

## Variation for tolerance to drought stress among lines of *Medicago truncatula* HapMap

Loua Haddoudi<sup>1</sup>, Khawla Agrebaoui<sup>1</sup>, Naceur Djéballi<sup>2</sup>, Mohsen Hanana<sup>1</sup>, Jean-Marie Prospéri<sup>3</sup>, Ndiko Ludidi<sup>4</sup>, Chedly Abdelly<sup>1</sup>, Mounawer Badri<sup>1\*</sup>

<sup>1</sup>Laboratory of Extremophile Plants, Centre of Biotechnology of Borj Cedria, Tunisia;

<sup>2</sup>Laboratory of Bioactive Substances, Centre of Biotechnology of Borj Cedria, Tunisia;

<sup>3</sup>INRA, Campus Supagro Montpellier 2, Place Viala, Montpellier Cedex 2, France; <sup>4</sup>Plant Stress Group, Department of Biotechnology, University of the Western Cape, South Africa,

\*e-mail: mounawer.badri@gmail.com

*Medicago truncatula* is an omni-Mediterranean species grown as an annual forage legume. In addition to its small genome size and simple genetics, *M. truncatula* harbors several attributes which make it an attractive model legume. In this study, we investigated variation for tolerance to water deficit in 202 lines of *Medicago truncatula* HapMap, generated by the Centre of Biotechnology of Borj Cedria (CBBC) and INRA Montpellier. Plants were cultivated under 100 and 30% of field capacity and were harvested at the flowering stage. Results from ANOVA showed that variability of measured parameters was explained by the effects of line. Out of the 12 measured characters, 8 were significantly explained by the effects of line. Furthermore, high to moderate broad-sense heritability ( $H^2$ ) values were observed for most traits in drought-stress. Positive correlations were found between traits related to aerial and roots growths while length of roots is negatively correlated with chlorophyll content (CHL). Based on their response to drought-stress, studied lines were clustered into three groups. A first group was formed by the 7 most affected lines, a second group was constituted by 84 tolerant lines and a third group was composed by 147 intermediate lines. Hence, the lines from the first and second groups are useful for the identification of the genetic determinants for tolerance to water deficit in *M. truncatula*.

**Keywords:** *M. truncatula* HapMap, lines, water deficit, morphological traits.