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Efficiency of the Use of the Preparation Gumimax in Silk Breeding

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Annotation. This article presents the results of a study on the treatment of mulberry trees with the modern drug Gumimax Silkworm and the feeding of silkworms with these leaves. The conclusions on the positive effect of this drug on the biological and productivity indicators of silkworm have been raised. In particular, it was found that the mass of the silkworm increased by 3,1-4,5 g in the experimental variants compared to the control, the viability of the worms fed with the test preparation was higher by 10,6 % compared to the control variant, it is known that the number of healthy cocoons is 8-12 % higher than in the control. It was also found that the mass of one cocoon is 0,8-1,5 g heavier than the control in the experimental variants, there were no signs of poisoning, the occurrence of diseases and a lag in the development of the silkworm. It should be noted that as a result of the treatment of mulberry trees with the investigated "Gumimax" - a double-acting drug, the amount of substances necessary for the growth and development of silkworms in the composition of the leaves increases, and the quality of the leaves increases due to the acceleration of the photosynthesis process, which in turn indicates food satiety and acceleration of the metabolic process in the body of the silkworm, i.e., about improving the digestibility, digestibility of feed.

Keywords: silkworm, caterpillar, mulberry tree, biological indicator, productivity, cocoon, cocoon shell, amount of silk, cocoon density, silkiness.

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The development of sericulture in the republic has an ancient and extremely interesting history, for example, there is evidence that the practice of spinning silk existed in the Fergana Valley in the south of Uzbekistan, as well as at the source of the Zarafshan River, 4000 years ago. These rich traditions, climate, population density, and the abundance of labor resources in the villages make this land a promising area for investment [1, p. 6-8].

Uzbekistan ranks third in the world in the production of silk raw materials and accounts for about 2% of the world's production. Thanks to the reforms implemented in the last five years, the silk industry in Uzbekistan has developed rapidly. In 2016-2020, the production of silk fabrics increased 4 times, the export of silk products increased 3,5 times, and the export of silk fabrics increased 50 times, which in turn ensured that Uzbekistan took the 6th place in the world [7, p. 4-5].

Increasing the fodder base of the silk industry, as well as increasing the production volume of exportable products a program of measures to increase the size of silk weaving and mulberry plantations,

In order to improve the quality of silkworm cocoons, treatment of mulberry trees with "Gumimax" biostimulator, and thus research on the effect of biological and productivity indicators of silkworms is important.

The amount and quality of feed given to livestock, including mulberry silkworms, plays a major role in obtaining a high yield. The fact that the mulberry silkworm is monophagous, which means that it feeds only on the leaves of the mulberry tree, requires extensive scientific research on the mulberry tree. Because the feed is nutritious and fertile (in sufficient quantity), silkworm breeds and hybrids show their genetic potential to the maximum [14; 235-239], [15; 1-7].

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The origin of the hybrid seeds prepared in the cultivation of industrial cocoons and the pure silkworm breeds involved in their creation are also of great importance [6; 8-10], [4; 40-41], [11; 67-69]. Industrial hybrids "Golden Valley 1" and "Golden Valley 2" created by scientists produce 75-80 kg of cocoons from one box of worms. Also, the performance and technological characteristics of the newly acquired Line 27 and Line 28 systems are excellent.

[18; 72-75 p.] recommended the production of new "Musaffo tola 1" and "Musaffo tola 2" hybrids of mulberry silkworm with high cocoon and silk yield and thin fiber for industrial cocoon cultivation. The author emphasizes that for these hybrids, new varieties of mulberry with high nutrition and high content of crude protein are needed, because good mulberry varieties are needed for good viability of hybrids with a high percentage of raw silk from the cocoon.

[2, p.101-107], [3; p.40-41], [17; p. 423-427], [18; p.181-187] have found that the growth of the silkworm is largely dependent on quality food. It is noted that the amount and quality of food determines the transition of worms from one age to another, and the worms grow to a normal size.

Information on the nutritional composition of mulberry leaves, the effect of new promising mulberry cultivars on the dynamics of silkworm growth, the effect on silkworm viability and technological parameters was based on these experiments [16;119-130], [19; 242-244].

[10; 157-161 p.] evaluated nine promising mulberry cultivars by rearing two silkworm hybrids. The feeding experiment revealed that ASS-143 and ASS-203 were superior to other varieties and all economic traits of cocoons were good. It is also noted that ASS-143 and ASS-203 performed significantly better than other cultivars even in repeated worming seasons [12; 65-67] [13; 19-22].

The valuable characteristics and chemical composition of the leaves of the new control varieties "Markhamat", "Mustaqillik-2018", "Jarariq-12" and "Tajik seedless " created by the employees of the Silk Industry Institute were analyzed in the spring and summer seasons. In this, leaf area, weight and nitrogen, protein, ash, polyprenols, vitamin E, as well as nutritional properties of mulberry varieties were evaluated for each variety, and recommendations were given for the introduction of these varieties into production in farm conditions specialized for silkworm feeding [5, p. 151-155.], [9, p. 74-82].

In [9, p. 46-47] researches, Line-27, Line-28, Line-101, Line-205 systems of mulberry silkworm selection were cultivated with leaves of newly created mulberry varieties and as a result found that the dynamics of silkworm growth depended on mulberry tree varieties.

[12; p. 65-67] conducted research on ten breeds to evaluate the variability, heritability and genetic development of 9 different quantitative traits of silkworm. Wide variation was observed for most traits, and the majority of total phenotypic variation was genetic in nature. The significant variability, high heritability observed in this study was evident in fiber length, adult larval weight, total number and weight of eggs laid by a single female butterfly.

