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COCOON PRODUCTIVITY AND YIELD IN LATEST-STAGE IMPROVEMENT OF Z LETHAL GENES BALANCED BREED OF MULBERRY SILKWORM

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ABSTRACT
This article presents the results of the analysis of the cocoon productivity and the yield of the progeny obtained with participation of simple silkworm lines but with high silk quality of the C-8 ngl strain, balanced for the l_1 and l_2 lethal genes located on the Z-chromosome of the mulberry silkworm.
KEY WORDS: *silkworm, hybrid, cocoon, silkiness, lethal gene.*

INTRODUCTION

The sericulture branch is one of the important areas of the agricultural sector not only in Uzbekistan, but also worldwide [3]. Currently, more than 22 thousand tons of cocoons are produced in our country per year. Increasing the quality indicators of the silk and cocoon yield to the level of international demand is one of the priority and urgent tasks of genetic-selection research in today's sericulture industry [5, 6, 7, 8].

Although it has been many years since this branch was founded [1, 2, 4, 9], it still has not lost its relevance in agrarian sector. Today, in this regard, the PRC is considered as a country where first-generation male hybrids are widely used in successful genetic-breeding practices [15].

Currently, in our republic also at the Scientific Research Institute of Sericulture, scientific research is being carried out on the creation of new hybrid combinations by maintaining, monitoring and improving the translocation in the genotype of Z-lethal genes balanced breeds [10, 11, 12, 13, 14].

The purpose of our research work is to investigate the effect of lethal genes on cocoon productivity of the third generation obtained during improvement of the C-8 ngl breed.

RESEARCH MATERIALS AND METHODS

The experiments for the research work were carried out in the "Mulberry Silkworm Breeding" laboratory of the Research Institute of Sericulture, and the C-8 ngl breed of silkworm and new lines created on the basis of this breed were developed. For the experiment, the newly created strains and as a control C-8 ngl breed were taken. Experimental silkworms were reared under optimal hygrothermal conditions.

Breeds (strains) used as parents and hybrid generation worms obtained with this parental participation were reared for determining cocoon productivity traits. Populations of 45 of each breed (strain) and hybrid within healthy cocoons were randomly sampled.

Cocoon and silk productivity of parent and maternal breeds and F_1 hybrids is an indicator calculated on the basis of eggs hatching, their viability and weight of 1 piece of cocoon.

RESEARCH RESULTS AND THEIR DISCUSSION

A number of sex-limited breeding strains of the mulberry silkworm have been created, which, as a result of crossbreeding with breeds and strains with high technological performance, embody the high technological performance obtained as a mother in male hybrids of the F_1 generation. Therefore, new hybrids have thin and high silkiness performance.

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Cocoon weight of mulberry silkworm hybrids. Cocoon shell weight and silkiness are the main indicators in determining productivity. According to the results of some studies, male cocoons are lighter in weight. For this reason, male hybrids have not received much attention.

By the third stage of improvement, the alternative strains of the new C-8 ngl breed were considered to be equal to the control option in terms of productivity. (Table 1)

Table-1

Cocoon productivity performances in third stage improvement of C-8 ngl breed of mulberry silkworm (in 2022)

Number of experimented cocoons, pcs	Mean weight				Cocoon silkiness, $\overline{X}\pm S_x$, %	Pd
	Cocoon $\overline{X}\pm S_x$, g	Pd	Cocoon shell $\overline{X}\pm S_x$, g	Pd		
C-8 ngl						
45	1,96±0,01	-	455±0,003	-	23,1±0,13	-
Improvement F_3 grey (♀ ℓ_2 × ♂ ℓ_1)						
45	1,74±0,01	0,999	403±0,005	0,987	23,1±0,15	0,151
Improvement F_3 light yellow (♀ ℓ_1 × ♂ ℓ_2)						
45	1,6±0,02	0,999	405±44,4	0,076	25,4±1,44	0,806

It can be said based on Table 1 which shows the cocoon productivity performances in the third stage of improvement, a significant increase was achieved in terms of cocoon caliber, shell weight and silkiness in two main directions. Indeed, as a result of enlargement of cocoons of the C-8 ngl breed and softening of cocoon shell and poles than usual of the C-8 ngl breed taken as a comparator, the acceleration of the process of silkiness decrease and serious change of yield once again manifested in the numbers. In particular, the silkiness of the C-8 ngl breed was 23.1%, while in the improvement F_3 generation, the highest level of silkiness was shown in the first grey group - 25.4%

CONCLUSION

Depending on the obtained cocoon productivity, it can be concluded that in the second stage of improvement, there was an increase in cocoon productivity performances compared to the comparator. It fell short of demand. However, this result can be considered satisfactory, given that it was recorded at an intermediate stage of improvement. The reason for such a decrease is the disturbance of the double lethal balance and the heterozygosity of the ℓ_1 or ℓ_2 lethal genes each individually in the genotype, albeit partially. This was demonstrated by the example of worms wrapped in cocoons after hatching the yellow seeds of the male generation improvement.

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