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Cloning of STH2 gene, to transform Bg 360 and Bg 250 Sri Lankan rice varieties

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Arabidposis STH2 is identified as a positive regulator of light signaling pathway. It is a protein that containing tandem repeated of Zn^{+2} binding B-boxes and interacts with bZIP transcription factor HY5. The HY5 which acts downstream of the several photoreceptors, is a positive regulator of light signaling pathway. In the dark HY5 activity is negatively regulated by COP/DET/FUS mediated degradation of the HY5 protein. The STH2 protein in *Arabidopsis* activates transcription and positively regulated light mediated development in plants by interacting with HY5 and COP1. The HY5 promotes the expression of light regulated genes such as ribulose-1, 5-bisphosphate carboxylase/oxygenase (Rubisco), which catalyses an important step in photosynthesis. Therefore the STH2 might act as a cofactor for HY5 that activate transcription of photosynthesis genes resulting high productivity in crop plants. To test this hypothesis we are intended to over express the STH2 gene in Sri Lankan rice varieties. In order to transform the rice plants with STH2 gene, in this study we have taken an attempt to clone the STH2 gene from its BAC clone F10A5 to pCAMBIA 1303 binary vector. The F10A5 clone was digested with Mfe1 and Xho1 restriction enzymes. The STH2 gene (9.5 kb DNA fragment) was cloned into pBSK+ vector. The STH2 pBSSK+ clone was then digested with Pst1 and Kpn1 and the STH2 gene (7.5 kb DNA fragment) was cloned into the pCAMBIA 1303 binary vector. This recombinant plasmid construct will be used to transform *Agrobacterium* GV3101 in order to carry out the *Agrobacterium* mediated transformation of the two rice varieties.

Acknowledgement:
We acknowledge the financial support from NSF grant RG/2007/BT/09

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