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RESEARCH ARTICLE

First record of the ant-loving cricket *Myrmecophilus crenatus* Gorochov, 1986 (Orthoptera, Myrmecophilidae) in Kazakhstan

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Abstract

The ant-loving cricket *Myrmecophilus crenatus* Gorochov, 1986 was found in the Turkestan oblast of southern Kazakhstan. This is the first species record for this area. Thus, the current fauna of ant-loving crickets in Kazakhstan includes three species – *Myrmecophilus crenatus*, *M. acervorum* (Panzer, 1799) and *Bothriophylax semenovi* (Miram, 1930).

Keywords

New record, *Myrmecophilus crenatus*, crickets, ant guest, Kazakhstan

Introduction

Ant-loving crickets (Myrmecophilidae Saussure, 1874) are the obligate inquilines within ant and termites nests or burrows of various rodent and other vertebrate species. The crickets are very small, wingless and flattened, yellow, brown or nearly black in color. Ant-loving crickets do not produce sound and lack both wings and tympanal organs on the front tibia. Two subfamilies – Botryophilacinae Miram, 1934 (vertebrates guest) and Myrmecophilinae Saussure, 1874 (ant and termites

guest). They containing 6 genus and fewer than 100 species. In Kazakhstan, the fauna of ant-loving crickets has not been studied enough. Up to the present time only 2 species – *Bothriophylax semenovi* (Miram, 1930) and *Myrmecophilus acervorum* (Panzer, 1799) (Childebaev & Storozhenko 2004; Childebaev et al. 2014) were known in Kazakhstan fauna.

Ant-loving cricket *Myrmecophilus crenatus* Gorokhov, 1986 belongs to the subgenus *Paramyrmecophilus* Gorochov, 1986 of the genus *Myrmecophilus* Borowiec, 1984 of the subfamily Myrmecophilinae of the family Myrmecophilidae. The male body length is 2.4 mm, female is 2.6 mm long; pronotum of male is 0.8; female is 0.9; hind femur is 1.5 in both sexes; ovipositor is 1.1 mm. Coloring is light, yellowish. Head with small dark eyes. The width of the antennal cavities is approximately 1.5 times less than the distance between them. The apical segment of the maxillary palps is almost 2 times longer than the 3rd segment and approximately 2.5 times longer than the 4th segment. The width of the hind femur is almost 1.5 times less than its length. Hind tibia about 1.4 times shorter than hind femur. The upper edge of the hind tibia is almost straight, and the lower one is arched. On the outside of the hind tibia there are 1 spike and 3 spurs. The longest of them is superior, equal in length to half of the hind tibia. The spike is almost 2 times shorter than it. The average spur is 1.5 times shorter than the spike. The lower spur is almost 2 times shorter than the average. A slightly darker transverse strip extends along the posterior edge of the tergites of the chest and abdomen. Cerci more or less elongated, equal in length to the hind tibia. Ovipositor slightly longer than hind tibia. The top of the internal folds of the ovipositor is wide, with almost identical large teeth. The view was described by A.V. Gorokhov from the Mogoltau mountains on Uzbekistan-Tajikistan border (Gorochov 1986, Cigliano et al. 2019). Like many other members of the family, it is an obligate inquiline of ants.

Key of the species of Myrmecophilidae of Kazakhstan

1 (2) The body is not disc-shaped. The head is hypognatic. The antennae are very long. The lateral pronotum lobes not bent under the disc. The legs are quite long. Front and middle coxae short. Hind legs with slender thighs and long legs, equipped with long and rare spikes. Cerci long and thin. Ovipositor is not retractable ..... **.....Botryophilacinae Miram, 1934. The only species *Bothriophylax semenovi* (Miram, 1930)**

2 (1) The body is disc-shaped. The head is opistognathic. Antennae only slightly longer than body. The lateral pronotum lobes bent under the disc. The legs are relatively short. Front and middle coxae long. Hind legs with very wide hips and short legs, equipped with long and rare spikes. Cerci short, thick. Retractable ovipositor ..... **Myrmecophilinae Saussure, 1874**

3 (5) On the inside of the hind tibia there are 4 spines. First and third spikes longer than second and fourth..... **subgenus *Myrmecophilus* Berthold, 1827**

