

**INFLUENCE OF NUCLEAR POLYHEDROSIS DISEASE AND
REPRODUCTIVE INDICATORS IN COMBATING IT IN THE
CULTIVATION OF TUT SILK GURT RACES IN VARIOUS CLIMATIC
CONDITIONS
(in the conditions of Karakalpakstan)**

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Abstract

The article scientifically substantiates the revival and care of marked hybrid seeds of the mulberry silkworm at various temperatures and humidities, provides theoretical data, and conducts an in-depth analytical study. The goal is to improve the productivity and technological properties of cocoons based on the adaptation of targeted silkworm hybrids to the sharply changing natural and climatic conditions of the Republic of Karakalpakstan.

Keywords: silkworm eggs, incubation, temperature, humidity, light, mulberry leaf, marked silkworm, hybrid, silkworm colony, bunch, pupa, butterfly, varietal cocoon, silk fiber.

Introduction The demand for silk fibers and goods made of natural silk in our country and in the world markets is growing every year. Based on this requirement, the government has adopted several decisions in recent years to develop sericulture and produce high-quality raw silk.

In particular, the Resolutions of the President of the Republic of Uzbekistan dated February 24, 2023 No. PP-73 "On measures for the further development of the silk industry" and dated June 1, 2023 "On additional measures to support home-based work in the field of sericulture and further expand the fodder base for cocoon production."

The Decree of the President of the Republic of Uzbekistan No. UP-85 defines urgent tasks for the development of primary seed production of silkworm breeds and hybrids, the creation of breeds and hybrids that meet international standards by developing advanced scientific developments and intensive agrotechnologies, taking into account the natural and climatic conditions of the regions, increasing the production of local silkworms and cocoons, and expanding the export opportunities of the silk industry by improving their quality. [1,2].

The extent to which the problem has been studied. In the Republic of Uzbekistan, comprehensive scientific research has been conducted by G.A. Verbiskaya, I. Khakhanov, L.F. Kashkarova, M.A. Khakimova, S. Sobirov, D.A. Ismatullaeva, Ya.M. Ziyaeva, and others aimed at studying the epizootology of infectious diseases, combating them, preventing them, and increasing the viability of silkworms and cocoon yields.

Also, on a global scale, research aimed at selecting populations resistant to yellow fever by genetic selection, studying the relationship between the host and

parasite of pebrina, using biostimulants, searching for new effective disinfectants, and studying the specific and non-specific resistance of silkworms to infectious diseases has been conducted by a number of leading scientists worldwide: V.A. Golovko, I.A. Kirichenko, I.V. Issi, R. Nirupama, N. Bukhadze, and others, and positive results have been achieved.

Currently, there are insufficient scientifically grounded comprehensive measures for the use of silkworm breeds resistant to silkworm diseases in Uzbekistan, as well as methods and means of combating them. Based on the above, one of the urgent tasks in sericulture is the selection of measures to prevent nuclear polyhedrosis, which is a dangerous infectious disease of the silkworm, the selection of modern means to increase the resistance of silkworms and the development of new methods for their application, the selection of breeds resistant to nuclear polyhedrosis, and the creation of breeding systems and breeds resistant to it.

It should be noted that scientists from countries with developed silk industries, such as M.E. Braslavsky, G. Bekirov, Yu. Shukurlyu, N. Bulatze, S. Salimdjanov, and Bharat B., V. Satish, F. Pescio, P. Marino, and H. Yenciso, have conducted research on silkworm rearing methods in tropical, subtropical, and extremely humid regions, as well as in unfavorable conditions, ensuring the adaptation of silkworms to unfavorable conditions using monovoltin breeds, and the rational use of biologically active substances, achieving certain positive results [3,4].

N.V. Shurshikova, M.E. Braslavsky, V.A. Strunnikov, U.N. Nasirillaev, A.B. Yakubov, B.U. Nasirillaev, E.A. Larkina, N.K. Abdikayumova, Hemmatatadi N., Keshan B., and Sabhat A. conducted scientific research on artificial sex regulation or the gradual modification of animal sexes [5, 6, 7, 8].

