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ORTHOPTERA INSECTS ON THE LOW HILLS OF KARAKALPAKSTAN (UZBEKISTAN)

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ABSTRACT
In this study, the field research results conducted between 2021 and 2024 on the study of the current state of the fauna of representatives of a large family of insects, the impact of environmental factors on their distribution, and the biological diversity of species in the areas of Kara tau, Sultan Wais, i.e., Kuskhana tau, which are all the low hills in Karakalpakstan, are presented. There are 6 orders, 15 families, 42 species, and subspecies belonging to 36 genera. It has been found that 3 species of Mantoptera, termites, 1 species of Rlecoptera, Phasmatoptera, Blattoptera, and Dermaptera, and 38 species of Orthoptera are distributed in the studied area. The identified 42 species are divided into 9 zoogeographic and 16 ecological groups.
KEY WORDS: *low hills, insecta, Orthopteroidea, order, genera, zoogeographic grouping, ecological grouping.*

INTRODUCTION

More than 30,000 species of Orthoptera insects are well-known around the world, and more than 700 of them can be found in Central Asian countries, including the Republic of Uzbekistan [1, 3, 5.].

The study on the fauna and species composition of Orthoptera insects in Central Asia began at the end of the 18th century. For the first time, the members of the expedition under the leadership of A.P. Fedchenko analyzed the materials collected for the identification of the species of Orthoptera insects and determined the taxonomic status of some species [7].

It is worth mentioning the research conducted by A.A. Bekuzin [1] on the distribution, fauna, and evolution of Orthoptera insects in Uzbekistan. His work on the study of the species composition of the locusts of the Sultan Uais mountain range located in Karakalpakstan is one of the important studies conducted in the area we are studying. According to his results, 23 species of grasshoppers were identified.

Of the works on the study of Orthoptera insects in the territory of Karakalpakstan, undoubtedly the researches of M.V. Stolyarov [6] are important, in which it is shown that 68 species of insects distributed in this area are distributed in different landscapes. Of these, 58 species belong to the family of grasshoppers, 7 species of locusts and 5 species of katydids. During this period, the number of Orthoptera insects in the territory of Karakalpakstan, and other species known, until M.V. Stolyarov studied, together made up 68 species. Distribution of grasshoppers in different stations and landscapes along the Southern Aral Sea G.Sh. Shamuratov and L.M. Kopaneva [8], in which the authors, based on scientific sources and according to the results of their research, provided information about 58 species of grasshoppers.

Especially, during the independence periods, a number of scientific works were carried out on the fauna, ecology, inter-landscape distribution and the development of ecologically harmful control measures. In particular, the formation of the fauna of Orthoptera insects of the South Aral Sea region along the landscape and its distribution in various agrocenoses were studied. However, studies on categories such as Blattoptera, Mantoptera, Dermaptera, Rlecoptera, Phasmatoptera have hardly been conducted.

MATERIALS AND METHODS

A total of 2,948 insect samples in the larval and imago stages were collected and studied from 21 coordinates of Kara tau, Sultan Wais, Kuskhana tau regions as the low hills of Karakalpakstan during the period of 2021-2024.

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Figure 1. The map of the research areas (based on Google Earth).



Grasshoppers, stick insects, cockroaches, termites, springflies and insects belonging to the large order of the Orthoptera family and plant species of different stations where they are distributed and found in the studied areas were taken as research materials.

RESULTS AND DISCUSSION

As a result of the research, on the low hills of the Karakalpakstan six orders of Orthoptera insects, 15 families, 42 species and subspecies belonging to 36 genera have been found. Of the identified species, 36 species are distributed in the Kara tau region, and 15 species are distributed in the Kuskhana tau region. These species are divided into 16 ecological groups according to life forms, and 9 groups according to zoogeography (Table 1). The major Physlum are as follows: Arthropoda, Hexapoda, Insecta, Pterygota, Neoptera, Orthopteroidea.

Note: *+ - very rare species; ++ - rare species; +++ - permanent species.*

Herpetobionts - Herp. Biont, Facultative hortobionts - fac.xor.b, Psammobionts - psammo.b., Hortobionts - hortob., Tamnobionts - tamnob., Specialized phytophile - Spe.phyt., Eremobionts - eremob., Hortobionts with spikes - hort.b, Fissurobionts - fissurob., Layered geophile, Geobionts - geob, Geophile ambusher - geo. amb, Phytophilic ambusher - phytophus. amb., Flying Migrant

Table 1

Distribution of species of white-whiskered Orthoptera insects in South Uzbekistan by landscape.

№	Studied species	Low hills and their surrounding			
		Kara tau	Kuskhana tau	Ecological groups	Zoogeographic groups
1	2	3	4	5	6
Blattoptera,					
Ectobiidae					
1.	*Blattella germanica*	+++	-	syn.trop	1
Isoptera					
Hodotermitidae					
2.	*Anacanthotermes ahngerianus*	+++	-	geo. amb	8
Mantoptera					
Mantidae					

