

## CHANGE OF GENETIC CHARACTERS IN PLANTS, GENETIC ANALYSIS

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**Abstract:** This article provides detailed information on the inheritance and variability of genes in plants, biochemical processes, molecular genetic methods, mutational and hybridological analysis, combination or recombination, mutagenesis, aneuploidy, genetic studies.

**Key words:** aneuploid, monosomy, nullisomy, mutation, locus, genotype, phenotype, variability, heredity, modification, correlative, selection.

Genes are the basic units of genetic information contained in DNA molecules. They play an important role in the development and functioning of the body, for example, they determine eye color, growth, susceptibility to various diseases, etc. Each person has about 20-25 thousand genes that are passed from parents to children. These genes contain instructions for synthesizing proteins that perform various functions in the body, including maintaining health and regulating biochemical processes. Genetic analysis is a collection of methods for studying heredity and variation in plants. G. t. with the help of this method, specific developmental differences in the signs and characteristics of organisms are studied, the amount of genes controlling these differences and the character of their interaction are determined. Genetic analysis includes cytogenetic, molecular-genetic, population, aneuploid, mutational and hybridological analyses. Using the cytogenetic method, the relationship between the structure and functions of chromosomes and the development of a certain trait is studied. The molecular genetic method is used to study the relationship between the molecular structure of genes and the synthesized proteins in accordance with the information contained in them. The population method is based on the application of mathematics and variational statistics methods in genetic research. The aneuploid method, based on the use of monosomic and nullisomic chromosomes, allows to determine the genes located on each chromosome of the genome, as well as the genetic significance of certain chromosomes. The mutagenic effect of radiation and

chemicals on the body is studied using the mutation method; the rate and nature of mutations in certain loci (genes) and the nature of chromosomal aberrations (anomalous structures) are checked.

Genetic testing involves DNA analysis to identify changes (mutations) in genes associated with various diseases or conditions.

The main stages of genetic research are as follows:

1. Obtaining biomaterial: plant gene is used for DNA analysis and other biological material is used.
2. Isolation of DNA: DNA from the biomaterial is isolated and purified and prepared for analysis.
3. DNA analysis: Various techniques such as next-generation sequencing (NGS) are used to detect mutations and other changes in DNA.
4. Interpretation of results: Geneticists analyze the obtained data and interpret it in the context of the clinical appearance of the plants.
5. Variability - diversity of signs and characteristics of living organisms and viruses. The term "variation" also refers to organisms developing new traits and characteristics or losing old traits and characteristics. variability means the opposite of heredity. The variability that occurs in natural conditions is natural, that is, spontaneous, and the variability created in an experiment is called artificial, that is, induced variability. the source of variability can be a combination or recombination of genetic material, a change in the composition of genes or chromosomes, and the influence of environmental conditions. According to its nature, variability is divided into genotypic, hereditary and phenotypic, i.e. non-heritable forms.

Genotypic variability is the variability of the traits and characteristics of organisms related to the genotype, which is preserved in generations (according to Ch. Darwin, it is not clear), that is, a sudden change of traits - mutation (mutational variation) or the combination of traits during the hybridization of organisms (combination due to variability).

In phenotypic variability, the genotype does not change. An example of this is the change of all morphophysiological and biochemical signs (ontogenetic, i.e., age-related variability) during the individual development of an organism along with its age (aging). Another kind of modification variation (modification) can be seen in individuals belonging to the same species, genetically identical, but living in different conditions and differing from the organism in terms of quantity and quality. According to Ch. Darwin, modification variation is clearly the variability is

manifested by the change of certain signs in a certain direction and has a mass character. Morphoses are the modified changes that occur under the influence of various physical and chemical factors. Morphoses associated with the mutation of certain genes are called phenocopies. Phenotypic variability can be explained not by signs and characteristics in organisms, but by inheritance of their development potential. For this reason, there must be certain conditions for the genotype to manifest itself in the phenotype. For example, for a plant to be green, it needs light along with a gene that controls the synthesis of chlorophyll. The degree of variability that appears under the influence of environmental conditions also largely depends on heredity, because the genotype determines the norm of the organism's reaction to each trait. Hereditary and non-hereditary variability of organisms is individual qualitative and quantitative, independent and correlative (interrelated), adaptive (adaptive) and non-adaptive and b. determines the variety of signs. In the process of evolution, different forms of variability are not equally important. Genetic variability is the basis of organic evolution and a source of material for selection. Natural variation allows organisms to adapt to changing environmental conditions. Mathematical statistics and comparative descriptive methods are the main methods of studying variability.

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