Jasmonic and abscisic acid contribute to metabolism re-adjustment in strawberry leaves under NaCl stress

Abstract

The aim of this research was to evaluate the effect of exogenous jasmonic acid (JA) and abscisic acid (ABA) at different salinity regimes, on primary and secondary metabolic changes of 'Kurdistan' and 'Queen Elisa' strawberry leaves. The reduction of adverse effects of salt shock and gradual salt regime by increasing total phenolic content and total antioxidant capacity, has been confirmed in 'Kurdistan' and 'Queen Elisa' after application of JA and ABA. The presence of the two hormones under non-saline condition significantly increased total soluble protein content but under salt shock it caused adverse effects. Abscisic acid and JA caused a clear increase in total soluble proteins of 'Kurdistan' leaves at both gradual salt stress and non-saline condition. Adverse effects of gradual salt stress were not eliminated by the application of both hormones. The role of JA and ABA in aspartic acid increment at gradual salt regime was notable. Salt shock induced tyrosine increase and both hormones enhanced asparagine, alanine, histidine, and GABA contents, respectively. In the presence of ABA the effect of 20 and 40 μM JA resulted in the highest fructose content in 'Queen Elisa' leaves at gradual salt stress. Application of ABA plus 40 μM JA increased the inositol accumulation, compared to gradual salinity without ABA application. The study reveals that JA and ABA are important plant stress hormones and application of ABA in dependency of different JA concentrations activates the protective mechanism of the strawberry plant against NaCl stress.

Key Words Abscisic acid ·Jasmonic acid ·Primary metabolites ·Secondary metabolites ·Salinity ·Strawberry