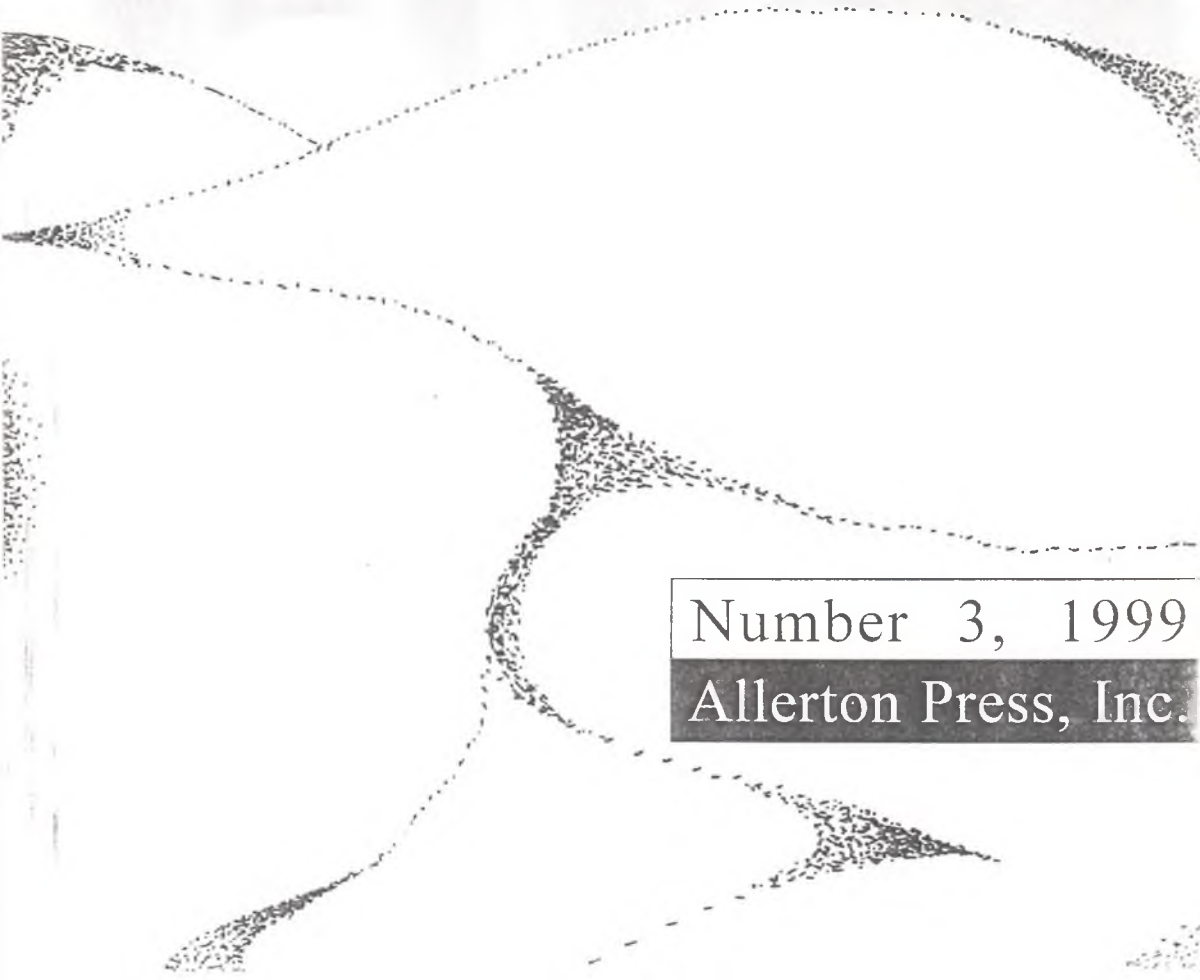


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THE TARSONEMID MITES OF TURKMENISTAN

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Based on our research, some information on the tarsonemid mites (*Tarsonemina*, *Trombidiformes*) dwelling in ants' nests was published by a number of authors [1-7].

In Turkmenistan, some matters of the habits and ecology of the tarsonemid mites were studied only in the agrobiocoenosis of the cotton plant [8-10]. To date in line with published and our data, a total of 45 species of the *Tarsonemina* cohort mites were registered in various regions of Turkmenistan. However, the myrmecophylous species of the tarsonemid mites in our country remained unstudied. Therefore, in 1993-1996 we collected mites from the contents of 150 ants' nests and from the surface of the body of about 7000 ants belonging to 11 species. The mites were collected by the generally adopted procedure in acarology. Micropreparations from the fixed material were prepared in a Fohr-Berlios liquid.

As a result, a total of 3150 specimens of the tarsonemid mites relating to 17 species were collected (Table 1).

