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## **THE EFFECT OF POLLINATING INSECTS ON SEED GERMINATION IN FERULA DSHIZAKENSIS KOROVINA**

<sup>1</sup>Usanov U. N.

<sup>1</sup>Khalimov F. Z.

<sup>2</sup>Umirov N. U

<sup>1</sup>Samarkand state university, Samarkand, Uzbekistan

<sup>2</sup>Jizzakh state pedagogical university, Jizzakh, Uzbekistan

### **Abstract**

The article analyzes the influence of pollinating insects on seed productivity of the species *Ferula dshizakensis* Korovin, which belongs to the genus *Ferula* Lindl. It was found that seed productivity of plants protected from insects by fine-mesh material was 23% lower in the species *Ferula dshizakensis* Korovin.

**Keywords:** *Ferula dshizakensis* Korovin parakladium, umbel, umbelium, seed yield, pollinators.

### **Introduction**

It is known that Uzbekistan is rich in medicinal plants, and interest in them has been high since ancient times. In our republic, more than 750 species of plants with medicinal properties are found in scientific medicine and folk medicine. Among them, the most numerous are 119 species belonging to 57 genera belonging to the *Apiaceae* L. family. Currently, it is important to cultivate these plants on an industrial scale, determine their natural reserves and study the factors affecting their number [1].

There are 180-185 species of the genus *Ferula* Lindl. on Earth, 106 species in the CIS countries, 105 species in Central Asia, 48 species in Uzbekistan, more than 50 in Western Tian-Shan, about 60 species in the Pamir-Alay range, and 33 species in the Western Pamir-Alay range [2].

*Ferula dshizakensis* Korovin is a polycarpic plant. The root is cylindrical. The root neck is fibrous and contains last year's leaf remains. The stem is thin, strong, the joints are slightly expanded, the upper part is sparsely branched, up to 30 cm long,



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the upper branches are collected in several places. The umbel is various, the end is almost sessile, 5-10 rays, up to 4.0 cm long, the adjacent ones have 1-3 long bands, the umbels are 10-flowered, the bracts are yellow, oval [3].

*Ferula dshizakensis* grows on rocky and gravelly mountain slopes and in rock crevices at an altitude of 800-1500 m above sea level. It flowers in May-June and fruits in June-July [4].

Several studies have been conducted to identify insects that are trophically associated with members of the genus *Ferula* [5,6,7,8]. The most recent studies revealed that the entomofauna of the *Ferula kuhistanica* species includes 95 species belonging to 8 orders, 48 families, and 85 genera [9], of which 37 species belonging to 4 orders and 17 families of pollinating insects were recorded [10], but no specific studies have been conducted to determine the impact of pollinating insects on seed productivity.

### Material and methodology:

Studies on *Ferula dshizakensis* were conducted in the spring and summer of 2025 in the northwestern part of the Malguzar Range - around the Amir Temur Gate at an altitude of 400-500 m above sea level (40°04'28"N 67°41'54"E). For the study, 10 bushes of the *Ferula dshizakensis* species growing in the area were covered with fine mesh material before the flowering period to protect the plant flowers from pollinating insects (Figure 1).



**Figure 1. *Ferula dshizakensis* is surrounded by fine mesh material to protect it from pollinating insects.**

After the germination period, fine mesh material was removed from the experimental plants and the seeds from each plant were placed in separate containers. For comparison, seeds from plant bushes in the same area that were not protected by fine mesh material were also taken into separate containers. Biometric indicators of each plant bush (number of paracladia, number of seeds with umbels and umbels) were determined.

### **Analysis and Conclusion:**

In an experiment conducted in 2025 on the species *Ferula dshizakensis*, the average height of plant bushes protected from insects with fine mesh materials was 47 cm, the average number of paracladia was 9, and the average number of seeds was 183 (Table 1).

**Table 1 Seed productivity indicators of *Ferula dshizakensis* when protected from insects with fine mesh material n=10**

Plant bushes protected with fine mesh material (number)	Plant height (cm)	Number of paracladia (pcs)	Number of seeds (pcs)
1	38	8	174
2	48	9	181
3	46	9	186
4	54	10	190
5	50	9	184
6	42	8	177
7	52	9	180
8	50	9	192
9	47	8	179
10	44	9	188
<b>Average</b>	<b>47</b>	<b>9</b>	<b>183</b>

In plants not protected from insects by fine mesh material, the average height of the bushes was 47 cm, the average number of paracladia was 9, and the average number of seeds was 236 (Table 2).

**Table 2 Seed productivity in *Ferula dshizakensis* without insect protection with fine mesh material n=10**

Plant bushes protected with fine mesh material (number)	Plant height (cm)	Number of paracladia (pcs)	Number of seeds (pcs)
1	52	9	250
2	50	9	245
3	49	8	234

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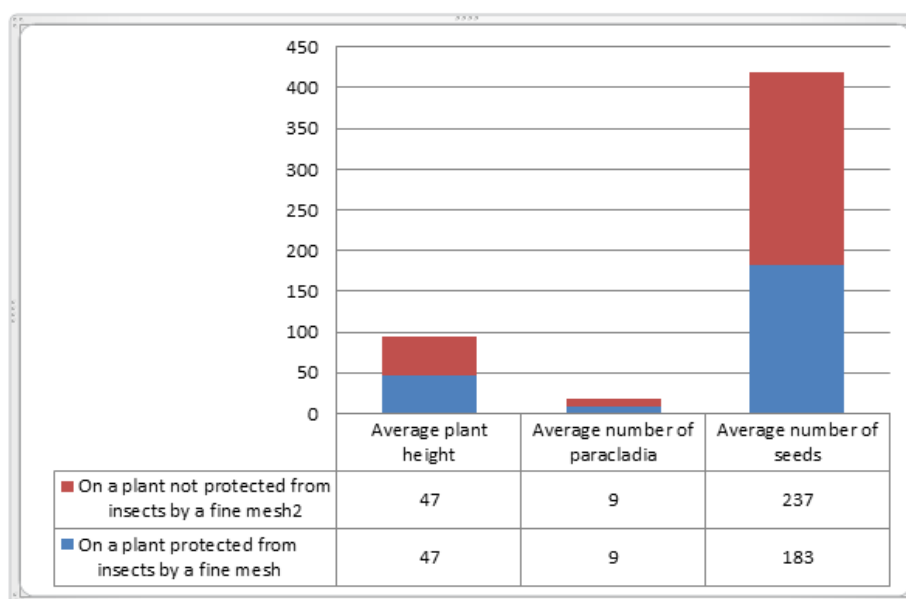
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4	54	10	248
5	48	9	230
6	44	8	225
7	47	9	242
8	46	8	220
9	40	9	241
10	42	8	236
<b>O'rtacha</b>	<b>47</b>	<b>9</b>	<b>237</b>

In the species *Ferula dshizakensis*, the average height of the plants protected from insects with fine mesh material and those not protected was 47 cm, and the average number of paracladia was 9 in both. However, it was found that the average number of seeds in the plants protected with fine mesh material differed by 53 from the plants not protected with fine mesh material (Figure 2).



**Figure 2. Comparative analysis of seed productivity indicators in *Ferula dshizakensis* with and without insect protection with fine mesh material**

In conclusion, according to the results of the experiment conducted on the species *Ferula dshizakensis*, it was found that the average number of seeds was 23% lower in plants protected from insects with fine mesh material. Thus, it was found that





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pollinating insects increase the amount of seed formation in the plant *Ferula samarkandica* by 29% and *Ferula dshizakensis* by 23%.

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