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# Hemiptera are Pests of Cotton

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**Abstract:** The article presents materials on the study of hemiptera pests of cotton, their species composition, harmful species, their food connections, biological characteristics, harmfulness, features of development phases, and measures to combat them are recommended.

**Key words:** Plant protection, food connections, modern methods, Hemiptera, pests, cultivated plants, cotton, biology, harmfulness.

**Introduction.** Scientists drew attention to the fact that there is an expansion of the life ranges of some pests and an increase in their harmfulness. Such pests include bedbugs, whiteflies, cicadas, and other insects that damage agricultural plants [1,2,3,4,5].

This is especially true for hemiptera. A.Kh. Kuchkarov in his scientific work "Dominant species of bedbugs-myrids of the Tashkent oasis and their role in biocenotic processes" noted that as a result of feeding bedbugs, there is a violation of the condition and further development of plants, accompanied by various deformations and death of individual parts of plants. This is mentioned by G.K. Dubrovsky [5,6].

Currently, various agricultural crops are widely cultivated in the world, which naturally causes the appearance of new pests or an increase in the activity of already known pests, the expansion of their distribution area, a change in the species composition and features of their development.

Therefore, in order to develop modern approaches to the protection of cultivated plants and the application of control measures, research is needed to study these pests, determine their species composition, the most harmful species, bioecological and other features, distribution, features of the harm caused in modern conditions, their natural enemies, the influence of environmental factors and other topical issues related to these pests.

The purpose of our research on hemiptera is to study the species composition of hemiptera that damage cotton at the present stage, to determine their harmfulness, biological, ecological characteristics, dynamics of development and abundance, and on this basis to develop protective measures.

**Materials and methods of work.** The material for this work was 10 years of research conducted in Uzbekistan. Collections, observations, experiments and records were carried out. The methods generally accepted in entomology and special techniques of A.Kh. Kuchkarov [5] and G.K. Dubovsky [6] were used.

**Research results.** The territory of Uzbekistan is characterized by a large amount of heat and a significant duration of vegetation in the summer period, ensuring the cultivation of many heat-loving cultivated plants.

A necessary condition for the use of the summer period in agriculture is artificial irrigation, which allows the use of unique climatic resources in terms of the amount of heat and light. In conditions of artificial irrigation, favorable conditions are created for the vegetation of various heat-loving plants.

The climate of Uzbekistan varies markedly in certain zones within Uzbekistan itself. Thus, the Fergana Valley, Northern Uzbekistan, the Zeravshan Valley, Khorezm and Karakalpakstan, and Southwestern Uzbekistan differ markedly in basic meteorological indicators [7].

Our research was conducted mainly in the Ferghana Valley, Northern Uzbekistan, Zeravshan Valley and Southern Uzbekistan, and other regions of Uzbekistan were studied. Practice has shown that protecting plants from pests is much more effective from an economic point of view than eradicating them. Based on this, one of the first tasks was to develop methods for rapid diagnostics of hemiptera, study local entomophages and develop new biological means of protecting cotton.

Harmful organisms pose a constant danger to cultivated crops, including cotton. It is quite difficult to accurately determine the pest in the field, but the developed express diagnostics for determining them in the field is based on the main morphological features and the structure of the sexual apparatus greatly facilitates the determination. Research in the field of development of express diagnostic methods for various types of

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semi-hard-winged pests, the study of which is currently of practical importance, we are constantly conducting. The harmfulness of herbivorous bedbugs on cotton is manifested as follows. Hemiptera have a piercing-sucking oral apparatus and pierce plants to feed on vegetable juice. Well-marked dark spots are formed in the places of punctures. As a result of nutrition, fruit elements fall off. Feeding a field bug on cotton leads to the fall of buds, flowers, ovaries. The boxes are deformed, the yield decreases.

In addition, A.Sh. Khamraev, A.S. Baltabaev noted that at the puncture site of the cotton capsule, a tumor growth appears on its inner side, turning into a brown substance in which microorganisms are detected [8].

