Poster Abstract – A.05

IDENTIFICATION OF DURUM WHEAT CULTIVARS BY SSR MARKERS

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In the Mediterranean countries, Italy plays an important role and long tradition in durum wheat cultivation. Over 170 cultivars of durum wheat are subscribed in the Italian list of variety. Inexpensive and powerful tools are needed in order to assess distinctness, uniformity and stability of cultivars. They would also be useful, a posteriori, to settle legal conflict over the recognition of a seed stock. Generally, morphological traits provide low informativeness, due to limited level of polymorphism, often exhibit a polygenic control and their expression is subjected to environmental effects. Seed protein storage analysis for cultivar identification is limited since protein polymorphism is not so high. A much more powerful and informative tool is provided by molecular markers. Particularly, microsatellites or SSR markers are abundant, multiallelic, highly polymorphic and not influenced by environment.

The aim of this study was: i) to test the efficiency of SSR markers in DNA fingerprinting of durum wheat; ii) to distinguish 80 cultivars with a reduced number of SSR markers; iii) to construct an identification key based on molecular data.

Preliminary, an analysis of SSR markers informativeness in a set of 28 durum wheat cultivars was carried out by using 11 primers. The SSR markers screened included 8 *Xgwm* and 3 *Xwmc*. All primers pairs produced fragments in the examined cultivars. The number of fragments amplified ranged from 4 to 27. The level of informativeness of SSR markers was estimated by Resolving power (Rp) index. The Rp of the 11 SSR markers ranged from 0.90 to 10.14. A strong relationship ($r^2 = 0.90$) was observed between the Rp and cultivar identification. On average, SSR markers with an Rp value of 2.89 were predicted to distinguish 7 cultivars. One SSR marker resulted highly informativeness (Rp = 10.14) and was able to distinguish all 28 cultivars. This SSR marker was tested on 80 durum wheat cultivars and distinguished 69 genotypes. The indistinguishable cultivars were identified by another informative SSR marker. In addition, an identification key was worked out for cultivar identification with the data of two SSR markers.

The present work showed that two primers pairs resulted sufficient to distinguish all durum wheat cultivars examined indicating a very good discriminating ability of SSR markers. This result suggested that the SSR analysis was a technique quick, reproducible and generates several polymorphisms useful in cultivar identification studies.