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Study of Main Pests of Seed Orchards of Tashkent Region in the Fall Season

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Annotation: The article presents the results of studying the infestation of seed orchards in Tashkent region in the autumn, as well as the distribution and biology of one of the dominant species - Eriosoma lanigerum Haus.
Key words:seed orchards, aphids, heteroptera, mite, damage, Eriosoma lanigerum,population

INTRODUCTION

Agriculture is considered as an important sector of Uzbekistan's economy.This sector will meet the demand of the country's population for food products, and the processing industry for raw materials. About 90% of food products are produced in the agricultural sector. Agriculture is a guaranteed market for the products of a number of industries, such as agricultural machinery, chemical industry, as well as the supply of food products and raw materials for the processing industry to the consumer market of the republic[1;2;4].

In recent years, agricultural reform has become an urgent task to increase the share of fruit and vegetable crops among exported agricultural products and to take consistent measures to introduce market mechanisms in this area. This is due to the fact that the system does not have effective mechanisms for the development of horticulture, viniculture and olericulture, especially the lack of a scientific approach, which leads to underutilization of the existing potential of the industry [5;6].

In particular, horticulture in Uzbekistan faces serious difficulties in the system of protection of fruit crops from pests. Many species of pests and pathogens that were previously of no economic importance have begun to cause serious damage to gardens. However, in order to effectively control the pests of seed orchards, the most important step is to determine exactly what insects are causing damage in the garden areas, their dynamic amount and the taxonomy. It is also necessary to provide information on the current state of gardens in the Republic, the composition of pests and their level of damage, the rate of annual increase [7;13].

MATERIALS AND METHODOLOGY

Based on the above, in the autumn of 2020, scientific research was conducted to study the species composition of the main pests of orchards in the Tashkent region. Our main research was conducted in the orchards of horticultural farms of Tashkent region (Figure 1).

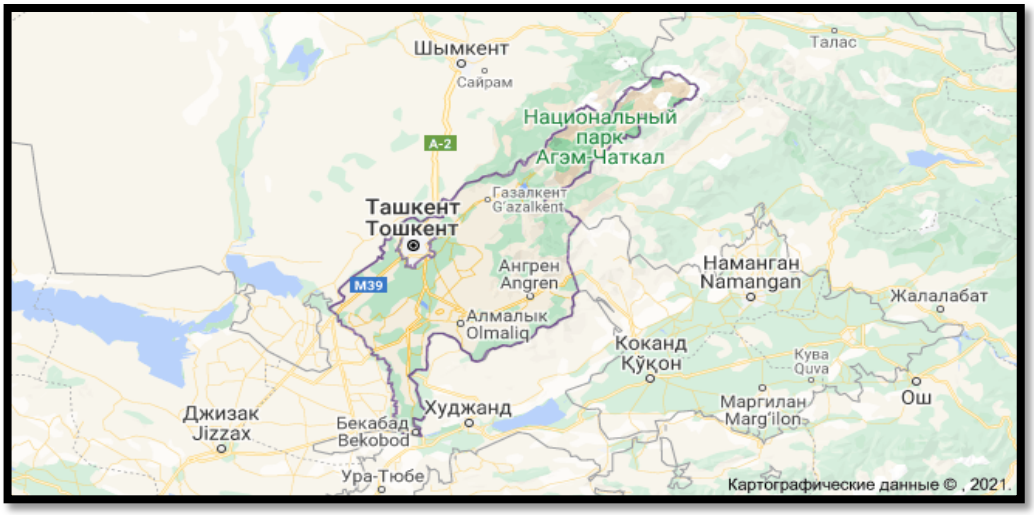

Figure 1. General map of Tashkent region

Tashkent region is located in the north-eastern part of the Republic of Uzbekistan at 42^0 17^1 and 40^0 15^1 northern latitudes and 68^0 $89^1$and 71^0 02eastern longitudes. The northern and eastern part borderwith the Shymkent region of the Republic of Kazakhstan, the eastern and south-eastern part with the Osh region of the Kyrgyz Republic and with the Fergana Valley, the southern part with the Sogd region of the Republic of Tajikistan and the western part with the Syrdarya region.