S. priscus. A cosmopolitan species. We found it in nests of ants of the species *Tapinoma simrothi* in the Western Kopet Dag Mts. (the Aidere ravine, vicinity of the village Khodzhağala). It dwells in the soil, feeds on remnants of food of the nest host. It apparently reproduces in the anthills because we found specimens of both sexes and larvae of the mites there.

B. centriger. A cosmopolitan species. We found it in nests of ants of the species *Catoglyphis cinnamomea* in the Western Kopet Dag Mts. (the Aidere ravine) and in a nest of the *Messor excursions* in the Chardzhou, Sakar, and Sayat Districts. It dwells in the soil and reproduces in anthills.

B. tarsalis. A cosmopolitan species. We found it in nests of ants of the species *C. cinnamomea* in the Western Kopet Dag Mts. (the Aidere ravine), in the vicinity of the Zerger station in the Eastern Kara-Kum Desert, and in the Chardzhou, Sakar, and Deinausk districts. It dwells in the soil, and is often encountered at the beginning of spring and in autumn.

B. mirabilis. We found it in nests of the ant *C. cinnamomea* in the Western Kopet

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Dag Mts. (the Aidere ravine, villages Duzly and Parkhai) and in the Southeastern areas of Turkmenistan. In anthills, it feeds on the remnants of the food of their inhabitants, usually single specimens are encountered. Outside of Turkmenistan, the species is found in countries of Europe [2].

Table 1. Species Composition of Myrmecophylous Tarsonemid Mites and Their Landscape-Geographical Occurrence

Taxons	Mountains	Deserts	Cultural zones
Fam. <i>Siteroptidae</i> , 1970			
<i>Siteroptes priscus</i> , 1959	+	—	—
Fam. <i>Pygmephoridae</i> , 1965			
<i>Bakerdania centriger</i> , 1951	+	—	+
<i>Bakerdania tarsalis</i> , 1921	+	+	+
<i>Bakerdania mirabilis</i> , 1969	+	—	+
<i>Brennandania silvestre</i> , 1936	+	+	+
<i>Brennandania csibia</i> , 1981	—	—	+
<i>Microdispus minutus</i> , 1981	+	+	+
Fam. <i>Scutacaridae</i> , 1916			
<i>Imparipes parthianensis</i> , 1992	+	+	+
<i>Imparipes turkmeniensis</i> , 1992	+	—	+
<i>Imparipes mongolicus</i> , 1967	+	+	—
<i>Heterodispus elongatus</i> , 1904	+	—	+
<i>Scutacarus serotinus</i> , 1992	+	—	+
<i>Scutacarus argillaceus</i> , 1992	+	—	+
<i>Scutacarus diversietus</i> , 1992	+	+	+
<i>Scutacarus spherioideus</i> , 1959	+	—	+
Fam. <i>Tarsonemidae</i> , 1876			
<i>Tarsonemus fusarii</i> , 1941	+	+	+
<i>Tarsonemus lucifer</i> , 1959	+	+	+

B. silvestre. A cosmopolitan species. We found it in nests of the *T. simrothi* and *Messor aralocaspius* in the Western Kopet Dag Mts. (the Aidere ravine, Khodzhangala village), Repetek, Kugitang (Daraidere and Khodzhangaravul ravines), and in the Amu Darya River valley. In the spring and autumn specimens of this species form large-scale accumulations in anthills.

B. csibia. We found it in nests of the *M. excursions*, *Catoglyphis aenescens*, *C. pallida*, *Pheidole pallidula* in Repetek, the Khalach, Karabekaul, and Chardzhou districts. It is often encountered in early spring and in autumn. It reproduces in anthills. The population of this species is high everywhere. It was previously found in Hungary, Egypt, and Iraq.

M. minutus. A common species. We found it in nests of the ants *T. simrothi*, *C. aenescens*, *C. cinnamomea*, and *Messor aralocaspius* in the Western Kopet Dag Mts.

(Khodzhal village, Aidere ravine), Eastern Kara-Kum Desert, and in the Amu Darya River valley on cotton plant fields. It dwells in the soil, feeds on remnants of ant food. Outside of Turkmenistan, it is found in the Ukraine and Uzbekistan [11].

I. parthianensis. A common species. We found it in nests and on the abdomens of *T. simrothi*, *C. aenescens*, *C. cinnamomea*, *Ph. pallidula*, *M. aralocaspius*, *Messor variabilis*, *Crematogaster subdentata* in the Western Kopet Dag Mts., in the Amu Darya River valley, Repetek, Kyzyl Kum Desert (the vicinity of Farap settlement). It dwells in the soil, feeds on the remnants of ants' food. Specimens are found in anthills where they are attached to the abdomen of the ants. Found only in Turkmenistan.

I. turkmeniensis. A rare species. We found it in nests and the abdomens of *Ph. pallidula* and *M. variabilis* in the Western Kopet Dag Mts. (the village Shibli-Baba) and in the middle course of the Amu Darya River. It dwells in the soil, feeds on the remnants of ant food, and is spread by ants. The species to date is registered only on the territory of Turkmenistan.

