

DEVELOPMENT OF A LINKAGE MAP FOR THE DISSECTION OF AGRONOMICAL KEY TRAITS IN DURUM WHEAT

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Durum wheat (*Triticum turgidum* L. var. *durum*) is mainly produced and consumed in the Mediterranean regions, an environment where poor soil, high and low temperature and drought represent the main limiting factors affecting yield and grain quality. High-yielding cultivars endowed with drought tolerance and disease resistance, in addition to high commercial and technological value, are therefore desirable. Breeding for stress tolerance and grain quality is an important task to increase and improve durum wheat productivity. Traditional approaches based on cross and subsequent selection for phenotype have not been completely successful, being the stress tolerance and the grain quality polygenic traits characterized by low heritability and high “genotype x environment” interaction. New chances to dissect the genetic bases of the important agronomically traits come from developing genetic maps based on molecular markers, discovering QTL and using these QTLs in plant breeding via marker-assisted selection.

We are currently developing a SSR linkage map on a RIL population derived from two durum wheat varieties, Creso and Trinakria, with different drought tolerance. In replicated field trials carried out in south Italy, Trinakria yielded more in rainfed conditions than in trials with supplementary irrigation, a result according previous knowledge indicating Trinakria as drought resistant cultivar. They also showed a different level of resistance to *Alternaria*. About 110 F8 Recombinant Inbred Lines (RILs) are now available from this cross and more than 300 biochemical and molecular markers with known map position have been tested between parental lines, resulting in 163 polymorphic markers. The polymorphic markers have been used to characterise the whole segregant population and the segregation data of the alleles at the polymorphic loci have been analysed in order to construct the linkage map.