

# FINLAND

## INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS & SOCIAL SCIENCE





**FINNISH International Scientific Online  
Conference:**

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SCIENCE»**

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**Issue 1, Part 1**

**Indexed databases:**



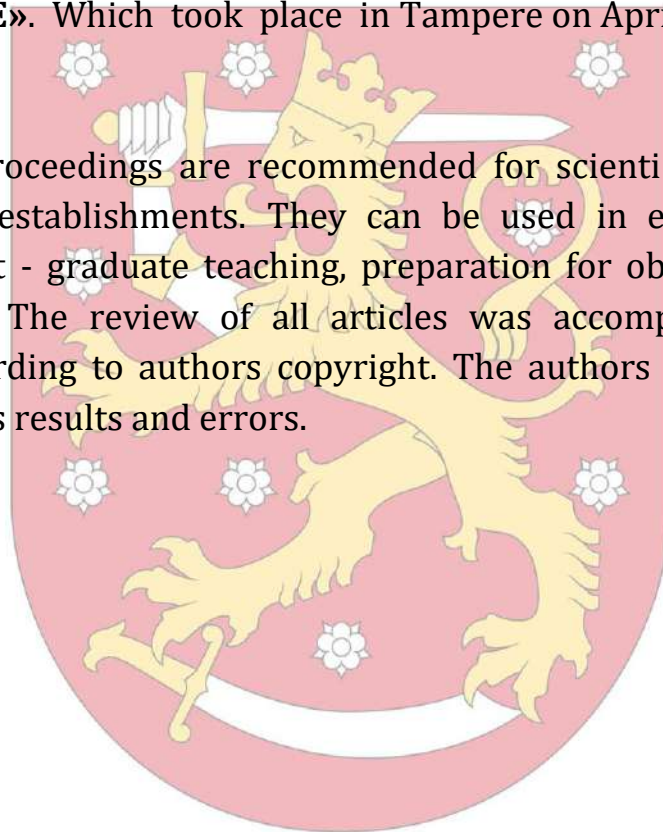
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**INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS & SOCIAL SCIENCE:** a collection scientific works of the International scientific conference (15<sup>th</sup> April, 2023) – Tampere, Finland «AID», 2023. Issue 1 Part 1.

**Languages of publication:** English, Russian, German, Italian, Spanish

The collection consists of scientific research of scientists, graduate students and students who took part in the International Scientific online conference «**INTERNATIONAL CONFERENCE ON MANAGEMENT, ECONOMICS & SOCIAL SCIENCE**». Which took place in Tampere on April 15, 2023.

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**ECOLOGICAL AND FAUNAL CHARACTERISTICS OF GROUND BEETLES  
(COLEOPTERA, CARABIDAE) OF LOWER ZARAFSHAN (UZBEKISTAN)**

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**Annotation:** the taxonomic composition and ecological-faunistic characteristics of the fauna of ground beetles in the lower reaches of the Zarafshan River have been analyzed. 43 species of ground beetles belonging to 28 genera, 19 tribes and 9 subfamilies have been identified. The dominant species are *Calathus ambiguus* (20.21%), *Machozetus lehmanni* (17.44%), *Harpalus distinguendus* (16.23%), *Scarites bucida* (7.6%) and *Machozetus concinnus* (5.35%), while the subdominant - *Scarites terricola* (4.32%) *Megacephala euphratica* (3.97%), *Amara aenea* (2.94%), *Amara ovata* (2.25%) and *Harpalus rubripes* (2.07%). The composition of the carabid fauna consists of two ecologically sharply different species complexes: xerophiles (inhabiting desert biotopes) and mesohygrophiles (inhabiting agrocenoses).

**Keywords:** Zarafshan River, ground beetles, taxonomic composition, similarity coefficient, new records.

**Introduction.** The family Carabidae is one of the largest families of beetles. According to some estimates, the number of ground beetle species in the world fauna exceeds 40000 [Thiele, H.U., 1977].

