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VITALITY INDICATORS OF F2 GENERATION IN IMPROVING BALANCED C-8 NGL BREED OF SILKWORM BY DOUBLE LETHAL

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ABSTRACT: In this paper, the signs of embryonic and postembryonic vitality of the F2 generation are compared in the process of improving the C-8 ngl silkworm breed balanced on the embryonic Z-lethal genes of the mulberry silkworm.

KEYWORDS: Bombyx mori L, Z-lethal, embryonic and postembryonic, vitality, lethal gene

INTRODUCTION

In the last 3-4 years one can see a rapid development of the silk industry in the Republic of Uzbekistan. At the same time, there is a need to intensify efforts on systematic work which has intended to ensure the efficient use of infrastructure resources in this sector, improve breeding performance, strengthen the feed base, as well as to improve the quality and competitiveness of products [1].

Although more than a century has passed since only F1 hybrids were fed in mulberry silkworm production and cocoon cultivation, the research and studies on the production of male hybrids of mulberry silkworm and the sexual dimorphism have not lost relevance.

At present, sex-controlled breeds are only partially used in practice. The problem of their low performance in seed production is characterized by the higher cost of breeding these breeds [2].

Due to the specification in the preparation of male hybrid eggs, the value of eggs in this direction of the mulberry silkworm is theoretically 4 times higher than that of ordinary breeds [3].

Although the initial work in this direction has been carried out for a long time, some scientists have conducted research and studies at the Uzbek Silk Research Institute. In particular, U.N. Nasirillaev and others obtained a new translocation in the genotype of large-

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cocoon breeds "Guzal" and "Marvarid" and managed to mark the sex of these breeds in their egg stage, that is, light yellow eggs hatch male and gray eggs hatch female breeds [4].

Considering the scientific and practical relevance of the issue of sex control of the silkworm which has been taken as the aim of the work, we are conducting our research to improve the C-8 ngl breed balanced with double lethal.

MATERIALS AND METHODS

To determine the viability of the worms, they got hatched in the replication of each breed (line) or families, then they were taken for breeding, 250 worms were selected by counting on the 1st day of the 2 instars. At the stage of cocooning when the worms become cocoons, they were counted again to know how many worms had turned into healthy pupa out of 250 worms.

The vitality indicator at the 5 instars was calculated among the cocoons with healthy pupa by counting deaf cocoons (which did not progress to the pupa stage of metamorphosis during cocooning) in percentage.

The worms of the breed and combinations selected for the experiment were kept at a temperature of 26-27 °C and relative humidity of 70-75% at a young instar and for adult worms at a temperature of 24-25°C and relative humidity of 65-70%. Experimental worms were fed with mulberry leaves of Jarariq 4, Jarariq 5, and Jarariq 6 mulberry varieties at the rate of 1000 kg of mulberry leaves per 1 box of worms. The worms were counted in 3 replicates out of 250 when they were at the 2 instars. When the worms become cocoons, the viability of the worms was determined based on the proportion of healthy pupa cocoons.

RESULTS AND DISCUSSION

The most important criterion in the evaluation of each breed and hybrid is the viability of eggs and worms. Because in the first generation, due to heterosis, worms are observed to be more resistant and more viable than the parental forms. Based on these, in our experiments, the viability of worms and the incidence level of worms with diseases in the fifth instars group were determined (Table 1).

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Table 1

Egg color and lethal	Analyzed replications/ number of eggs, pcs	Egg hatching, %	Worm vitality, %	Disease rate, %
C-8 ngl				
Gray ♀♀	7468	89,3	85,4±2,14	1,5±0,54
Light yellow ♂♂	8223	89,7	87,0±2,21	2,2±0,44
improving ♀(C-8 ngl×L-28) × ♂(L-28×C-8 ngl) F_2				
Gray ℓ_1♀♀+♂♂	3409	78,8	81,2±0,61	2,9±0,43
Gray ℓ_2♀♀+♂♂	5983	74,2	89,2±2,20	1,8±0,48
Light yellow ℓ_1♂♂	518	88,5	84,4±1,00	3,4±0,31
Light yellow ℓ_2♂♂	681	93,5	85,2±1,22	2,5±0,44
Crossbreeding under analysis♀(tr24w_2w_2×L-67) × ♂(L-28×C-8 ngl)				
Gray ℓ_1♀♀+♂♂	2729	70,1	90,0±0,54	2,6±0,88
Gray ℓ_2♀♀+♂♂	4729	66,4	87,6±1,16	1,5±0,55
Light yellow ℓ_1♂♂	867	88,8	88,8±1,64	3,6±0,86
Light yellow ℓ_2♂♂	1527	93,5	89,5±1,71	2,8±0,62

The table above lists three different signs, the first of which is that the hatching of the eggs is almost stable due to the lethal balance in the rare C-8 ngl breed. Only gray eggs with female worms had a hatching rate of 89.3% and light yellow eggs with male worms had a hatching rate of 89.7%. Due to the presence of one of the double lethal in the main ♀ (C-8ngl × L-28) × ♂ (L-28 × C-8 ngl) combination of the F2 generation, the high result on egg hatching in females was noted to be gray ℓ178,8 %, and in males light yellow ℓ2 93,5 %.

To clarify which lethal is accepted by the main combination of the F2 generation, a maximum limit in the females of ♀(tr24w2w2×L-67) × ♂(L-28×C-8 ngl) combination created using a translocation holding line in the analytical hybrid genotype was gray ℓ170,1 %, while in the males the light yellow ℓ2 93,5 %.

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In the C-8 ngl breed the vitality of female worms was 85,4% and male worms 87,0%. The best vitality in the main combination of the F2 generation under improvement was ℓ2 89,2 % in gray female worms while in male worms light yellow 85,2%. The best viability in the analytical hybridization was gray ℓ1 90,0 % in female worms and male worms the light yellow ℓ293,5 % in.

Another important indicator was the incidence of worms with diseases in the C-8 ngl breed, which averaged 1,5 and 2,2%, respectively, in females and males. In the main combination of the F2 generation of improvement, a satisfactory result was in female worms gray 1,8% and in male worms light yellow 22,5%. In the analytical hybridization, gray ℓ2 1,5 % female worms were infected and light yellow ℓ22,8 % male worms were infected.

It can be concluded from the results of the study that embryonic and postembryonic vitality was not significantly reduced due to the imbalance of the double lethal balance in the rare C-8 ngl strain and choosing this or that lethal. However, in the next stages of improvement work, it is advisable to increase the intensity of selection work and strictly control the lethal balance.

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