Researchfrom March to December 2020 were carried outin the field conditions in the pear orchards of "Eco AgroChroms" LLC (Limited Liability Company) in Kibray district of Tashkent region, in the apple orchards of "DonoMedGroup" LLC, in the apple and pear orchards of "DormonTaraqqiyoti" LLC, in the apple orchards of "Farmates" LLC, in the apple orchards of "Agro Elite" farm, in the apple orchards of "Qurbonali-Agro" farm in Ortachirchik district, in the quince and apple orchards of "Abdulloxagro" farm, in the apple orchards of "Iskandar Ahad" farm, in the apple orchards of "Alfiya-mevalari" LLC in Yangiyul district, in the apple orchards of"Tinchliknavo grand" farm in Yukorichirchik district, in the apple and pear orchards of "Kahramon" farm in Akhangaron district, in the apple orchards of "AskarovDilkhushbog'i" farm in Tashkent district, in the apple, pear and quince orchards of "Premerover" farm in Pskent district.

The degree of damage to aphid was analysed taking into account changes in trees and shrubs (formation of galls, leaf curling, discoloration, change in the shape of shoot, drying or shedding, immaturity or shedding of fruits, etc.).

Materials are collected and processed based on the methods proposed by A. K. Mordvilko [10], G. X. Shaposhnikov [11; 12], B. A. Mamontova - Soluxa, I. A. Cherkasova [9]. During the study, more than 125 seeded fruit trees were observed and 122 insect samples were taken from them. All samples were re-examined under laboratory conditions. Temporary preparations of aphids in glycerinwere also prepared and studied. Immature winged aphidsgivinglive-offspring were stored in dry test tubes until adulthood.

Morphological and classification features of aphids were analyzed comparatively using special aphidological literature [2; 3;] and determined to the level of the species.

RESULTS

As a result of field research in the fall season orchards of Tashkent region the following pests were determined: 4 orders (Homoptera, Hemiptera, Acariformes Lepidoptera), 5 families (Aphidae, Diaspididae, Tingidae, Tetranychidae, Tortricidae) and 8 genera (Aphis, Lepidapia, Quadraspid, Quadraspidator) Stephanitus, Amphitetranychus Oud, Tetranychus, Cydia, Yponomeuta), a total of: 12 species of pests were identified. These are *Aphis pomi De Geer.1773, Eriosoma lanigerum Hausm., Psylla vasilievi Suts., Tetranychus urticae., Tetranychus viennensis Zacher, Lepidosaphes*

ulmi, Diaspidiotus perniciosus, arlatoria oleae, Stephanitis oshanini Vas., *Stephanitis pyri Fabricius., Carpocapsa pomonella L., Grapholita molesta* (Table 1).

Table 1. Species composition of pests of orchards in different regions of Tashkent region in the fall season

№	Type of pests	Kibraydistr	Urtachirchiqdistr	Yangiyuldistr	Yukorichirchiqdistr	Ohangarondistr	Tashkentdistr	Pskentdistr
***Aphidae*family**								
1.	*Aphis pomi* Degeer	++++++	++++	++	+	++	+	+++
2.	*Eriosoma lanigerum*	+++	++	+	+			
***Diaspididae* family**								
3	*Quadraspidiotus perniciosus*	++++				+		+++
4	*Parlatoria oleae* Colve.	+++	+	++	+	++		+++
5	*Lepidosaphes ulmi* Linneas,1758	++	++	+		+		
***Tetranychidae*family**								
6	*Tetranychus viennensis Zacher*	+	++					
7	*Tetranychus urticae* Koch.		+++	++		+		
***Tingidae*family**								
8	*Stephanitis oshanini* Vas.			+	+			
9	*Stephanitis pyri* Fabricius	+	++++		+	+	+	+
10	*Carpocapsa pomonella L*	+++++	++++	++	+	+	+	+
11	*Grapholitamolesta*(Busk.1916					+		
Tortricidae								
12	*Yponomeuta malinellus Zell.1838.*	+						+

Note: + An indication of how many of this pest have been recorded in seed orchards in the district

So it can be seen from the table above that the most common pests found in seed orchards in the fall are: Aphis pomi Degeer, Carpocapsa pomonella L.,Parlatoria oleae Colve.,Quadraspidiotus perniciosus, Eriosoma lanigerum and Stephanitis pyri Fabricius, while the least common are

Tetranychus viennensis Zacher, Stephanitis oshanini Vas.,*Yponomeuta malinellus Zell.* and Grapholita molesta (Busk.).

