Entry No. 8RGS-0061

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	: flooding
Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 3	: micronutrient deficiency
Title of Entry	: Hotspots of Abiotic Stress Tolerant Rice
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Crop productivity and stability of the food system are threatened by climate change, mainly through the effects of predicted abiotic stresses. Despite extensive research on abiotic stress tolerance in the past decades, the successful translation of these research to fields/farmers is scarce. The impelling demand of climate resilient varieties, and the poor translation of research into the field despite the availability of high throughput technologies lead us to critically analyse a neglected aspect of current abiotic stress tolerance research. Although environmental factors play the most important role in the development of adaptive traits of plants, most abiotic stress tolerance research ignores eco-geographic aspects of highly stress tolerant accessions. In this study, we critically examined the geographic distribution pattern of highly tolerant rice accessions of all majo abiotic stresses (cold, salt, alkali, drought, and both flash and prolonged floods) along with one micronutrient deficiency. Remarkably, we identified a shared geographic distribution pattern of highly tolerant accessions for all these abiotic stresses including zinc deficiency despite the sparseness of highly tolerant accessions. The majority of these stress tolerant accessions predominately originated from Bangladesh centred narrow geographic region. Natural coincidence of the areas of preference of the 7 abiotic stresses along with one nutrient deficiency in a narrow geographic region is literally impossible; rather it is the specific pattern of preferential distribution

of abiotic stress tolerant rice accessions. Remarkably, Bangladesh is one of the most vulnerable climate change countries of the world where rice is literally the nutritional lifeline. We therefore analysed the climatic and agro-ecological features of Bangladesh and experimentally validated the cold tolerance of Rayada rice, the most primitive type deepwater rice ecotype that is confined to Bangladesh. Finally, we discussed the implication of the specific distribution pattern of abiotic stress tolerant rice and proposed a concerted research effort to identify the genomic speciality of abiotic stress tolerant rice accessions and subsequent development of climate resilient rice varieties capitalizing the shared distribution pattern of abiotic stress tolerant rice and high throughput technologies.

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