VIABILITY ANALYSIS OF DUST GRAINS OF COTTON VARIETIES AND HYBRIDS IRRADIATED IN GAMMA RAY SOURCE BASED ON COBALT-60 RADIOISOTOPE (60-SO) (M_1)

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Abstract. *The article presents the results of the analysis (M_1) of pollen grains of varieties and hybrids of cotton irradiated in a source of gamma rays based on cobalt-60 radioisotope (^{60}CO) .*

Key words*: cotton, variety, hybrid, pollen grains, mutation, flower****.***

АНАЛИЗ ЖИЗНЕСПОСОБНОСТИ ПЫЛЬЦЫ СОРТОВ И ГИБРИДОВ ХЛОПЧАТНИКА, ОБЛУЧЕННЫХ В ИСТОЧНИКЕ ГАММА-ЛУЧЕЙ НА ОСНОВЕ РАДИОИЗОТОПА КОБАЛЬТА-60 (^{60}CO) (M_1)

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Аннотация: *В статье представлены результаты анализа (М 1) пыльцевых зерен сортов и гибридов хлопчатника, облученных в источнике гамма-лучей на основе радиоизотопа кобальта-60 (60-Co).*

Ключевые слова: *хлопчатник, сорт, гибрид, пыльцевое зерно, мутация, цветок.*

Introduction: Mutagenesis is the engine of evolution. All our normal genes are yesterday's "mutants" that have conditionally proven their usefulness. Due to mutations,

bacteria became the first microorganisms with a cell nucleus, and they became multicellular, giving rise to all the diversity of life forms.

A mutation is a change that affects a DNA, gene, or chromosome. This can be caused by various external and internal factors. Mutations often occur before the process of mitosis, when the DNA molecule is replicated in the cell nucleus. For example, UV radiation causes errors in replication . Mutational variation creates new genes or changes existing ones, thereby enriching the population's gene pool. Mutations of each individual gene are rare in nature [1].

In order to increase the productivity and scope of economically valuable mutations, scientific research is being conducted to find factors that change the mutagenic effect, to determine the role of genotype in experimental mutation, and to determine the environmental conditions in the manifestation of the genetic potential of induced mutants. The expediency of revealing hybrids obtained as a result of crossing cultivated and wild forms that are close to each other within the species and genetically distant from each other is also important for the issue of using the experimental mutagenesis method in selection in order to improve individual, lacking economically important characters in industrial varieties. 'attention [2], [3]

Literature review: It turns out that the closer the varieties are to each other in terms of origin and genotype , the more similar the rate and character of mutation will be. This confirms that NI Vavilov's law of homologous series in genetic variation is correct. The temperature before and after irradiation, the conditions of the light regime during the irradiation period have a great influence on its result . Irradiation at low temperature increases the rate of chromosomal changes, and high temperature reduces the number of mutations. During radiation, high temperature has a regenerative effect on chromosomes. A short bright day has the same effect. If the seed has been irradiated, this year there will be a slight slowdown in the development and production of cotton. The development of all plants, the external appearance of the bushes, the shape of the leaves, the buds , and the lack of reproduction will change dramatically from the norm. There are very large and small plants. Most of them will be unviable. Most of the changes under investigation are called radiomorphosis, which revert to the original in later generations. Radiomorphoses are not adaptive variations, so they are less viable.

Research methodology : The analysis of the viability of dust particles was carried out in laboratory conditions. To determine fertility, pollen was collected from ten flowers of each plant. The study of the viability of dust grains was carried out using the methodology of Z. Pausheva [6] . The most effective way to determine the viability of dust grains is in vivo [7] . Chemical dyes that give color can be used to determine whether it is fertile or sterile . The acetocarmine method was used to determine the viability of dust grains. For this, mature flower pollen was placed in carnoia fixative . Pollen was placed in Carnois fixative for half an hour to several hours. The material was washed and preserved in an 80% solution of ethyl alcohol. After that, the dust grains settle on the glass of the product, a drop of acetocarmine is added and covered with a coverslip. Heated in alcohol and seen under a microscope. From dust grains prepared preparations were examined under a microscope at different magnifications (10x, 40x, 100x) under a binocular microscope. In addition, it is possible to determine the fertility directly with acetocarmine or iodine without putting the pollen grains collected from the plant in a fixative. Granular cytoplasm and spermatozoa in viable pollen grains are stained carmine red. Sterile pollen grains are almost not stained with acetocarmine, or the color is unevenly distributed in the cytoplasm of pollen grains. The number of stained and unstained dust particles was counted for analysis . The number of stained and unstained dust grains was statistically analyzed, and the viability of dust grains (%) was interpreted as a percentage.

Analysis and results : Studying and researching the viability of plant pollen grains is important in solving many problems of practical selection. Pollen grains are formed in the anthers of flowers and develop from a microspore in a microsporangium. Environmental pollution has a negative effect on the productivity of plants. The main amount of pollutants accumulates in the vegetative organs, in turn, problems arise in the reproductive organs of the plant, and the viability and quality of dust particles decrease under the influence of aerotechnological pollutants.

of **two** combinations , varieties and lines of cotton crossbred in our laboratory was irradiated at the Institute of Nuclear Physics under the Academy of Sciences of the Republic of Uzbekistan.

