azerbaycan'ın Şahbuz, Laçın, Kelbecer ve Gedebey bölgelerinde yaşayan köstebeklerin (*Microtus arvalis*) toplanarak teşhis edilmiş bulunan Acaridae ve Glycyphagidae familyalarına ait 19 türün, yakalanma sıklıkları, bolluk değerleri ve diğer bazı ekolojik özellikleri verilmektedir.

**Anahtar Sözcükler:** Acari, Acaridae, Glycyphagidae, Köstebek (*Microtus arvalis*), Yuvalar, yüksek yayla, Ekoloji.

### Introduction

The existence of the Acarodidea in the nests of rodents is discussed in the works of numerous researchers (Kamensky (1), Krasicova (2), Sorokin (3), Vysotskaya (4), Volgin (5), Chikilevskaya (6), Tareev (7)) and is mentioned in a number of papers (Michael (8), Oudemans (9), Heychaus (10), Kirshenblak (11), Zachvatkin (12)). There is no information on the acarofauna of nests in the high mountains in the existing publications. Therefore our investigations were directed toward the study of the fauna of rodent nests, which is of interest from the standpoint of the mites adaptation to the external environmental conditions (cold, short summer, strong wind, high air humidity, etc.) The study of the ancient fauna is also necessary for elucidation of the ways of formation and the location of the mites in high mountains.

The mites inhabit plant litter, reserves made by the rodents their excrements, bacteria, fungi. The absence of direct sun rays, stable humidity and temperature during all the seasons create favourable conditions for the vital activity of Acaroidea and other mites in the rodent nests, with the help of the rodents themselves and numerous parasitic and free-living arthropoda. The Acaroidea, by

phoresia, resettle from the nests to the neighbouring storehouses, depots, livestock sheds etc.

### Materials and Methods

We investigated 366 nests of the common vole *Microtus arvalis*, in 170 of which mites were found. The selection of the mites from the nests (in accumulation of plant residues, extracted from the nests) was conducted by examination by magnifying-glass, following control of extract neatness under the binocular. The nests preliminarily screened through the metallic sieves. The collected mites were transferred to test-tubs with 70% ethyl alcohol, and then we prepared the constant preparation in the Fore liquid.

### Results

In the obtained nests 2360 specimens of the Acaroidea were found. The species composition, frequency, quantity, infestation and mite abundance in nests of the common vole are given in Table 1. The mites found in the nests belong to 2 families, 11 genera and 19 species. It is believed that these species do not exhaust the fauna of the Acaroidea in the nests of the common

Mite's Species	Total mites	Frequency (%)	Abundance index	Intensity of infection
<b>Acaridae</b>				
<i>Acarus farris</i> (Ouds.)	449	14.2	1.2	8.6
<i>A. tyrophagoides</i> (Zachv.)	7	1.1	0.02	1.8
<i>Kuzinia laevis</i> (Duj.)	9	0.3	0.02	9.0
<i>Tyrophagus longior</i> (Gerv.)	1	0.3	0.003	1.0
<i>T. perniciosus</i> Zachv.	9	1.1	0.02	2.3
<i>T. humerosus</i> Ouds.	1	0.3	0.003	1.0
<i>Mycetoglyphus fungivorus</i> (Ouds)	88	7.1	0.2	3.4
<i>Acotyledon sokolovi</i> Zachv.	707	13.1	1.9	14.7
<i>A. rhizoglyphoides</i> (Zachv.)	288	4.6	0.8	16.9
<i>A. calcis</i> Rupës	168	6.0	0.5	7.6
<i>Acotyledon sp.</i>	108	5.2	0.3	5.7
<i>Rhizoglyphus echinopus</i> (F.et. R.)	5	0.8	0.01	1.7
<i>Robinisca macrocnemis</i> Zachv.	2	0.3	0.005	2.0
<b>Glycyphagidae</b>				
<i>Glycyphagus abnormis</i> Volgin	376	21.0	1.0	4.8
<i>G. ornatus</i> (Kram.)	127	4.9	0.4	6.9
<i>Glycyphagus sp.</i>	1	0.3	0.003	1.0
<i>Myacarus hypudaei</i> (Koch)	5	0.3	0.01	5.0
<i>Xenorictes heptneri</i> Zachv.	8	0.5	0.02	4.0
<i>Lapidophorus sp.</i>	1	0.3	0.003	1.0

Table 1. The frequency and quantity of the Acaroidea in the nests of the Common Vole in the subalpine belt of Azerbaijan.

vole. The collection of material during all seasons and in other altitudinal belts may add to them.