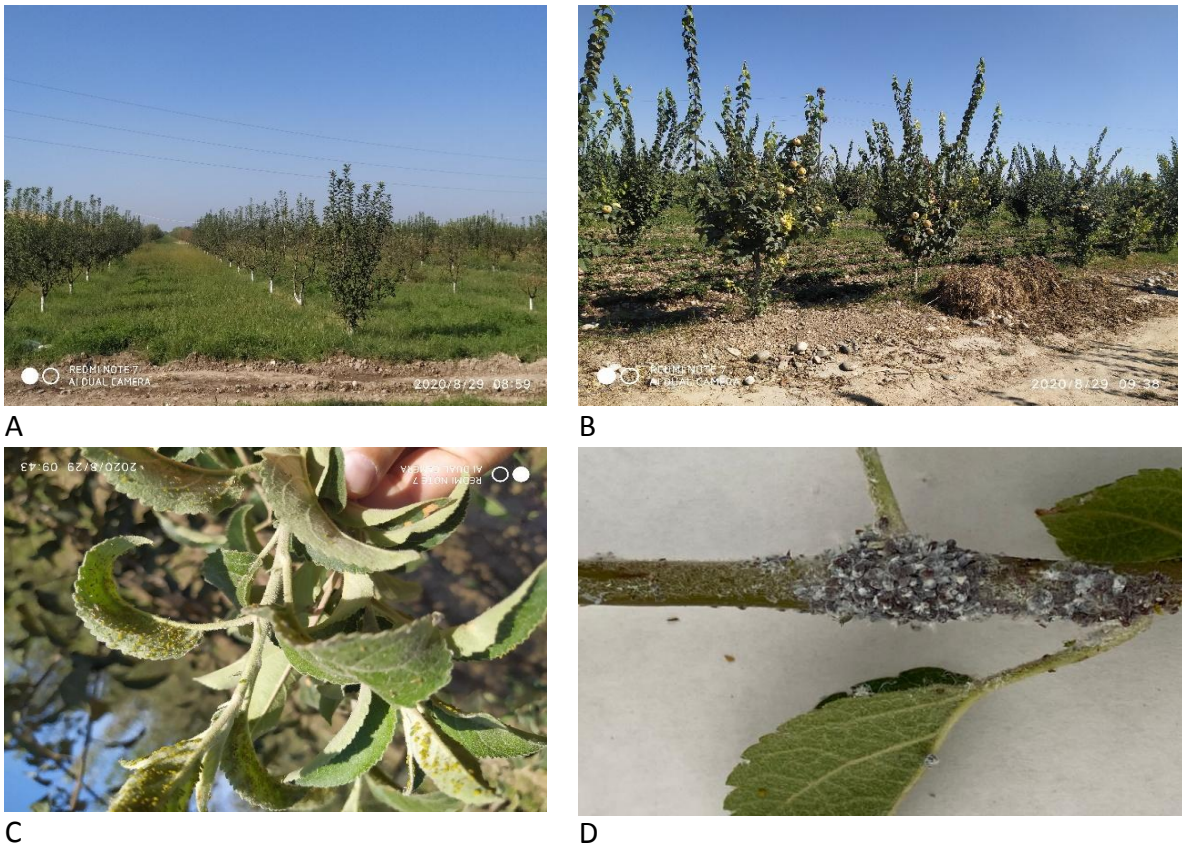

Figure 2. A – Apple, B – Quince gardens;Infection of apple leaves and shoots from C-Aphis pomi, D-Eriosoma lanigerum

Themainfocusofourresearchwasonthespecificfeaturesofthedistribution and biology of *EriosomalanigerumHausm*, which ranks high in terms of damage to seed orchards.

Systematic role of *Eriosoma lanigerum*

Table 2.

	**class:**	*Insecta*	
	order:	*Homoptera*	
	family:	*Aphidae*	
	genus:	*Aphis*	
	species:	*Eriosoma lanigerum* (Hausmann, 1802)	

Eriosoma lanigerum is one of the most dangerous pests of apples, and rarely harms pears and quinces as well.

Explanation. According to V. V. Yakhontov's "Central Asian Agricultural Pests," Eriosoma lanigerium is native to North America, and the insect entered Europe 200 years ago with tree seedlings. This pest came to Uzbekistan in 1905 as a result of import of seedlings [14].

There are winged and bloodless varieties of this pest, and the winged aphid has a white feather on the abdomen. The body is cylindrical, about 2.2 mm long, the rest of the body, ie the head, chest and legs are black, and the abdomen is dark brown.(Figure 3).

Figure3. Wingless and winged *Eriosoma lanigerum.*

The color of the winged aphid is different from that of the wingless aphid. It can be seen that the surface of the wingless aphid is completely covered with a waxy shiny white powder. This is why the aphidis also called "shiny aphid".