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3.	*Mantis religiosa*	+	+	flying. mig.	1
4.	*Iris polystictica*	+	+	flying. mig	4
Empusidae					
5.	*Empusa pennicornis*	-	+	phytophus. amb	1
Dermaptera					
Labiduridae					
6.	*Embia tartara*	++	-	geo. amb.	8
Plecoptera					
Nemouridae					
7.	*Amphinemura mirabilis turkestanica*	++	-	hydrob	8
Phasmatoptera					
Diapheromeridae					
8.	*Sceptrophasma bituberculatum*	-	+	hortob	7
Orthoptera					
Tettigonioidae					
9.	*Decticus verrucivorus* (Lin)	++	-	geobionts - geob	1
10.	*Decticus albifrons P.*	+++	-	geobionts – geob	4
11.	*Semenoviana plotnikovi* (Uv, 1914)	+	-	herbi.e.t.c	8
12.	*Platycleis intermedia* Serv.	+++	++	fac.xor.b	2
Grylloidae					
13.	*Melanogryllus desertus*	++	+	issurob.	3
14.	*Tartarogryllus tartarus* Sauss.	+	-	issurob	7
15.	*Velarifictorus bolivari* (Uv)	+	-	issurob.	8
16.	*Oecanthus turanicus*Uv.	-	++	spe.phyt	7
Gryllotalpidae					
17.	*Gryllatalpa unispina* Sauss.	++	-	geo. amb.	1
Tridactylidae					
18.	*Bruntrydactilus tartarus* (Saussure)	++	-	geo. amb.	1
Tetrigidae Ramb.					
19.	*Tetrix bolivari* Saulcy.	++	-	geo. amb	1
Pyrgomorphidae Brunner					
20.	*Pyrgomorpha bispinosa deserti*..	+++	++	fac.xor.b	7
Pamphagidae					
21.	*Thrincnus turcmenus* B.-Bien.	+	-	psammo.b	8
Acrididae					
22.	*Dericorys albidula* Aud.-Serv.	+++	-	tamnob	6
23.	*Dericorys tibilalis* (Pall.)	+++	-	tamnob	8
24.	*Anacridium aegyptium* (L.)	++	+	tamnob.	4
25.	*Calliptamus italicus italicus* (L.)	+++	++	hortob	3
26.	*Calliptamus turanicus* Serg.Tarb	+++	-	hortob	7
27.	*C.barbarus cephalotes* (Costa)	+++	++	hortob.	2
28.	*Heteracris littoralis littoralis*	+	-	tamnob	9
29.	*Heteracris adspersa* (Redt.)	-	++	tamnob.	8
30.	*Duroniella gracilis* Uv.	++	-	fac.xor.b	8
31.	*Aiolopus thalassinus* (F.).	++	-	fac.xor.b	1
32.	*Locusta migratoria migratoria* L.	-	++	flying. mig	1
33.	*Oedipoda miniata* (Pall.)	+++	-	eremob.	3
34.	*Acrotylus insubricus* (Scop.)	+++	++	eremob.	3
35.	*Sphingonotus nebulosus*	+	-	eremob	6

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36.	*Sph. satrapes* Sauss.,	+	-	eremob	8
37.	*Sphingoderus. carinatus* (Sauss.)	-	++	hortob	5
38.	*Psevdoshingonotus savignyi* Sauss.	++	-	eremob	8
39.	*Helioscirtus moseri* Sauss.	+++	-	eremob	9
40.	*Notostaurus albicornis* (Ev.)	++	-	fac.xor.b	3
41.	*Eremippus simplex simplex* (Ev.)	++	-	tamnob	5
42.	*Glyptobothrus biguttulus* (L.)	+	-	hortob	1
Total: number of species and groups		36	15	16	9

Flying. mig., Synanthropic species - syn.trop., Hydrobiont species - hydrob., Herbivorous xortobiont - Herbi.e.t.c.. 1- Transpolearctic species, 2 – Europe – Siberia species, 3 – Europe – Kazakhstan species, 4 – Europe – Central Asia species, 5 – Kazakhstan – Western Mongol species, 6 – Kazakhstan - Mongol, 7 – Central asia – Kazakhstan species, 8 – Central asia species, 9 – Central asia, Kazakhstan species.

The main species of studied insects are *Anacanthotermes* Jacob 1903., *Platycleis* Fieb., 1852., *Decticus* Aud-Serv., 1831., *Velarifictorus* Rand., 1964., *Pyrgomorpha* Aud. Serv., 1839, *Dericorys* Serville, 1838., *Calliptamus* Aud. Serv., 1831. species of the genus are dominant.

Among these species, the largest number of 11 species (26.2%) is the Transpolearctic species group, while the least two species (4.8%) are Euro-Siberian, Kazakhstan-West Mongolian species, Kazakhstan-Mongolian species, Central Asia, Kazakhstan species groups.

In the ecological grouping according to life forms, it was found that hortobionts and eremobionts are the most, and at least one species is synanthropus, geophilous ambusher, hydrobiont, herbivorous hortobiont, specialized phytophile, herpetobiont, psammobiont, flying migrant group. Natural climatic conditions of the studied area play an important role in such distribution of ecological groups. This can be explained by the fact that species such as *Calliptamus turanicus* Serg.Tarb *Dericorys tibilalis* (Pall.) were not found by researchers for 10-12 years until 2015, only because the amount of rain has increased in these areas [4,6,8].

To conclude, in the low hills of Karakalpakstan there are 6 orders, 15 families, 42 species and subspecies belonging to 36 genera. It was found that 3 grasshopers, termites, bohorikors, sticklebacks, water beetles, and 38 species of arachnids are distributed in the studied area. These species are divided into 9 zoogeographic and 16 ecological groups.

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