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The effect of salicylic acid on some physiological and biochemical characteristics of *Rhazya stricta* under salt stress

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Abstract

Today, medicinal plants are important economic plants that are used in traditional and modern medicine. On the other hand, salinity stress is one of the most important abiotic stresses in many areas of Iran, which has caused many problems. Therefore, it is important to investigate the effects of salinity stress on medicinal plants. Salicylic acid as a hormone also plays an important role in improving the resistance of plants to abiotic stresses. In this study, the effect of salinity stress and its interaction with the application of salicylic acid on the changes in the physiological and biochemical indicators of *Rhazya stricta* was investigated. For this purpose, a factorial experiment was conducted in a completely randomized block design with three replications at the University of Zabol. The test factors included four levels of salinity (water (as a control), 4, 8, and 12 dS/m) and three levels of salicylic acid (0 as a control, 2 and 6 mM). Induced cellular responses of *Rhazya stricta* under the influence of salinity stress and salicylic acid by measuring membrane lipid peroxidation index and activity of antioxidant enzymes (catalase, peroxidase, guaiacol peroxidase, polyphenol oxidase), flavonoid, anthocyanin levels, the number of photosynthetic pigments and proline was evaluated. The results showed that salinity stress caused a significant increase in membrane lipid peroxidation and salicylic acid decreased the amount of MDA. According to the results, it was found that with the increase of salinity stress along with the application of salicylic acid, the activity of antioxidant enzymes increases. Also, the results showed that salinity stress decreased the photosynthetic pigments, but the combined application of salinity with salicylic acid increased the amount of chlorophyll. With increasing salinity, the amount of carotenoid and proline increased, and salicylic acid treatment significantly increased the amount of carotenoid and proline under salinity stress conditions. According to the results, salicylic acid at 2 mM decreased malondialdehyde and increased the activity of enzymatic and non-enzymatic antioxidant systems. The results showed that the best salicylic acid treatment is 2 mM level, which increased the resistance to salinity stress in *Rhazya stricta*.

Keywords: Antioxidant, Phenolic compounds, *Rhazya stricta*, Salicylic acid and Salt