



Nutritional Relationships of Cycadids on Again Developed Lands of Uzbekistan

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Abstract

The article presents data on the relationship of cycads with field crops on the newly developed lands of the Jizzakh and Hungry steppes on grassy and stunted vegetation. In our region, the appearance of oligophages is typical for cereals, Asteraceae, legumes, and many other plant families. The data on the food specialization of the species found in the Hungry Steppe are consistent with the literature for individual species, and new information on relationships with host plants has been clarified. Most of the cycad species in the studied region are associated with wild cereals. Representatives of the Marev family are among the widespread and characteristic groups of plants in the steppe part and on saline soils.

In our region, 12 species were found on corn, 26 on alfalfa, 6 on cotton, 3 on beets, 13 on wheat, 13 on barley, and 2 species of cycads on potatoes.

Key Words: Hungry Steppe, Entomofauna, Landscape, Haymaking, Biocenosis, Old-developed, Newly-developed, Light Trap, Phytophage, Phloem, Xylem, Polyphage, Oligophage, Bluegrass, Wormwood, Rainfed Wheat, Nightshade, Mallow, Umbrella.

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Introduction

In Uzbekistan, in particular, in the Hungry Steppe, grandiose work is being carried out to irrigate and develop virgin lands for agricultural crops, primarily for medium-staple varieties of cotton. This causes fundamental changes in the composition of vegetation and, consequently, the entomofauna.

Revealing patterns of changes in the entomofauna, enhancing the activity of beneficial species and suppressing harmful ones is impossible without an active study of individual groups of insects, their significance in the overall structure of the fauna, biology and ecology. In this regard, regional-faunistic studies are of great importance. Cicadas - one of the numerous groups of insects - are widely represented in the most diverse landscapes of Central Asia. They are especially abundant in herbaceous communities. Among these insects, there are many pests of agricultural crops,

ornamental plantings, hayfields and pastures, many species are carriers of viral plant diseases.

The distribution of cicadas by crops and biocenoses on old and newly developed lands was revealed.

Changes in the fauna of cycads of the Hungry Steppe in connection with its development and their connection with field crops of newly developed lands have been studied.

Materials and Methods

The material for the article was our collections in various geographical points of the Hungry and Jizzakh steppes. The collection of material on the species composition of cicadas was carried out in the Gallaral, Zaamin, Ilyichevsk, Dustlik districts of the Jizzakh region; Gulistan, Yangier, Kirov, Chardarya districts of the Syrdarya region.

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The collection of material was carried out in ecologically different natural and anthropogenic landscape zones: desert, foothill, mountain, old-irrigated and new-irrigated.

Collection of cycads was carried out by mowing with an entomological net with tied bags. 50 double sweeps of the net were taken as a unit of account.

With high-quality collections, a simple device was used to select cycads from the net [5]. It consists of an ordinary test tube and a glass tube of the same diameter, connected by a rubber tube 5-6 cm long. The rubber tube makes it possible to fold the glass parts parallel to each other. At the same time, the rubber at the bend is flattened, which prevents the passage of insects from the glass tube to the test tube and back.

Light traps designed by D.G. Sakharov or a simple electric lamp with a power of 150 W, suspended on a pole, were used to catch cicadas in the light. Fishing was carried out at 21.00-23.00 local time [9].

Results and Discussion

Cicadas are insects with great mobility, they jump well and many of them fly, most of the species are associated with cultivated and weed vegetation, they are full-winged, which makes it easier for them to move to field crops.

All cycads are phytophages sucking the contents of the conducting system of plants, most suck juices from phloem vessels, some representatives use the contents of xylem vessels (*Cicadella viridis*, *Poophilus nebulosus*), representatives of the subfamily *Turhlocybinæ* (*Empoasca*, *Kyboasca*, *Chlorita*, *Tamaricella*, *Asianidia*) suck out the content of leaf cells [2,7,8].

Among cycads, both polyphages and oligophages are found [2], monophages are rare. On herbaceous and low-growing vegetation in our region, oligophages are characteristic of cereals, *Asteraceae*, legumes, and many other plant families. Data on the food specialization of the species found in the Hungry Steppe are given mainly in the works of A.F. Emelyanov [2]. On the whole, our data agree with the literature data for individual species, and new data on relationships with forage plants have been elucidated.

Most of the cycad species in the studied region are associated with wild cereals. *Laodelphax striatellus*, *Pentasteridius pallens*, *Eupelix cuspidata*, *Psammotettix striatus*, *P. pictipennis*, *Anaceratagallia laevis*, *Aconura depressa*, *A. volgensis*, *A. Jacovlevi*, *A. amitina* were recorded on

the coastal sea (*Aeluropus littoralis*), of which only species of the genus *Aconura* are monophages, feed on reeds (*Phragmites communis*) *Chloriona unicolor*, *Chloriona clavata*, *Doratyropsis horos*, *Paralimnus eferatus*, *P. sangusticeps*.

Eupelix cuspidata, *Balcluta rhenana*, *Chiasmus conuspurcatus*, *Stenometopiellus sigillatus* are found on bluegrass (*Toe bulbosa*).

