Proceedings of the Joint Meeting AGI-SIBV-SIGA
Assisi, Italy – 19/22 September, 2011
ISBN **978-88-904570-2-9**

Poster Communication Abstract – 2A.75

PHYSICAL MAPPING OF GENOMIC AND EST-DERIVED SSR MARKERS ON THE HOMOEOLOGOUS GROUP 5 CHROMOSOMES OF WHEAT

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Durum wheat, cytogenetic map, 5A chromosome, microsatellites

The International Wheat Genome Sequence Consortium, aimed to physical mapping of bread wheat genome, assigned to Italian research groups the genetic and physical mapping of 5A chromosome. The aim of the present work was to find new molecular markers on chromosome 5A to saturate the existing genetic map, and to develop a cytogenetic deletion map of the homoeologous group 5. A set of 167 microsatellite markers identified in public databases as mapping on 5A and 5B chromosomes were physically mapped. In particular, 135 were genomic microsatellites (gSSR), 30 were derived from expressed sequence tags (EST-SSRs), and 2 were STS. Amplified bands were visualized by capillary electrophoresis performed using an ABI PRISM 3100 Avant Genetic Analyzer.

The SSR markers were physically mapped on 5A and 5B chromosome bins by using a set of aneuploid lines derived from the hexaploid wheat cultivar Chinese Spring (*Triticum aestivum*). Cytological mapping of microsatellite markers on 5A was conducted with nulli-tetrasomic lines CS-N5AT5B and CS-N5AT5D, the di-telosomic line CS-DT5AL, and 14 deletion lines of which 4 belonging to 5A short arm and 10 to the long arm. Besides, physical mapping of SSRs on 5B chromosome was carried out with the nulli-tetrasomic line CS-N5BT5D, the di-telosomic line CS-DT5BL, and 6 deletion bin lines of which 4 belonging to the chromosome short arm and 2 to the long arm. All the bin lines were tested for carrying the correct homozygous terminal deletions by PCR amplification with specific SSR markers belonging to the missing chromosome region.

Out of 167 analysed markers, 110 were physically mapped on specific 5A and 5B chromosome bins, while the other 57 were amplified both in 5A, 5B and 5D nulli-tetrasomic lines. A total of 46 SSR markers were assigned to chromosome 5A, 34 on 5B and 6 on 5D; 24 SSRs produced multiple loci which mapped to 5A and 5B (16), 5B and 5D (4), 5A and 5D (1) and 5A, 5B and 5D (3). For both the homoeologous the majority of markers were physically mapped in the bins of the long arm. Infact, the most represented bins were 5AL5-0.46-0.55 for 5AL and 5BL6-0.29-0.79 for 5BL, while the regions which were the most lacking of markers were represented by bin C-5AL5-0.46 and 5BS4-0.43-0.71, respectively for 5AL and 5BS. Physical mapping of SSR markers on 5A will provide a very powerful tool to anchor the 5A BAC sequence contigs to the chromosome.