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Study of Let.Dw Gene Identified in G. Hirsutum Type of Cotton in Interspecies Hybrid Joints

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Abstract: In this article, the influence of the lethal Let dw gene identified in the L-691 line of the G. hirsutum type of cotton obtained by artificial industrialization on the morphological characteristics of the cotton in the next stages of interspecies hybridization and the heredity of this gene were studied and conclusions were drawn based on the scientific results.

Keywords: Cotton, lethal, gene, hybrid, interspecies, first generation, second generation, genotype, phenotype, species, line, heredity, evolution.

The cotton family belongs to the genus Gossypium, and according to systematics, it consists of 37 (Mauer, 1954) and now 58 species (A.A. Abdullaev, 2010).

A.G. that the number of haploid chromosomes in the cotton plant is -13 in Old World species and p-26 in New World polyploid species. After Nikolayev (1920) and H.J. Denham (1924) determined the degree of consanguinity between cotton species, a great opportunity arose to study the evolution of the origin of polyploid species.

Researches on obtaining interspecific hybrids were carried out by scientists in the Gossypium genus (Zaysev -1924, Harland -1927), but since the hybrids obtained by them were non-pollinated, keying joints were not studied. pods in the hybrid plant. - created variety 8802. After that, large-scale research on transferring the valuable characters of wild cotton species to cultivated varieties will begin. At S.S. Kanash (1932) repeated pollination of a pollenless hybrid between G. hirsutum x G. herbaseum with pollen of Ghirsutum species resulted in fertilized the same time, great attention is paid to studying the phenogenetics of the Gossypium family. In particular, research was carried out to determine the origin of polyploid species. In this regard, the works of scientists A. Skovsted (1934), S. M. Weber (1935), Mauer (1938), Harland (1940), J. Beesley (1942), Stephens (1947) can be highlighted.

A. Skovsted (1934) stated that 13 pairs of chromosomes of the G. Hirsutum species of polyploid cotton originated from the joining of large Old World and 13 pairs of small New World cotton species. His theory was later confirmed by many scientists.

Academic A.Abdullayev (1974) crossbred polyploid cotton types and determined how close these types are to each other. According to the obtained data, it has been proved that G. Tomentosum is the closest type to G. Hirsutum.

It was found that the seeds did not germinate or the plants died in different phases of the ontogenesis in the hybrid joints of the species, and it was found that these species did not undergo meiosis9 in the normal state or depended on letagens. However, there is not enough research in this regard.

According to T.C. Fadeeva (1980), about 120 families in the plant world are shown to have lethal genes. El (1977), D.M. Stelley (1990), Samora and others identified non-allelic Le1, Le2 and Le2, dav lethal genes in Gossypium El and carried out genetic analysis.

Philips (1977) determined that it is possible to prevent the negative effects of lethal genes in interspecies *G. barbadense G. hirsitum* hybrids by high temperature.

According to Stelley (1990), the Le 1 lethal gene has a stronger effect on the plant during antogenesis than the Le 2 gene. He determined that during the interaction of the Le 1 gene with the Le 2 dav gene, micros (root rot) disease begins earlier than the interaction of the Le 2 gene with the Le 2 dav gene. Determines that Le 2 -26 is located on the chromosome. However, it should be noted that in the analysis of the literature, foreign scientists did not show information about the cause of small stature under the influence of lethal genes.

F.H. Jumayev 1997, F.H. Jumayev, which causes the plant height to be small in the heterozygous state of the lethal gene Led D.W in *G. Hirsutum* type of cotton. Jumayev, M.F. Abzalov in 1997 first identified the negative effect of the gene on the plant antogenesis development in the L-691 line, but the effect of this gene in other species was not studied. Therefore, crossbreeding between the polyplot *G,Tomentosum* and the L-691 line belonging to the *G.hirsutum* species was carried out in order to study whether this gene has a negative effect on the plants in the process of antogenesis, just like in the G. hirsutum species. their descendants were studied and genetically analyzed.

Allopolyploid (tetroloid) species of *Gossypium* family Karpas subfamily *G. tomentosum* Nut TT Ex sen, a representative of the wild cotton species growing on the Hawaiian Islands and *G. hirsutum L.* Genetic analysis of the inheritance of traits in the first and second generations of the L-691 line, which gives plants separation, and the G tomentosum x L-691 interspecies hybrids obtained with their participation. F. Jumayev (2022) studied the higher yield of cotton and norval plants after the *Glycine max* plant in a field experiment.

As can be seen from the experimental data (table-1), a total of 62 plants were studied in L-691 line under field conditions, of which 39 were small and 23 (normal) tall. If we analyze according to the x-square hypothesis, this theoretically expected ratio of 2:1 P is fully confirmed with a probability of 0.50. As for genetic analysis, in the L 691 line genotype, the Led dw gene (Led dw led dw) is in a heterozygous state, and when it is pollinated, it is constantly keying in the joint Let dw Led dw -1 /4. Led dw Led dw gives separation in the ratio of 2/4 and let dw let dw -1/4, dw here, the plant does not germinate from the seeds in the dominant homozygous state and has a negative effect on the embryonal development process, leading to a lethal state (death). will come. In the heterozygous state, the plants are small, and in the recessive homozygous state of the Led dw gene, the plants grow normally and become tall.