[13; p. 19-22], genotypic variability and correlation coefficients were studied in six egg productivity traits of 27 different multivoltine breeds of mulberry silkworm. All the characters studied in the genotype are considered very important. The least difference between genotypic and phenotypic coefficient of variation was observed.

[17; pp. 423-427], [19; pp. 181-187] conducted scientific experiments by mixing different amounts of mulberry leaf powder in the composition to create an artificial feed suitable for feeding silkworms. The authors were told that 38% mulberry leaf powder is the optimal feed. They also found that silkworm breeds adapted to artificial feed in the 9th generation (78-80 % viability) and hybrids adapted well in the 12th generation (85-90 % viability) and the worms' viability was high.

Research material and methodology

"Pioneer" mulberry trees were sprayed, and after 15 days, mulberry silkworm Ipakchi 1 x Ipakchi 2 hybrid worms were fed from the age of 3. In this process, silkworms were weighed daily (Fig. 1), the number of pupae was counted, cocoon development was observed, and cocoon biological and productivity parameters were determined (Table 1).

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Figure 1. Weight of 50 worms 4-5 ages treated with drug-treated leaves

As can be clearly seen from the above histogram, the average weight of 4- and 5-year-old silkworms fed on leaves treated with the studied drug was found to be higher than that of the control variant. It was found that the weight of 50 worms in the 1st variant increased by 1,8-3,0 g compared to the comparator in the 4th year and by 11,4-16,7 g in the 5th year. If we analyze these indicators in depth, it was found that the weight of 1 worm at the 4th year is 0,04-0,06 grams more than the comparison and the weight of 1 worm at the 5th year is much higher by 0,3-0,4 g.

Indicators such as viability, weight of 1 cocoon, weight of cocoon shell, silkiness of silkworms fed with Gumimax preparation were also studied.

Table 1
Biological and productivity averages of Silkworm

S/n	Options	The viability of worms, %	Weight of 1 cocoon, g	Cocoon weight, mg	Silkiness, %
1	Option 1 (30 g of the drug in 20 l dissolved in water)	93,3±2,90 **Pd=0,999**	1,73±0,04 **Pd=0,998**	398,0±0,22 **Pd=0,980**	22,1±1,01 **Pd=0,870**
2	Option 1 (50 g of the drug in 20 l dissolved in water	94,7±3,08 **Pd=0,999**	1,77±0,02 **Pd=0,999**	407,3±0,41 **Pd=0,999**	22,9±1,88 **Pd=0,960**
3	Comparator (with succulent leaf)	89,2±4,11	1,58±0,10	375,7±0,82	21,0±0,88

As can be seen from the obtained results, the highest indicator of worm viability was observed in option 2 (94,7%) and the heaviest cocoons were also observed in option 2 (1,77 g). It was observed that the index of silkiness, which is important for us, is equal to 22,9% in option 2. The lowest indicator of silkiness was equal to (21,0%) in the comparative variant.

Also, special attention was paid to the influence of processed leaves on the silkworm and the quality of the final product, i.e. silk fibers

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Table 2
Cocoon values

S/n	Options	The average thickness of the cocoon shell, mm	The average density of the cocoon shell, mm
1	Option 1 (30 g of the drug in 20 l dissolved in water)	0,80	0,35
2	Option 1 (50 g of the drug in 20 l dissolved in water	0,78	0,33
3	Comparator (with succulent leaf)	0,62	0,31

The average thickness of the silkworm cocoon was 0,80 and 0,78 mm in the experimental variants, and 0,62 mm in the 3 variants (control). In the control, the amount of silk in the shell of cocoons is less by 0,18 and 0,16 mm. The density of the cocoon shell is an indicator that expresses the weight of the cocoon shell corresponding to a certain volume. Cocoon shell density values and non-linearity in density were determined.

According to the results of the experiment, compared to untreated hybrid cocoons, worms fed with leaves treated with "Gumimax" had silkiness of cocoons by 10%, thread length by 21,6%, continuous length by 7%, and the occurrence of fibrous waste by 13,3% confirmed to be less than. That is, it can be clearly seen that the quality of silkworm cocoons that have eaten treated tree leaves is higher.

It should be noted separately that no signs of poisoning, disease, or retardation of worms development were observed in the process of silkworm care until cocoon wrapping. This, in turn, can be considered as a sign that Gumimax has a stimulating, i.e. refreshing, property.

In conclusion, it can be said that as a result of treatment of mulberry trees with this researched "Gumimax" - a double strong drug, the amount of substances necessary for the growth and development of silkworms in the composition of the leaves increases, and the quality of the leaves increases due to the acceleration of the photosynthesis process, which in turn indicates the satiety of the feed and the acceleration of the metabolic process in the silkworm's body, that is, the improvement of the digestibility of the feed. Studies have shown that worms fed on treated leaves have an effective effect on biological and productivity indicators.

Summary

1. It was found that the weight of silkworms increased by 3,1-4,5 g in the experimental variants compared to the control.
2. The viability of worms fed with the researched drug was 10,6% higher than the control version.
3. It was found that the number of healthy cocoons was 8-12 % higher than the control.
4. It was found that the weight of one cocoon was 0,8-1,5 g heavier in the experimental variants compared to the control.
5. No signs of poisoning, disease, or retardation were observed during the development of the silkworm.

Based on the above, it can be concluded that "Gumimax" biostimulant affects the good development of mulberry leaves, expands the food base for silkworms, and has a positive effect on the quality of silk. It has been scientifically confirmed.

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