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DEVELOPMENT OF NOCTUDAE (LEPIDOPTERA) AND THEIR ENTOMOPHAGES IN AREAS OF NATURAL DISASTER IN SIRDARYA REGION

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Abstract
At present, due to the rapid development of the world, anthropogenic factors, and the impact of natural disasters, many tric organisms are disappearing or their mutual relations are being disturbed.
As a result of floods, windstorms, and rains in Jokhan, a lot of animal world has been destroyed and the natural balance of their biocenosis has been destroyed, some species have disappeared, and pests have multiplied.
In this article, on May 1, 2020, a natural disaster occurred due to the flooding of the Sardoba reservoir due to heavy rainfall in the Syrdarya region. As a result, water overflowed from the "Sardoba Reservoir" dam in the Sardoba district of the Syrdarya region, and a number of settlements, social sector objects, agricultural crops, including grain, cotton fields and other crops in the Sardoba, Aqoltin and Mirzaabad districts were severely damaged, resulting in a change in biodiversity. dedicated.

Keywords Entomophage, pest, moths, noctuidae, Leridoptera.

INTRODUCTION

The main phytophagous species found in the cotton agrobiocenosis: Several phytophages were found in the cotton agrobiocenosis during the research conducted in the areas affected by the natural disaster of Syrdarya region. The process of damage to cotton was observed mainly by spider mite, autumn nightworm, bollworm, caradrina, plant aphids, caterpillars, cotton mite, thrips. (Ergashev 2023) The types of these pests and their biological features are as follows.

Agrotis segetum Den.et Shsiff. It is found everywhere in the conditions of our republic. This pest damages more than 150 types of plants belonging to 34 families. Among them, cotton, alfalfa, tomato, sugar beet, corn, grain, oilseeds are the most popular food of autumn night. (Alimukhamedov Khojaev 1987) According to our observations, in the first half of August, when seedlings were planted in autumn night greenhouses, the presence of middle-aged and old worms was observed. Later (during the pruning period) the autumn night did not harm the plants. At the same time, it was observed that butterflies of the pest flew into the greenhouses and laid eggs. But because there was not enough food in these lands, the pest could not develop.

Cotton bolworm - Helicoverpa armigera Hbn. It

lays one, sometimes two, eggs on the growth point of the tomato that has entered the field. The 1st-year-old worms that hatched from the eggs first feed on the leaves at the point of growth, then the 2-3-year-olds damage the pods and flowers, and the older worms damage the fruit and make it unfit for consumption. The worm hatched from the egg develops in greenhouse conditions for 25-30 days and destroys 20-25 pods, flowers and fruits [1, 2, 4, 5, 6].

In areas where the bollworm is not controlled, it can destroy 70-80% of vegetable crops and 35-40% of cotton crops when it multiplies. According to information provided by domestic and foreign authors, the cotton bollworm damages more than 250 plants.

The bollworm damages the flowers, bolls and bolls of cotton, as well as corn stalks, tomato fruits, okra, hemp and chickpea buds, pea pods and fruit organs of many other plants. Damaged combs and young nodes are often shed, and the bollworm sometimes damages the stem tips.

Distribution of species of weeds that damage agricultural crops in flooded areas of Syrdarya region in "Hosilabad f/x", Gulistan district of Syrdarya region, "Bek kalaster" of Mirzaabad district, "Inderama cluster" of Sardoba district in 2021-2023.

In cotton agrobiocenosis, the occurrence of tunlams was shown to be somewhat higher than in other crops. The level of harmfulness has also been studied, and the most common are cotton bollworm, autumn bollworm, tamki bollworm, and wild bollworm.

During cotton ginning period, 10 female butterflies, which were flown and fertilized from the mushrooms collected from nature, were released to the designated areas. The next generation of butterflies was studied in the rest of the pieces [7, 8, 9, 10, 11].

Observations were made every 3 days until the butterflies laid eggs and died. Observations revealed that butterflies continued to lay eggs on the cotton plant for 12 days.

Distribution of species of tunlams that damage agricultural crops in the flooded areas of Syrdarya region was statistically analyzed by Dospekhov 1985y methods from the results of experiments during the year in "Hosilabad f/x" Guliston district of Syrdarya region, "Bek kalaster" of Mirzaabad district, "Inderama cluster" of Sardoba district.

The results of the experiments were statistically analyzed according to the methods of Dospekhov 1985.

Monitoring of the spread of cotton agrobiocenosis and their development in flooded areas of Syrdarya region in January-March 2021-2023 (Guliston-"Hosilabad f/x", Mirzaabad-"Bek kalaster", Sardoba-"Inderama cluster" areas 2021-2023).

