Effect of Salinity Stress on Growth and Biochemical Characteristics of Three Population of Damask Rose of Iran

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Salinity stress is one of the important environmental factors that reduces the growth and yield of plants, especially in arid and semi-arid regions of the world. To investigate the effect of salinity levels (0.6, 3, and 6 dS m⁻¹) on 3 populations of damask rose (from Fars, Kerman, and Isfahan provinces) a factorial experiment was conducted in a completely randomized design with four replications and some growth and biochemical parameters were evaluated. Results showed that 6 dS m⁻¹ salinity significantly reduced leaf area in Maymand population and root and shoot dry weight in Kashan population. The reduction of chlorophyll content in the treatment of 6 dS m⁻¹ was more than that of control in the Meymand population (from 0.44 to 0.3 mg FW). Lalehzar population had the highest proline content (15.84 μmol mg⁻¹ FW) and the highest activity of catalase (8.4 U mg⁻¹ FW), peroxidase (11.76 U mg⁻¹ FW), and superoxide dismutase (17.7 U mg⁻¹ protein) at the concentration of 6 dS m⁻¹. The accumulation of the highest amount of sodium and chloride ions occurred in the leaves. Lalehzar and Meymand populations had the highest concentrations of sodium ions (19.6 μmol g⁻¹ DW) and chlorine (11.51 μmol g⁻¹ DW) at 6 dS m⁻¹, respectively. With increase in salinity levels, the amount of potassium ion in leaf in all three populations did not change significantly, while its increased amount in stem and root was significantly. Lalehzar population had the highest potassium ion in stem (10.89 μmol g⁻¹ DW) and root (6.87 μmol g⁻¹ DW) at the concentration of 6 dS m⁻¹. Totally, from data obtained in this investigation, it may be concluded that Lalehzar and Meymand populations had the highest and lowest tolerance to salinity respectively.

Keywords: Damask rose, Enzyme, Proline, Salt tolerance.

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