



FAUNA AND PLANT NUTRITION OF BED-BUGS BELONGING TO THE FAMILY OF MIRID (*MIRIDAE*) FOUND IN COTTON, ALFALFA, VEGETABLE AGROCENOSSES AND NATURAL ECOSYSTEMS OF THE AMUDARYA AND KHODJAYLI DISTRICTS OF THE REPUBLIC OF KARAKALPAKSTAN

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| Article history: | Abstract: |
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| Received: December 10 th 2021 Accepted: January 11 th 2022 Published: February 24 th 2022 | This article presents the vegetation and species composition, seasonal dynamic distribution, phenogram of cannabis belonging to the family Mirid (Miridae), which occurs in cotton, alfalfa and vegetable agrobiocenoses and natural ecosystems of agricultural crops in the Amudarya and Khodjayli districts of the Republic of Karakalpakstan. The nutrition and damage caused by the reproductive organs of the cotton plant have been identified. Cotton and alfalfa plants have been found to reproduce naturally and produce several generations. It has been found to cause great damage to cotton and alfalfa, as well as vegetable crops. Thus, it causes great damage to cotton, alfalfa and vegetable crops, reduces their productivity and causes great damage to the economy of our country. |

Keywords: Phytophagous, Entomophagous, Larvae, Imago, Agrocenosis, Biocenosis, Biotope, Pest, Endemic, Anthropogenic, Field Bug, Alfalfa Bug, Semi-Rigid Winged Insects.

INTRODUCTION

The global environment is leading to an increase in the impact of various pests and various diseases on agricultural crops globally. Pest negative food is estimated at \$ 1.4 trillion, accounting for 5% of global GDP. Accordingly, one of the pressing issues is to ensure food security in agriculture and improve the system of protection of agricultural crops from pests.

LITERATURA REVIEW

The most dangerous species of agricultural crops in the country are prickly sucker miridae traps. These include field trap (*Lygus pratensis* Linnaeus 1758) and alfalfa trap (*Adelphocoris lineolotus* Goeze 1778). Hemiptera (Hemiptera-Heteroptera) is one of the larger families and belongs to the class of insects. Among the representatives of the family of semi-solid birds, the family of miridae (Miridae) occupies the main place. Insects belonging to this family consist of phytophagous and zoophagous predators, which are of great ecological importance in nature [1]. Many of them are pests of agricultural crops. Some common species are very rare, endemic species. Today (*Hemiptera-Heteroptera: Miridae*) mirids are a large family, comprising 750 families and 6,000 species. Of these, the Palearctic fauna consists of 220 families and 2,000 species, 165 families and 650 species found in the CIS [2].

Semi-rigid winged insects are very close to cycads in origin and morphology. These two groups are very close to each other and differ from each other in the structure of their front wings and trunks. There are 45,000 species of hemispheres worldwide, belonging to more than 50 families (1995, 1996, 1999, 2005, 2006) and some species belonging to the *Cimicidae* family are found all over the world. [3] The relevance of our scientific observations is that they belong to the colorful wildlife of this region. Conduct an inventory of insects found in the area, protect their beneficial rare species in nature, monitor them, and preserve biodiversity (UN Biodiversity under the UN Convention 1992). The study of the fauna of the Mirid bugs in the region, the conduct of scientific research in the Republic of

Karakalpakstan is one of the most pressing issues of today. Since these insects are pests of agricultural crops, their research consists of studying the damage they cause, their ecology, and their economic importance. The only way to solve these problems is to determine the species composition of myrrh chains, their nutrition, population, migration and development, a comprehensive study of their biodiversity in nature. Biodiversity conservation is the preservation of entomophagous species that are stable in the natural ecosystem.

RESEARCH METHODOLOGY

To study the fauna, seasonal dynamic distribution, biology, ecology of plant nutrition, damage to cotton, alfalfa and other agricultural crops in the Amudarya and Khodjayli districts of the Republic of Karakalpakstan.

Collection of samples from insects was carried out by shaking the entomological toils 10-25-50-100 times. The shakes were performed during the daytime active time of the mirid bugs from 10:00 to 12:00 to 15:00. Observations were not made in cloudy, rainy, high wind speeds, and cloudy weather. To compare the results, the material collection with the toil was performed by one person at one time of the day using a standard toil. A single shake was performed at half the height of the toil, covering a 90-degree angle.

