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**MATERIALS FOR THE HEMIPTERANS FAUNA (HETEROPTERA)
OF KOLSAI KOLDERY STATE NATIONAL NATURE PARK**

Abstract. As a result of the research performed at SNNP “Kolsai Koldery”, we noted 26 species of hemipterans, belonging to 3 families. According to nutrition connections the identified hemipterans are 6 species are phytophages: polyphages (4 %), wide oligophages (22 %), 1 species - zoophytophage (4 %), the remaining 16 species are mycetophages (70 %). By confinement to the habitats, the hemipterans of SNNP “Kolsai Koldery” are divided into several groups: dendrobionts (15 species), hortobionts (6 species), herpetobionts (2 species). On the territory of SNNP “Kolsai Koldery” according to ecological features, all identified species are mesophiles. For the true bugs of SNNP “Kolsai Koldery” all known types of voltinism are characteristic: monovoltinism (6 species), bivoltinism (1 species), acyclic species (16 species).

Key words: Hemiptera, Heteroptera, “Kolsai Koldery” National Nature Park.

Introduction. The unique landscape diversity of SNNP “Kolsai Koldery” many natural and historical monuments determines the intensified development of tourism, both domestic and international. Also, this zone is interesting from the point of view of species diversity of insects, as it is a plain and mountains and is influenced by mesofauna of various biotopes.

Hemipterans (Heteroptera) are a group of insects that inhabit a wide variety of biotopes and play an important role in biological processes in biogeocenoses. Among the above-ground hemipterans, some live openly on plants, others under bark, and others in plant bedding or soil. Many species are serious plant pests. These are, for example, pine submissive bugs, harmful turtle, cruciferous bugs and many others.

The purpose of the study is to identify the biodiversity of hemipterans insects that inhabit the territory of the study, to study the ecological, biological characteristics and spread of hemipterans species in the territory of the SNNP “Kolsai Koldery”.

In the natural park “Kolsai koldery” despite the important economic importance of hemipterans, their species composition, biology, ecology, vertical belt distribution and economic importance are not sufficiently studied, which determines the relevance of the present study.

The basis for this work was the authors collected material and field observations. Collections of material were carried out from June to August 2018-2019 in various biotopes of SNNP “Kolsai Koldery”.

Field work was carried out in the gorge: Kurmeti, Saty, Karabulak, Kok-Zhazyk, Sary-Naua, Kayyndy, Taldy, Zhaman-bulak, Lake Kolsai, the species composition of hemipterans insects was studied.

Methods of researches. In the course of research, conventional techniques [1-4] with original modifications were used to collect field faunistic entomological materials.

Results of researches. The following are the species found in the territories studied and an analysis of this material is given.

Class: Insecta

Order: Hemiptera

Family: Aradidae

Aneurus avenius avenius (Dufour, 1833). Almaty region, Rayymbek district, SNNP “Kolsai Koldery”, 12.06.2018, 5 ♀, 4 ♂; 20.07.2019, 3♀, 4♂; gorge Sata, flood plain of the Saty River, 25.06.1919, 3 ♀, 2 ♂; the surroundings of Kaiynda Lake. 18.07.2018, 3♀, 4♂; 22.07.2019, 3 ♀, 2 ♂. Dendrobiont (under the lagging behind bark of stubs and trees and in crevices of wood of deciduous trees, in bark cracks on branches and thin trunks); mezofit; there is no narrow food specialization; Feeds on possibly phloem juice, there is an indication of the juice nutrition of *Coriolus fungi* [5]; acyclic; winters imago and larvae of all stages.

Aradus angularis J. Sahlberg, 1886. Almaty region, Rayymbek district, SNNP “Kolsai Koldery”, 06/12/2018, 2♂; Kurmeti cordon, 06/19/2019, 2♀, 1♂; Sary-Nahua cordon. 08/07/2019.2♀, 3♂. Dendrobiont (inhabits under the bark of coniferous trees, in cracks of the bark on branches and thin trunks); mesophile, mycetophagus (on tinder fungus); acyclic; winters imago [5, 6].