Table 1

In our research conducted in the 1st quarter, the incidence of pests in the Mirzaabad area of Tunlam compared to the Gulistan district was lower in January-March

№	Latin name	Uzbek name	Level of encounter		
			A non-flooded area	Flooded area	
			Gulistan (Hosilabad f/x)	Mirzaabad (Bek Kalaster)	Sardoba (Inderama cluster)
Order Leridoptera. Family Noctuidae					

1	*Agrotis segetum* Den.et Schiff	Kuzgi tunlam	+	-	+
2.	*A. obesa.* V	Tamaki tunlam	+	-	-
3	*A.exclamationis.* L	Undov tunlam	+	-	-
4	*Autographa gamma*. L	Gamma tunlam	+	-	-
5	*Helicoverpa armigera.*Hbn	Fo‘za tunlami	++	-	+
7	*Ochopleura flammarta* Den.et.	Qora yelkali tunlam	+	+	-
8	*Syngrapha circumflexa* L	Metal rang tunlami	+	-	-
9.	*Xestia c-ni Turn*. L	Qora-s tunlami	++	-	-
1	*Euxoa agricola* V.	Yovvoyi tunlami	++	+	-

Note: The degree of occurrence is (+++) high, (++) average, (+) low.

In the experiment, the occurrence of pests was observed at a low or medium level in January-March in all regions, some did not occur. In particular, pests such as cotton bollworm (Helicoverpa armigera.Hbn), black-s bollworm (Hestia c-ni Turn. L), and wild bollworm (Euxoa agricola V) were rarely encountered in the flooded area.

In Mirzaabad district, black-shouldered terns (Ochopleura flammarta Den. et) and wild terns (Euxoa agricola V.) species were found in Mirzaabad district, and no other terns were observed.

In Sardoba district, it was found that the cotton tunnel and the autumn selections were found to a small extent, and no other tunnels were found.

Including, in the months of January - March, the occurrence of tunlams in the fields planted with cotton in the areas where the natural disaster was observed was less than the average (Table 2).

Table 2

Control of the spread of cotton agrobiocenosis and their development in flooded areas of Syrdarya region in April-June 2021-2023

(Guliston-Hosilabad f/x, Mirzaabad-Bek cluster, Sardoba-Inderama cluster areas 2021-2023)

№	**Latin name**	**Uzbek name**	**Level of encounter**		
			A non-flooded area	**Flooded area**	
			Gulistan (Hosilabad f/x)	**Mirzaabad (Bek Kalaster)**	**Sardoba (Inderama cluster)**
Order Leridoptera. Family Noctuidae					
1	*Agrotis segetum* Den.et	Kuzgi tunlam	++	-	+
2.	*A. obesa*. V	Tamaki tunlam	+	+	-
3.	*A.exclamationis.* L	Undov tunlam	++	+	+
4.	*A. xanthgrapha.* F	Ksantgrafa tunlam	+	+	-
5.	*Autographa gamma*. L	Gamma tunlam	++	+	+

6.	*Helicoverpa armigera*	Fo‘za tunlami	++	+++	+++
7.	*Noctua arbona*	Arbona tunlami	+	-	-
8.	*Mamestra suase* Schiff	A’lo tunlam	++	-	-
9.	*Ochopleura flammarta*	Qora yelkali tunlam	+	+	-
1	*Syngrapha circumflexa* L	Metal rang tunlami	+	+	-
1	*Xestia c-ni Turn*. L	Qora-s tunlam	++	-	-
12	*Euxoa agricola* V.	Yovvoyi tunlam	++	+	-

Note: The degree of occurrence is (+++) high, (++) average, (+) low.

In the months of April-June of our study, in the areas of Syrdarya region where the natural disaster was observed, the level of occurrence of tunlams, especially cotton tunlam (Helicoverpa armigera), was observed in Sardoba district and Mirzaabad districts. As a result of the surveys, it became clear that the area with the least number of pests (tunlams) was Sardoba district (Table 3).

Table 3

Control of the spread of cotton agrobiocenosis and their development in flooded areas of Syrdarya region in July-September 2021-2023

(Guliston-Hosilabad f/x, Mirzaabad-Bek cluster, Sardoba-Inderama cluster areas 2021-2023)

№	Latin name	Uzbek name	Level of encounter		
			A non-flooded area	Flooded area	
			Gulistan (Hosilabad f/x)	Mirzaabad (Bek Kalaster)	Sardoba (Inderama cluster)
Order Leridoptera. Family Noctuidae					
1	*Agrotis segetum* Den.et	Kuzgi tunlam	++	++	+
2.	*A. obesa*. V	Tamaki tunlam	++	+	-
3.	*A.exclamationis*. L	Undov tunlam	+++	++	+
4.	*A. xanthgrapha*. F	Ksantgrafa tunlam	++	+	-
5.	*Autographa gamma*. L	Gamma tunlam	++	+	+
6.	*Helicoverpa armigera*	Fo‘za tunlami	+++	+++	+++
7.	*Noctua arbona* Hnfn	Arbona tunlami	++	+	+
8.	*Mamestra suase* Schiff	A’lo tunlam	++	+	+
9.	*Ochopleura flammarta*	Qora yelkali tunlam	++	+	-
1	*Syngrapha circumflexa* L	Metal rang tunlami	+	+	+
1	*Xestia c-ni Turn*. L	Qora-s tunlam	++	+	-
12	*Euxoa agricola* V.	Yovvoyi tunlam	-	-	-

In the third quarter of the year, in July-September, the number of eggs and larvae of moths was the highest. It was observed that cotton boll weevil (Helicoverpa armigera) is often found in areas where natural disasters were observed and in areas where it was not observed. Wild nightshade (Euxoa agricola V) was not observed in all three regions according to the results of observations (Table 4).