I. mongolicus. A rare species. We found it in nests and on the abdomens of *C. pallida* and *C. aenescens* in the Western Kopet Dag Mts. (Aidere ravine), in Kugitang (Khodzhal village), and in the Sakarchagi district (village of Ainakol). It dwells in the soil and is spread by ants. It was previously known in Mongolia [6].

H. elongatus. This is a common species. We found it in nests and on the abdomens of *C. aenescens* and *C. cinnamomea* in the Western Kopet Dag Mts. (Aidere ravine, Khodzhal village) and in the middle course of the Amu Darya River. It lives in the soil and is spread by ants. Apart from Turkmenistan, the species is widespread in Western Europe, Mongolia, and Central Asia [2, 11].

S. serotinus. A rare species. We found it in the nests and abdomens of ants of the species *M. excursions* in Kugitang (the village of Koiten) and in the Karabekul District. It dwells in the soil and feeds on the remnants of ant food. It is spread by ants. The species is known only in Turkmenistan.

S. argillaceus. A rare species. We found it in nests and on the abdomen of *Cr. subdentata* in Kugitang (Khodzhal ravine) and in the Deinau District. It dwells in the soil and is spread by ants. To date it is known only in Turkmenistan.

S. diversisetus. A rare species. We found it in nests and on the abdomens of *C. cinnamomea* in the Western Kopet Dag Mts. (Aidere ravine), *Cataglyphis setipes* in the Kyzyl Kum Desert (Tollekuj well), and in the Dostluk District. It dwells in the soil and is spread by ants. The species is known only in Turkmenistan.

S. spheroides. A cosmopolitan species. We found it in nests and on the abdomen of *M. aralocaspius* in the Western Kopet Dag Mts. (the villages of Khodzhal and Akyala), and in the Khalach and Deinau districts. It dwells in the soil and feeds on the remnants of ant food. It is spread by ants. It is encountered quite rarely under the conditions of Turkmenistan.

T. fusarii. A cosmopolitan species. We found it in nests of *T. simrothi*, *C. aenescens*, *M. aralocaspius*, *Tetramorium schneideri* in the Western Kopet Dag Mts. (Aidere ravine, village of Khodzhal), Repetek, in the Amu Darya River valley. It often forms large-scale accumulations. Specimens of both sexes and their larvae are encountered in anthills.

T. lucifer. A common species. We found it in nests of *T. simrothi*, *C. pallida*, and *M. variabilis* in the Western Kopet Dag Mts. (the village of Duzly-Depe), the Sakarchagi District, the Eastern Kara-Kum Desert, and in the Amu Darya River valley. It dwells in the soil and feeds on remnants of ant food. Apart from Turkmenistan, this species is known in Western Europe, Korea, the Ukraine, and in Uzbekistan [2, 11].

To establish the degree of similarity of the myrmecophilous mites dwelling in different landscapes, we used the parameter of the similarity of various animals after Sørensen [12]. When comparing the species complexes of the tarsonemid mites of a mountain landscape with a cultural one, the high value of the coefficient (0.89) is explained by the fact that 15 of the 16 species registered in a mountain landscape are also encountered in anthills of irrigated fields.

The relatively low value of the coefficient when comparing the species composition of the mites of a desert landscape with those of a mountain one (0.66) and a cultural one (0.60) is explained by the fact that of the eight species registered in a desert landscape, all the species for a mountain landscape and seven of a cultural one are characteristic ones.

Most species of the myrmecophilous tarsonemid mites in anthills are necro- and saprophages. This is why they are found in the nests of ants feeding on the bodies of animals and seeds of plants. Apparently, the ants, being in a biocoenotic relation with the tarsonemid mites, participate in the dissemination of the soil-dwelling mites and in the creation of sources of their reproduction in the nests. These features are observed especially clearly in anthills located directly in agrobiocoenoses and in nearby areas. The tarsonemid mites disseminating from anthills participate actively in the decomposition of decaying organic remnants, loosen and improve the aeration of the soil [2]. By our observations, the relations between the mites of the family *Scutacaridae* and ants lead to their active dissemination in the soils of various landscapes. Moreover, these mites form separate populations in the soil in combination with other soil-dwelling tarsonemid mites at sites of accumulation of organic residues, playing a definite role in the process of the circulation of substances in biocoenoses.

CONCLUSIONS

1. In different landscape geographical regions of Turkmenistan in the nests of 11 species of ants, we found 17 species of tarsonemid mites. The species *I. mongolicus* was discovered for the first time in Turkmenistan.

2. The favorable microclimate of ant nests creates conditions for the dwelling and reproduction in them of various species of the tarsonemids.

3. The freely living acutacarid mites spread to new habitats by attaching themselves to the abdomens of ants.

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