

Effect of exogenous application of salicylic acid on proline metabolism in salt stressed *Chamomile recutita*

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Abstract

*The effect of exogenously applied salicylic acid (SA, 0.1 mM) on plant growth parameters, compatible solutes (proline, glycinebetaine) accumulation and on proline metabolism, in leaves and roots of Chamomile recutita plants grown in saline and non-saline control was investigated. Exogenously applied SA resulted increased plant growth significantly both in saline and non-saline conditions. The magnitude of increase in free proline accumulation was significantly increased in presence of NaCl but highly significant was found with the addition of SA to NaCl in leaves. Proline was found ≈ 5.3 folds increased in leaves and ≈ 1.3 folds only in root in presence of both treatments NaCl+SA with age of plant growth over that of non-saline control. Leaves tissue always maintained higher level of free proline contents than the roots. Anabolic enzymes such as pyrroline-5-carboxylate reductase and γ -glutamyl kinase activities increased in all three treatments than the non-saline control and the magnitude of increase was found more pronounced in presence of both treatments than the others. In other way catabolic enzyme, proline oxidase activity was inhibited in all treatments. Nevertheless, the reduction in the activity was more in presence of both treatments than the others. Therefore, during the exogenously applied SA to salt stress, proline metabolism was significantly altered and the extent of alteration varied between the SA and salt stress, leading to the maintenance of the turgor by accumulating higher levels of free proline accumulation in *C. recutita*, supporting its protection from salt stress. Further, with addition of SA to salt of *C. recutita* was evident from the higher level of glycinebetaine (GB) compared with non-saline control or/others treatments. The enhanced activities of P-5-CR & γ -glutamyl kinase, and proline content in response to NaCl and/or SA treatment, whereas their interaction had an additive/cumulative effect. Hence, SA could be used as*

a potential growth regulator to improve plant salt stress tolerance. It was, therefore, concluded that SA ameliorated the stress generated by salt through the alleviated proline metabolic pathway/system.

Keywords- *Chamomile recutita*; Compatible osmolytes; glycinebetaine; osmotic pressure; proline; salicylic acid; salinity.

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