When we crossed *G. tomentosum* plant with L-691 line, 7 plants grew and developed in F1 *G. tomentosum* x L-691 generation, and 4 of them were small plants and 3 were tall plants. This theoretically expected ratio of 1:1 is fully confirmed with a probability of P of 0.80. It is clear from the obtained information that the plant belonging to the *G tomentosum* species has a precessive homozygous genotype for the Led dw gene, therefore 1: Separation was observed in 1 ratio, that is, it looks like this in the form of a scheme:

Table-1. Effect of Let.dw gene on the plant in Goza L691 line and hybrid joints

Material	N	Small	tall	ratio	X^2	P
G.tomentosum	1		1			
L-691	62	39	23	2:1	0,40	0,50
F_1 *G.tomentosum* x L-691	7	4	3	1:1	0,14	0,80
F_2 *G.tomentosum* x L-691	102	73	29	2:1	1,09	0,25

We transplanted the seedlings from the first stage into a Wagner bucket and moved them into the greenhouse to obtain more seeds and test the second stage with a stage F1 *G. tomentosum*. x L-691 isolate the flower of the plant with papyrus paper for self-pollination and analyze the F2 generation by planting seeds from these plants.

As can be seen from the first table, only 102 of the 160 seedlings planted in the F_2 *G tomentosum* xL691 joint germinated, of these 102 plants, 73 were small plants and 29 were tall (normal) plants. gave separation to the plants. The separation ratio obtained from this experiment, just like the L 691 line, is fully consistent with the theoretically expected ratio of 2:1 with a probability of P of 0.25. In this joint, the Led dw gene is dominant in the homozygous state of the genotype. because 1/4 of the

seeds had a lethal effect on them and they did not germinate. 3/4 of the seeds with heterozygous and recessive homozygous genotypes germinated and gave rise to short and tall plants.

It can be said that the Let.dw gene showed negative lethality in hybrid joints obtained within *G. hirsutum* species, and the same negative effect was fully demonstrated in interspecies hybrid joints obtained with G. tomentosum species. it was determined.

References

1. Abdullayev A.A. (2010) - "Atlas rhoda Gossypium L/ xlopchatnika" Tashkent, Izd. SCIENCE 258-259.
2. Abdullayev A.A. (1974) - "Evolution I systematics polyploidnix vidov khlopchatnika" Tashkent, FAN Oz SSR str. 216-233.
3. Jumayev F.H. (1997) – Cytophenogenetics rassheplyayushegosya karlika khlopchatnika G. Hirsutum L. Autoref. Na sois. sugar Boil. Nauk. Tashkent. Str. 22
4. Jumayev F.H., Abzalov M.F. (1997) - Plant effect of the new Let,dw gene in cotton of G. hirsutum species. J. Cotton. T. N1 Bet 10-11
5. Jumayev F.H. The role of soy in soil productivity and efficient use of lands.American journal of agriculture and horticulture innovations.Volume 02 Issue 10- 2022. 41-44
6. Kanash S.S. (1932) - Mejbidovaya hybridizatsiya v pridelakh raznochromosomniy vidov hlopchatnika. Trudy Sr. Aznihi.
7. Mauer F.M (1954) – Khlopchatnik. roof 1. Tashkent izd AN. page 5-55.
8. Mauer F.M (1938) - O preskhajdenii kulturnikh vidov khlopchatnika. Izvest. AN USSR. sir Biologist N3.
9. Nikolaeva A.G (1920) – Primenenie cytologicheskogo metoda prireshenie nekorikh voprosov genetiki. Trudy III Vsesoyuz. Siezda po selexii a semenovodstvu. Saratov.
10. Fadeeva TS (1980) - Sranitelnaya genetics plant. L. izd. LGU. str 106-108.
11. Beasley J (1942) - Meiotic chromosome behavior in species, species hybrids. Haploids and induced polyploids of Gossypium. Genetics. N27.PP.141-160.
12. Denhan H (1924) – The cytology of the cotton plant. Ann.Bot. London. N38.
13. Harland S. (1940) - Taxonomic relationships in the genus Gossypium. J.Wash .acad .Sel.N30
14. Phillips L.L. (1977) – Interspecific incompatibility in Gossypium .IY. Temperature – conditional lethality in hybrid of G. klotzschianium. Amer. J.Bot.Y.64.N7 pp914-915
15. Samora P. (1994) - Localization and Mapping of the Le1 and Le 2 loci of cotton G.hirsutum.J. Heredity Y.85 n2 pp 151-157
16. Skosted A. (1934) – Cetological studies in cotton. II. Two interspecific hybrids between Asiatic and New World cottons. J. Genet. N28 pp. 407-424
17. Stelli D.M (1990) – Localization of the Le 2 locus of the cotton G.hirsutum. J.Heredity N81 pp193-197
18. Stephens G.(1947) - Cytogenetics of Gossypium and the problem of the origin of New Word cotton . Advances in genetics. N1 pp 33-39
19. Webber J.M (1935) – Interepecitic hybdiration in Gossypium and the metodic behaviour F1 plants. J.Agr . Res. V.51. N12.
20. Rakhmonberdievich, Y. O., & Razzokov, K. K. (2022). Scientific Methods of Analysis to Improve Occupational Safety by the Sanitary and Hygienic Condition of Industrial Premises. European Journal of Life Safety and Stability (2660-9630), 1-5.