

Physiology of Osmoregulation and Cell Composition in Salt Li^+ and Na^+ Adaptation of *Nostoc muscorum*

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Abstract: Adaptation to salt in the cyanobacterium *Nostoc muscorum*, is composed of a few mechanisms which together lead to the generation of a salt-tolerant cell. The initial mechanism combines a stimulation of photosynthetic activity with the accumulation of sucrose as an osmoregulator. The secondary mechanism involves the adaptation of N_2 fixation activity and protein biosynthesis. Under conditions for photoautotrophic growth, significant Na^+ extrusion was observed 30 min after salt shock. Sucrose accumulation reached a maximum value after 16 hours and Li^+ accumulation reached equilibrium after 40 hours. The final concentrations of Li^+ and Na^+ and sucrose and glucose inside the 0.6 molar Na^+ and Li^+ grown cells indicate that the inorganic ions and organic 'compatible' solutes are the major osmotic species which account for the adaptation of *Nostoc muscorum* to Li^+ and Na^+ . Thus, in the present investigation microarray data identifies the genes that represent various functional categories needs more intensive research with genetics and physiology to determine gene functions, their chromosomal organization and their mode of regulation.

Keywords: *Nostoc muscorum*

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