Aradus aterrimus Fieber, 1864. Almaty region, Rayymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, Kok-Zhazyk cordon. 06/14/2018, 2♀, 3♂; Kurmeti cordon, 06/19/2019, 2♀, 2♂; 1st lake Kolsay. 07/21/2019, 1♀, 2♂. Dendrobiont (on *Pinus pine*); mesophile (in the mountains rises to a height of 2300-2500 m above sea level); mycetophage; eats mushroom juice; acyclic; winters imago and larvae of all stages [5].

Aradus betulae (Linnaeus, 1758). Almaty region, Rayymbek district, SNNP “Kolsai Koldery”, lake Kayyndy. 06.15.2018, 2♀, 3♂; 06/23/2018, 3♀, 3♂; 07/23/2018, 4♀, 3♂; 06/17/2019, 2♀, 2♂. Dendrobiont (inhabits on sick and dead birch trees and other deciduous trees affected by trutovities from the polyporacea group [7]; mycetofage; mesophil; acyclic; winters imago and larvae of all stages.

Aradus bimaculatus Reuter, 1872. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Saty, 06/25/2018, 1♀, 2♂; gorge Karabulak. 07/17/2018, 3♀, 2♂; 07/21/2019, 1♀, 2♂. Dendrobiont (on the dying bark of white and silver poplars, as well as on aspen, oak, alder, etc. affected by mushrooms); mesophyll, mycetophagus, feeds on mushroom juice; acyclic; winters imago and larvae of all stages. Rare. It was found under the bark of *Picea excelsa* [8].

Aradus cinnamomeus Panzer, 1794. Almaty region, Raiymbek district, “Kolsai kolderi”SNPP, Kok-Zhazyk cordon. 06/14/2018, 3♀, 4♂; Kurmeti cordon, 06/19/2019, 1♀, 2♂; 1st lake Kolsai. 07/21/2019, 2♀, 2♂. Dndrobiont (inhabits on young pines); mesophil; mycetofag, eats mushroom juice; acyclic; winters imago and larvae of all stages [9].

Aradus corticolis Linnaeus, 1758. Raiymbek district, SNNP “Kolsai Koldery”, 1st lake Kolsai. 05/16/2018. 3♀, 2♂; gorge Taldy. 07/17/2019. , 2♀, 2♂; gorge: Karabulak, Sary Nahua. 08.24.2019.1♀, 2♂. Dendrobiont [under the bark of trees and in the folds of the tinder fungus *Fomesmarginalis* (on pines and other trees) and *Daedaleaquercina* (on oak and conifers); mesophyll; eats the juice of fungus- trutoviki (mycetophagus); acyclic; winters imago and larvae of all stages [10].

*Aradus crenaticollis*R.F.Sahlberg, 1848. Almaty Region, Raiymbek District, SNNP “Kolsai Koldery”, gorge Karabulak, Sary-Nahua. 12.06.2018, 2♀, 1♂; 07/20/2019, 1♀, 2♂; gorge Saty, the Saty river floodplain, 06/25/1919, 2♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 3♀, 2♂. Dendrobiont (lives on conifers, pines on fungus- trutoviki); mesophil, mycetophage, eats mushroom juice; non-cyclic; winters imago and larvae of all stages [11].

*Aradus distinctus*Fieber, 1860. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, Sary-Nahua. 12.06.2018, 2♀, 2♂; 07/20/2019, 3♀, 2♂; gorge Saty, the Saty river floodplain, 06/25/1919, 2♀, 1♂; gorge Taldy. 07/18/2018, 1♀, 2♂; 07/22/2019, 3♀, 2♂. Herpetobiont (in detritus on dry and moist soils; in oak forests near rivers, on sand dunes near *Populusnigra*); mesophyll; mycetophagus, feeds on fungi growing among plant debris); acyclic; winters imago and larvae of all stages [5]. West Eurasian species.