Based on the manuals of Pali V.F (1966), samples of plants were collected in the area. Herbariums were made and plant species were identified.

Based on the manuals of Puchkov V.A. (1974), samples of semi-rigid winged insects distributed in this area were collected and their species were identified. Insect collection was carried out by the following methods.

1. Hand picking (done with tweezers and hand) for less moving insects.
2. Using an entomological toil.
3. With the help of light.
4. Dug the soil deep using handle traps.
5. Food handle traps.
6. Processing of the collected material.

The following equipment was used: chloroform, envelopes, entomological toil, paper, cotton swabs, entomological tweezers (forceps), entomological needles.

RESULTS AND ANALYSIS

Theoretical and practical significance of the research consists of that the data obtained determine the damage caused by pests in cotton and alfalfa agrocenosis and vegetable crops, as well as other agricultural crops of great importance in agriculture of the Republic of Karakalpakstan and recommend to farms to develop effective control measures.

It is a basic handbook for studying the biodiversity of pest species in the region and can be used as a textbook on entomology in higher education institutions, in practical and seminar classes. It can be used as a practical manual for masters and doctoral students for research work. In compiling an insect cadaster in the area, early warning of farms will help to develop pest control measures in advance. It provides practical help in preventing its spread in natural ecosystems, as well as in cotton and alfalfa agrocenosis.

It greatly assists in the development of comprehensive entomological control measures and environmental monitoring of agricultural pests in the Republic of Karakalpakstan. The obtained results of scientific research give high efficiency in the identification of phytophagous and entomophagous insects that cause damage to agricultural plants in agrocenosis and biocenosis in plant protection. The aim is to preserve the unique flora and fauna of various biotopes in the area, identify beneficial entomophagous species of insects, preserve and increase their populations and use them to reduce harmful phytophagous species, protect natural ecosystems, and preserve them for future generations.

It is determined group of Miradae bugs (Insecta), category (Hemiptera), junior category (Heteroptera), family (Miridae), generation (Lygus), genus (Pratensis Lunnaeus) (1758), field alfalfa and alfalfa *Adelphocoris lineolatus* Goeze (1778) in the areas where research was carried out. Their distribution in different biotopes and feeding of plants with reproductive organs in separate cotton and alfalfa agrocenosis are given in Table №1. This table shows which plants the miradae bugs feed on, lay eggs, in some plants only the imago occurs, and in some plants the larvae meet until adulthood.

Research works in the fields of Amudarya district of the Republic of Karakalpakstan, in collective farm named Yuldash Urozbaev, in farm named Jumaniyazov Zafar, in farm named Jamshidov Olimboy, Khodjayli district, "Oq Oltin MMTP", Tanarov Soqi farm, in the irrigated areas of the Amat Uygur Seedbreeding Farm in the territory of "Dustlik MMTP", observations were carried out on medium-fiber cotton varieties C-27-54 R-1 in cotton and alfalfa agrocenosis.

Two species belonging to the Mirid family, the *Lygus Hahn* genus, considered *Lygus pratensis* L and *Lygus gemellatus* H-S. Alfalfa bugs *Adelphocoris Reut* genus 1 species *Adelphocoris Lineolatus* Goeze was encountered. 1 species of *Trigonatylus ruficornus* Geoff has been identified in the genus *Trigonatylus fieb*. The 1 generation of *Stenodema calcaratum* Fieb was entered in the *Stenodema Lap* lineage. Belonging to the genus *Pioecilosetus*, 2 species included *Pioeciloscytus cognatus* Fieb and *Pioeciloscytus vulneratus* Pz. The *Campylomma Reut* lineage included 1 species *Campylomma verbasci* M-D. The *Atomoscelus Reut* lineage included the 1 species *Atomoscelus onustus* Fieb type. The genus *Deraeocoris Gbm* included 1 species *Deraeocoris punctulatus* Fall. The *Dicyphus Fieb* lineage included 1 type *Dicyphus sp* type. The genus *Orthotulus Fieb* included 1 type *Orthotulus flavosparsus* type C.

The genus *Pentatomidae* included 1 species of *Dolicoris baccarum* in the genus *Dolicoris*. The genus *Carpocoris* includes 2 species *Carpocoris coreanus iranus* and *Carpocoris fuscispinus*. The *Nezara* lineage included 1 type *Nezara*

viridula. The *Holcostethus* genus included 1 species *Holcostethus vernalis*. The genus *Eurydema* included 1 type *Eurydema vertralis*. The *Graphosoma* lineage included 1 species of *Graphosoma Lineatum*.

