

A METHOD FOR PRESERVING THE POPULATION OF SILKWORM CATERPILLARS IN THE EVENT OF SEASONAL FROSTS

Abdrimova Gulbahor Erimmatovna

Associate Professor, Head of the Department of Sericulture,
Karakalpak Institute of Agriculture and Agricultural Technologies

Oripov Otabek Oripovich

Doctoral Student DSc, Scientific Research
Institute of Sericulture, Scientific Research Institute

Eltaeva Aigerim Azat kizi

2nd Year Student of the Karakalpak
Institute of Agriculture and Agricultural Technologies

ABSTRACT

Collecting, packing and storing a mulberry leaf in sealed cellophane bags of 40x50 cm in size of 2.5-3 kg of feed at a temperature of +2-+4°C, and then feeding the caterpillars of the first two ages with this leaf in packages under a wet cover 2 times a day helps to preserve the population of silkworm caterpillars.

Global climate change around the world poses all agricultural workers, including silkworm breeders, with the need to look for ways to preserve the crops grown, the number of animals, and plant diversity [1], [2], [3], [4]. In addition, the subcontinental climate of Uzbekistan is characterized by sharp changes in seasonal and daily temperatures and almost annual early spring frosts. It is in early spring that widespread incubation of grenades and feeding of silkworm caterpillars begins. Therefore, finding a way to preserve the caterpillar population in the event of extreme conditions is an economically important and urgent task.

The work was carried out in 2021, 2022, 2023 in the laboratory of genetics and selection of silkworms at the Research Institute of Silkworms. The experiments used silkworm hybrids from sex-marked breeds at the grena and caterpillar stages: S-13, S-14, Marked 1, Marked 2, as well as the parthenogenetic clone 9PK. These breeds have serious genetic changes in their genomes, resulting from high doses of X-ray irradiation and thermal activation of the grena for parthenogenetic development. These breeds were not chosen for the experiments by chance. If genetically modified breeds normally tolerate the new method of feeding caterpillars, then we can expect that the traditional breeds for Uzbekistan can be fed using the new technology without loss.

In early spring, mulberry leaves of varietal trees were collected in advance and packaged in plastic bags measuring 40-50 cm, 2.5-3.0 kg of leaf in each and placed in a refrigerator at $t_0 = 2-4^{\circ}\text{C}$. The revived caterpillars were placed in perforated parchment bags under a damp cover and fed 2 times a day with crushed mulberry leaves stored in the refrigerator.

Table 1 shows the biological indicators of hybrids fed until the 3rd age with a leaf from the refrigerator, prepared in advance. The control hybrid Asaka x Markhamat was fed with a regular leaf.

Table 1 Some biological indicators of hybrids (average for 3 years).

Name of hybrids	Viability of caterpillars, %	Weight		Silk content, %
		cocoon, city	shells, mg.	
C - 13 x C - 14	91,2	1,72	413	24,0
C - 14 x C - 13	88,1	1,80	410	22,8
Marked 1 x Marked 2	89,8	1,67	398	23,8
Marked 2 x Marked 1	89,4	1,70	440	24,1
9пк x C - 5	91,2	1,72	396	23,0
Asaka x Marhamat (counter)	91,4	1,84	415	23,5

Considering that, starting from the 1st instar, the caterpillars received a fresh, but not yet ripe leaf, one could expect a slight decrease in biological parameters. And so it happened. For example, the viability of caterpillars of the experimental hybrids was 88.1-92%, and the control 92.4, but the decrease is very insignificant. The remaining biological indicators are also at the control level: cocoon weight in the experiment - 1.67-1.70 g, in the control - 1.84 g, shell weight in the experiment - 398-440 mg, in the control - 415 mg; Silk production of cocoons in the experiment was 22.8-24.1%, in the control – 23.5%. Thus, the method of feeding caterpillars with mulberry leaves, which have been previously collected, packaged and stored in the refrigerator, does not have a negative impact on the biological parameters of hybrids from sex-marked breeds.

In order to find out whether the feeding method affects the quality of the silk thread, samples of cocoons (50-60 pieces) of each hybrid were unwound. The technological properties of the studied hybrids are shown in Table 2.

Table 2 Technological indicators of hybrids (average for 3 years).

Name	Dry cocoon weight, g.	Exit		Metric number, units	DNR KN	Unwinding, %	Productive thread length, m.
		raw silk, %	silk products				
C - 13 x C - 14	0,96	44,87	49,35	2924	831	90,4	1323
C - 14 x C - 13	0,82	45,10	49,18	3134	754	91,0	1315
Marked 1x Marked 2	0,93	45,85	51,00	2710	874	91,8	1286
Marked 2 x Marked 1	0,89	47,20	51,24	3118	1022	91,7	1435
9фк x C - 5	0,84	45,63	50,25	2718	868	91,3	1142
Asaka x Marhamat (k)	0,80	44,92	50,0	2872	875	90,95	1240

From Table 2 it can be seen that all technological indicators are at the control level, i.e. Feeding younger caterpillars with leaves prepared in advance and stored in the refrigerator does not change the quality of the mulberry.

The experience of our work shows that in order to keep all breeds and hybrids of silkworm intact in the event of sudden early spring frosts, you should:

1. When warning the hydrometeorological service about possible frosts, prepare in advance a sufficient amount of lye leaf, preferably the varieties Tajik seedless, Surkh-tut, Zhar-Aryk 4, 5, 6, 7, 8, 9, which retain their feeding qualities for a long time.
2. Pack the leaf hermetically in plastic bags measuring 40 cm x 50 cm, 2.5-3.0 kg of feed each. After removing the required amount of sheet, the bag must be closed again.

3. Place the tightly packed sheet in refrigeration chambers at +22, +40C. The leaf can also be stored in cool, dark places along earthen and concrete walls for about 7-8 days in large, loosely filled bags.

4. Caterpillars should be placed in parchment bags under a damp cover. Feeding the caterpillars with the prepared leaf can be done 2 times a day.

Preliminary collection and storage of leaves in refrigeration chambers makes it possible to preserve all breeding material without loss, especially at breeding silk stations and grain factories, under unfavorable weather conditions

Information about the authors

1. Yakubov A.B. – Experience of feeding silkworm caterpillars with mulberry leaves stored in the refrigerator. //ref.sb. “Silk” No. 4, 1975. S-14.

2. Yakubov A.B., Kurbanov R.K., Gatin F.G. – Mulberry varieties for autumn-winter feeding of silkworms. //ref.sb. “Silk” No. 1, 1978. P-8-9.

3. Yakubov A.B., Nasirillaev U.N., Kurbanov R.K., Gatin F.G. – A new method in sericulture. //magazine “Agriculture of Uzbekistan” No. 3, 1980. P-43.

4. Yakubov A.B., Gatin F.G., Pashkina T.A. – Recommendation “On carrying out rearing of silkworms in unfavorable conditions.” //Tashkent-1990