

Category	: 8th Rice Genetics Symposium
Select Theme	: Genetics of Abiotic interactions: Stress tolerance and Mitigation
Endorsement email	:
Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 1	: Drought
Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 2	: heat
Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 3	: cold
Title of Entry	: Serine hydroxymethyltransferase-3 from salt-tolerant rice revealed its regulatory influence on salinity stress responses
Presenting author	: Vandna Rai
Presenting author email	: vandnarai2006@gmail.com
Co author 1	: Pragya Mishra
Co author 2	: Nagendra K Singh
Co author 3	: Teruhiro Takabe
Co author 4	:
Co author 5	:
Co author 6	:
Co author 7	:
Co author 8	:
Co author 9	:
Co author 10	:
Co author 11	:
Co author 12	:
Co author 13	:
Co author 14	:

Affiliation presenting author	: ICAR-National Research Centre on Plant Biotechnnology
Affiliation 1	: ICAR-National Research Centre on Plant Biotechnnology, New Delhi
Affiliation 2	: ICAR-National Research Centre on Plant Biotechnnology, New Delhi
Affiliation 3	: Plant Biotechnology Research Centre, Meijo University, Nagoya, Japan
Affiliation 4	:
Affiliation 5	:
Affiliation 6	:
Affiliation 7	:
Affiliation 8	:
Affiliation 9	:
Affiliation 10	:
Affiliation 11	:
Affiliation 12	:
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Select only one type of presentation	: 15 minute oral presentation

Abstract : Among abiotic stresses, salinity stress adversely affects growth and development in rice. Contrasting salt tolerant (CSR27), and salt sensitive (MI48) rice varieties provided information on an array of genes that may contribute for salt tolerance of rice. Earlier studies on transcriptome and proteome profiling led to the identification of salinity stress-induced serine hydroxyl methyltransferase-3 (SHMT3) gene. In the present study, SHMT3 gene was isolated from salt-tolerant (CSR27) rice. The functional characterization of OsSHMT3 from salt-tolerant OsSHMT3 exhibited salinity-stress induced accentuated and differential expression levels in different tissues o rice. OsSHMT3 was overexpressed in E. coli and assayed for enzymatic activity and modelling protein structure. Further, Arabidopsis transgenic plants overexpressing OsSHMT3 exhibited tolerance towards salinity stress. Comparative analyses of OsSHMT3 vis a vis wild type by ionomic, transcriptomic and metabolic profiling, protein expression and analysis of various agronomic traits revealed a pivotal role of OsSHMT3 in conferring tolerance towards salinity stress. The gene can further be used in developing gene based markers for salinity stress to be employed in marker assisted breeding programs.

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