Aradus flavicornis Dalman, 1823. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, 06/14/2018, 2♀, 1♂; Kurmeti cordon, 06/19/2019, 1♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 2♀, 2♂. Dendrobiont (inhabits on deciduous); mesophil, mycetophage, eats mushroom juice; acyclic; winters imago and larvae of all stages [12].

Aradus pictus Baerensprung, 1859. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, Kok-Zhazyk cordon. 06/14/2018, 3♀, 2♂; Kurmeti cordon, 06/19/2019, 2♀, 2♂; 1st lake Kolsay. 07/21/2019, 2♀, 3♂. Dendrobiont (on the fungus- trutoviki on conifers); mesophyll, mycetophagus, eats on mushroom juice; acyclic; winters imago and larvae of all stages [13].

Aradus hieroglyphicus J. Sahlberg, 1878. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, 06/14/2018, 2♀, 2♂; Kurmeti cordon, 06/19/2019, 1♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 3♀, 2♂; gorge Zhaman-bulak. 06/15/2018. 1♀, 2♂. Dendrobiont (on tinder-stands on aspen and willow, as well as under the bark of pyramidal and other poplars and white acacia; mesophile, mycetophage (eats on mushroom juice); acyclic; winters imago and larvae of all stages [7].

Aradus lugubris Fallen, 1807. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, Kok-Zhazyk cordon. 06/14/2018, 3♀, 2♂; Kurmeti cordon, 06/19/2019, 2♀, 3♂; 1st lake Kolsay. 07/21/2019, 4♀, 3♂. Dendrobiont (lives on coniferous trees in the mountains); mesophil, mycetophagus, feeds on juice of mushrooms [4]; acyclic; winters imago and larvae of all stages

Aradus obtectus Vasarhelyi, 1988. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, 1st lake Kolsay. 05/16/2018. 2♀, 2♂; gorge Taldy. 07/17/2019. 3♀, 2♂; gorge Karabulak, Sary Nahua. 08/24/2019. 1♀, 2♂; Lake Kayyndy. 06/15/2018, 2♀, 2♂; 06/23/2018, 3♀, 2♂. Dendrobiont (on Pinus, Betula, Acer); usually on the fungus- trutoviki on conifers; growing on stumps of birch; mesophile, mycetophagus, feeds on the juice of fungi-tinder fungi; acyclic [5]; winterslarvae.

Aradus ribauti E. Wagner, 1956. Almaty Region, Raiymbek District, SNNP “Kolsai Koldery”, gorge Karabulak, 06/14/2018, 2♀, 2♂; 06/21/2019, 3♀, 2♂; gorge Taldy. 07/18/2018, 1♀, 2♂; 07/22/2019, 3♀, 2♂; gorge Zhaman-bulak. 06/15/2018. 3♀, 2♂. Dendrobiont (on Populus tremula and other Populus); mesophile, mycetophagus, feeds on the juice of fungus- trutoviki; acyclic; winters imago and larvae of all stages [7].

Aradus setiger Kiritshenko, 1913. Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, 06/14/2018, 2♀, 2♂; 06/21/2019, 1♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂. Dendrobiont (on the fungus- trutoviki, on aspen and willow, as well as under the bark of poplars and white acacia [11]; mesophilus, mycetophage, feeds on mushroom juice; acyclic; winters imago and larvae of all stages.

The Berytida Family – Berytidae.

Berytinus clavipes (Fabricius, 1775). Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, 06/14/2018, 2♀, 3♂; Kurmeti cordon, 06/19/2019, 2♀, 1♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 2♀, 2♂; gorge Zhaman-bulak. 06/15/2018. 3♀, 2♂. Hortobiont; mesophil (inhabits in forest steppe, rarefied forests, forest edges and forest glades, parks, mesophite meadows, in the middle belt of mountains); wide oligophytophag (feeds on grassy legumes: Ononis, etc. [5]; monovoltine; winters imago. Kazakhstan it is ubiquitous.