The *Lygaeidae* family included 1 species of *Corizus Hyoscyami* in the *Corizus* family. The genus *Pyrrhocoris* included 1 species of *Pyrrhocoris apterus*.

The *Nabidae* family included 1 species of *Nabis ferus* in the *Nabis* family. The *Anthocoridae* family included 1 species of *Orius niger* in the *Orius* family.

1. *Nabis ferus*, a member of the *Nabidae* genus and the *Nabis* family, is a species of *Nabis* major Costa.

2. The family *Anthocoridae*, the genus *Orius* included *Orius niger*, *orius* Croatian Reuter type.

3. *Campylomma* Reut genus belonging to The *Miridae* family includes the *Campylomma* verb M-D type.

4. The *Miridae* family included the genus *Punctulatus* Fall in the genus *Deraeocoris*.

Table 1

Entomophagous species of predator bugs belonging to the family (Miridae) found in the agroecosystems of cotton and alfalfa in the Amudarya and Khodjeyli of the Republic of Karakalpakstan (1.05.30.08.2019-2020)

| Nº | Family | Category | Species |
|----|---------------------|--------------------|-------------------------|
| 1 | <i>Nabidae</i> | <i>Nabis</i> | <i>ferus</i> |
| 2 | | <i>Nabis</i> | <i>Major Costa</i> |
| 3 | <i>Anthocoridae</i> | <i>Orius</i> | <i>niger</i> |
| 4 | | <i>Orius</i> | <i>Horvathi Reuter</i> |
| 5 | <i>Miridae</i> | <i>Campylomma</i> | <i>Verdasci M-D</i> |
| 6 | | <i>Deraeocoris</i> | <i>Punctulatus Fall</i> |

Entomophagous bugs-*Nabis ferus*, *nsbius major Costa*, *Orius niger*, *Orius horvatni Reuter*, *Campulomma verbasi MD* and *Deraeocoris punctulatus Fall*, which belong to this family and offspring, naturally control the population of pests of cotton, and entomophagous insects which artificially reduce alfalfa and other agricultural crops throughout the season. They have been found to reproduce naturally in agroecosystem and biocenosis, feeding on the eggs, larvae and imago of phytophagous insects. In the future, we need to find entomophagous species of semi-rigid winged insects that resemble these insects and use them effectively by propagating them in the laboratory and placing them in areas where crops are grown.

Scientific research conducted in different regions and districts of Uzbekistan and the Republic of Karakalpakstan.

The Republic of Karakalpakstan is represented in Table 2 by 12 families of the genus Hemiptera (*Miridae*, *Pentatomidae*, *Lygaeidae*, *Anthocoridae*, *Nabidae*, *Reduviidae*, *Scutellerida*, *Pyrrhocoridae*, *Scantius*, *Manacinus*, *Acantius*, *Acantius*, *Allacum*, *Allacum*), distributed in cotton, alfalfa and vegetable crops and natural ecosystems. Of these insects, 53 species are phytophagous and 5 species are entomophagous.

The *Mirid* family includes 19 species, including *Lygus Hahn*, 2 species of *Lygus pratensis Linnaeus*, *Lugus rugulupens Popp*, and *Lygus gemellatus H-S*. Alfalfa bugs encountered *Adelphocoris Lineolatus Goeze*, a genus belonging to the genus *Adelphocoris Reut*.

Table 2

Species composition of bugs belonging to the genus Hemiptera-Heteroptera: Miridae, found in cotton, alfalfa, vegetable crops and natural ecosystems of the Amudarya, Khojayli districts of the Republic of Karakalpakstan (1.04.30.10. 2015-2020)

| Nº | Name of the Families | Name of the Categories | Name of the Species |
|-------------------------|-----------------------------|----------------------------|---------------------------------------|
| I | Miridae | <i>Adelphocoris</i> Reut | <i>Adelphocoris Lineolatus Goeze.</i> |
| | | <i>Lygus</i> Hahn | <i>Lygus pratensis</i> Linnaeus. |
| | | | <i>Lygus gemellatus</i> H-S. |
| | | | <i>Lygus rigilipens</i> Popp |
| | | <i>Polymerus</i> Fieb | <i>Polymerus cognatus</i> Fieb. |
| | | <i>Trigonatylus</i> Fieb | <i>Trigonatylus ruficornis</i> Geoff. |
| | | <i>Stenodema</i> Lap | <i>Stenatylus calcaratum</i> Fieb. |
| | | <i>Poecilocyttus</i> Fieb. | <i>P. cognatus</i> Fieb. |
| | | | <i>P. vulneratus</i> Pz. |
| | | | <i>P. brevicochis</i> Reut. |
| <i>Campylomma</i> Reut | <i>C. verbasci</i> M-D. | | |
| <i>Atomoscelus</i> Reut | <i>A. onustus</i> Feieb. | | |
| <i>Deraeocoris</i> Cbm | <i>D. punctulatus</i> Fall. | | |

