VARIABLE SALINITY TOLERANCE IN ANABAENA SP. BHUAR002 THROUGH REGULATION OF ION UPTAKE AND PRODUCTION OF OSMOPROTECTANT

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Abstract: Filamentous, heterocyst-forming, diazotrophic cyanobacterium Anabaena sp. BHUAR002 was isolated from usar (saline) land near Banaras Hindu University campus, and grown routinely on Allen Arnon medium. The growth of cyanobacterium was measured at various concentrations (upto 1000 mM) of different salt combinations. NaCl, NaCl+Na2CO3 (1:1) and NaCl+Na2SO4 (1:1) and found that the cyanobacterium tolerated the salinity of 500 mMNaCl, 700 mMNaCl+Na2CO3 and 1000 mMNaCl+ Na2SO4, indicating that elevated carbonate and sulphate support the growth of cyanobacterium under salinity and increase the tolerance range. Natural abundance 13C-NMR spectra chemical shifts showed sucrose as the osmoticum synthesized in NaCl and NaCl+Na2CO3 (1:1). However, synthesis of sucrose was not found in case of NaCl+Na2SO4 (1:1). Intracellular Na concentration increases under different salt concentrations as compared to control. K concentration also increases with increase of different salt concentration as compared to control is also an indication of acclimatization against salt stress; this type of ionic ratio was found in all three salt stress conditions. Intracellular Cl concentration was found minimum in case of NaCl+Na2SO4 as compared to NaCl and NaCl+Na2CO3 incubated cells.

Keywords: Intracellular ion concentration, Osmotic, Salinity, Tolerance range

REFERENCES


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