Berytinus crassipes (Herrich-Schaeffer, 1835). Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge Karabulak, 06/14/2018, 2♀, 1♂; Kurmeti cordon, 06/19/2019, 2♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 2♀, 3♂; gorge Zhaman-bulak. 06/15/2018. 2♀, 2♂. Hortobiont; mesophil (lives in rarefied forests, forest edges and forest glades, parks); polyphitofag (eats legumes, sedge, cereals, seeds ([5]; monovoltine; winters imago.

Berytinus distinguendus (Ferrari, 1874). Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, gorge. Karabulak, 06/14/2018, 2♀, 1♂; Kurmeti cordon, 06/19/2019, 2♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 2♀, 3♂; gorge Zhaman-bulak. 06/15/2018. 2♀, 2♂. Hortobiont; mesophyll (in places of growth of stunted alfalfa: *Medicago rigidula*, *M. minima* [5]; narrow oligophytophage; monovoltine; winters imago.

Berytinus hirticornis Brulle, 1835. Almaty Region, Raiymbek District, SNNP “Kolsai Koldery”, Kok-Zhazyk cordon. 06/14/2018, 1♀, 2♂; Kurmeti cordon, 06/19/2019, 2♀, 2♂; gorge Karabulak, 06/14/2018, 2♀, 3♂; Kurmeti cordon, 06/19/2019, 3♀, 2♂; gorge Taldy. 07/18/2018, 1♀, 2♂; 07/22/2019, 2♀, 1♂; gorge Zhaman-bulak. 06/15/2018. 2♀, 3♂. Hortobiont; mesophyll; wide oligophytophage (on legumes); monovoltine; winters imago [5].

Berytinus minor minor (Herrich-Schaeffer, 1835). Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, Kok-Zhazyk cordon. 06/14/2018, 3♀, 2♂; Kurmeti cordon, 06/19/2019, 2♀, 2♂; gorge Karabulak, 06/14/2018, 2♀, 1♂; Kurmeti cordon, 06/19/2019, 3♀, 2♂; gorge Taldy. 07/18/2018, 3♀, 2♂; 07/22/2019, 2♀, 1♂; gorge Zhaman-bulak. 06/15/2018. 3♀, 3♂. Hortobiont (On and under different-level vegetation); mesophile (sparse forests, forest edges and forest glades, parks, hillsides and river terraces, meadows: numerous in the middle mountain belt); wide oligophytophage (on legumes: *Trifolium*, *Medicago*, *Ononis*); monovoltine; winters imago [5,14].

Berytinus montivagus (Meyer-Dur, 1841). Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, Kok-Zhazyk cordon. 06/14/2018, 2♀, 2♂; Kurmeti cordon, 06/19/2019, 3♀, 2♂; gorge Karabulak, 06/14/2018, 3♀, 3♂; Kurmeti cordon, 06/19/2019, 3♀, 4♂; gorge Taldy. 07/18/2018, 1♀, 2♂; 07/22/2019, 2♀, 3♂; gorge Zhaman-bulak. 06/15/2018. 2♀, 3♂. Hortobiont; mesophile (dry slopes of hills, river terraces and other places covered with *Medicago lupula* and other types of low alfalfa); wide oligophytophage (*Medicago* and *Trifolium*); monovoltine [5]; winters imago.

Redbug Family – Pyrrhocoridae.

