Abstract

Water stress, permanent or temporary, limits the growth and the distribution of natural vegetation and theperformance of cultivated plants more than any other environmental factors. Water deficit stress provokes reactive oxygen species (ROS) in cluding superoxide, hydroxyl and hydrogen peroxide production in plant cell chloroplasts and subsequently causes lipid membrance peroxidation and damage. In this research, the effects of water stress and the effect of alpha tocopherol as protecting factor in *Lepidium sativum* L. on metabolites compatible (prolin and soluble carbohydrates contents) and antioxidant enzymes activity were studied, an experiment was conducted in factorial based on randomized complete block design with three replications and two treatment, treatment drought stress levels (in three levels) and treatment different concentrations alpha-tocopherol (in three levels) in laboratory of Zabol University in 2013. The statistical analysis showed that water deficithad significant effect on soluble carbohydrates, proline contents and antioxidant enzymes activity, as this enhancement was remarkably in severe stress whereas, foliar application of alphatocopherol decrease it. Prolin and soluble carbohydrates levels were significantly for all treatments except for the treatment medium stress along with 15Mm alpha-tocopherol. Enzymes levels in medium stress and sever stress were significantly different, 5Mm alpha-tocopherol along with different water stress showed no reducing effect. However, 15Mm alpha-tocopherol especially in medium stress could reduce the effect of water stress through reduction in level of metabolites produced in response to low irrigation. In addition, plants were preferred alphatocopherol utilize as a scavenger than the enhancement enzyme activity in against stress. The latter could in directly decrease enzyme activity and improved growth conditions for plants.

Key words: *Lepidium sativum* L., prolin, antioxidant enzymes, water deficit.

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The effect of water stress and its interaction with alpha-tocopherol on some physiological and biochemical traits in *Lepidium sativum* L.

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