OFANTO X CAPPELLI, AN INTEGRATED DART-SSR LINKAGE MAP OF DURUM WHEAT FOR DISSECTION OF TRAITS LINKED TO GRAIN YIELD AND WATER DEFICIT TOLERANCE


*) CRA- Centro di Ricerca per la Cerealicoltura, SS 16 km 675, 71100 Foggia, Italy
**) Dip. Scienze Agronomiche e Genetica Vegetale Agraria, Via E. De Nicola 1, 07100 Sassari, Italy

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Durum wheat (Triticum turgidum L. var. durum) is largely grown in Mediterranean environments where drought stress affects grain yield and yield stability. Drought tolerance, high yield and yield stability are key agronomic traits characterized by a complex genetic basis, being controlled by many loci throughout the genome. This work aimed to develop a new durum wheat intervarietal genetic map based on SSR and DArT markers for the dissection of the genetic bases of important agronomic traits. 161 recombinant inbred lines (RILs) F8-F9 derived from the cross between durum wheat varieties Ofanto and Cappelli were used in this study. Ofanto is a modern cultivar with yield capacity and stability; Cappelli is an old cultivar with lower yield but higher water use efficiency (WUE) with respect to Ofanto. The genetic map comprises 132 SSR, 4 TRAP and 439 DArT markers distributed within 21 linkage groups. A significant deviation from the expected mendelian ratio was registered in segregation for 13.8% of the markers. 42.9% of markers were localized on the A genome chromosomes, while 57.1% were distributed on the B genome chromosomes. The A genome accounted for a map length of 608 cM, while the B genome for 793.6 cM. The employment of the map in the dissection of physiological traits related to water stress tolerance is presented.