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BIOECOLOGY OF DEVELOPMENT OF CITRUS MOTH (PHYLLOCNISTIS CITRELLA) OF TASHKENT REGION

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Abstract:

This article provides information on the bioecology of the development of the citrus miner moth, which causes great harm to lemons and its development at different stages in the conditions of the Tashkent region.

Keywords: Lemon, moth, quarantine, citrus miner, harm, pest, egg, larva.

INTRODUCTION.

In recent years, the supply of citrus fruits in the greenhouses of the country has been expanding. These mainly include lemons, oranges, grapefruits, and mandarins. Since citrus trees require a subtropical climate, in our region they are grown in semi-basements and greenhouses. Due to the fact that citrus fruits contain trace elements necessary for the human body, the demand for them is growing. However, in addition to the fact that the cultivation of citrus trees has certain difficulties in our climate, they are also negatively affected by various pests of all seasons.

Citrus crops are infested with more than 30 pests. At present, the main goal is to grow new varieties of lemons resistant to pests. Worldwide, the loss of yield of lemons due to various pests has reached 10% [2].

It is important to develop a system of effective protection of citrus trees from pests in order to reduce the damage, so that the pest does not spread to other places. This requires the study of the seasonal development dynamics of the pest in the distributed area.

Citrus porous moth - Phyllocnistis citrella Stainton is an object of external quarantine in some countries and was first identified in the Republic in the 1990s. Today, Phyllocnistis citrella is found in almost all regions of Uzbekistan [8, 9, 10]. The citrus moth-forming moth is a very dangerous pest not only for lemons but also for mandarins, oranges, grapefruits, and other citrus crops [3, 4, 5].

To effectively protect the lemon plant from the citrus porous moth, it is first necessary to know the bioecological development characteristics of the pest.

The citrus pore-forming moth is an oligophagous species that is mainly adapted to infect citrus crops. The pest has been identified in lemons, oranges and grapefruits. Citrus porous moth infects citrus crops not only in the open field, but also in indoor greenhouses. Citrus porous moth is abundant in lemon crop areas mainly in June-July, causing damage to the plant until late autumn, when it settles on the back of the plant leaf [1, 6, 7].

Climatic conditions are of great importance in the development of the pest. It takes 38-45 days for one generation to develop. Butterflies are light-loving. They lay their eggs on the leaves. The larvae that hatch from the eggs enter the leaf and damage the parenchymal tissue of the leaf, leaving marks on the leaf during the damage, as a result of which the affected part of the leaf begins to dry out and the rope is deformed. If an obstacle is encountered in front of the larva moving between the leaves, it changes the direction of movement, so that snake-like lines appear on the surface of the leaf. During the rotation of the fungus, the pest stops moving, at which time the larva wraps around the leaf, turns red and turns into a fungus.

Weather is of great importance for the development of the citrus fungus-forming moth, mainly in June-July, when favorable conditions for the reproduction of this pest can be found in many lemon groves, and strong damage has been noted by many researchers. [11, 12]

SOIL AND CLIMATIC CONDITIONS OF THE STUDY AREA.

The experiments were carried out mainly in greenhouses in Tashkent region.

The average temperature in 2020, high temperature and soil temperature in January, February, March, April, May, June, July, August, September for the I-II-III decades were calculated and the average temperature in 2020 was summarized. According to the Boz-Suv meteorological station, the temperature in the region fluctuates sharply throughout the year. Humidity averages 51-58%. The highest temperature is 42°C and the lowest is -30°C. Annual precipitation is around 270-360 mm. The soils of the experimental fields were composed mainly of glacial soils.

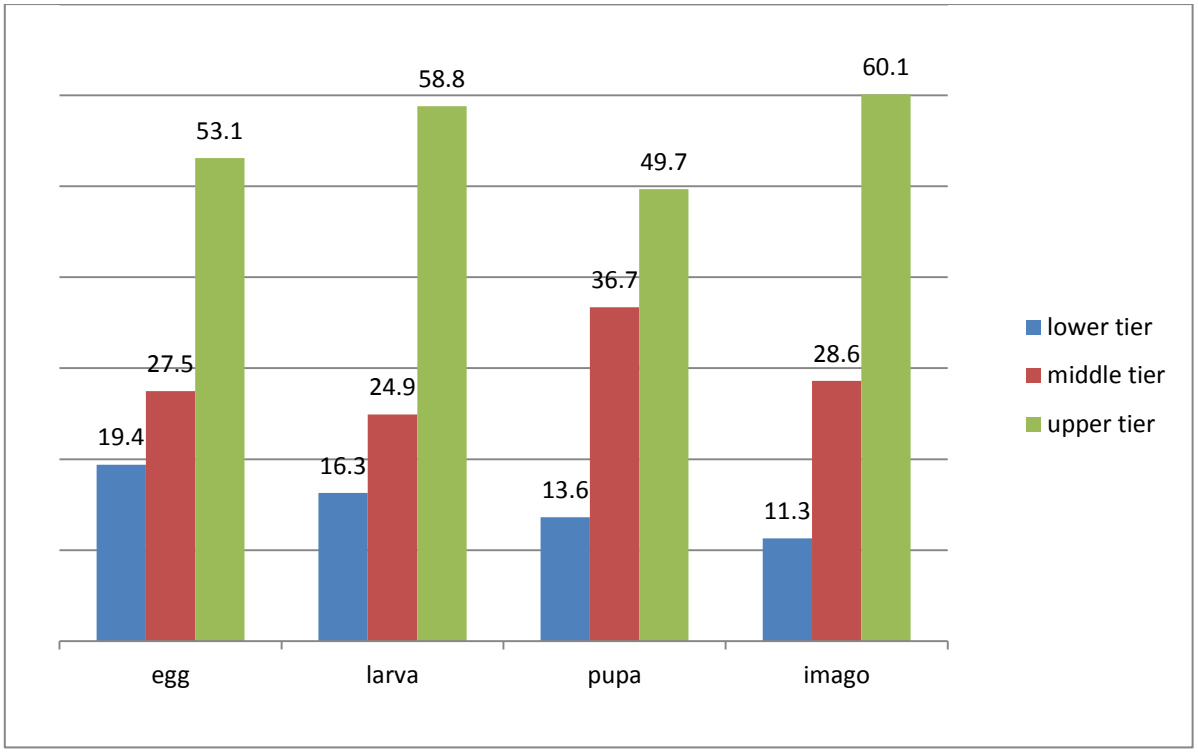
RESEARCH METHODS.