If we pay attention to the biology of this aphid, we can see the peculiarity, that is, this type of aphid is in the stage of small and adult insects of different ages during the winter. In winter, the aphidcan be found in the roots of apple trees, among the bark, and in the cracks of thicker branches.

According to V.V. Yakhontov, the aphid of this plant overwinters in the egg stage in its native North America [14].

A temperature of +5 C is required for the aphids of the apple to hatch from the eggs or for those who have overwintered during the larval stage to wake up from hibernation.

Like other species of aphids, the increase in population dynamics of this species occurs twice a season.

In summer, warm air temperatures, dry air, and an increase in beneficial insects prevent the proliferation of Eriosoma lanigerium, and a sudden decrease in aphid is observed.

The reasons for the initial increase in the number of aphid populations in apple orchards coincide with different vegetation periods of the forage plant, along with the abundance of nutrients, the first 3 generations of apple aphid also give birth to too many larvae. In terms of fertility, spring-summer aphids predominate.

V.V. According to Yakhontov, apple aphid peels four times. Born aphids\ are motile, crawling only on the fallen tree. At this time, the larvae that have fallen from the tree enter the soil and begin to feed by sucking the aphid from the roots, while the larvae of the apple aphid do not move once they begin to feed. The bloodless aphid sticks together and is unable to pull its thin and slender trunk out of the tree for almost a lifetime. In late April and early May, the first wings appear in part of the larvae, and as the wings grow, winged aphids appear.

Scientific studies suggest that the first winged aphids are found in late May. The number of winged aphids in the colony is very small, only 1-2.

Spread. Blood lice are found in Tashkent, Andijan and Namangan regions, in some parks of Fergana and Surkhandarya, in Osh and Jalal-Abad regions of Kyrgyzstan, in Keles, Shymkent and Jambul districts of Kazakhstan, in Gissar valley of Tajikistan and in Khojand region; blood lice are

also found in India, Korea, Japan, North and South America, Africa, Australia, and Europe, spreading to northern Europe, where the January isotherm is minus 3-4 ° C, and in America to the north, where the January isotherm is minus 5-7 ° C. passes. The homeland of the blood lice is North America.

Our research on "Study of the main pests of orchards in Tashkent region" began in the second half of June. In June, July and August, we observed a sharp decrease in the density of aphid, which then reached a very low level (Kurbanali agricultural farm in Orta Chirchik district, "Agro Elite" LLC in Qibray district, 16-21.06.20, 16-20.07.20 and 16- 20.08.20).

By September, the number of such aphids has increased by 10-20 (Kurbanali agricultural farm in Orta Chirchik district, "Agro Elite" LLC in Qibray district, 16-20.09.20)(Figure 4).

Figure4. The state of infestation of forage plants to varying degrees by aphid populations

From the aphids of the autumn generation grows a bisexual offspring, which suckles 4 times and lays eggs in pairs when they reach adulthood. Eggs perish under the influence of cold and snow in our conditions. During our laboratory tests, it became clear that this mother would die on her own after laying the eggs.

In Tashkent, red blood cell has a full life cycle and its seasonal development lasts from late March to January.

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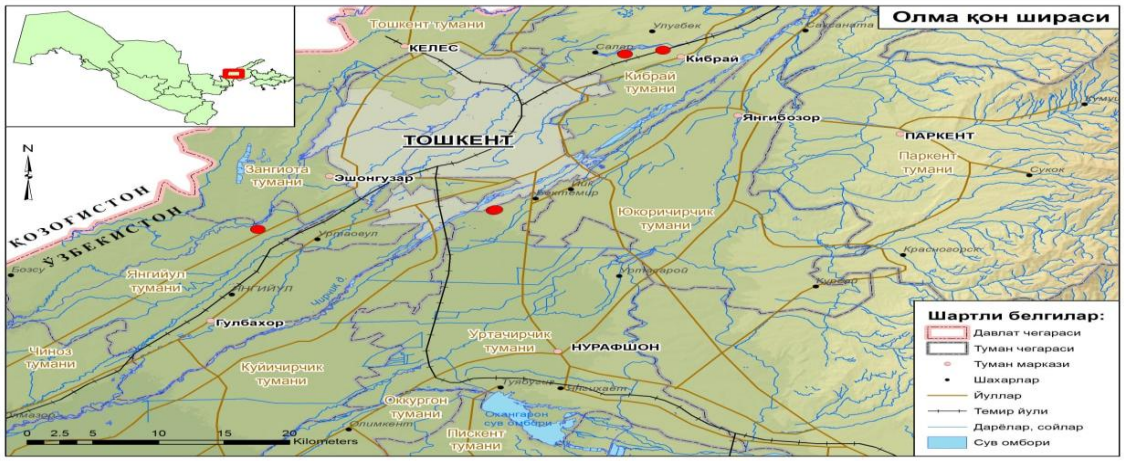

Figure5. The most infested areas of aphids in Tashkent region.

