

PHYTOPHAGOUS INSECTS OF VEGETABLE AND MELON AGROCENOSIS OF CENTRAL FERGANA

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<https://doi.org/10.35410/IJAEB.2020.5491>

ABSTRACT

The phytophagous insects of vegetable and melon crops in Central Fergana consists of 148 species and 7 subspecies belonging to 113 genera and 32 families of 7 orders. 19 species (12.3%) are found in Central Fergana for the first time. Among these species, the representative of Pentatomidae family – *Eurydema oleracea* (Linnaeus, 1758) and the Aphididae family – *Aphis frangulae beccabungae* Koch, 1855, was not registered previously in fauna of Uzbekistan. In addition, today, Uzbekistan is experiencing adventive and quarantine species of Phthorimaea operculella (Zeller, 1873) (potato beetle), *Tuta absoluta* (Meyrick, 1917) (Tomato leaf miner) and *Myiopardalis pardalina* Bigot, 1891 (melon flies) was registered for the first time in Central Fergana. Among the vegetable species, the number of polyphage per vegetable and melon is 69, of which 19 species (12.3%) are fully replicable insects in agrocnosis. Only typical for vegetable crops are 78 (50.3%), which are not found in fields. As well as, only 6 varieties of field pests in food range (3.9%) do not contain vegetables. Dominant species amount to 45 (29%) in various agrocnosis of Central Fergana. The dominant genus in the fauna are 22 (19.5%), with 40 species (25.9%) insects in many agrocnosis. The analysis shows that Central Fergana's vegetable and melon crops are different from the general fauna of Uzbekistan. The analysis shows that Central Fergana's vegetable and melon crops are different from the general fauna of Uzbekistan.

Keywords: Phytophagous insects, entomofauna, vegetable and melon, insects, adventive, Central Fergana.

1. INTRODUCTION

The latest analysis of vegetable and melon crop insect fauna in the valley is about half a century old. In particular, T. Tursunkhojayev's research activities conducted in the 1960s and 1970s focused on the entomofauna of the East Fergana region [9; 27]. There is also general information that some of the scientific sources in the fauna of the Central Asian region and Uzbekistan show that insects are found in Fergana Valley [1; 4; 13; 19; 20; 30]. The aforementioned sources can still be considered as the starting point for conducting the ecological and fauna research in the area, but their taxonomic views are now outdated.

Later on, two groups of Homoptera order – analyzes fauna research in the Cicadinea and Aphidinea that can be found in agroecosystem in Fergana valley [2; 8; 17; 18]. Therefore, the entomofauna of Central Fergana has not been fully studied. Thus, the conducted research results will serve to fill up a certain amount of gaps.

The aggravation of climatic conditions in the last decades and changes in crop varieties have an impact on the region’s entomofauna. Particularly, renewal of agricultural crops composition in the country, specializing in new varieties and types of crops, leads to increased diversity of insects, especially adventitious species.

2. MATERIALS AND METHODS

The study was conducted during 2012-2019. on the fields of farmer and household farms of Central Fergana and adjacent territories, where the main part of the vegetable and gourd crops of Uzbekistan is grown.

The study used the methods of general and agricultural entomology, as well as a number of determinants [6; 10; 11; 16; 23; 24; 29].

3. RESULTS AND DISCUSSION

The remaining number of taxons is decreasing sequentially with Orthoptera, Hemiptera, Diptera and Thysanoptera orders. It should be noted that the only type of Thysanoptera family (3.1%) and one genius (0.9%) in the vegetable and melon crops (0.65%) is common (see Fig. 1).

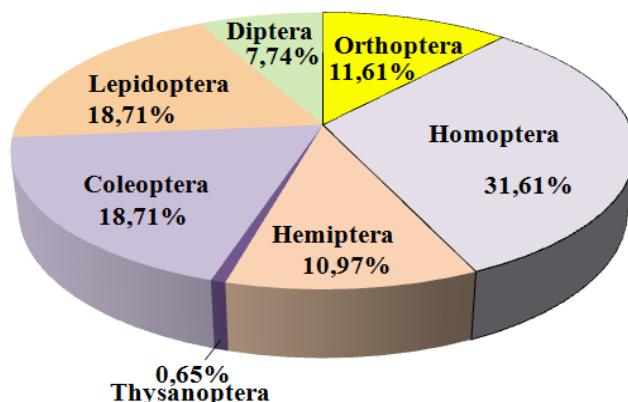


Fig. 1: Taxonomic distribution of phytophagous orders

The next place in the fauna is taken by Coleoptera and Lepidoptera groups. They include 7 (21.9%) and 5 (15.6%) families respectively, 21 (18.6) and 20 (17.7%) genius, as well as each group consists of 29 (18.71%) species (see Table 1).

