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Original Article

Effect of proline on *Triticum aestivum* (wheat) under the drought conditions of salinity

Manisha Jain [a], *Elsa Mini Jos* [a], *Deepika Arora* [b], *Y.V.R. Kameshwar Sharma* [c,*]

[a] *Department of Biological Sciences (III), Sri Venkateswara College, University of Delhi, Delhi 110021, India*
[b] *Department of Botany (II), Sri Venkateswara College, University of Delhi, Delhi 110021, India*
[c] *Department of Biochemistry, Sri Venkateswara College, University of Delhi, Delhi 110021, India*

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ABSTRACT

Background: The increasing salinity is a major problem in agriculture around the world. Salt stress results in inhibition or reduction in plant growth which affects productivity. Also, most of the crop plants like wheat are glycophytes, which are sensitive to even low salt concentrations.

Hence it is important to find out the role played in plant salt tolerance by compatible osmolytes such as proline. Proline appears to be the preferred organic osmoticumin many plants. The proposed functions of proline under stress conditions include osmotic adjustments, protection of enzymes and membrane, as a hydroxyl radical scavenger, as well as acting as a reserve of energy and nitrogen for utilization during exposure to salinity.

Method: Wheat (Triticumaestivum) seedlings were grown in salt solutions ranging from 0.5 M to 5 M NaCl concentration for 7 days. The tissues were homogenized in 3% sulphosalicylic acid to obtain the extract. The extract was made to react with ninhydrin in acidic conditions to form a red chromophore which was read at 520 nm to determine the proline concentration.

Result: Experimental findings confirm the accumulation of proline under salt stress. There is a linear correlation between the given salt stress, and the proline accumulated implying the role of proline as a compatible osmolyte.

Conclusion: The development of salt tolerant crop varieties would have a huge impact in the agricultural economy. Salt tolerant genotypes would reduce pressure on water resources and low quality water could be used for irrigation. Engineering crops to accumulate compatible osmolytes like proline could be a nature friendly method of adapting plants to stress.

1. Introduction

Wheat is an important food crop worldwide. High salt concentrations decrease the osmotic potential of soil solution creating a water stress in plants. Secondly, they cause severe ion toxicity, since Na+ is not readily sequestered into vacuoles as in halophytes. Finally, the interactions of salts with mineral nutrition may result in nutrient imbalances

* *Corresponding author*. Tel.: +91 (0) 11 24118590, +91 9910374426 (mobile); fax: +91 (0) 11 24118535.
E-mail address: sharmabiochem@gmail.com (Y.V.R. Kameshwar Sharma).
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