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Consequences of Ca(II) Supplementation on Phenotypic Characters of BINA dhan-8 and BRRI dhan 29 under salinity stress

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[Introduction]

Rice is the most suited crop for saline soils because it can tolerate standing water, which is necessary for reclamation of saline soils. The addition of Ca(II) to the root environment of salt stressed plants would maintain or enhance the selective absorption of K^+ at high Na^+ concentrations and prevent the deleterious effects of the excess of Na^+ . Another role attributed to supplemental Ca(II) addition was its help in osmotic adjustment and growth via the enhancement of compatible organic solutes accumulation. The present study has been conducted to elucidate the Ca(II) ionic role to mitigate the salinity stress in rice plant under salt affected soils.

[Materials and Methods]

A pot culture experiment was conducted from January to June, 2015 at the net-house of the Department of Agricultural Chemistry, Sher-e-Bangla Agricultural University, Dhaka-1207 to study the effect of salinity and supplemental Ca on the growth characters of Binadhan 8 and BRRI dhan 29 rice cultivars. The three factors experiment composed of Factor A: two selected rice cultivars, Factor B: 4 salinity levels (0, 4, 8 and 12 dSm^{-1}) and Factor C: 3 levels of Ca supplement (0, 5 and 10 mM). The significantly higher plant height, total tillers hill⁻¹, effective and non-effective tillers hill⁻¹, root and shoot dry weight hill⁻¹ and total dry matter hill⁻¹ were found in BRRI dhan 29 than Bina dhan 8 under different salinity and supplemental Ca levels.

[Results and Discussion]

With increase of salinity, the above growth parameters of the selected rice cultivars showed significant negative growth trend but increasing Ca levels, all parameters indicate significant positive trend except non-effective tiller hill⁻¹. The interaction effect of cultivars and salinity levels and cultivars and Ca levels on above growth characters were significant, where a negative relationship with increasing salinity levels and a positive relationship with increasing supplemental Ca levels have been found except non-effective tiller hill⁻¹. The interaction effect of salinity and Ca levels on all growth characters was significant, where these characters increased due to increasing the supplemental Ca levels at all the levels of salinity except non-effective tiller hill⁻¹. Interaction of variety, salinity and calcium significantly affected all the parameters studied. Each of the variety showed significant reduction in growth parameters due to higher salinity levels, while Ca supplementation had significant positive effects on these parameters at every salinity level.

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