Alleviatory Effects of Salt Stress by Mycorrhizal Fungi and Gibberellic Acid on Chamomile Plant

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Abstract:

A pot experiment was conducted to study the alleviation of salinity effects by GA3 or inoculation with arbuscular mycorrhizal fungi (AMF) and their effects on growth, flower yield and volatile oil content of chamomile plant. Salinity concentrations were 0, 3 and 6 dSm-1 NaCl and GA3 was used at 0, 75 and 150 mgL-1. Salinity treatments significantly decreased plant height, branch number and relative water content (RWC) compared with the control. The volatile oil percentage was increased while the volatile oil yield was decreased with increasing salinity level. Salinity treatments also reduced chlorophyll content and membrane stability index (MSI) however, total soluble sugars (TSS), proline content and antioxidant enzyme activities (CAT, SOD and POX) were increased relative to the control. N, P, K, percentages were reduced with increasing salinity concentrations. Meanwhile, sodium was gradually increased with increasing salinity level and hence Na:K ratio was increased in salt stressed plants. GA3 or AMF treatments alleviated the abovementioned negative effects of salinity. The increment of antioxidant enzymes activities and accumulation of proline as a result of GA3 or AMF treatments are suggested to involve as part of the defense against salinity in chamomile plant. To alleviate the negative effects of salinity on chamomile plant, treatment of GA3 at150 mgL-1 or AMF inoculation treatment was recommended.

Keywords:

Keywords: Salinity; Chamomile; Mycorrhiza; GA3; Chlorophyll; Proline; Antioxidant Enzymes

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