Research Methods and Materials Experiments on the creation and implementation of mulberry silkworm hybrids for changing environmental conditions were conducted in 2023-2024 in the laboratory of the Department of "Silkworm Breeding" of the Institute of Agriculture and Agrotechnologies of the Republic of Karakalpakstan, as well as in the Takhiatash district, on marked mulberry silkworm hybrids imported from the "Silkworm Breeding" laboratory of the Uzbek Research Institute of Sericulture.

In all research, observations, and experiments conducted to create and introduce mulberry silkworm hybrids adapted to changing environmental conditions, the geographical location of the Republic of Karakalpakstan was studied, including natural ecology, salinity, and the natural soil and climatic conditions of desert zones (*in cooperation with the Republican Agrometeorological Station, research institutes of the Academy of Sciences, and organizations for ecology and environmental protection*).

The selection of regions of the Republic of Karakalpakstan with different climatic conditions ensured more effective and reliable scientific research.

In the course of the research work, morphological, biological, technological, production, and statistical analysis methods were used, as well as the methodologies "Basic Methodological Rules of Silkworm Breeding Work" and "Agrotechnics for Cultivating White Silkworm Cocoon Breeds."

From the traditional breeding selection method at all stages of silkworm development, the method of selection based on the motor activity of the silkworm

moth, the method of differentiation by breed indicators, and the study of the variability of breeding families and individuals.

The research work is devoted to the selection of sex-marked silkworms, the improvement of their productivity indicators, and the preparation of 100% pure hybrids that fully demonstrate the properties of heterosis.

Research results and their discussion

If strict selection is carried out at all stages of silkworm development (egg, larva, pupa, butterfly), the indicators may change for the better. For example, the Takhiatash district is one of the most favorable regions for rearing silkworms and producing high-quality cocoons. During the experiments at the "Gulsara pillachi" farm, no cases of developmental retardation, disease, or poisoning were observed in the silkworms. The results obtained regarding cocoon yields are as follows. The indicators of the studied breeds are reflected in Table 1.

Table 1.

Analysis of cocoons of worms reared with a stimulant (Takhiatash district. Spring 2025)

No.	Options	Local hybrid "S-10 x S-12"			
		Weight of 1 cocoon	cocoon husk weight, mg	silkeness, %	fertility (from 1 box of seeds), kg
		$\bar{X} \pm S_{\bar{X}}, g$	$\bar{X} \pm S_{\bar{X}}, \%$	$\bar{X} \pm S_{\bar{X}}, \%$	
1	Experiment (yielding 0.05%)	1,51±0,01	345±10,1	22,6±0,23	63,7
2	Comparator (manual method)	1,37±0,03	263±14,4	20,1±0,54	58,0
Difference					5,7

Table 1 shows that the average weight of one live cocoon in the experimental variants was 1.51 g, while in the comparison variant, this result was 1.37 g. It was observed that the weight of 1 cocoon in the experimental variants was 0.12 g heavier than in the control variant. The cocoon shell weight in the experimental variants was 345 mg, and in the control variant, it was 263 mg, which is 82 mg higher than the comparison variant, and the silkeness in the experiment was 22.6%, and in the control variant, it was 20.1%.



Figure 1. Treatment of leaves with stimulants and silkworms care process

In the experiment conducted in the Takhiatash district using the Hosildor 0.05% stimulant, a cocoon yield of 63.7 kg was obtained, while in the control variant, it was 58.0 kg. The experimental variant outperformed the comparison variant by obtaining an additional 5.7 kg of cocoons from each box.

Conclusions, scientific research conducted in the climatic conditions of the Republic of Karakalpakstan, and observations were conducted based on the characteristics of the hybrids in each variant, with an in-depth analysis of temperature, humidity, nutrients, and other natural factors, and their influence was studied.

The soil and climatic conditions of the regions where experiments are conducted serve as the basis for developing recommendations based on the high or low productivity traits of foreign mulberry silkworm hybrids in these regions.

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