

Interactive effects of gibberellic acid (GA3) and salt stress on growth, biochemical parameters and ion accumulation of two rice (*Oryza sativa* L.) varieties differing in salt tolerance

ABSTRACT

Exogenous application of different plant growth regulators has raised some concern for improving quality and quantity of yield in different crops especially under unfavourable conditions. Rice (*Oryza sativa* L.) is an important crop in the world and salinity is one the main abiotic stress factor affecting its productivity. To determine genotypic and ontogenetic variations of different physiological activities including water and nutrient uptake during salinity and effectiveness of exogenous GA3 application on those parameters, two different rice varieties (Pokkali and MR219) were cultivated under controlled environment using five different salinity levels (0, 50, 100, 150 and 200 mM NaCl) and with or without application of GA3 (150 ppm foliar spray). A remarkable reduction in grain yield (even no grain formation at higher salt concentration) in both rice varieties was observed during our observation. Rice variety MR219 was less competitive than Pokkali under salinity while exogenous application of GA3 is useful to mitigate salinity stress in rice as it increased different yield components and yield (8.7% in MR219 and 16.7% in Pokkali). Considering the trends of growth reduction due to salinity and progressive impact of exogenous GA3 application on different morphological, physiological and biochemical activities, it can be stated that application of GA3 is useful to mitigate salinity stress and its effectiveness is more active to salt tolerant varieties.

Keyword: Salinity stress; GA3; Proline accumulation; Rice