

# Plant Genomics

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## Molecular analysis of bioengineered rice: A proteomic and transcriptomic approach

Soumitra Paul<sup>1</sup>, Dipak Gayen<sup>2</sup>, Swapan K Datta<sup>2</sup> and Karabi Datta<sup>2</sup><sup>1</sup>University of Calcutta, India

Food security is a major challenging issue in developing countries like India where rice is the staple crop. Abiotic stress like drought affects most of the rice production in India. The generation of drought tolerant rice cultivar by overexpression *AtDREB1A* is an important breakthrough in biotechnology research. In addition, rice contains very little amount of iron and zinc in the edible endosperm. Therefore, biofortification of these two micronutrients in rice grains is believed to be the most promising strategy for enhancing mineral nutrition in diets. The bioengineered high iron rice grain has already been developed by overexpression of soybean and rice endogenous ferritin genes. Low phytate rice grain by RNAi mediated silencing of phytic acid biosynthesis also facilitates iron accumulation in milled rice grain. However, the molecular signaling network operating in transgenic crops still remains unclear. In our current study, we performed the proteomic analysis of *DREB1A* over expressing drought tolerant rice cultivars. The proteome profile of rice roots revealed metabolic alteration in energy and carbohydrate metabolism. A novel r40c1 protein species has been identified which play a crucial role in *DREB1A* mediated drought tolerance. Recently, the role of miRNAs in iron transport has been deciphered in transgenic ferritin over expressing rice plants which unravel the molecular mechanism of iron loading in high iron rice grains. Four novel miRNAs targeting NRAMP4 has been considered for enhancement of iron loading in transgenic rice plants.

### Biography

Soumitra Paul is an Assistant Professor of Botany at Kaliganj Government College, Kaliganj, Nadia, West Bengal, India. He is a Doctorate in Botany (PhD) from University of Calcutta, India. He has 8 years of research experience on Crop Molecular Biology and Biotechnology and has published several papers in renowned international peer-reviewed journals. He is an Editorial Board Member and Reviewer of different journals such as *Frontiers in Plant Science*, *Rice and African Journal of Biotechnology* etc.

[psoumitra@gmail.com](mailto:psoumitra@gmail.com)

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