Entry No. IRRC-0091

Category	: International Rice Research Conference
Select Theme	: Climate change and environmental sustainability
Endorsement email	:
Keyword 1	: Climate smart agriculture
Keyword 2	: Adaptation to climate change
Keyword 3	: Environmental sustainability
Title of Entry	: Role of Calmodulin Binding Transcriptional Activation (CAMTA) proteins in response to abiotic stress in Rice
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Plants that successfully withstand stresses are constantly monitoring their external milieu and are transmitting that information inside the cells triggering a timely and appropriate cellular response. One of the important changes that happen immediately upon stress perception is the increase in the cytosolic [Ca2+] which involves several transcription factors. Calmodulin (CaM) binding transcriptional activator, popularly dubbed as “CAMTA”, is a group of transcription factors that are directly regulated by Ca2+/CaM binding and have been implicated to be involved in different stress related signaling pathways. In the present study, we compared the expression of CAMTA proteins in response to abiotic stresses in rice and observed that there was a significant up-regulation for all the CAMTAs under different stresses, specifically under salt and heat stresses. OsCAMTA1, being more altered in response to stress, was picked up for further studies. Characterisation of OsCAMTA1 gene, revealed the presence of three splice forms named as OsCAMTA1-4, 5 and 11, where only OsCAMTA1-4 could be translated into full-length protein. Upregulation of all the splice form was observed in response to salt stress. Interaction between calmodulin (CaM) and OsCAMTA1 splice form showed a strong interaction between CAM and OsCAMTA1-4, however, no interaction was found with other splice forms. We also observed the variations in the protein amount of different splice forms during salt stress conditions, which supported alternative splicing regulation of OsCAMTA1 in salt signaling pathways. Further, we raised OsCAMTA1-4 over-expressed tobacco lines where the increased chlorophyll retention of the OsCAMTA1-4 transgenics as compared to the wild type tobacco plants suggested the important role of OsCAMTA1 in salt stress signaling pathways. Our present study reveals the role and regulation of CAMTA proteins under different abiotic stresses with particular reference to salinity stress in rice. Read Less

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