The narrow oligophage *Labirrus bandlirohi* is trophically associated with polynyas, which has not been recorded on other plant species. Of the oligophages of *Compositae*, *Macropsidius dispar*, *Eromochlorita tessellata*, *Handianus imperator*, *Psammotettix striatus* were noted on sagebrush.

Among the widespread and characteristic groups of plants in the steppe part and on saline soils are representatives of the *Marev* family, on saltwort (*Salsola paulseni*, *Kochia prostrata*, *Atriplex tatarica*, etc.) *Neoliturus haematoceps*. The legume family is quite well populated by cicadas. The fauna of camel thorn (*Alhagi persarum*) is the richest. Feeding of 11 species of cycads was noted on it: oligophages *Agallia acuteangulata*, *Pseudophlepsus binotatus*, *P. comma*, *Eremophlepsus sexnotatus*, *Platymptopius albus*, *P. Pardalis*, polyphages *Batracomorpus irroratus*, *Pentasteridius upticaster* as, *Scorlus Poophilus nebulosus*, *Scenergatus viridis*. One species of *Pseudophlepsus binotatus* was recorded on licorice. 12 species feed on tamarisks (*Tamarix ramosissima*, etc.) [5] *Hemitropis tamaricis*, *H. setuculosa*, *H. viridissima*, *H. fasciata*, *Tettigometra varia*, *Tamarixella parvula*, *Opsioides discensus*, *O. tigrisipes*, *O. pallasi*, *O. versicolor*, *Euscelis heptneri*. As well as a specific species of monophage *Melamsalta musiva*, developing larvae on the roots of the underground [4, 10].

The species composition of cycad field crops, both on old developed and newly developed lands, is much poorer than on irrigated ones.

Only 2 species were found on rainfed wheat and barley in the foothill zone – *Stenometopiellus sigillatus* and *Psammotettix striatus*. Mass species on wheat in the plain zone are *Stenimetopiellus sigillatus* and *Psammotettix striatus*. In the virgin lands, these species live and feed on adzhirik, reed and other wild cereals.

As can be seen from the above list, the relationship between the inhabitants of wild cereals and species that feed on wheat and barley is quite significant.

A.A. Zakhvatkin points out 7 harmful species of cicadas for Central Asia on cereals: *Pentasteridius leporinus*, *P. pallens*, *Laodelphax striatella*, *Javesella pellucida*, *Cicadella viridis*, *Macrosteles*



laevis, *Psammotettix striatus*.

G.K. Dubovsky [1] cites 58 species of cicadas on bread and fodder cereals in the Ferghana Valley. We found 12 species of cicadas on corn: *Kelisia ribauti*, *Laodelphax striatella*, *Toya propingua*, *Scorlupaster asiaticus*, *Empoasca meridiana*, *Neoliturus haematoceps*, *N. opacipennis*, *Balclutha rozea*, *Macrosteles laevis*, *Aconurella prolixa*, *Stenometopiellus sigillatus*, *Psammotettix striatus*. A.F. Emelyanov in the reference book "Insects that harm corn in the USSR cites 25 species [2].

The types of cicadas that harm corn are closely related to those living on adzhirik and wild cereals. It should be noted that we have identified species on corn that were not previously recorded on virgin lands. These are *Keilsia ribauti*, *Laodelphax striatellus*, *Empoasca meridiana*. They probably switched to corn from other field crops. 26 species of cicadas were found in alfalfa fields: *Reptalus concolor*, *R. rufocarinatus*, *Asiraca clavicornis*, *Kelisia ribauti*, *Toya propingua*, *Dictyophara scolopax*, *Scorlupaster asiaticus*, *Phialenus spumarius*, *Anaceratagallia laevis*, *A. acuteangulata*, *Austragallia sinuata*, *Batracomorphus irroratus*, *Euplix cuspidata*, *Kyboasca bipunctata*, *Empoasca meridiana*, *tAsianidia asiatica*, *A. palloccita*, *Pseudophlepsius comma*, *Neoliturus shaemotoceps*, *N. opasipennis*, *Macrosteles larumevis*, *Platimetopius pardalis*, *P. dudovsachuskii*, *P. dudovskii*, *P. dudovskii*, *P. Rhoanans hepochlorus*. Some of these species, according to our observations and literature data, are not associated in nutrition with alfalfa (*Toya*, *Eupelix*, *Rhoanus*).

G.K. Dubovsky [1] lists 66 species for alfalfa fields of the Ferghana Valley.

The species that live in alfalfa crops on newly developed lands are closely related to leguminous plants growing on virgin lands, in particular with camel thorn. These are *Scorlupaster asiaticus*, *Batracomorphus irroratus*, *Kyboasca bipunctata*, *Neoliturus opacipennis*, *Platimetopiellus dubovskii*.