| | | | |
|------|--------------------|---------------------------------|--|
| | | <i>Dicyphus</i> Fieb | <i>Dicyphus</i> sp. |
| | | <i>Orthotylus</i> Fieb | <i>O. flavosparsus</i> C. |
| | | <i>Pichroscyrtus</i> Scrintini | <i>P. undulates</i> Reut |
| | | <i>Dichroscyrtus</i> | <i>D. pseudosalinus</i> |
| | | <i>Carpocoris</i> Iranus | <i>C.coreanus iranus</i> |
| | | <i>Dichronscyrtus</i> | <i>D. pscuvsalinus</i> |
| II | Pentatomidae | <i>Dolicoris</i> Linnaeus | <i>Dolicoris baccharum</i> Linnaeus |
| | | <i>Dicranocerhalus</i> Scopoli | <i>Dicranocerhalus agalis</i> Scopoli |
| | | <i>Carpocoris</i> | <i>Carpocoris fuscispinus</i> |
| | | <i>Carpocoris</i> Poda | <i>Carpocoris pudicus</i> Poda |
| | | <i>Nezara</i> | <i>Nezara viridula</i> |
| | | <i>Arenocoris</i> Scilling | <i>Arenocoris</i> Fallen |
| | | <i>Palomena</i> Linnaeus | <i>Palomena prasina</i> Linnaeus |
| | | <i>Holcostethus</i> | <i>Holcostethus vernalis</i> |
| | | <i>Eurydema</i> | <i>Eurydema vernalis</i> |
| | | <i>Eurydema</i> Linnaeus | <i>Eurydema oleracea</i> Linnaeus |
| | | <i>Eurydema</i> Linnaeus | <i>Eurydema ornate</i> Linnaeus |
| | | <i>Scutelleridae</i> Linnaeus | <i>Acanthosoma orrroidale</i> Linnaeus |
| | | <i>Graphosoma</i> | <i>Graphosoma</i> Lineatum |
| | | <i>Cemtopus</i> Germar | <i>Cemtopus latervalis</i> Germer |
| | | <i>Orthotulus</i> Fieb | <i>Orthotulus flavosparsus</i> Fieb |
| III | Lygaeidae | <i>Corzus</i> Linnaeus | <i>Corzus hyoscyami</i> Linnaeus |
| | | <i>Pyrrhocoris</i> | <i>Pyrrhocoris apterus</i> |
| | | <i>Lygaeus</i> Linnaeus | <i>Lygaeus equestris</i> Linnaeus |
| | | <i>Scantius</i> Linnaeus | <i>Scantius acgyptius</i> Linnaeus |
| | | <i>Spilostehus</i> | <i>Spilostehus rubriceps</i> |
| IV | Nabidae | <i>Nabis</i> | <i>Nabis ferus</i> |
| | | <i>Nabis</i> | <i>Nabis rugosus</i> |
| | | <i>Nabis</i> Costa | <i>Nabis maior</i> Costa |
| VI | Antocoridae | <i>Orius</i> | <i>Orius niger</i> |
| | | <i>Orius</i> Reuter | <i>Orius horvathi</i> Reuter |
| VI | Reduviidae | <i>Rhynocoris</i> Poda | <i>Rhynocoris iracundus</i> Poda |
| | | <i>Deraeocoris</i> Linnaeus | <i>Deraeocoris vuber</i> Linnaeus |
| | | <i>Stenodema</i> Fallen | <i>Stenodema calcarata</i> Fallen |
| | | <i>Rhinocoris</i> | <i>Rhinocoris iracindus</i> |
| | | <i>Rhinocoris</i> | <i>Rhinocoris ribicox</i> |
| VII | Scutelleridae | <i>Acanthosoma</i> Linnaeus | <i>Acanthosoma heamorrhoidae orrroidale</i> Linnaeus |
| VIII | Pyrrhocidae | <i>Pyrrhocoris</i> Linnaeus | <i>Pyrrhocoris apterus</i> Linnaeus |
| IX | Scantius | <i>Scantius</i> Linnaeus | <i>Scantius aegyptius</i> Linnaeus |
| X | Allacuminatus guer | <i>Henestaris</i> Rurm | <i>Henestaris nalophilus</i> Rurm |
| | | <i>Bhyparochromus</i> quadretus | <i>Baryprochromus xantnochilus quadretus</i> |
| | | <i>Blissus</i> | <i>Blissus bachanorum</i> |
| XI | Hyoscyami | <i>Corzus</i> Linnaeus | <i>Corzus</i> Linnaeus |
| XII | Acgyptius | <i>Scantius</i> Linnaeus | <i>Scantius</i> Linnaeus |