4 (6) Coloring is brownish-red, matte, sometimes with light bandages. Body length 2.5–3.0, ovipositor length 0.9. Cerci short, thick ....***Myrmecophilus acervorum*** **(Panzer, 1799)**

5 (3) On the inside of the hind tibia there are 3 spines. First is the longest spike, third spike – the shortest ..... **subgenus *Paramyrmecophilus* Gorochov, 1986**

6 (4) Coloring is light, yellowish. Body length 2.4–2.6, ovipositor length 1.1. Cerci elongated, approximately equal in length to hind tibia..... .....***Myrmecophilus crenatus*** **Gorochov, 1986**

Material and methods

The material was collected in the Turkestan region (formerly South Kazakhstan) within the project "Comprehensive assessment of the state of the environment and the health of the population of the city of Kentau and surrounding settlements" section "Assessment of the State of the Fauna of the Kentau City Agglomeration". The species was determined by I.I. Temreshev. For the identification, clarification of the biology and distribution of the cricket ant we referred to Gorochov (1980, 1986), Storozhenko (2004), and Cigliano et al. (2019). To determine the social insects in the nests of which *M. crenatus* was found, sources from the list of literature were used (Dlussky 1981, Seifert 2012, Zhuzhikov 1979). Material is stored in the personal collection of authors.

Results

For Kazakhstan *M. crenatus* is indicated by us for the first time. It was discovered in the vicinity of the village of Bayaldyr and in the vicinity of the village of Karnak in Turkestan oblast at different points quite distant from each other.

Material examined. 1 female, 19.10.2019, Turkestan oblast, Kentau city agglomeration, neighborhood Karnak village, in a nest of Turkestan termite *Anacanthotermes turkestanicus* Jacobson, 1904, under a stone, I.I. Temreshev; 1 male, 1 female, 22.10.2019, Turkestan region, Kentau city agglomeration, neighborhood Bayaldyr village, in the nest of the ant *Tapinoma erraticum* (Latreille, 1798), under a piece of concrete on a semi-desert site, I.I. Temreshev; 1 male, 03.15.2020, Turkestan region, Kentau city agglomeration, neighborhood Bayaldyr village, in the nest of the ant *T. erraticum*, under a stone on a semi-desert site, I.I. Temreshev (Figs 1–3).

Discussion

We discovered the ant-loving cricket in the nest of *T. erraticum* that allows us to more accurately evaluate its hosts, since the original description (Gorochov 1986)

Figure 1. Ant-loving cricket *Myrmecophilus crenatus* Gorochov, 1986 from Kazakhstan

Figure 2. Nest of Turkestan termite *Anacanthotermes turkestanicus* Jacobson, 1904, where the ant-loving cricket *Myrmecophilus crenatus* Gorochov, 1986 was found

simply indicates "anthill" for the holotype. We supposed that the occurrence of ant-loving cricket in the nest of the Turkestan termite *A. turkestanicus*, was rather accidental, since there were anthills of different ant species *T. erraticum*, *Messor aralocaspius* (Ruzsky, 1902), and *Cataglyphis aenescens* (Nylander, 1849). It is possible

Figure 3. Nest of ant *Tapinoma erraticum* (Latreille, 1798), where the ant-loving cricket *Myrmecophilus crenatus* Gorochov, 1986 was found

that a female of ant-loving cricket was found in a nest of Turkestan termite due to resettlement (sort of "transshipment base" during migration).

The ant-loving cricket was not previously observed in Kazakhstan (Childebaev & Storozhenko 2004). We suggested that the *M. crenatus* probably inhabit the Kentau city agglomeration (the Turkestan region, Kazakhstan), but was not found due to its rarity. This is its main difference from another ant cricket *M. acervorum*, which is invasive species in Kazakhstan (Childebaev et al. 2014) and neighboring Uzbekistan (Lebedeva 2017). In future, additional finds of *M. crenatus* are possible in other areas of the south Kazakhstan. Thus, now Myrmecophilidae family in the Republic of Kazakhstan includes 3 species – *M. crenatus*, *M. acervorum* and *B. semenovi*.

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