Information about the fauna of ground beetles in Uzbekistan, in particular the Zarafshan Range, can be found in the works of A. Dadamirzaev (Dadamirzaev, 1978) and F. Khalimov (Khalimov, 2020). In Uzbekistan, ground beetles, as entomophages of crop pests, have been studied in more detail in cotton agrocenoses (Dadamirzaev, 1978, Bekmetova, 1991) and vegetable crops (Adashkevich and Shukuraliev, 1990, Halimov, 2020).

**Results and discussion.** During the research, 43 species of ground beetles were identified, belonging to 28 genera, 19 tribes and 9 subfamilies.

The number of species is clearly dominated by the subfamily Harpalinae, which includes 21 species and 49% of the total species diversity.

The subfamily Trechinae accounts for 19% of the species (8 species). Among the dominant subfamilies are also Scaritinae and Cicindelinae, constituting 12% and 8% of the carabid fauna, respectively. The subfamilies Brachininae, Broscinae, Carabinae, and Melaeninae are the only species in the beetle fauna of the region.

However, if you look at the abundance of individuals, the picture changes slightly. Thus, in terms of the abundance of individuals, the share of the subfamily Harpalinae is still increasing and amounts to 82% of all collected beetles. On the contrary, the share of the subfamilies Trechinae, Cicindelinae and Omophroninae is significantly reduced. Only Scaritinae retains its position, although some changes are also observed. In general, according to the abundance of individuals, the share of 5 out of 9 subfamilies is less than 1%.

If we analyze the fauna of ground beetles by tribes, then the tribe Harpalini has the largest number of representatives - 23.26% (10 species). The following places are occupied by Scaritini, Bembidiini and Lebiini (each 9.3% (4 species)).

And here the proportion of different tribes in terms of the number of species and the abundance of individuals do not coincide. Thus, in terms of the abundance of individuals, the proportion of the tribe Harpalini increases sharply and amounts to 42.24% of all collected beetles. This is due to the abundance of specimens of the dominant species of this tribe - *Harpalus distinguendus* and *Machozetus lehmanni*. The tribe Sphodrini has a single representative (*Calathus ambiguus*) and makes up 2.33% of the species diversity of the ground beetle fauna. However, due to the high abundance of this species, the tribe Sphodrini accounts for 27.92% of all collected beetles. *Calathus ambiguus* is the most numerous species in agrocenoses and biotopes adjacent to agrocenoses.

In the biocenoses of the lower Zarafshan, the dominant species of ground beetles are *Calathus ambiguus* (the degree of dominance is 20.21%), *Machozetus lehmanni* (17.44%), *Harpalus distinguendus* (16.23%), *Scarites bucida* (7.6%) and *Machozetus concinnus* (5.35%), and subdominant - *Scarites terricola* (4.32%) *Megacephala euphratica* (3.97%), *Amara aenea* (2.94%), *Amara ovata* (2.25%) and *Harpalus rubripes* (2.07%).

In desert biotopes, where sands, sandy soils and salt marshes predominate, a peculiar fauna of ground beetles is formed. It is dominated by species adapted to desert conditions of the genera *Megacephala*, *Scarites*, *Machozetus* and *Dyschirius*. *Megacephala euphratica*, the only representative of the genus *Megacephala* in the Palearctic, is widespread on solonchaks. And in the sand dunes, the most numerous species of the genus *Scarites*. Although many species of this genus are distributed in the tropical zone, more than 10 species are found in Uzbekistan (Kryzhanovsky, 1953). On the desert biotopes of the study area, 4 species of this genus were identified, where the most numerous is the endemic of Central Asia - *Scarites bucida*. If *Scarites terricola* was found both in desert biocenoses and in agrocenoses, then *Scarites subcylindricus* was found only in agrocenoses. Over the years of research, only one specimen of *Scarites procerus eurytus* was caught. However, this species is widespread in the mountainous and foothill regions of Uzbekistan (Khalimov, 2020).