Pyrrhocoris apterus (Linnaeus, 1758). Almaty region, Raiymbek district, SNNP “Kolsai Koldery”, Kok-Zhazyk cordon. 06/14/2018, 3♀, 4♂; Kurmeti cordon, 06/19/2019, 5♀, 6♂; gorge Karabulak, 06/14/2018, 4♀, 3♂; Kurmeti cordon, 06/19/2019, 4♀, 4♂; gorge Taldy. 07/18/2018, 6♀, 5♂; 07/22/2019, 3♀, 5♂; gorge Zhaman-bulak. 06/15/2018. 4♀, 3♂; 07/12/1920, 4♀, 6♂. Herpetobiont; mesophil (lives in forests and clearings, forest strips, parks, protective plantations and other mesophilic biotops; among detritus; often feeds on plants, small insects and ticks, dead insects, fallen seeds and juice of green parts of plants (*Malvaneglecta*, *Alcea rosea*, *Lavatera thuringiaca*, *Caragana arborescens*); up to 2 generations per year; winters imago, in groups among plant residues [5,15,16].

Table 1 – Taxonomic composition of hemipterans in the SNPP “Kolsai Koldery”

Family	Species name	number of species	%
Aradidae	<i>Aneurusaveniusavenius</i> (Dufour, 1833)	16	70
	<i>Aradus angularis</i> J.Sahlberg, 1886		
	<i>Aradus aterrimus</i> Fieber, 1864		
	<i>Aradusbetulae</i> (Linnaeus, 1758)		
	<i>Aradus bimaculatus</i> Reuter, 1872		
	<i>Aradus cinnamomeus</i> Panzer, 1794		
	<i>Aradus corticolis</i> Linnaeus, 1758		
	<i>Araduscrenaticollis</i> R.F.Sahlberg, 1848		
	<i>Aradusdistinctus</i> Fieber, 1860		
	<i>Aradusflavicornis</i> Dalman, 1823		
	<i>Aradus pictus</i> Baerensprung, 1859		
	<i>Aradus hieroglyphicus</i> J.Sahlberg, 1878		
	<i>Aradus lugubris</i> Fallen, 1807		
	<i>Aradusobtectus</i> Vasarhelyi, 1988		
	<i>Aradusribauti</i> E.Wagner, 1956		
<i>Aradussetiger</i> Kiritshenko, 1913			
Berytidae	<i>Berytinus clavipes</i> (Fabricius, 1775)	6	27
	<i>Berytinuscrassipes</i> (Herrich-Schaeffer, 1835)		
	<i>Berytinus distinguendus</i> (Ferrari, 1874)		
	<i>Berytinushirticornis</i> Brulle, 1835		
	<i>Berytinus minor minor</i> (Herrich-Schaeffer, 1835)		
	<i>Berytinus montivagus</i> (Meyer-Dur, 1841)		
Pyrrhocoridae	<i>Pyrrhocoris apterus</i> (Linnaeus, 1758)	1	3
In total:		23	100

As can be seen from the data presented in table 1, representatives of the Aradidae family – 16 species, and Berytidae – 6 species predominate in species diversity from the identified bugs.

The seasonal development of the hemipterans is heterodynamic. Voltinism of the population reflects the number of annual generations realized by the population in a certain part of the species range. For the hemipterans of SNNP “Kolsai Koldery” all known species of Voltinism are characteristic:

- monovoltinism (one generation per year) – 6 species;
- bivoltinism (two generations per year) – 1 species;
- acyclic species have a stretched life cycle, i.e. throughout a year there are different phases and stages of development – 16 species.

The nutrition of hemipterans is extremely varied. There are mycetophages, phytophages and zoophyphages on the SNNP “Kolsai Koldery” area (table 2).

Table 2 – Food specialization of hemiptera of “SNNP “Kolsai Koldery”

Species groups		Number of species	%
Zoophytophages		1	4
mycetophages		16	70
phytophages	polyphages	1	4
	wide oligophages	5	22
In total:		23	100

According to nutrition connections the identified hemipterans – 6 species are phytophages: polyphages (4 %), wide oligophages (22 %), 1 species – zoophytophage (4 %), the remaining 16 species are mycetophages (70 %).

