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USE OF THE LACEWING ENTOMOPHAGE (*Chrysopa Septempunctata*) AGAINST SUCKING PESTS IN THE ALMOND BIOCENOSIS AND DETERMINING ITS BIOLOGICAL EFFECTIVENESS

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Abstract

This article presents scientific research on the use and determination of the biological effectiveness of the lacewing entomophage (*Chrysopa septempunctata*) against the spider mite pest (*Tetranychus urticae* Koch.), found in the almond biocenosis of the Fergana Valley during 2022-2024. When using the lacewing entomophage against spider mites at a 1:5 ratio, the biological effectiveness was 52.5% on day 7, 61.8% on day 9, and 72.5% on day 11; 43.5% on day 7, 50.2% on day 9, and 68.3% on day 11; 41.4% on day 7, 48.3% on day 9, and 51.6% on day 11.

Keywords: Biocenosis, almond, pest, entomophage, biological effectiveness, *Tetranychus urticae*, *Chrysopa septempunctata*, study, results.

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ПРИМЕНЕНИЕ ЭНТОМОФАГА ЗЛАТОГЛАЗКИ (*Chrysopa septempunctata*) ПРОТИВ СОСУЩИХ ВРЕДИТЕЛЕЙ В БИОЦЕНОЗЕ МИНДАЛЯ И ОПРЕДЕЛЕНИЕ ЕГО БИОЛОГИЧЕСКОЙ ЭФФЕКТИВНОСТИ

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Аннотация:

В статье представлены научные исследования по применению и определению биологической эффективности энтомофага златоглазки (*Chrysopa septempunctata*) против вредителя паутинного клеща (*Tetranychus urticae* Koch.), встречающегося в биоценозе миндаля Ферганской долины в течение 2022-2024 гг. При применении энтомофага златоглазки против паутинного клеща в соотношении 1:5 биологическая эффективность составила 52,5% на 7 сутки, 61,8% на 9 сутки и 72,5% на 11 сутки, 43,5% на 7 сутки, 50,2% на 9 сутки и 68,3% на 11 сутки, 41,4% на 7 сутки, 48,3% на 9 сутки и 51,6% на 11 сутки.

Ключевые слова: Биоценоз, миндаль, вредитель, энтомофаг, биологическая эффективность, *Tetranychus urticae*, *Chrysopa septempunctata*, исследование, результат.

Introduction

The peach aphid (*Myzodes persicae*), widespread in the almond biocenosis, is a major sucking pest. This pest is also common on apricots, peaches, and almonds. Peach aphids cover plant leaves, fouling them, absorbing leaf sap, and altering their color and shape. As a result, severely damaged trees drop their fruit, and in some cases, the fruit's shape is altered.

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The aforementioned scientific studies have shown that this pest is widespread in the Fergana Valley and causes significant economic damage to peaches, apricots, cherries, almonds, and a number of other stone fruit trees.

In our research, we used the entomophagous lacewing against this pest and achieved high biological effectiveness. The main part of the research was conducted at the Kuva Scientific and Practical Center for the Development of Household Plots (Household Service) LLC in the Kuva District of the Fergana Region on a 10-hectare plot where the peach aphid (*Myzodes persicae*) was identified, infecting almond seedlings of the "Shirin mağiz" variety. It was found that, on average, one hectare of the study area contained up to 16+2 peach aphids per almond leaf.

Table 1 Use of the lacewing entomophage (*Chrysopa septempunctata*) against the peach aphid (*Myzodes persicae*) in almond biocenosis and determination of biological effectiveness. (Garden area of the Kuva Scientific and Practical Center for the Development of Household Land Plots LLC, Kuva District, Fergana Region, 10 hectares, 2022-2024.)

Options	Number of aphids, pcs.		Biological efficiency by days, %.		
	In one sheet	Average in one modular tree	7.	9.	11.
Predator: Aphid 1:5	11,4±02	1124,2±0.04	64.7	72.5	81.8
Predator: Aphid 1:11	16,5±08	1542,6±0.03	58.6	65.3	70.4
Predator: Aphid 1:15	14,8±04	1396,3±0.06	46.5	57.4	65.2
Control	15,2±06	1487,4±0.05	-	-	-
Medium			45,6	65,0	72,4

During the experiments, the average air temperature was +24±2°C, and the relative humidity was 60±2%. The entomophage lacewing was applied to five modular trees covering an area of 1 hectare using special cloths during the egg stage. The entomophage was distributed across the modular tree at ratios of 1:5,

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1:10, and 1:15, and the average number of aphids was calculated. The biological effectiveness of the entomophages was calculated every 3 days (Table 5.3).

