

Salt tolerance of potato: Genetically engineered with *Atriplex canescens* BADH gene driven by 3 copies of CAMV35s promoter

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Potato (*Solanum tuberosum* L.) is ranked among the top leading staple food in the world. Salinity adversely affects potato crop yield and quality. Therefore, increased level of salt tolerance is a key factor to ensure high yield. The present study focused on the agrobacterium-mediated transformation of *Atriplex canescens* betaine aldehyde dehydrogenase (*BADH*) gene, using single, double and triple CAMV35s promoter to improve salt tolerance in potato. Detection of seven potato lines harboring *BADH* gene, followed by identification of T-DNA insertions, determination of transgenes copy no through Southern hybridization and quantification of *BADH* protein through ELISA were considered in this study. The results clearly depicted that the salt tolerance of potato was found to be promoter-dependent, as the potato transgenic lines with triple promoter showed 4.4 times more glycine betaine production which consequently leads towards high resistance to salt stress as compared to transgenic potato lines with single and double promoters having least production of glycine betaine. Moreover, triple promoter transgenic potato lines have also shown lower levels of H₂O₂, malondialdehyde (MDA), relative electrical conductivity, high proline and chlorophyll content as compared to other two lines having a single and double promoter. *In silico* analysis also confirmed that *Atriplex canescens* *BADH* has the tendency to interact with sodium ions and water molecules. Taken together these facts, it can be concluded that over-expression of *BADH* under triple CAMV35s promoter with more glycine betaine, chlorophyll and MDA contents, high relative quantities of other metabolites resulted in an enhanced level of salt tolerance in potato.

Biography

Arfan Ali has completed his PhD from the University of the Punjab, Pakistan and Post-doctoral studies from the Centre of Excellence in Molecular Biology. Currently, he is serving as an Assistant Professor at the University of Lahore, Pakistan. He has published more than 32 papers in reputed journals.

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