According to our information, the cotton agrobiocenosis is inhabited mainly by 8 species of myrid bugs. From the genus *Adelphocoris - Adelphocoris lineolatus, Adelphocoris jakovlevi*; from the genus *Lygus – Lygus pratensis, Lygus rugulipennis, Lygus gemellatus*; from the genus *Campylomma - Campylomma diversicornis, Campylomma verbasci*; from the genus *Camptobrochis – Camptobrochis punctulatus.*

Not all of the listed species are phytophagous. So, the predatory bug Campylomma diversicornis Reut. it is known as entomoacariphage. It feeds on thrips, aphids, spider mites. Predatory bug Campylomma verbasci Mail-D. known as phytozoophages, it feeds not only on plant foods, but also on cotton aphids, tobacco thrips, spider mites. The numerous Camptobrochis punctulatus Fall, which we also found on cotton, feeds on animal and plant food. As an entomophagus, it destroys tobacco thrips and cotton aphids.

The study of the development of bedbugs has shown that the timing of passage from egg to imago is more dependent on temperature and humidity. The dynamics of the number of phytophagous bedbugs showed that during the formation of generative organs on cotton and in the second decade of August, there is an increase in the number of imagos and hemiptera larvae.

The most harmful species is Adelphocoris lineolatus Goeze.

The harmfulness of Adelphocoris lineolatus lies in the fact that it sucks the juices from plants and their generative organs, as a result of which they fall off. Especially dangerous are the damages inflicted on young plants during the formation of generative organs. The preserved boxes contain fiber, brown in color. *Adelphocoris lineolatus Goeze is omnivorous. When feeding on alfalfa in any phase of plant development, it causes drying and falling of damaged plant organs. Adelphocoris lineolatus Goeze – is determined by the following morphological features. A large insect, 7.5-8.9 mm long, greenish-yellow or light green in color, sometimes has 3-4 spots on the pronotum and 2 black stripes on the shield, the hips of the legs with brown spots.*

*Adelphocoris jakovlevi Reut, is known as a pest of the fruit elements of cotton and alfalfa. Adelphocoris jakovlevi Reut is less common than Adelphocoris lineolatus.*

*Lygus pratensis L., a polyphagus, feeds on cotton and other cultivated plants. Crop yield losses from it reach from 20 to 30%.*

Our and literary studies have shown that buds, flowers and ovaries of cultivated plants damaged by Lygus pratensis die, the quality and yield of cotton decreases [9, 10].

Lygus rugulipennis Popp. harmful species, found on cotton and other agricultural plants. *Lygus rugulipennis Popp. a pale green, sometimes gray or reddish-brown bug, covered with gray hairs, elytra have a thick dotted line.*

**Table 1.**

**Analysis of the fauna of hemiptera – bedbugs in the Ferghana and Zeravshan valleys (2011-2021)**

| Family | Number of births | Number of types |
|---|---|---|
| *Nepidae* | 3 | 3 |
| *Naucoridae* | 1 | 1 |
| *Notonectidae* | 1 | 1 |
| *Saldidae* | 1 | 1 |
| *Geridae* | 1 | 1 |
| *Corixidae* | 1 | 1 |
| *Leptopodidae* | 2 | 2 |

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| | | |
|---|---|---|
| *Tingidae* | 4 | 8 |
| *Miridae* | 29 | 50 |
| *Nabidae* | 1 | 3 |
| *Anthocoridae* | 2 | 3 |
| *Cimicidae* | 1 | 1 |
| *Reduviidae* | 4 | 8 |
| *Berytidae* | 2 | 4 |
| *Lygaeidae* | 27 | 40 |
| *Pyrrhocoridae* | 2 | 3 |
| *Stenocephalidae* | 1 | 2 |
| *Coreidae* | 10 | 11 |
| *Rhopalidae* | 6 | 12 |
| *Acanthosomatidae* | 2 | 4 |
| *Cydnidae* | 3 | 4 |
| *Scutelleridae* | 3 | 4 |
| *Pentatomidae* | 26 | 49 |

As can be seen from Table 1. the conducted taxonomic analysis of the fauna of hemiptera showed an extensive list of the main families and species.

**Conclusions.** To develop modern plant protection measures, it is necessary to take into account that some species of herbivorous bugs are zoophages, along with feeding on plant juices, they feed on animal food. Herbivorous hemiptera, as well as other insects, are attacked by natural enemies, which play an important role in reducing their numbers.

To ensure the effectiveness of the protective measures carried out, it is necessary to determine the species composition of bedbugs on cotton, study their harmfulness and the nature of the harm caused by them, identify biological and ecological features, the dynamics of their development and abundance in specific regions. In addition, the use of natural populations of natural entomophages is recommended.

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