Table 4

Control of the distribution and development of weeds in the agrobiocenosis of cotton in the flooded areas of Syrdarya region in October-December 2021-2023

(Guliston-Hosilabad f/x, Mirzaabad-Bek cluster, Sardoba-Inderama cluster areas 2021-2023)

№	Latin name	Uzbek name	Level of encounter		
			A non-flooded area	Flooded area	
			Gulistan (Hosilabad f/x)	Mirzaabad (Bek Kalaster)	Sardoba (Inderama cluster)
Order Leridoptera. Family Noctuidae					
1	*Agrotis segetum* Den.et Schiff	Kuzgi tunlam	-	-	+
2.	*A. obesa.* V	Tamaki tunlam	-	-	-
3.	*A.exclamationis.* L	Undov tunlam	-	+	+
4.	*A. xanthgrapha.* F	Ksantgrafa tunlam	-	-	-
5.	*Autographa gamma*. L	Gamma tunlam	-	-	-
6.	*Helicoverpa armigera.*Hbn	Fo‘za tunlami	-	+	-
7.	*Noctua arbona* Hnfn	Arbona tunlami	-	+	-
8.	*Mamestra suase* Schiff	A’lo tunlam	-	-	-
9.	*Ochopleura flammarta* Den.et.	Qora yelkali tunlam	++	+	-
10	*Syngrapha circumflexa* L	Metal rang tunlami	-	-	+
11	*Xestia c-ni Turn*. L	Qora-s tunlam	+	+	+
12	*Euxoa agricola* V.	Yovvoyi tunlam	++	+	+

Note: The degree of occurrence is (+++) high, (++) average, (+) low.

In the cotton field, the rate of occurrence of nightworms in October-December was very low, because during this period the pests are preparing to leave for the village. Despite this, the presence of the Black-shouldered Tuna (Ochopleura flammarta Den.et) and the Wild Tuna (Euxoa agricola V.) indicates that they cause more damage to agricultural crops.

Parasitic and predatory entomophages of nightshades were also encountered in cotton fields during our experiment (Table 5).

Table 5

Distribution of parasitic entomophages of cotton in the flooded areas of Syrdarya region and their development in the region

(Guliston-Hosilabad f/x, Mirzaabad-Bek cluster, Sardoba-Inderama cluster areas 2021-2023)

№	The name of an entomophagus	Level of encounter		
		A non-flooded area	Flooded area	
		Gulistan (Hosilabad f/x)	Mirzaabad (Bek Kalaster)	Sardoba (Inderama cluster)
1	Trichogramma (*Tr pintoi)*	++	+	+
2	Trichogramma *(Tr evenes)*	+	+	-
3	Bracon *(Bracon hebetor say)*	++	-	+

Note: The degree of occurrence is (+++) high, (++) average, (+) low.

It was observed that parasitic entomophages such as trichogramma pintoi, trichogramma evenes and bracon (Bracon hebetor say) were found. Entomophagous encounters were lower in flooded areas than in non-flooded areas.

In addition to these parasitic entomophages, predatory entomophages of tunlams were also found in the cotton crop (Table 6).

Table 6

Distribution of predatory entomophages and their development in cotton agrobiocenosis in the flooded areas of Syrdarya region

(Guliston-Hosilabad f/x, Mirzaabad-Bek cluster, Sardoba-Inderama cluster areas 2021-2023)

№	The name of entomophagus	Level of encounter		
		A non-flooded area	Flooded area	
		Guliston (hosilobod f/x)	Mirzaobod (Bek kalaster)	Sardoba (Inderama klaster)
1	*Chysopa carnea*	++	+	+
2	Coccinellidae	++	+	+
3	*Orius niger*	+	+	+
4	*Nabius ferus*	++	-	+

Note: The degree of occurrence is (+++) high, (++) average, (+) low.

According to this, among the predatory entomophages of the tunlams, such as Golden-eyed (Chysopa carnea), Khanqizi (Coccinellidae), Qandala (Orius niger), Qandala (Nabius ferus) were found. In particular, in the area where there was no natural disaster, the level of encounter of natural predatory entomophages was average. In the areas of Sardoba and Mirzaabad, the meeting of predatory entomophages was rarely observed.

CONCLUSION

Cotton agrobiocenosis in the flooded area is much less compared to the areas that were not affected by tundra.

As a result of the research, it was observed that the number of pests is greater than natural entomophages in the areas where a natural disaster was observed, especially the ratio of the number of ants to entomophages was found to be much higher.

In the areas flooded by the Syr Darya, the natural biosphere was damaged, including the increase in the number of pests.

Among the predatory entomophages in the cotton fields, it was observed that the golden-eyed (shrysopa carnea) and coccinellidae entomophages were found more than other entomophages.

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