

## VARIETIES OF MARKER GENETIC LINKAGE WITH TARGET GENE AND CHROMOSOME LOCI

**Yu. V. Chesnokov**

*Agrophysical Research Institute  
14, Grazhdanskiy pr., St.-Petersburg, 195220  
E-mail: yuv\_chesnokov@agrophys.ru*

The mapping of quantitative trait loci (QTL) and the identification of marker-gene association are the most important tools in modern molecular and genetic investigations. The use of molecular markers makes it possible not only to identify and localize the chromosome loci and genes determining the investigated characteristics in linkage groups, but also to reveal their interrelationships. However, it should be borne in mind that the linkage of the marker to the target gene or chromosome locus may be different due to differences in the statistically significant marker-gene interaction. The paper considers three main types of polymorphic genetic markers. Direct markers (direct, D) mark loci encoding various kinds of functional genes or mutations. Such markers, if they are molecular, are located directly in the desired gene. The second type is linkage disequilibrium markers. They mark chromosome loci or genes that are present in population in disequilibrium linkage with a functional gene or mutation (morphological markers), a biochemical product of marker gene (biochemical markers), or a DNA marker (molecular markers). The third type is linkage equilibrium markers. They mark loci that are present in population in linkage equilibrium with a functional gene or mutation (morphological markers), a biochemical product of marker gene (biochemical markers), or a DNA marker (molecular markers). Based on the classification of the markers' types, it can be concluded whether there is a possibility to use these markers for the purpose of solving genetic and breeding problems and whether the different types of molecular and genetic markers can be useful for plant genetic resources screening, including DNA-genotyped lines and accessions.

**Keywords:** genetic markers, types of linkage, marker-gene interaction.