Different amounts of radiation provide different benefits. Accelerating, critical or mutagenic and lethal amounts are distinguished. Cobalt-60 radioisotope (^{60}Co) with the absorption power of 0.05 Gr/s after irradiation of hybrid samples of cotton with gamma rays.

irradiated in a gamma ray source (see Fig. 1).

Figure 1. Irradiation of hybrid samples of cotton with gamma rays, irradiation in a source of gamma rays based on Cobalt-60 radioisotope (60-Co) with an absorption intensity of 0.05 Gr/s.

1) Stimulator-1 (weak)
2) Incentive -2 (medium)
3) At the mutation level (strong) irradiated and stored for a period of rest.

The purpose of irradiating hybrids is to increase the number of crossing overs that destroy the linkage groups in them, and thus isolate and multiply unique combinations.

It is known that the effect of gamma rays on cotton seeds causes changes in a number of morphological characters. Changes in characters such as leaf color, type of branching, number of branches, stem growth, etc. are mainly conservative-hereditary. Co, the reaCon for sharp morphological changes in cotton is the genetic changes that occur under the influence of gamma rays under the influence of external conditions. In addition, a number of paratypic (or modification) changes of quantitative characters under the influence of environmental conditions are determined . For example, early maturity, fiber length, yield and quality of cotton are subject to Come degree of paratypic variation depending on the agronomic practices used and Coil-climatic conditions. [4], [5].

In the course of our research, the effect of gamma rays based on cobalt-60 radioiCotope (60-Co) on the generative organ of plants, i.e. pollen grains, was studied. (See Figure 2)

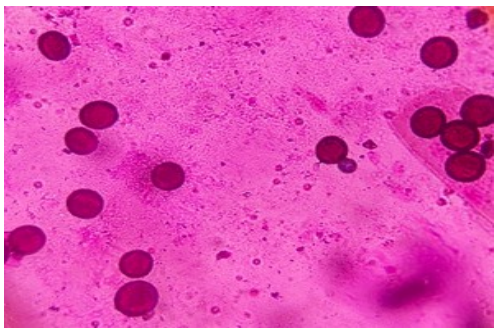

Figure 2. M $_{1 \text{ of Ghoza}}$ General view of pollen grains of L-21 x Elastic hybrid.

According to the results of the research, Indicators of viability of cotton grains of varieties and hybrids irradiated in a gamma ray Cource based on cobalt-60 radioiCotope (60-Co) (see Table 1) Hairless I amount 80.2%, II amount 79.9%, III amount 71.4%, Future-2 I amount 80%,

Amount II 88.0%, Amount III 72.9%, Future Amount I 82.5%, Amount II 90%,

Indicators of viability of dust grains of varieties and hybrids of cotton irradiated in a Cource of gamma rays based on cobalt-60 radioiCotope (60-Co) (M $_1$)

Table 1

No	**Varieties and hybrids**	**How much?**	**Analyzed powder particles total number of**	**Fertile powder grains**	**Sterile powder granules**	**Powdered grains the viability of (%)**
1	Hairless	I	8118	6512	1606	80.2%
		II	3014	2410	604	79 . 9 %
		III	3148	2250	898	71.4%
2	Future-2	I	4556	3002	1554	80%
		II	6787	5975	812	88.0%
		III	1850	1350	500	72.9%
3	The future	I	5021	4145	876	82.5%
		II	3046	2743	303	90%
		III	2950	2240	710	75.9%
4	Future x Future-2	I	-	-	-	-
		II	8785	8002	783	91.0%
		III	3246	2712	534	83.5%
5	Future L-21	I	3785	2850	935	75.2%
		II	10177	8000	2177	78.6%
		III	5947	5151	796	86.6%
6	L-1305	I	2933	2150	783	75.8%
		II	5023	3950	1073	78.6%

		III	8885	7251	1634	81.6 %
7	LM x Future	I	7847	5896	1951	75 . 1 %
		II	1985	1518	467	76.4%
		III	2980	1988	992	66.7%
8	Elastic x Future	I	2018	1803	215	89.3%
		II	3460	2951	509	85.2%
		III	4054	3247	807	80.0%
9	L-21 x Elastic	I	-	-	-	-
		II	3450	2880	570	83.4%
		III	9782	7813	1710	65.8 %

The low index in the III volume was 75.9%, the high result in the Future x Future-2 I volume was 91.0%, and in the III midor it was 83.5%. In the first generation hybrids of cotton irradiated in the Cource of gamma rays based on cobalt-60 radioiCotope (60-Co), Kalajak x L-21 I amount 75.2%, II amount 78.6%, III amount 86.6%, LM x Kalajak I amount 75.1, As a result of the analysis, it was determined that the viability of dust grains was 78.6% in the amount of II, 81.6% in the amount of III, 83.4% in the amount of L-21 x Elastic II, and 65.8% in the amount of III .

Summary: It should be noted that varieties and hybrids of cotton irradiated in a Cource of gamma rays based on cobalt-60 radioiCotope (60-Co) The analysis of vitality (M_1) revealed different effects on plants in different amounts of radiation and it was found that it was 65.8%-91.0%

Cytomorphological analysis of pollen is important for genetic and selection work, because information about the stage of development,

the diameter of the dust grains, the degree of coloring allow us to more accurately assess the productivity of the sample, the success of pollination is determined, which directly affects the yield.

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