



Mitigation of drought stress on Fenugreek plant by foliar application of trehalose

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Abstract: The present work aimed to study the alleviation effect of foliar treatment of different concentrations of trehalose at different water holding capacities (WHCs) on growth, photosynthetic pigments, seed yield quantity and quality in fever of nutritional value and antioxidant activities. In addition to raise the efficiency of Fenugreek plants to resist water stress to reduce the amount of irrigation water. So, this experiment was carried out at the green house of National Research Centre on Fenugreek plant. Three concentrations of trehalose were foliar sprayed (Tre0, Tre1 and Tre2). Plants were irrigated with different WHC 100% and 60%. Data showed that, irrigation of Fenugreek plants with lower WHC 60% resulted in decreases in all growth parameters, photosynthetic pigments, yield components, carbohydrate% and protein%. Meanwhile phenolic and flavonoids contents increased by drought stress. Antioxidant activity at 50 and 100 μ g/l showed significant increases in response to drought stress. On the other hand, treatment Fenugreek plant with different concentrations of trehalose led to increases in growth parameters, photosynthetic pigments, yield components, carbohydrate, protein, total phenolic, flavonoids contents, and antioxidant activity of the yielded seeds either in non stressed and drought stressed plants relative to corresponding controls. Generally, 500 μ M Tre was the most pronounced and effective treatment in alleviating the deleterious effect of drought stress on Fenugreek plants.

Key words: Antioxidant activity, Fenugreek, flavonoids, phenolics, protein, trehalose.