Trigonatylus fieb genus 1 species *Trigonatylus ruficornus* Geoff has been identified. *Stenodema Lap* genus 1 species *Stenodema calcaratum* Fieb has entered. The genus *Pioecilosetus* includes 3 species *Pioeciloscytus cognatus* Fieb, *Pioeciloscytus vulneratus* Fieb, *Pioeciloscytus brevicochis* Reut.

The *Campylomma* Reut lineage included 1 type *Campylomma verbasci* M-D. The *Atomoscelus* Reut lineage included the 1 species *Atomoscelus onustus* Fieb type. The genus *Deraeocoris* Gbm included 1 species *Deraeocoris punctulatus* Fall. The *Dicyphus* Fieb lineage included 1 type *Dicyphus* sp type. The genus *Pichroscyrtus* Scvintin includes 1 species *Pichroscyrtus undulates* Scvintin. The genus *Dichroscyrtus* included 1 species *Dichroscyrtus Pseudosalinus*. The genus *Carpocoris* includes 1 species *Carpocoris coreanus iranus*. The genus *Dichrocoris* includes 1 species *Dichronscyrtus pscuvsalinus*.

Zoogeographic map of the regions of the Republic of Karakalpakstan where Miradae chains encountered are studied.



Figure 3

1. Sand area fauna.
2. In this area, in the large sandy area around Toxyo-Tash HHES, bugs found in plants such as Kyrgyz alhagi, spruce tamarix hispida were identified.
3. Irrigated fertile area fauna.
4. Irrigated fertile soil area is a fauna, which includes cotton and alfalfa agrocenosis. In these areas, cotton and alfalfa in the Amudarya and Khodjayli districts, as well as vegetable bugs have been identified. Amudarya district, in the collective farm named Yuldash Urozbaev: in the field of Jumaniyozov Zafar farm 8, black spots formed after feeding field and alfalfa bugs from bolls of cotton C-27-54 R-1 cultivar. Similar black spots appear on the flower and stem (Fig. 3-4).



Figure 4

CONCLUSIONS AND RECOMMENDATIONS

In the Amudarya and Khojayli districts of the Republic of Karakalpakstan, 19 species of bugs belonging to the Mirid (Miridae) family were identified. Of these, 17 species of phytophagous and 2 species of entomophagous were identified. The feeding plants of these bugs in cotton, alfalfa, vegetable agrocenosis and natural ecosystems belong to 18 families and 46 species of plants have been identified. In 32 species of these plants, field bugs were found to lay eggs. Their biology, ecology, plant nutrition were determined. It has been found that feeding on the reproductive organs of the cotton plant causes 5-7% damage to the cotton crop. In areas where these pests are observed as pests of agricultural crops, it was found that they feed on the juice and seeds of plants such as cotton, seed alfalfa, fodder alfalfa, vegetable crops such as carrots, hashish carrots, vegetable beets, red beets, radishes, turnips. Today, the scientific study and effective use of wildlife, its restoration remains a topical issue around the world. Rare entomophagous species of Mirid bugs have also been identified in this area.

Insects that appear in the cotton and alfalfa and other agrocenosis in recent years include the Colorado potato beetle, pomegranate beetle, flies where made pores in the melon, grape harvest-bug, oriental fruit bugs, mulberry moth.

In the future, it is recommended that these rare entomophagous species be conserved and used effectively in reducing phytophagous insect populations.

It is recommended to identify and eradicate species that cause damage to agricultural crops.

It consists of developing measures to control phytophagous species and recommending them to farms.

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