Table 2: The taxonomical table of vegetable-melon crops insects in Central Fergana

№	Order	Famil y	%	Genus	%	Taxon	%
1	Orthoptera	5	15,6%	15	13,3%	12(5)	11,6%
2	Homoptera	8	25%	38	33,6%	48(1)	31,6%
3	Hemiptera	2	6,3%	12	10,6%	17	10,9%
4	Thysanoptera	1	3,1%	1	0,9%	1	0,65%
5	Coleoptera	7	21,9%	21	18,6%	29	18,7%
6	Lepidoptera	4	12,5%	20	17,7%	29	18,7%
7	Diptera	5	15,6%	6	5,3%	12	7,7%
	Total:	32		113		148(7)	

Taxonomic distribution of insects of vegetables and melons in Central Fergana is as follows: when analyzing the distribution of insects by families, 10 of them (Pyrgomorphidae, Tetrigidae, Aphrophoridae, Dictyoparidae, Thripidae, Coccinellidae, Meloidae, Pyraustidae, Ephydridae, Tephritidae) were monotypic and 6 families (Gryllotalpidae, Issidae, Curculionidae, Pieridae, Syrphidae, Anthomyiidae) were of 2 species, and the rest of the families (Cixiidae, Aleyroididae, Gelechiidae, Delphacidae, Gryllidae, Scarabaeidae, Tenebrionidae, Agromyzidae, Elateridae, Chrysomelidae, Pentatomidae, Acrididae, Miridae) combined 3 and more species. 1 out of more than 10 species (Aphididae – 14 species) and more than 20 species Cicadellidae (21 species) and Noctuidae (23 species) families dominate in Central Fergana.

The high number of Noctuide is also confirmed in a number of research activities conducted in recent years. In particular, this group of insects were recorded in the work of T.Tursunkhojayev in 1971 – 7 varieties in vegetables, M.I.Rashidov in 1988 [25] – 17 types in tomatoes, B.A.Akromov [3] – 12 species in onions, U.D. Ortiqov [22] – 15 species in tomatoes, B.A.Sulaymonov [26] found that 16 species damaged tomatoes in greenhouse conditions. In our research, there are 23 species (14.8%) in the fauna, 19 species in tomatoes and 14 in beets. Four species (*Agrotis segetum*, *A.ipsilon*, *Heliothis armigera*, *A.gamma*) are common in almost all agrocenosis of Central Fergana.

Interpretation by authors of Noctuidae representatives as a high-quality polyphage in a group of other families allows explaining their role and significance in evolution.

The fauna is characterized by a high proportion of genus in the variety of species. At the same time, the genus of individual vegetable and melon crops (total 113) are monotype (90%, 79.6% of total genus), as well as 14 genus (12.4%) in 2 species, 3 genus (2,6%) in 3 species, 2 genus (1.8%) in 4 and 4 genus (3.5%) in 5 species. Fauna has no more than 5 species of genus.

18 species (11.6%) included in the list of vegetable and melon crops insects catalog were considered by other authors in the Central Fergana region. They are related to G.K.Dubovsky [9], A.M.Jabborov [12], A.G.Kojevnikova [17] A.A.Mukhamediev [18] and T.Tursunkhodjaev [27] research.

19 species (12.3%) are found in Central Fergana for the first time. Among these species, the representative of Pentatomidae family – *Eurydema oleracea* (Linnaeus, 1758) (Bagdad, 15.09.2016; “Sharq yulduzi”; Plant: *Brassica oleracea*) and the Aphididae family – *Aphis frangulae* beccabungae Koch, 1855 (Yazyavan, 20.08.2015; “Cho`liguliston”; Plant: *Brassica oleracea*) was not registered previously in fauna of Uzbekistan.

In addition, today, Uzbekistan is experiencing adventive and quarantine types of *Phthorimaea operculella* (Zeller, 1873) (potato beetle), *Tuta absoluta* (Meyrick, 1917) (tomato moth) and *Myiopardalis pardalina* Bigot, 1891 (melon flies) was registered for the first time in Central Fergana [7, 21]. The occurrence, biology and ecological features of these species are described separately in other works.

The species included in the list of scientific sources amount to 26 (16.8%), mostly referred to the works of E.V.Zvezomb-Zubovsky, [31], T.Tursunkhodjaev [27], D.A.Azimov et all. [5], A.Sh.Khamraev [13, 14], E.Sh.Toreniyazov [28], A.G.Kojevnikova [17], M.I.Rashidov [25], U.D.Ortikov [22], B.A.Akromov [3], B.A.Sulaymonov [26], Sh.T.Khodjaev [15].