In the studies, the distance between each modular tree was set at 50 meters, and the modular trees were surrounded by an entomological net.

It should be noted that the average age of the isolated modular trees was 4-5 years, as it was difficult to wrap the modular trees with entomological netting. Therefore, when we controlled sucking pests in the almond biocenosis, we primarily selected 4-5-year-old almond trees.

According to this, in our first treatment, when applying the entomophagous lacewing against the peach aphid at a 1:5 (predator:host) ratio, the biological effectiveness was 64.7% on day 7, 72.5% on day 9, and 81.8% on day 11. In the second treatment, the biological effectiveness was 65.3% after 7 days, 65.3% after 9 days, and 70.4% after 11 days.

Table 5.4.

Use of the lacewing entomophage (*Chrysopa septempunctata*) against the spider mite pest (*Tetranychus urticae* Koch.) in almond biocenosis and determination of its biological effectiveness. (Kuva Scientific and Practical Center for the Development of Household Plots, Household Service, Kuva District, Fergana Region, almond orchard area: 10 hectares, 2022-2024)

Experimental variant and spider mite offspring ratio, pcs.	Average number of spider mites per leaf, pcs.				Spider mite infestation, % per day.		
	before applying lacewings, pcs.	offspring of spider mites infected with lacewing, by days, pcs.			7.	9.	11.
		7.	9.	11.			
predator: spider mite 1:5	15,2±0,4	8,4±0,8	6,5±0,2	4,9±0,3	52,5±0,2	61,8±0,4	72,5±0,2
predator: spider mite 1:10	16,3±0,2	10,5±0,2	8,4±0,5	6,8±0,4	43,5±0,4	50,2±0,3	68,3±0,6
predator: spider mite 1:15	15,8±0,5	11,7±0,3	9,7±0,3	8,2±0,7	41,4±0,8	48,3±0,6	51,6±0,3
Average	15,7±0,3	10,2±0,4	8,2±0,3	6,6±0,4	45,8±0,4	53,4±0,4	64,1±0,3
Control	13,7	-	-	-	-	-	-
	15,3	-	-	-	-	-	-
	14,8	-	-	-	-	-	-

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In our third variant, using the lacewing entomophage against the pest at a ratio of 1:20, the biological effectiveness was 46.5% on day 7, 57.4% on day 9, and 65.2% on day 11. The average biological effectiveness was determined on day 11 at 72.4%.

The entomofauna of the Fergana Valley is very extensive, and there are various entomophages of pests found in the almond biocenosis. One of the sucking pests in the almond biocenosis that causes significant economic damage is the spider mite (*Tetranychus urticae* Koh.). To expand our laboratory research against the spider mite (*Tetranychus urticae* Koch.), we conducted studies on the use and biological effectiveness of lacewing progeny bred on a new generation of lacewing against the spider mite (*Tetranychus urticae* Koch.). Our research was conducted at the Kuva Scientific and Practical Center for the Development of Household Plots (Household Service) LLC in the Kuva District of the Fergana Region on 2 hectares of a 10-hectare almond orchard allocated for this experiment and infested with spider mites. The total number of almond seedlings in our experimental plot was 365 bushes per 2 hectares. These experiments were conducted on both small and large plots, and average values were calculated. It was found that, on average, each almond leaf harbors 15-16 generations of spider mites.

Conclusion

After applying the lacewing entomophage against the spider mite pest (*Tetranychus urticae* Koch.), observations were conducted every 3 days, the results were calculated, and their average value was presented. The experiments were conducted for 7-9-11 days, and the obtained results were calculated. The average daily temperature during the study period was $+28.2 \pm 2^\circ\text{C}$, and the average relative humidity was $61 \pm 2\%$.

The first observations began 7 days after applying the lacewing entomophage against the spider mite at a 1:5 ratio in the almond biocenosis. Accordingly, the

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biological effectiveness was 52.5% after 7 days, 61.8% after 9 days, and 72.5% after 11 days. In the second variant, when applied at a ratio of 1:10 against spider mites, the biological effectiveness was 43.5% on day 7, 50.2% on day 9, and 68.3% on day 11, and in the third variant, when applied at a ratio of 1:15, the biological effectiveness was 41.4% on day 7, 48.3% on day 9, and 51.6% on day 11. The average biological effectiveness was 45.8% on day 7, 53.4% on day 9, and 64.1% on day 11.

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