



## Cotton Genetic Resources: A Unique Source for the Development of Modern Varieties

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Improvement of yield and fiber quality traits, as well as resistance to biotic and abiotic stresses, is one of the main tasks of cotton research and production programs. In cotton growing, one of the urgent issues is the identification and development of initial donors genetically resistant to the stress factors such as salinity, drought, insect pests, and pathogens. Furthermore, using the wild ancestors of cotton species in breeding allows for increasing the genetic variability of economically important traits of cultivated cotton varieties. Especially, the enrichment of the cotton gene pool with wild species resistant to various stressor factors and complex and synthetic hybrid populations with unique characteristics and able to quickly adapt to different conditions obtained through interspecies hybridization and experimental polyploidy methods, and their introduction into practice is an urgent scientific and is of practical importance.

However, one of the disadvantages of cotton breeding is the limited use of plant genetic diversity that leads to genetic uniformity and the narrow genetic bases of modern varieties, degeneration, and other negative aspects. The involvement of new gene/alleles of wild cotton relatives increases the prospect of creating unique source materials with valuable properties and a new gen-immune system of potential resistance to agricultural diseases and insect pests in the breeding processes. The natural biodiversity of cotton (the genus *Gossypium* L.) - its wild relatives are the richest source of genetic resources and the smallest part is used in breeding programs. A large part of the gene pool still awaits recognition. The use of the valuable wild cotton germplasm to improve local cul-

vars and create new genotypes remains limited by our insufficient knowledge of the entire biological and morphological diversity of the *Gossypium* L. genus. In particular, the valuable intraspecific potential of *G. herbaceum* L. and Australian cotton are underutilized species.

Recently, the interests of geneticists and breeders in Australian cotton species has increased significantly. Several representatives of Australian cotton have been identified and recommended for practical use of genetics and breeding studies, possessing economically valuable traits such as early maturity, high fertility, deciduousness, resistance to drought, reduced temperatures, to agricultural pests, including aphids (*Aphis gossypii* Glov.) and spider mite (*Tetranychus urticae* Koch), to fungal disease (*Verticillium dahliae*, etc.).

The basis for the successful and effective use of this genetic potential is the development and solution of complex and controversial fundamental problems of systematics (taxonomy), evolution and phylogeny, distant hybridization, and other problematic theoretical issues of cotton growing.

Solving the above theoretical and practical issues is necessary to increase the commercial efficiency of cultivated varieties for rational and effective use of biological diversity of polymorphic cotton species, as well as creating new cultivars with complex economically valuable traits, and adaptive resistance to biotic and abiotic environmental factors.

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