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Assisted and traditional assessment of saline stress tolerance in *Lotus glaber*.

ARIEL CLÚA[1], MARIANA BARRAGÁN[1], MARÍA SILVIA TACALITI[1], DANIEL GIMÉNEZ[1] and ANA MARÍA CASTRO [1,2] *

[1] *INFIVE y Genética, Facultad Ciencias Agrarias y Forestales, UNLP, Argentina*
[2] *CONICET, Argentina.*

[*] *Corresponding author*

Narrowleaf birsdfoot trefoil is a naturalized grass in the Salad River Basin, which is a region with variable type of soils, being the Natralboles and Natracualfs the most frequent (Salazar *et al*. 1980). These soils induce plant salinity stress. High salinity in soils is a common abiotic distress, producing deprived water supply, affecting plant growth and productivity by osmotic stress and/ or ion toxicity. The most typical plant symptom of salinity injury is a retarded growth due to inhibition of cell elongation (Nieman, 1965). Largely differences have been found between and within species in the degree of adaptation to water stress. It is important to investigate the metabolic changes involved in plant adaptive strategies to water stress and their physiological basis could be useful for breeding and management purposes. Consequently, the aims of this work are to study: (i) the Narrowleaf birdsfoot trefoil intrapopulation variation in osmotic adjustment capability; (ii) the morphological and metabolic changes in response to water stress caused for salinity, and (iii) the assessment of biochemical and molecular markers associated with tolerance to saline stress.

The birdsfoot trefoil plants were collected from different populations of the Salado river basin, living in contrasting environments. Shoot explants of 5 cm long, were sectioned from plants to obtain clones, under natural conditions of light, temperature, and humidity. The explants grew in trays containing Hoagland's solution (Hoagland & Arnon 1950). After 20 days half plantlets of every genotype were transferred to another tray containing 200mM of ClNa. The rest of the plantlets remained in Hoagland solution as controls. It was recorded the survival, fresh and dry weights in aerial and root parts, root volume, foliar area, non-structural carbohydrates, protein contents, proline and isozymes. Samples were collected after 15 days of treatment. A sample of 0.5 gr of fresh weight was collected in one-week plantlets to analyze DNA by RAPDs in a bulk screening method.

The most tolerant genotypes subjected to saline stress showed the highest survival and their foliar area, fresh and dry weights and root volumes were not significantly different from control plants. On the other hand, susceptible genotypes showed losses of 60-100% in the above mentioned parameters. Similarly, reduced, non-reduced and total carbohydrates were similar in control and stressed plants of tolerant genotypes. The susceptible genotypes showed a significant increase of the carbohydrate contents when subjected to saline stress, comparing with their controls. The protein contents decreased in every genotype under stress. Tolerant genotypes showed a high significant increase of proline under stress

compared to their checks. Peroxidase system discriminated the tolerant genotypes from susceptible ones under stress. Three RAPDs were identified only in tolerant genotypes.

The traditional and assisted selection permitted the identification of tolerance to saline stress in *Lotus glaber.*

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