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Influence Of The External Environment On The Manifestation Of Silkworm Productivity Traits

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Abstract. The article analyzes the influence of the external environment on the manifestation of the silkworm's productive traits. Environmental factors such as temperature, humidity, and light play an important role in the manifestation of the silkworm's productive traits.
Keywords: silkworm, conditions, hybrid, weather and climatic conditions, genetic potential.

According to the International Commission on Sericulture, Uzbekistan is the third largest producer of cocoons in the world (1.2% of global production), with a yield of 56.9 kg per box of eggs1. Uzbekistan's geographical location makes it attractive and, at the same time, problematic for silkworm breeding, as there are zones with favorable and complex ecological conditions in Uzbekistan.

The breeding of silkworms in regions with extreme ecological conditions and global changes in weather and climate conditions on Earth necessitate the intensive development of new methods for the selection and breeding of plants and animals adapted to the changed environmental conditions.

Undoubtedly, the Republic of Karakalpakstan differs significantly not only in its weather and climate, but also in its soil characteristics, water availability, and other conditions from other regions of the country.

The creation of breeding populations that ensure a normal level of growth, development, reproduction, and silk productivity under less favorable conditions reflects the interests of the silk industry in obtaining high cocoon yields in regions significantly different in their zonal characteristics.

Thus, the creation and implementation of silkworm hybrids for extreme ecological conditions is a pressing problem in sericulture.

External conditions play a crucial role in the realization of the genotype, in its most complete phenotypic manifestation. From genes and their primary products - proteins - to a phenotypically mature organism, a number of processes occur, which can be influenced to varying degrees by environmental factors and other changes. These complex relationships between genotype and living conditions are known as genotype reaction norms.

Unlike other insect species, the silkworm, as a strict monophage, feeds exclusively on the leaves of the mulberry tree. The content of nutrients in the leaves can vary depending on the variety of the tree and the cultivation techniques. Thus, [5;p.113-116] experimentally identified varietal differences in the main elements (in grams) of feed consumed by 100 caterpillars:

Silk variety	Total nitrogen	Protein nitrogen	Sugar	Raw fat
SANIISH 14 variety	13,30	11,87	26,28	12,24
Tajik seedless variety	15,72	14,07	35,55	15,36
B%% of the variety indicators SANISH 14, accepted as 100%	118,2	118,5	135,3	125,5

In specialized silkworm breeding literature, the influence of environmental conditions on the growth, development, and productivity of poikilothermic silkworms has been sufficiently detailed. [5;p.79], and other authors have demonstrated the cumulative influence of feed quantity and quality, hygrothermal regimes, and zonal characteristics on the productivity level of the silkworm.

It is known that the silkworm, being a strictly monophagous species, receives the necessary substances for growth, development, and silk synthesis from the leaves of the mulberry tree. In years with unfavorable weather and climatic conditions, the necessary amount of nutrients does not accumulate in the leaves of the

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silkworm, for this very reason, the silkworm caterpillars lay incomplete cocoons with reduced weight and silk content.

A series of works on the use of various ingredients for the enrichment of the silkworm's forage leaf has been published. Studies on the importance of ingredients in increasing productivity were also conducted on the silkworm. Among such works are experiments [1;p.13-17], which established the possibility of increasing the silk content in cocoons.

In our research, we propose to achieve an increase in the productive qualities of the silkworm by selecting appropriate silkworm varieties with a large fleshy leaf blade and optimal biochemical composition of the forage leaf. Based on his research, he proposes to conduct selection based on samples of breeding batches coming from the breeding grounds of the cotton ginning plants [2;p.26-28]. Certain genes are most fully manifested only in certain living conditions, which can be highly specific. Another group of genes manifests their effect only in combination with other genes [4;p.30-44]. This is the dynamics of gene expression in the selection process, which continuously changes the norm of the organism's reaction.

Currently, the need for natural silk is increasing. Until the nineties, the breeding of hybrid combinations of silkworms under production conditions with a single spring feeding fully satisfied the need for silk. Currently, the task of repeated feeding is being set. In conditions of hot dry summer, not all breeds are capable of fully demonstrating their genetic potential. Therefore, the need for breeding and introducing silkworm hybrids for extreme ecological conditions is increasing. Such hybrids can be used both in areas with complex natural conditions and in repeated feeding in the southern regions of Uzbekistan.

Also, new regionalized silkworm hybrids are poorly distributed in production, in particular, hybrids involving sex-regulated breeds: C-13 x C-14, C-14 x C-13, Mech-1 x Mech-2, Mech-2 x Mech-1, clonal 100% pure hybrid of one direction - 51.40 pc x Sovetskaya 5, as well as unmarked breeds Ipakchi-1, Ipakchi-2 and their hybrids Ipakchi-1 x Ipakchi-2, Ipakchi-2 x Ipakchi-1. These hybrids were created at the end of the nineties, underwent three-year state and two-year production trials, after which they were allowed to be regionalized in the republic. Among the aforementioned hybrids, only Ipakchi-1 x Ipakchi-2, Ipakchi-2 x Ipakchi-1 are widely implemented. As can be seen from the brief literature review, many scientific developments have been dedicated to breeding new breeds and hybrids of the silkworm, developing new varieties of the silkworm and its hybrids, and developing new methods for silkworm breeding. However, today the number of cocoons produced is insufficient to provide the textile industry with sufficient raw materials, so that the raw materials are of high quality. Therefore, in recent years, special attention has been paid to the quality of raw silk.

A comprehensive assessment of the suitability of varieties for feeding silkworm caterpillars under ecologically challenging conditions of repeated feeding was conducted at the Research Institute. Evaluation, carried out taking into account the indicators of unwinding, raw silk yield, production length of the cocoon thread, and its metric number (fine), showed that the following varieties were the best in terms of the manifestation of technological characteristics:

Jar canal 4,
Tajik seedless,
October.

From the analysis of the technological indicators of cocoons obtained under unfavorable conditions of late-spring feeding, it follows that the varietal characteristics of the feed influence not only the manifestation of biological traits but also the quality characteristics of the unwrapped silk.

Summarizing the results of searching for scientific literature reflecting experiments on the use of various silkworm varieties to increase the cocoon yield of the silkworm, we consider it possible to recommend feeding the caterpillars in the extreme conditions of Karakalpakstan with the leaves of the regionalized Tajik seedless, October, and the promising Jar ariq 4 silkworm varieties, as well as using these varieties when feeding fine-silk breeds and hybrids.

Thus, based on the study of literature sources, scientific reports, and the experience of manufacturers, it has been established that the main factors ensuring successful feeding in extreme ecological conditions are silkworm breeds and hybrids adapted to less favorable breeding conditions. Breeds and hybrids intended for breeding in extreme conditions were selected for use as source material in breeding: C-5, C-5ngl, C-10, C-12, C-13, C-14, Asaka, Markhamat, Ipakchi 1, Ipakchi 2, Marked 1, Marked 2, parthenoklones by analyzing the main productive properties of marked and unmarked breeds maintained in the live silkworm collection.

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