

Alfalfa Ecotypes from Siwa Oasis: Variation by means of Bio-agronomic Characters and SSR Analyses

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North African oases are likely to be an environment where pure *M.sativa* ssp. *sativa* germplasm has been maintained for thousands years; besides, soil and irrigation water salinity levels may have exerted a selective pressure towards alfalfa populations and their symbiont *S. meliloti*. Objective of this work is to study the variation of alfalfa germplasm collected in Siwa oasis (Egypt) in view of improving collection procedures and optimising the use of this germplasm in the alfalfa breeding programs of the Lodi Institute.

Seventeen alfalfa farm landraces (ecotypes) were collected in 1998 together with soil and irrigation water samples; plant material (120 plants/population) was grown at Lodi Institute with 4 Egyptian and 3 Italian cultivars in tube-plots 5 cm diameter 80 cm high (density equivalent to 500 plants/m²) organised in a randomized block design with 4 blocks. Irrigation was not limiting. Five cuttings were made in the sowing year and in the 1st productive year respectively; dry matter, stem height and earliness were recorded at single plant basis.

The Siwa landraces differed from both the Egyptian and the Italian cultivars for the estimate of fall dormancy degree and for the later achievement of the reproductive stage during summer cycles. Dry matter yield was not significantly different in the three groups. A variation among the 17 ecotypes was found due mainly to different stem elongation rate, rate of development and dry matter production.

Bulk samples of 120 plants/population were analysed by means of 36 microsatellite (SSR) loci derived from both *M. truncatula* and *M. sativa*. The analyses generated 86 polymorphic alleles that produced a unique pattern per population. The UPGMA dendrogram designed on the polymorphic alleles showed three main clusters : the Egyptian ecotypes, with high internal genetic similarity (DICE coefficient value of about 0.8), the Egyptian cultivars and the Italian cultivars.

Three populations (two ecotypes and one Egyptian variety) were used for single plant analysis based on 32 plants/population. Thirty-one out of 86 polymorphic alleles had a frequency of more than 10% in at least one population and were considered 'high frequency' alleles. The comparison of the UPGMA dendrograms designed using total alleles or 'high frequency' alleles shows minor differences in within-cluster population grouping while the main clusters remained the same.