According to habitat, the hemipterans in the SNNP “Kolsai Koldery” are divided into several groups: dendrobionts (15 species), hortobionts (6 species), herpetobionts (2 species).

On the territory of the SNNP “Kolsai Koldery”, according to ecological features, all identified species are mesophiles.

Conclusion. As a result of the research conducted at SNNP “Kolsai Koldery”, we noted 26 species of hemipterans, belonging to 3 families. According to nutrition connections the identified hemipterans are 6 species are phytophages: polyphages (4 %), wide oligophages (22 %), 1 species - zoophytophage (4 %), the remaining 16 species are mycetophages (70 %). By confinement to the habitats, the hemipterans of SNNP “Kolsai Koldery” are divided into several groups: dendrobionts (15 species), hortobionts (6 species), herpetobionts (2 species). On the territory of the SNNP “Kolsai Koldery”, all identified species are mesophiles according to environmental features. For the hemipterans of SNNP “Kolsai Koldery”, all known species of Voltinism are characteristic: monovoltinism (6 species), bivoltinism (1 species), acyclic species (16 species).

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«КӨЛСАЙ КӨЛДЕРІ» МЕМЛЕКЕТТІК ҰЛТТЫҚ ТАБИҒИ ПАРКІ ЖАРТЫЛАЙ ҚАТТЫҚАНАТТЫЛАР (НЕТЕРОПТЕРА) ФАУНАСЫНА МАТЕРИАЛДАР

Аннотация. «Көлсай көлдері» МҰТП-нің қайталанбас ландшафттық алуан түрлілігі, көптеген табиғи және тарихи ескерткіштер ішкі және халықаралық туризмнің дамуын айқындайды. Бұл аймақ жәндіктердің алуан түрлілігі тұрғысынан да қызықты, өйткені бұған жазық таулар және әртүрлі биотоптардың мезофаунасы әсер етеді.

Жартылай қаттықанаттылар (Heteroptera) – биогеоценоздарда биологиялық процестерде маңызды рөл атқаратын және әртүрлі биотоптарды мекендейтін жәндіктер тобы. Жер үсті жартылай қаттықанаттылардың

арасында, біреуі өсімдіктерде, басқалары өсімдік қабықтарының астында, үшіншісі – өсімдік төсенішінде немесе топырақта ашық өмір сүреді. Көптеген түрлер – өсімдіктердің маңызды зиянкестері. Бұл, мысалы, карагай түбегі, зиянды тасбақалар, крест гүл шоғыры және тағы басқалар.

Зерттеудің мақсаты – зерттеу аумағын мекендейтін жартылай қаттықанатты жәндіктердің биологиялық алуан түрлілігін анықтау, "Көлсай көлдері" МҰТП аумағында жартылай қаттықанаттылар түрлерінің экологиялық, биологиялық ерекшеліктерін және таралуын зерттеу.

"Көлсай көлдері" табиғи паркінде жартылай қаттықанаттылардың маңызды шаруашылық маңызына қарамастан, олардың түрлік құрамы, биологиясы, экологиясы, белдеулер бойынша бөлу және шаруашылық маңызы жеткілікті түрде зерттелмеген, зерттеудің өзектілігі осымен анықталады.

Бұл жұмыс авторлардың жеке жиындары мен далалық бақылаулары негізінде жазылды. "Көлсай көлдері" МҰТП әртүрлі биотоптарында материалды жинау 2018-2019 жылдары жүргізілді. Дала жұмыстары – Құрметі шатқалы, Саты шатқалы, Қарабұлақ, Көк-жазық, Сары-Науа шатқалы, Қайыңды шатқалы, Талды, Жаман-бұлақ, Құрмет, Көлсай көлдері аумағында жартылай қаттықанатты жәндіктердің түрлік құрамы зерттелді.

