

## Effect of Sodium Chloride on Growth, Nutrient Accumulation, and Nitrogen Fixation of Common Bean Plants in Symbiosis with Isogenic Strains

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### ABSTRACT

The effect of sodium chloride (NaCl)-salinity on growth responses and tissues organic solutes and mineral content was investigated in common bean plants inoculated with salt-tolerant *Rhizobium tropici* wild-type strain CIAT899 and four mutant derivatives having decreased salt-tolerance (DST). Under non-saline conditions two mutants formed partially effective (HB10, HB12) and another two almost ineffective (HB8, HB13) nodules. A great variation of NaCl tolerance in the different symbiosis tested was observed at harvest, 32 day after planting. Common bean plant responded to salinity by decreasing the content of dry plant biomass, nodule number and the nitrogen fixation, and increasing the root to shoot ratio. The salt dose of 25 mM produced an increase of total soluble sugar and free amino acids content. This result suggest that these metabolites might be related with a nodule osmotic adjustment response under saline conditions, however cannot be excluded that the increase of amino acids content could be a consequence of protein degradation. In the other hand, sodium, calcium and phosphorus contents in shoot increased under the saline treatments. Potassium (K) and calcium (Ca) contents, unlike phosphorus (P) content, in shoot were not related with the symbiotic efficiency of mutant, however the decrease of P content suggest that these symbioses have limited their P absorption process independently of the saline treatment. NaCl tolerance associated with a retention of sodium and maintenance of potassium selectivity seem to be a strategy used for the salt stressed common bean plants in symbiosis assayed here.

**Keywords:** common bean root nodules, *Phaseolus vulgaris*, salt stress

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