ISSN NO: 2771-8840
Date of Publication: 06-02-2024

Correlative relationship of chlorophyll "a" and "b" pigments in genetics of cotton weight per boll yield in plants with anthocyanin lines L-2, L-3, F_1, F_b, F_2

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Annotation. In the article: Based on the results of the experiments, the following scientific opinion is expressed. Experiments have shown that the separate actions of salinization and alkalization did not significantly affect the value of the ratio of chlorophyll a to chlorophyll b. The absence of significant changes in the value of this indicator indicates that these factors do not affect the light collection complex of the thylakoid membranes of this test crop.

Keywords: recessive, lethal, mutant, selection, viresens, xanthoviresens, havirs, phenotype, heterozygote.

During the experiment, the inheritance of quantitative traits in the F_1, F_b, F_2 generations of the L-2 and L-3 cotton lines with different levels of anthocyanin pigment was studied, and the obtained results were summarized in Table 1. The cotton weight per boll of L-2 line (5.5 ± 0.35) was the highest in the experiment, and the L-3 line hybridized with it showed the lowest result (3.82 ± 0.39). At the same time, it was found that the variation in the L-3 ridge is very large (V%=40.02).

Table (1): Heredity of cotton weight in one boll

№	Stuff	Cotton weight in one bag (g)				
		n	X ± m%	S	V %	*hp*
1	L-2		5,5±0,35	0,78	14,25	
2	L-3		3,82±0,39	1,53	40,02	
3	F_1 (L-2xL-3)		4,98±0,23	1,31	26,32	
4	F_b (L-2xL-3)xL-3		4,82±0,22	1,45	30,10	
5	F_2 (L-2xL-3)		5,02±0,11	1,07	21,42	
6	F_2 (Anthocyanin: dark red)		4,87±0,16	1,08	22,25	
7	F_2 (Anthocyanin: Type L-2)		5,43±0,26	1,10	20,31	
8	F_2 (Anthocyanin: Type L-3)		5,27±0,40	1,60	30,42	
9	F_2 (Green)		5,36±0,31	0,88	16,46	

The weight of F_1(L-2 x L-3) plants in one pod is 4.98±0.23 g, the coefficient of variation is V%=26.32, the coefficient of dominance is hp=0.38, which means that the results are biased towards the L-2 ridge. In Fb (L-2 x L-3) x L -3 plants, the dark mark was 4.82±0.22 g, and it was relatively shifted towards the L-2 ridge. F_2(L-2 x L-3) plants had a total weight of 5.02±0.4 g, coefficient of variation V%=20.42, showing a result close to the result of the L-2 line.

In turn, F_2(L-2 x L-3) plants were divided into four phenotypic classes. One pod weight was studied separately for plants belonging to each of the four classes. The cotton weight per boll (5.43±0.26) of plants similar to L-2 ridge separated from F_2 plants is almost the same as that of L-2 ridge taken as stock. But the cotton weight per bag (5.27±0.40) of plants similar to line L-3 was significantly better than that of the original line L-3 (3.82±0.39).

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The weight of dark red F_2 plants in one pod was also (4.87±0.16) close to L-2 range. It was found that the weight of cotton in one boll (5.36±0.31) was close to the result of the L-2 line.

In almost all F_2 plants, coefficients of variation were close to the L-2 range. A general analysis of the evidence on the inheritance of cotton weight in one boll, all above-ground organs with anthocyanin pigment L-2 line has anthocyanin pigments in certain organs is superior to the L-3 line by masculin character, or all above-ground organs anthocyanin plants are partially anthocyanin pigmented plants by masculin character. it can be noted that it dominates.

During the experiment, the heredity of fiber output in F_1, F_b, F_2 plants obtained by hybridization of cotton lines with different levels of athocyanin pigment was also studied.

The fiber yield of L-2 (27.39±0.17) and L-3 (30.66±0.77) lines obtained as material in the experiment were the lowest results observed during the experiment, and it was found that all the hybrid plants with their participation were better than the results of the material lines.

In particular, the fiber of F1(L-2 x L-3) plants was 37.01±0.42 percent, dominance coefficient hp=4.9, i.e. very good positive heterosis was observed.

Fb (L-2 x L-3) x L-3 plants showed better fiber yield (37.65±0.50) (Table 2).

F2(L-2 x L-3) plants showed total fiber yield of 36.80±0.43 percent. The F2 plants were in turn separated into four different phenotypic classes. They are plants similar to the L-2 ridge and L-3 ridge, plants with dark red and green pigments.

Table (2): Heredity of fiber output

№	Stuff	Inheritance of fiber output (%)				
		n	X ± m%	S	V %	*hp*
1	L-2		27,39±1,17	2,62	9,57	
2	L-3		30,66±0,77	3,00	9,81	
3	F_1 (L-2xL-3)		37,01±0,42	2,38	6,43	
4	F_b (L-2xL-3)xL-3		37,65±0,50	3,20	8,51	
5	F_2 (L-2xL-3)		36,80±0,43	4,07	11,06	
6	F_2 (Anthocyanin: dark red)		36,88±0,59	3,97	10,76	
7	F_2 (Anthocyanin: Type L-2)		37,23±1,32	5,60	15,05	
8	F_2 (Anthocyanin: Type L-3)		35,91±0,67	2,68	7,46	
9	F_2 (Green)		37,65±1,19	3,28	8,98	

Among the F_2 plants, it was determined that the fiber yield in plants similar to the L-2 ridge was 37.23±1.32 percent, and the fiber yield in the plants similar to the L-3 ridge was 35.91±0.67 percent. It was determined that the fiber yield of dark red F_2 plants was 36.88±0.59 percent, and that of green plants was 37.65±1.19 percent. As a general analysis of the results of genetics of this fiber yield, it can be assumed that the correlation between anthocyanin pigment and fiber yield is not significant without researching the correlative relationship between them. Because the fiber yield in the parent plants is very low, this trait is improving in the offspring. Among the im F_2 plants, the fiber yield in plants with the same pigmentation as L-2 and L-3 ridges was much higher than that of the parent plants. This condition indicates that the fiber output trait is inherited on the basis of polymer genes. The coefficient of variation fluctuated between 6.43 and 15.05. According to our opinion, the genes providing the fiber output of the L-2 and L-3 ridges are mostly located in the same loci, and the presence of these polymer genes in the heterozygous state is similar to each other. In their hybrids, the transition of these genes to the homozygous dominant state is increased. Most likely, as a result of these processes, strong positive heterosis was observed in F_1 plants because the genes ensuring fiber output were dominant homozygous, and this condition caused the masculin trait to be in a stable state without sudden separation in the next generations.

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Conclusions

Among the cotton lines with different levels of anthocyanin pigment, it was found that the single boll weight was better in the lines containing a large amount of anthocyanin pigment. It was found that fiber yield is inherited independently of the amount of anthocyanin pigments, and this trait is inherited on the basis of polymer genes.

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