Title : Effects of trehalose on the antioxidant system of radish seedlings under salt stress

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ABSTRACT

Radish (*Raphanus sativus* Linn.) sprouts are a type of microgreen that is popular in many countries due to their high antioxidant content. Trehalose (Tre) and sodium chloride (NaCl) can stimulate antioxidant activity and reduce free radical levels in various plant species. This research aimed to study the effects of Tre and NaCl alone or their combination on the growth, antioxidant enzyme activity, free radical levels and total antioxidant capacity of radish sprouts. The experiment was divided into two parts: (1) investigated the effects of Tre and NaCl alone or their combination on the growth of radish sprouts. The results showed that the treatments with 10 mM Tre combined with 50 mM NaCl led to the best growth performance. This was analyzed based on length, relative water content and water status of stems and leaves. (2) Investigated the effects of Tre, NaCl and Tre combined with NaCl on changes in antioxidant enzyme activity, free radical levels and total antioxidant capacity in radish sprouts treated with 10 mM Tre, 50 mM NaCl and 10 mM Tre combined with 50 mM NaCl, compared to the control group. The results showed that antioxidant enzyme activity including superoxide dismutase, catalase, glutathione peroxidase and ascorbate peroxidase and total antioxidant capacity (ABTS and DPPH assays) increased. Additionally, free radical levels (hydrogen peroxide and hydroxyl radicals) decreased compared to the control group. From this study, it can be concluded that the application of Tre and NaCl promotes the growth of radish sprouts, enhances antioxidant enzyme activity and total antioxidant capacity and reduces free radical levels in radish sprouts.