

Title : Effects of water deficit on growth, chlorophyll, proline, and total phenolic content of Chinese white radish seedling

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ABSTRACT

Pretreatment of some plants with low NaCl concentrations before exposure to water deficit stress can promote growth and ability of water deficit stress tolerance. This research aimed to investigate the effects of water deficit stress on growth and some important physiological compounds in Chinese white radish (*Raphanus sativus* L. var. *longipinnatus* Bailey) seedlings pretreated with 10 mM NaCl. The experiment was divided into three parts. Experiment 1, growth of Chinese white radish seedlings treated with 10 mM NaCl for 5 days. The results showed that 10 mM NaCl increased seedling growth rate in terms of shoot height, fresh weight, and dry weight, with the highest growth rate observed in day 4. Experiment 2, growth of Chinese white radish seedlings pretreated with 10 mM NaCl under water deficit stress. Four-day-old seedlings from the first experiment were transferred to water deficit conditions induced by -0.5 MPa mannitol solution for 3 days. The results indicated that pretreatment with 10 mM NaCl increased shoot height, fresh weight, and water content in seedlings under water deficit stress. Experiment 3, some important physiological compounds of Chinese white radish seedlings pretreated with 10 mM NaCl under water deficit stress. The results indicated that pretreatment with 10 mM NaCl increased proline accumulation in cotyledons, hypocotyls, roots, and seedlings, as well as total phenolic contents in cotyledons and seedlings. However, chlorophyll a, chlorophyll b, and chlorophyll a+b contents in cotyledons decreased, while those in hypocotyls remained unaffected. These results indicate that pretreatment of radish seedlings with 10 mM NaCl for 4 days can promote growth and enhance tolerance to water deficit stress for 3 days.