In our research, the damage from aphids was 2 in the apple and quince orchards of "Abdullox agro" farm in Ortachirchik district, Tashkent region, 1 in the apple orchards of "DonoMedGroup" LLC in Qibray district, Tashkent region and 1 in the apple orchards of "Dormon Taraqqiyoti" LLC, and in Yangiyul district in the apple orchards of "Alfiya -evalari" LLC in 1 coordinate (Figure 3).

The sudden cooling of the air temperature, the complete shedding of the leaves of the plants, also causes the Eriosoma lanigerium to enter a period of winter dormancy. In all control areas of the Tashkent region where the study was conducted, this aphid went into hibernation in late November and early December (Figure 4).

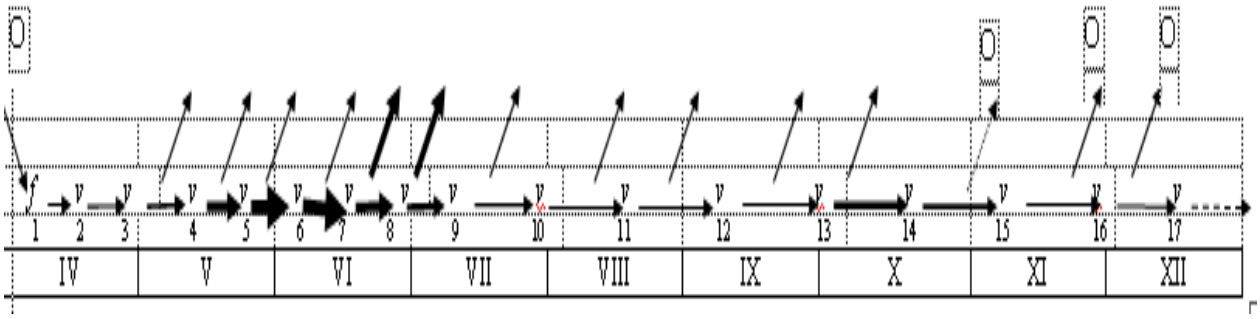

Figure **6. The life cycle of eriosoma lanigerum aphid in the apple plant.**

Explanation: o - overwintered eggs; f - founders; c - live reproductive aphids of winged and wingless females; O - the end of the life cycle; 1, 2, 3 ... - number of joints; III, IV ... -months; the degree of thickness of the lines represents the density of a certain amount of aphids and the length of the lines represents the time required for the development of joints.

(in "AgroElite" LLC of Kibray distr., in "Eko Agro Chroms" LLC, in "Dono Med Group" LLC, in PharmatexLLC, in Agro elif farm (26.11.20), In "Iskandar Ahad", "Kurbonali" agricultural farms in Urta Chirchiq distr., (28.11.20), "Alfiya-mevalari" LLC in Yangi-Yul distr., "Tinchlik havo grand" farm in Yukori-Chirchik (30.11.20), "Kahramon" farm in Akhangaran distr., (02.12.20), "Askarov Dilkhush bog'i" farm in Tashkent dirst. (04.12.20), "Premerover" farm in Pskent distr.(06.12.20)).

Briefly considering the ecological characteristics of Eriosoma lanigerium, we have witnessed that this species of aphids spread only through seedlings, despite the fact that it migrates from one place to another. If the apples in the garden are close together, the larvae shed on the ground can also climb on a neighboring tree and form a colony.

Taking into account the above, based on the results of the "Study of the main pests of orchards in Tashkent region", the following conclusion was drawn:

Coordinates of distribution of the main pests of seed orchards of Tashkent region were determined.

As a result of field research in the fall season orchards of Tashkent region the following pests were determined: 4 orders (Homoptera, Hemiptera, Acariformes Lepidoptera), 5 families (Aphidae, Diaspididae, Tingidae, Tetranychidae, Tortricidae) and 8 genera (Aphis, Lepidapia, Quadraspid, Quadraspidator) Stephanitus, Amphitetranychus Oud, Tetranychus, Cydia, Yponomeuta), a total of: 12 species of pests were identified.

Eriosoma lanigerum has been proven to be one of the main pests of seed orchards in Tashkent region, and its biology and distribution characteristics have been identified.

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