The number of citrus porous moths in the preimagonal period was calculated according to the method of A. C. Beattie, 1989. To do this, 100 lemon leaves are examined (in 3 tiers: bottom, middle and top). 2 out of every 5 lemon trees are sampled. When the number of pests is low, each lemon tree in the area is inspected and the total number of eggs, larvae, and fungi on 50 leaves in different tiers is counted using a magnifying glass.

RESEARCH RESULTS.

According to observations in greenhouses in Tashkent region, 53,1% of citrus moth-laying moth females lay their eggs in the upper tier of the lemon plant. 27,5% for the middle tier and 19,4% for the lower tier.

Larvae and fungi are more common in the upper tier of the plant – 58,8-49,7%, and less in the middle and lower tier – 24,9-16,3 and 36,7-13,6%. In the case of the imago, it is 60,1% in the upper tier, 28,6% in the middle tier and 11,3% in the lower tier. (Figure 1).



Amount of pest on plant layers,% (Fig. 1).

Larval development is completed in 15–20 days. During the rotation of the mushroom, the movement stops. At this time, the larva wraps around the leaf, turns into a fungus and turns red. The fungus is formed in 14-18 days.

Table 1

Embryonic development of an egg laid by a female pest (Kibray district, Tashkent region, 2020).

date	The average number of eggs laid, pcs	Embryonic development of eggs, day	The number of larvae hatched from the eggs	
			quantity	%
10.06	112,2 ± 0,8	7,62 ± 1,62	102,3 ± 1,6	91,2
12.07	110,5 ± 0,6	6,93 ± 1,82	100,2 ± 1,8	90,7
08.08	118,4 ± 1,2	7,34 ± 1,67	104,8 ± 1,2	88,5
average	113,7 ± 0,8	7,29 ± 1,70	104,4 ± 1,5	90,1

Observations were made on the development of eggs laid by citrus pore-forming moth female pests. During the observations, the average number of larvae hatched from the laid eggs was calculated. As a result, an average of 90.1% of larvae hatched from laid eggs. (Table 1).

During the study, the development of the citrus porous moth at different stages of development was observed from generation to generation. The development of the I and II generations of the citrus porous moth begins from the first decade of March to the third decade of May and lasts from 39,55 ± 2,44 to 40,32 ± 1,62 days.

The best time for the development of III-IV generations is from the first decade of June to the first decade of August. This phase lasts 36,08 ± 1,66- 35,61 ± 1,86 days.

In September-November, due to a sharp drop in temperature, the pest prolongs its development. The development period of generations V-VI-VII was correspondingly extended to 41,68; 38,24 and lasted 43,42 days (Table 2).

Table 2

The average duration of the development of porous moths at different stages in Qibray district of Tashkent region is 2020

Developmental stage	Duration of development I, VII generations, days						
	I	II	III	IV	V	VI	VII
Eggs	7,25 ± 1,12	6,66 ± 1,44	6,22 ± 1,88	6,36 ± 1,10	6,12 ± 1,23	6,34 ± 1,34	7,12 ± 2,12
Larva	17,18 + 1,34	18,34 ± 1,80	16,44 ± 2,12	15,14 ± 0,86	16,82 + 0,64	16,22 ± 1,36	20,16 ± 1,86
Pupa	15,12 ± 2,22	15,32 ± 1,68	14,42 ± 1,38	14,11 ± 2,44	18,74 ± 2,42	15,68 ± 0,86	16,14 ± 2,12
By general generation	39,55 ± 2,44	40,32 ± 1,62	36,08 ± 1,66	35,61 ± 1,86	41,68 ± 2,12	38,24 ± 2,46	43,42 ± 2,36

As mentioned above, the porous moth poses a great threat to lemon yields. In this regard, to assess the economic significance of this pest in the context of Tashkent region, it is necessary to study the dynamics of its development. Observations have shown that the phenology of the porous moth in lemons is closely related to the phenophase of the plant it feeds on.

During the observations, it was observed that the butterfly moths, which form pores, fly out in early March. The mass flight of butterflies coincided with the period of mass germination of lemons, that is, in late March and early May. Laying of eggs began in the second decade of March. Maximum egg laying was observed in mid-June. The highest number of worms was observed in July, during the period of mass development of lemons.

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