

Growth and Biochemical Changes in Lupine Plant Grown under Saline Condition

M.M. Hussein, M.S. Abdel-Hady* and Hoda M.H. EL-Naggar*,
*Water Relations & Irrigation Dept. and * Botany Dept., Agric.
Div., National Research Centre, Cairo, Egypt.*

APOT experiment was conducted in the greenhouse of the National Research Centre at Dokki, Cairo Egypt during 2007/2008 winter season to evaluate the effect of different salt stress levels on some physiological and biochemical parameters. Lupine plants were irrigated by three concentrations of diluted seawater (2000, 4000 and 6000 ppm separately) higher than the control treatment (irrigated by tap water 250 ppm) and sprayed with ascorbic acid at two levels (100 and 200 ppm). The control plants received the same quantity of distilled water. Obtained results approved a negative relationship between salt concentration in the root media and vegetative growth parameters, *i.e.* plant height, root length, number of leaves and number of branches of lupine, on one hand. Also dry weight of the different plant parts decreased as the concentration of salt increased in water of irrigation. On the other hand, the top to root ratio decreased as the concentration of salt increased. Plant height, root length and number of branches gave its higher values when plants sprayed by 200 AsA. Root fresh weight showed the same response when plants sprayed by 200ppm of ASA. Fresh weight of stem, top and whole plants increased as the concentration of (Ascorbic acid) AsA increased up to the highest level used. Dry weight of different parts of lupine plant increased parallel to the increase in AsA level. The AsA treatments improved the plant height and number of green leaves. This was more clear under the highest salinity and ascorbic acid levels. Generally, root length or number of branches was slightly affected except for root length under the higher level of salinity which showed the same response of plant height and number of leaves. Negative relationship between the increase of salt concentration in water of irrigation by diluted seawater and the dry mass of different lupine plants and whole plant dry weight markedly depressed by salt stress but the AsA supply enhancing the resistance against this abiotic stress. The electrophoretic patterns (SDS-PAGE) for water soluble proteins of lupine cultivar under salt-stress and antioxidant (ascorbic acid) activity conditions showed that electrophoretic bands could be a useful tool for identification and characterization of biochemical genetic marker that are related to salinity tolerance also antioxidant activity which was used to protection from salinity conditions.

Keywords: Lupine (*lupinus termis* L.), Salinity, Diluted seawater, Ascorbic acid (ASA), Growth, Protein, Electrophoretic patterns.

Sweet lupines are now widely accepted as a supplement for ruminants because they are high in available energy and protein and have advantages in handling,