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Isolation and functional characterization of cold stress inducible promoter CAT01 from tomato

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Environmental stress such as drought, salinity and extreme temperatures are the major factors limiting plant growth and productivity. Cold stress leads to diverse change in transcription and translation of genes involved in developmental and physiological metabolism of plants. Constitutive over expression of transgenes imparting stress tolerance may hamper plant growth and productivity. It is desirable to produce transgenic plants that accumulate transgenic products only under stress conditions. To identify stress related transcripts we had utilized cold subtracted cDNA library to monitor gene expression changes after 24 hours of cold stress in tomato seedlings. Relative mRNA levels of cold stress associated gene CAT01 (NAC type transcription factor) from cold treated sample was compared with wild types. Sequence upstream of start codon from this transcript was selected to design the primers, promoter sequence was fused with GUS reporter gene and the recombinant transgenes was introduced into tomato cv. Pusa Ruby with *Agrobacterium tumefaciens* mediated genetic transformation. Histo-chemical and florometric analyses revealed promoter is inducible under all abioticstress conditions. This promoter is effective and desirable for deriving a low constitutive transgene expression under normal condition and high induction in response to cold, salt and drought stress. This method shall be advantageous as it will not have a major impact on plant biomass and yield.

Biography

Monika Bansal completed her PhD on the topic "Genetic transformation of Tomato for introduction of salinity tolerance". She worked as Senior Research Fellow at Haryana Agriculture University (June 2003-Dec 2003). Later she completed her Post-Doctoral fellow in the UGC funded project "Isolation and characterization of stress Inducible Promoter from Tomato" at Delhi University South Campus with Dr. Arun Sharma (Aug 2008 –Aug2011). She joined as Assistant Professor at Asian Institution Affiliated to Punjab University, Patiala during August 2011-July 2013). From August 2014 till date she is working as Assistant Professor at School of Agriculture, Lovely Professional University.

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