Entry No. IRRC-0455

Category	: International Rice Research Conference
Select Theme	: Genetics of Abiotic interactions: Stress tolerance and Mitigation
Endorsement email	:
Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 1	: heat
Genetics of Abiotic interactions Stress tolerance and Mitigation Keyword 2	: heat
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Title of Entry	: Sink activity and grain quality of rice genotypes under high night temperature
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Anjali Anand1*, Archana Kumari1, Meenakshi Thakur1, SM Trivedi1, Poornima Sharma1, Shalini G Rudra2 Division of Plant Physiology, ICAR-IARI, New Delhi 110012, INDIA 2 Division of Post Harvest Technology, ICAR-IARI, New Delhi 110012, INDIA High night temperature (HNT) during grain filling affects grain quality by affecting the amylose content, that in turn, can change the physico-chemical properties of starch related to food processing. A study was conducted to investigate the expression and activity pattern of starch synthesis and catabolic enzymes in developing rice grain to relate it to grain amylose content of the mature grains formed under HNT. Rice cultivars were phenotyped for tolerance to post anthesis high night temperature (3oC increase in night temperature over an average night temperature of 25oC during grain filling) and the short duration cultivars, Vandana and Nagina 22 were identified as susceptible and tolerant, respectively. Grain dry matter accumulation decreased in Vandana but was unaffected in the tolerant cultivar under HNT. Granule bound starch synthase (GBSS) activity, in general, was high in Nagina 22 compared to Vandana. The activity decreased by 10-17% in Nagina 22 and 33-44% in the latter cultivar during grain growth under HNT. A marked increase in GBSS activity in Vandana at 20 days after anthesis (DAA) suggested the compensation for amylose accumulation in later stages of grain growth. Activity of α-amylase increased at 5 DAA in Nagina 22 and 10 DAA in Vandana due

to starch remobilization from the pericarp and its accumulation in the endosperm of the developing grain. Evaluation of physicochemical changes in starch quality showed reduced peak viscosity and breakdown values of starch under HNT irrespective of genotypes indicating the resilience of starch granules, apparently due to higher proportion of amylopectin during grain development under stressed condition. Grain amylose content decreased by 2% in Vandana but was maintained in Nagina 22. HNT increased the expression of OsGBSS1 at later stages of grain development in Vandana whereas OsAMY3E was upregulated at an early stage. Our study elucidates the role of GBSS in affecting the grain starch quality under high night temperature.

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