It should be noted that dangerous *Pseudococcus comstocki* (Kuwana, 1902) pests in fruit trees, ornamental trees and bushes may be found in potatoes, eggplants and some legumes in some regions [13]. There is also information that locusts *Doclostarus maroccanus* Thunbg., *Ahceta deserta* Pall. are spread in all regions of the country and phylloxera *Geoica luifuga ferghanensis* Kan are spread in the valley [27]. Although these species are found in the region, they are not included in the taxonomic list because of the lack in vegetable and melon in the research area.

The remaining species (92 species, 59.3%) are among the insects registered in the Central Asian and Uzbekistan fauna, as well as unregistered insects in previous research of the Central Fergana region.

Among the vegetable species, the number of polyphage per vegetable and melon is 69, of which 19 species (12.3%) are fully replicable insects in agroecosis. Only typical for vegetable crops are 78 (50.3%), which are not found in fields. As well as, only 6 varieties of field pests in food range (3.9%) do not contain vegetables. Dominant species amount to 45 (29%) in various agroecosis of Central Fergana. The dominant genus in the fauna are 22 (19.5%), with 40 species (25.9%) insects in many agroecosis. The analysis shows that Central Fergana's vegetable and melon crops are different from the general fauna of Uzbekistan. The analysis

shows that Central Fergana’s vegetable and melon crops are different from the general fauna of Uzbekistan (see Table 2).

The analysis shows that Central Fergana vegetable-melon agrocenosis entomofauna is different from the fauna of Uzbekistan. That is, the abundance of desert species, the abundance of aborigines due to the location of the high mountain valley, slow exchange of adventitious or allochton species.

However, the complete abandonment of clover agrobiocenosis in the Central Fergana region in the early 1990s also affected the diversity of insects here. Since vegetable-melon crops are short-lived vegetation for insects, their lifecycle, as an intermediate chain, consist of primarily clover and subsequently weeds. For example, in 1994 as a result of increase in the number of clover bug in Altirik district, yields of all types of vegetables and melons have dropped to 15-35%.

Table 2: Distribution of insects on agroenosis in Central Fergana

#	Vegetable and melon crops	Taxon				Degree of dominance		
		Order	Family	Genus	Total species	Dominant	Sub-dominant	Few meet
1.	<i>Solanum tuberosum</i>	6	16	36	48	8	7	33
2.	<i>Solanum lycopersicum</i>	7	20	46	68	7	12	49
3.	<i>Solanum melongena</i>	6	19	43	47	5	10	32
4.	<i>Capsicum annuum</i>	6	10	22	24	4	5	15
5.	<i>Brassica oleracea</i>	7	21	41	51	6	11	34
6.	<i>Rhaphanus sativus</i>	5	9	19	21	2	6	13
7.	<i>Brassica rapa</i>	7	18	42	52	5	10	37
8.	<i>Raphanus sativus</i> var. <i>radicula</i>	5	10	22	26	4	8	14
9.	<i>Beta vulgaris</i>	6	23	57	79	9	20	50
10.	<i>Allium cepa</i> , <i>A. sativum</i>	6	14	31	42	4	6	32
11.	<i>Daucus carota</i>	6	21	56	70	11	13	45
12.	<i>Phaseolus vulgaris</i>	7	19	50	60	7	9	44

13.	<i>Phaseolus aureus</i>	7	17	41	49	5	9	35
14.	<i>Anethum graveolens</i>	6	12	17	23	2	3	18
15.	<i>Cucumis melo</i>	7	19	34	47	8	9	30
16.	<i>Citrullus lanatus</i>	7	19	35	43	5	13	25
17.	<i>Cucumis sativus</i>	7	20	38	50	9	8	33
18.	<i>Cucurbita moschata</i>	6	14	21	29	4	6	19
19.	<i>Cucurbita pepo</i> var. <i>ovifera</i>	5	16	30	32	4	6	22
20.	<i>Cucurbita pepo</i> var. <i>patisson</i>	6	15	24	25	2	7	16

4. CONCLUSIONS

In general, the results of faunistic analysis show that the phytophagous insects of vegetable and melon crops in Central Fergana consisted of 148 species and 7 subspecies belonging to 113 genera and 32 families of 7 orders. Scientific results show that the steppe nature and flora of Central Fergana, the vast part of the valley, are reflected in entomofauna. Location of the region near a particular zoogeographic region (mountain) is the basis for its agrocenosis in comparison with high varieties of mountain entomofauna, but the low share of xerophilus species is the basis for comparison to other regional agrocenosis.

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