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## PERFORMANCE OF *Hibiscus sabdariffa* UNDER CONSTRICTING CONDITION OF SALINITY STRESS USING SEED TREATMENT AND HUMIC ACID APPLICATION

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### Abstract

Salinity stress has a negative impact on some morphological, physiological, and molecular processes during the germination of rosella seeds. Various strategies such as the application of humic acid are used to increase the tolerance of plants to salinity stress. Seed priming is also considered as a solution to the problem of poor germination, seedling establishment, and induction of pre-germination metabolic activities in crops under abiotic stress. The present study was conducted to evaluate the effect of seed treatment and humic acid on the different growth stages of roselle under salt stress conditions by performing two separate seedling trays and pot experiments. Seed treatment with 1% of  $\text{Na}_2\text{SO}_3$  for 24 hours had the highest mean emergence percentage among studied priming treatments. The 200 mM level of salt stress reduced germination by 62% compared to normal conditions. Additionally, the highest emergence rate was obtained from 0.5%- $\text{Na}_2\text{SO}_3$  treatment at 12 hours under 50 mM of salt stress condition. Salinity reduced the values of the plant height, number of flowers, flower fresh weight, and flower dry weight. However, some priming and humic acid treatments, such as KCl treatment, decreased the negative impacts of salinity, enhancing flower dry weight by 138% compared to the control. In general, the highest values of flower-related traits under salinity were observed in KCl and  $\text{Na}_2\text{SO}_3$  treatments. Furthermore, humic acid increased all the studied traits and improved salinity tolerance compared to not applying humic acid. It can be concluded that it is possible to reduce the adverse effect of salinity stress on Roselle plant cultivation through seed priming and application of humic acid.

*Key words:* abiotic stress, potassium chloride, Roselle, seed pretreatment, sodium sulfite

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