The mites of the Acaridae (13 species) amount to 68.5% of the total, the Glycyphagidae (6 species)-31.5%. Six species of Acarodidea found by us are dominant: *A. rhizoglyphoides* (288 specimens), *A. sokolovi* (707), *A. farris* (449), *G. abnormis* (376), *A. calcis* (168), *G. ornatus* (127).

*A. sokolovi* was found in all the investigated regions, in rodent nests we found it in livestock sheds and plant residue.

*A. farris* was collected in summer. In our collections it was found in the rodent nests in Shahbus, Kelbajar and Lachin regions on the subalpine meadows on the mountain-meadow-soddy and on the alpine meadows on the mountain-meadow peaty soils.

*G. abnormis* is third in terms of quantity in our collections. It occurred on the subalpine and alpine meadows with mountain-meadow soddy and peaty soils. It was found only in nests of the common vole.

*A. rhizoglyphoides* was found in winter, spring and summer from the foothills to the high mountain. It was

also observed in hay, straw and livestock sheds and on bats.

*A. calcis* perhaps is a typical nidicolous species. In the USSR (1987) for the first time we found it the middle mountain belts in spring and summer.

*G. ornatus* inhabits an area from the semidesert lowland to the subalpine meadows with mountain-meadow peaty soil. It was also found in the nests of the house sparrow (*Passer domesticus*).

*M. fungivorus* is few in number, but a regularly encountered species.

It inhabits the subalpine meadows with mountain soddy soils. It was also noted in soil, hay and straw. The mites were found during all the seasons, but females with eggs were observed only in summer.

*Acotyledon sp.* We collected 109 specimens of the mites from 19 nests. The remaining species were found as single specimens: *A. tyrophagoides*, *K. laevis*, *T. longior*, *T. perniciosus*, *T. humerosus*, *R. echinopus*, *R. macrocnemis*, *M. hypudaei*, *X. heptneri*, *Glycyphagus sp.*, *Labidophorus sp.*

## Discussion

Comparing the abundance and frequency of mites inhabiting the nests with other locations, it may be noted that a number of species adapted only to rodent nests. These include *A. calcis*, *G. abnormis*, *M. hypudae*, *X. heptneri* and probably *Labidophorus* sp.

As a rule, *K. laevis* is a stenotopic inhabitant of bumblebee nests, the only site where the imaginal stage of this species had been determined. In our collections, 9 individuals in the hypopus stage were found.

Of the 19 species of the Acaroidea found by us in the nests of the common vole, some were also found outside nests: in the soil, 7 species *A. farris*, *A. tyrophagoides*, *T. perniciosus*, *M. fungivorus*, *A. rhizoglyphoides*, *R. echinopus*, *T. longior*; in hay, 7 species: *A. tyrophagoides*, *T. perniciosus*, *T. longior*, *M. fungivorus*, *A. rhizoglyphoides*, *R. echinopus*, *A. sokolovi*; in straw, 3 species: *T. longior*, *M. fungivorus*, *A. rhizoglyphoides*; in livestock sheds, 4 species *T. perniciosus*, *T. longior*, *A. sokolovi*, *A. rhizoglyphoides*; in the bird nests 2 species: *T.*

*longior*, *G. ornatus*; on the insects 1 species: *R. echinopus*; on the bats 3 species: *A. tyrophagoides*, *R. echinopus*; and *A. rhizoglyphoides*.

The peopling of the rodent nests with Acaroidea takes place by means of their migration from the soil and also with the rodents themselves, insects and birds.

The occurrence of the mites on the mountain and high mountain belts, i.e., 1900 m above sea level, suggests that the mites found in Azerbaijan in the rodent nests are northern and coldresistant.

In conclusion, it may be ascertained that the rodent nests serve as concentration and survival sites for the Acaroidea under the specific conditions of the high-mountain subalpine meadows in Azerbaijan.

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