

JOINT EVENT

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Overexpression of a tomato annexin gene AnnSp2, enhances abiotic stress tolerance in transgenic tomato through ABA synthesis and modulation of ROS productionRaina Ijaz¹, Javeria Ejaz¹, Muhammad Imtiaz² and Taotao Wang³¹University of Poonch Rawalakot, Pakistan²Guangzhou University, China³Huazhong Agricultural University, China

Drought and high salinity are two major abiotic stresses that affect the agricultural crops worldwide. Annexins belongs to a multigene protein family that play an essential role in plant stress responses and various cellular processes. Here, AnnSp₂ gene was cloned from wild tomato (*Solanum pennelli*) and functionally characterized in cultivated tomato. AnnSp₂ was found to be induced after exposure to drought, salt, H₂O₂ and ABA. Tomato plants overexpressing AnnSp2 remarkably increased plant tolerance to drought and salt stress, as determined through physiological analysis of the germination rate, root growth, survival rate, leaf water loss and Chl content. AnnSp2 transgenic plants were observed to be less sensitive to ABA during seed germination and seedling stages. However, under drought stress the ABA content significantly increased in the AnnSp₂ over expressing plants, reduced water loss, attributed to the enhancement of stress tolerance. Furthermore, we found that AnnSp2 reduced sensitivity of plants to drought by influencing ABA induced stomatal movement and expression of ABA inducible genes, including AREB, DREB, NCED, ERD were clearly up regulated under drought and salt stress conditions. Consistent with the accumulation of reactive oxygen species (ROS), lower lipid peroxidation level, increased peroxidase activities including APX, CAT and SOD all of which contributed to increased tolerance to oxidative stress compared with wild-type plants. These results therefore indicate that AnnSp₂ play an important role in the abiotic stress response and that overexpression of AnnSp2 in transgenic tomato improves salt and drought tolerance through ABA signalling and the regulation of ROS production in plants.

Biography

Raina Ijaz is working as an Assistant Professor at University of Poonch Faculty of Agriculture, Rawalakot (Azad Kashmir), and focusing on the fate of biotechnology in the horticultural plant vegetable science. She moved to Wuhan, China by the Scholarship Council (CSC) and finished her PhD under the guidance of Prof. Dr. Ye zhibiao at Huazhong Agricultural University in 2017. She has published five research publications in various well reputed scientific impact factor journals. She has participated in many national and international conferences, seminars and presented her research achievements. She is also serving as reviewer/referee for many national and international journals.

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