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BIOLOGICAL EFFECTIVENESS OF PREPARATIONS USED AGAINST VIRGINIAN JUNIPER APHIDS

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Abstract
This article analyzes the biological effectiveness of several chemical preparations (Confidor 20% e.c., Bi-58 (new) 40% e.c., Enjeo 24.7% e.c., and Bagira 20% e.c.) applied at different dosage rates against aphid pests (Pterochloroides persicae, Chaitophorus populeti, Sacchiphantes viridis) identified on virgin fir trees cultivated in Tashkent city and Tashkent region.

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Keywords: Virginian juniper, Forest conservation, aphid pests, chemical preparations, biological effectiveness.

Introduction

In recent years, one of the key solutions to improving the difficult environmental situation has been the expansion of green areas and the increase of forest resources. In this regard, the "Uzbekistan – 2030" strategy outlines plan to expand forest-covered areas in the country to 6.1 million hectares and to increase the production of tree and shrub seeds to 840 tons. The forest fund lands in our country have expanded by 1 million hectares, reaching a total of 11.9 million hectares, which constitutes 26.4% of the country's total land area. Out of this, 5.3 million hectares are covered with forest vegetation. Of the 3.5 million hectares of forested land, 2.2 million hectares are natural forests, while 1.2 million hectares are cultivated forests. In 2023, the Forestry Agency carried out afforestation and reforestation activities on 235,000 hectares. Additionally, 7,012 hectares of unused forest fund land were reclaimed and put into use.

Nowadays, due to the rapid acceleration of urbanization, the increase in industrial waste, and climate change, the ecological importance of green spaces, especially ornamental trees and shrubs, is steadily increasing. Among the ornamental trees planted in cities and their surrounding areas, virgin juniper (Juniperus virginiana) is widely used. This plant stands out not only for its aesthetic appearance but also for its ecological functions, such as trapping dust and gases and purifying the air. Recently, various aphid pests, including Pterochloroides persicae, Chaitophorus populeti, and Sacchiphantes viridis, have widely spread on virgin junipers, causing significant damage to their growth and development. Effective control of these pests is of great importance for forest management and the preservation of ornamental tree plantations.

The studies determined the level of damage caused by aphids on virgin junipers and examined the effectiveness of promising chemical preparations.

The research was conducted using all the methods and techniques widely employed in general entomology and agricultural entomology. The assessment of

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insect damage was based on the works of V.I.Tanskiy; the species composition and economic significance of pests were studied according to K.M.Valiyev, A.I.Vanin, A.I.Ilinskiy, I.V.Tropin, and Ye.G. Mozolevskiy. Agro-toxicological experiments involving commonly accepted insecticides, acaricides, biologically active substances, and fungicides were carried out following the methodology of Sh.T.Khodjaev. The biological efficacy results of the experiments were calculated according to the W.S.Abbott formula.

An inspection of fir trees cultivated and maintained in the Yakkasaroy district of Tashkent city and Qibray district of Tashkent region revealed that the trees were infested by three species of aphids. These are the large peach twig aphid (Pterochloroides persicae Chol.), the poplar aphid (Chaitophorus populeti L.), and the green pine aphid (Sacchiphantes viridis Rtzb.). As a result of the damage caused by these pests, the leaves of the trees were observed to yellow, darken, and fall off. Several long-acting protective agents were tested for control, yielding the following results.

The preparations Confidor 20% e.c. (0.2–0.3 l/ha), Bi-58 (new) 40% e.c. (1.5–2.0 l/ha), and Enjeo 24.7% e.c. (0.3–0.4 l/ha) were tested at two different dosage rates compared to the control. According to the results, the tested preparations showed almost the same high level of effectiveness. Specifically, Confidor 20% e.c. applied at 0.2 l/ha showed biological efficacy of 66.4–73.9% compared to the control during days 3 to 7, and 87.6% on day 14. When applied at 0.3 l/ha, it demonstrated 69.7% efficacy on day 3, and an average of 84.7–94.5% between days 7 and 14. Bi-58 (New) 40% e.c. at 1.5 l/ha exhibited 68.0–82.6% efficacy during days 3 to 7, and 88.7% on day 14. At 2.0 l/ha, it showed 69.4% efficacy on day 3, and an average of 89.4–99.8% between days 7 and 14. Enjeo 24.7% e.c. applied at 0.3 l/ha showed 68.6–85.5% efficacy during days 3 to 7, and 93.0% on day 14. At 0.4 l/ha, it demonstrated 77.4% efficacy on day 3, and an average of 92.1–97.4% between days 7 and 14 (Table 1).

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Table 1 Effect of Chemical Preparations Against Aphids on Virgin Juniper
(Tashkent City, Yakkasaroy District, Hamid Sulaymonov Street, 2025)

Variants (preparation names)	Dose, l (kg)/ha	Average number of pests per 10 cm shoot				Biological efficacy by days (%)		
		Before spraying	After spraying by days					
			3	7	14	3	7	14
Control (untreated)	-	13,2	14,4	15,1	15,4	-	-	-
Confidor, 20% e.c.	0,2	10,4	3,8	3,1	1,5	66,4	73,9	87,6
	0,3	10,9	3,6	1,9	0,7	69,7	84,7	94,5
Bi-58 (New), 40% e.c.	1,5	10,6	3,7	2,1	1,4	68,0	82,6	88,7
	2,0	9,9	3,3	1,2	0,2	69,4	89,4	99,8
Enjeo, 24,7% e.c.	0,3	38,0	13,0	6,3	3,1	68,6	85,5	93,0
	0,4	63,4	15,6	5,7	2,4	77,4	92,1	97,4
Bagira, 20% e.c. (template)	0,3	31,8	8,3	3,9	1,8	76,1	89,3	95,1
$LSD_{05=}$						1,0	2,11	0,7

When used as a template variant, the chemical preparation Bagira 20% e.c. at a dosage of 0.3 l/ha showed biological effectiveness ranging from 76.1% to 89.3% on days 3 to 7, and 95.1% on day 14 compared to the control.

Conclusion

To combat aphids on virgin firs, it is advisable to apply the following preparations at the recommended rates: Confidor 20% e.c. (0.2–0.3 l/ha), Bi-58 (New) 40% e.c. (1.5–2.0 l/ha), and Enjeo 24.7% e.c. (0.3–0.4 l/ha).

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