

## 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+Na<sub>2</sub>CO<sub>3</sub> (1:1) and NaCl+Na<sub>2</sub>SO<sub>4</sub> (1:1) and found that the cyanobacterium tolerated the salinity of 500 mM NaCl, 700 mM NaCl+Na<sub>2</sub>CO<sub>3</sub> and 1000 mM NaCl+Na<sub>2</sub>SO<sub>4</sub>, indicating that elevated carbonate and sulphate support the growth of cyanobacterium under salinity and increase the tolerance range. Natural abundance <sup>13</sup>C-NMR spectra chemical shifts showed sucrose as the osmoticum synthesized in NaCl and NaCl+Na<sub>2</sub>CO<sub>3</sub> (1:1). However, synthesis of sucrose was not found in case of NaCl+Na<sub>2</sub>SO<sub>4</sub> (1:1). Intracellular Na<sup>+</sup> concentration increases under different salt concentrations as compared to control. K<sup>+</sup> 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<sup>-</sup> concentration was found minimum in case of NaCl+Na<sub>2</sub>SO<sub>4</sub> as compared to NaCl and NaCl+Na<sub>2</sub>CO<sub>3</sub> incubated cells.

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

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