Tiettigometra vitellina, found on alfalfa, has previously been reported on Compositae; *Austroagallia sinuata* - on the eryngium; *Opsius tiigripes* - on tamarisk; *Balclutha rhenana* - on weed cereals. On this crop, species were also noted that were not found in the virgin lands (*Kelisia ribauti*, *Reptalus concolor*, *Empoasca meridiana*).

On cotton, we established the nutrition of 6 species of cicadas: *Cicadatra querula*, *C. ochreata*, *Melamsalta musiva*, *Empoasca meridiana*, *Kyboasca bipunctata*, *Austragallia sinuata*. All of them, with

the exception of *Empoasca meridiana*, are widespread on the wild vegetation of virgin lands and surrounded by crops of cultivated plants. *Kyboasca bipunctata* is trophically associated with elm, dzhugara, alfalfa, etc., and from wild plants - with camel's thorn. *Cicadatra querula* and *C. ochreata* develop on the roots of licorice and other plants. *Austragallia sinuata* was noted by us on the labiales. *Melamsalta musiva* is considered specific for tamarisks. We have repeatedly observed the feeding of adults of this cicada in cotton crops on newly developed lands.

In the reference book "Insects and mites" [2], 8 species of cicadas are indicated as cotton pests.

G.K. Dubovsky [1] believes that only 3 species of cicadas are harmful to cotton: *Austragallia sinuata*, *Empoasca meridiana*, *Kyboasca bipunctata*. trees.

We found 3 species of cicadas on beets: *Empoasca meridiana*, *Kyboasca bipunctata*, *Neoliturus haematoceps*.

On wheat - *Kelisia ribauti*, *Laodelphax striatellus*, *Javasella pellucida*, *Scorlupaster asiaticus*, *Empoasca meridiana*, *Kyboasca bipunctata*, *Neoliturus haematoceps*, *N. opacipennis*, *Balclutha rozea*, *B. rhenana*, *Macrosteles laevis*, *Stenometopiellus sigillatus*, *Euscelis lineolatus*, *Psammotettix striatus*, *P. pictipennis*.

Barley - *Kelisia ribauti*, *Laodelphax striatellus*, *Scorlupaster asiaticus*, *Kyboasca bipunctata*, *Empoasca meridiana*, *Neoliturus haematoceps*, *N. opacipennis*, *Balclutha rozea*, *B. rhenana*, *Macrosteles laevis*, *Stenometopiellus sigillatus*, *Euscelis lineolatus*, *Psammotettix striatus*.

On potatoes - *Scorlupaster asiaticus*, *Austragallia sinuata*, *Empoasca meridiana*, *Macrosteles quadripunctulatus*.

On plantings of carrots - *Empoasca meridiana*, *Neoliturus haematoceps*.

Thus, the species of cicadas that feed on cotton, alfalfa, cereals, vegetables and gourds are polyphages or oligophages, widely distributed on the wild vegetation of virgin and newly developed lands of the Hungry and Jizzakh steppes.

The relationship of cycads living on field crops of newly developed lands with wild plants is extensive. The transition of cycads from natural biocenoses to field crops is carried out, first of all, from plants of closely related genera and families. A significant part of cycads are polyphages. They easily move from wild vegetation to field crops. Among the cicada pests of field crops, one can single out an extensive group of species that are loosely associated with natural primary vegetation



and are rarely found outside cultivated landscapes, but are abundant on weeds. It is possible that some of these species are found in the wild only due to the presence of closely located developed lands. Such species can be considered *Psammotettix striatus*, *Macrosteles laevis*, *Toua propinqua*, *Empoasca meridiana*, *Laodelphax striatellus*, *Balclutha rozea*, *Aconurella prolixa*.

On cultivated plants from the families Solanaceae (potatoes), Malvaceae (cotton), Umbelliferae (carrots), pests are represented exclusively by polyphages, since oligophages have not been identified on representatives of these families under natural conditions.

Consequently, the harmful fauna of cycads on cotton, alfalfa, vegetable, melon and cereal crops is formed due to the transition from species of old-developed, weedy, as well as from undeveloped areas, adapting to new, more mesophilic conditions, as well as due to migration from the same crops to old-developed the lands of their environment [3].

Conclusion

The species composition of cycad field crops both on old developed and newly developed lands is much poorer than on irrigated ones.

We found 12 on corn, 26 on alfalfa, 6 on cotton, 3 on beets, 13 on wheat, 13 on barley, and 2 species of cycads on potatoes.

On corn, we have identified species that were not previously recorded on virgin lands. These are *Keilsia ribauti*, *Laodelphax striatellus*, *Empoasca meridiana*. They probably switched to corn from other field crops.

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The harmful fauna of cycads on cotton, alfalfa, vegetable, melon and cereal crops is formed due to the transition of species from old-developed, weedy and undeveloped areas, adapting to new, more mesophilic conditions, as well as due to migration from the same crops to old-developed lands with their surroundings.

The relationship of cycads living on field crops of newly developed lands with wild plants is extensive. The transition of cycads from natural biocenoses to field crops is carried out, first of all, from plants of closely related genera and families. A significant part of cycads are polyphages. They easily move from wild vegetation to field crops.

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