«Көлсай көлдері» МҰТП территориясында жүргізілген зерттеулер нәтижесінде жартылай қаттықанаттылардың 3 тұқымдасына жататын 26 түр анықталды. Табылған жартылай қаттықанаттылар коректік байланысы жағынан фитофагтар – 6 түр: полифагтар (4 %), кең олигофагтар (22 %), 1 түр – зоофитофаг (4 %), 16 түр – мицетофагтар (70 %). «Көлсай көлдері» МҰТП жартылай қаттықанаттылар тіршілік ету ортасына байланысты бірнеше топқа бөлінеді: дендробионттар (15 түр), хортобионттар (6 түр), герпетобионттар (2 түр). Зерттелген аймақ жартылай қаттықанаттылары экологиялық ерекшеліктері жағынан – мезофильдер. Оларға вольгинизмнің белгілі бар типі тән: моновольгинизм (6 түр), бивольгинизм (1 түр), ациклды түрлер (16 түр).

Түйін сөздер: жартылай қаттықанаттылар, Heteroptera, «Көлсай көлдері» мемлекеттік ұлттық табиғи паркі.

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МАТЕРИАЛЫ К ФАУНЕ ПОЛУЖЕСТКОКРЫЛЫХ (НЕТЕРОПТЕРА) ГОСУДАРСТВЕННОГО НАЦИОНАЛЬНОГО ПРИРОДНОГО ПАРКА «КӨЛСАЙ КӨЛДЕРІ»

Аннотация. Уникальное ландшафтное разнообразие ГНПП «Көлсай көлдері», множество памятников природы и истории обуславливает усиленное развитие туризма как внутреннего, так и международного. Также эта зона интересна с точки зрения видового разнообразия насекомых, так как является равниной и горами и испытывает на себе влияние мезофаун различных биотопов.

Полужесткокрылые – группа насекомых, заселяющих самые разнообразные биотопы и играющих важную роль в биологических процессах в биогеоценозах. Среди наземных полужесткокрылых одни живут открыто на растениях, другие под корой, третьи – в растительной подстилке или в почве. Многие виды – серьезные вредители растений. Это, например, сосновый подкорный клоп, вредная черепашка, крестоцветные клопы и др.

Цель исследования – выявление биоразнообразия полужесткокрылых насекомых, населяющих территорию исследования, изучить экологические, биологические особенности и распространение видов полужесткокрылых насекомых на территории ГНПП «Көлсай көлдері».

В ГНПП «Көлсай көлдері», несмотря на важное хозяйственное значение полужесткокрылых, их видовой состав, биология, экология, распределение по вертикальным поясам и хозяйственное значение изучены недостаточно, что и определяет актуальность настоящего исследования.

Сборы материала проводились с июня по август 2018-2019 гг. в различных биотопах ГНПП «Көлсай көлдері». Полевые работы проводились в ущ. Курметы, Саты, Карабұлақ, Көк-Жазық, Сары-Науа, Қайыңды, Талды, Жаманбұлақ, Курметы, оз. Колсай, изучался видовой состав полужесткокрылых насекомых.

В результате проведенных исследований в ГНПП «Көлсай көлдері» нами было отмечено 26 видов полужесткокрылых, относящихся к 3 семействам. По пищевым связям из них – 6 видов являются фитофагами: полифаги (4 %), широкие олигофаги (22 %), 1 вид – зоофитофаг (4 %), остальные 16 видов – мицетофаги (70 %). По приуроченности к местам обитания полужесткокрылые ГНПП «Көлсай көлдері» подразделяются на несколько групп: дендробионты (15 видов), хортобионты (6 видов), герпетобионты (2 вида). На территории парка по экологическим особенностям все выявленные виды – мезофилы. Для

полужесткокрылых ГНПП «Көлсай көлдері» характерны все известные типы вольтинизма: моновольтинизм (6 видов), бивольтинизм (1 вид), ацикличные виды (16 видов).

Ключевые слова: полужесткокрылые, Heteroptera, национальный природный парк «Көлсай көлдері».

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