The genus *Machozetus* is an endemic genus of Central Asia, which includes only two species - *Machozetus lehmanni* and *Machozetus concinnus*. In addition to Uzbekistan, *Machozetus lehmanni* is also recorded in Afghanistan, Iran, Tajikistan and Turkmenistan, and *Machozetus concinnus* in Tajikistan and Turkmenistan. In our studies, both species are dominant species in desert biocenoses.

In general, 23 species of ground beetles from 18 genera were found in the desert biocenoses of the Lower Zarafshan.

The dominant species in desert biocenoses are *Machozetus lehmanni* (37.41%), *Scarites bucida* (16.3%), *Machozetus concinnus* (11.48%), *Scarites terricola* (9.26%), *Megacephala euphratica* (8.52 %). These five species make up 82.97% of all identified beetles. *Acupalpus flaviceps* (4.07%) and *Dyschirius cylindricus* (3.33%) are noted as subdominant species.

Zoophages predominate in the trophic structure of the beetle fauna of desert biocenoses (17 species, 77.3%). Mixophytophages include 3 species (13.6%), and phytophages are represented by 2 species (9.1%). In agrocenoses, 23 species of ground beetles from 13 genera were identified. The most representative are the genera *Harpalus* (five species, 21.8%), *Bembidion* and *Amara* (three species, 13.0% each).

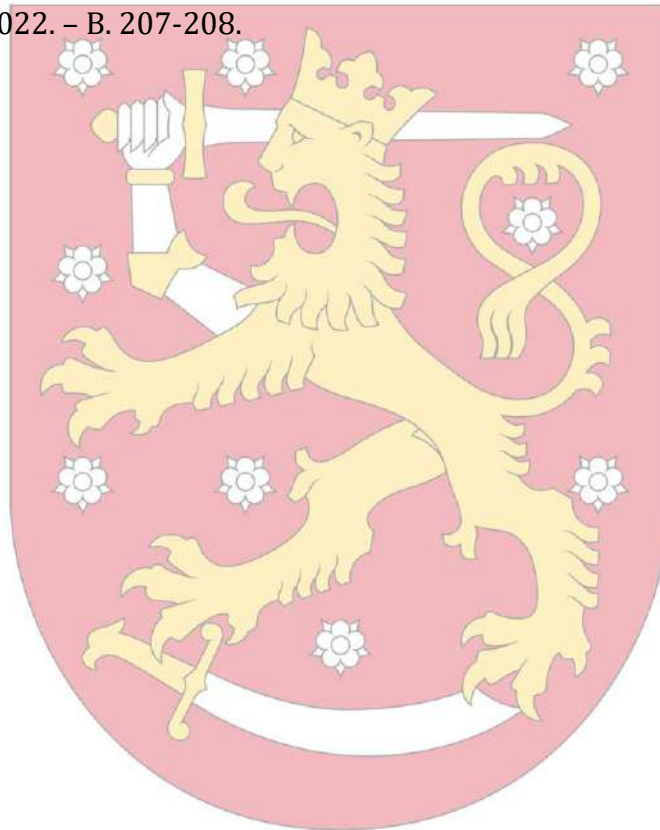
In general, in agrocenoses, the dominant species are *Calathus ambiguus* (39.8%), *Harpalus distinguendus* (21.77%) and *Amara aenea* (5.78%), and the subdominant species are *Scarites*

terricola (4.76%), Amara ovata (4.42%), Harpalus rubripes (4.08%), Harpalus rufipes (3.06%), Harpalus affinis (2.04%), Bembidion quadrimaculatum (2.04%), Scarites subcylindricus (2, 04%).

Thus, the fauna of the ground beetles of the Lower Zarafshan includes 43 species belonging to 28 genera, 19 tribes, and 9 subfamilies.

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