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Efficient transformation of submergence tolerant deep-water rice of North-East India and fast recovery of transgenic plants

S Leelavathi[1], **Van Cuu Nguyen**[1] and **V Siva Reddy**[1, 2]
[1]International Centre for Genetic Engineering and Biotechnology, India
[2]Regional Centre of Biotechnology, India

Rice is an important staple food for more than two billion people worldwide. Huge losses occur due to biotic and abiotic stresses. Submergence due to flash floods or heavy rains is a major abiotic stress affecting productivity of rice in low-lying areas. In north-east region of India well known for major genetic diversity of rice, several varieties are submergent tolerant for long periods. There are at least two different mechanisms involved in the submergence tolerance in rice, one mediated by Snorkel pathway and the other by Sub1 pathways. In order to characterize the functional role of each of the gene(s) involved in the submergence tolerance in these pathways, efficient transformation methods are needed for these genotypes. Here we present data on efficient transformation of two deep-water rice of North-East region of India namely Taothabi and Khongan. Transgenic rice plants that can be grown in the greenhouse were obtained in 35-45 days starting from the callus induction and co-cultivation by Agrobacterium. Molecular analysis confirmed stable integration and expression of reporter GUS gene. In addition to over express or down regulate genes involved in submergence tolerance, the methods developed will accelerate the functional validation of candidate genes identified through genomics studies.

Biography

S Leelavathi has completed her PhD in Anther Cultures of different *Brassica* spp. and has equal expertise in rice anther culture and haploid generation at Bose Institute, Kolkata, India. At ICGEB, New Delhi, she is focusing on chloroplast transformation and expression of foreign genes including several cellulolytic enzymes, which resulted in several original papers and patents. She is also specialized in nuclear transformation techniques of different plants including rice, cotton, tomato, lentil, etc. Her research in cotton regeneration using metabolic stress and transformation using embryogenic callus as explants for *Agrobacterium*-mediated transformation is an important landmark not only in cotton biotechnology, but other crops as well. Presently, she is interested in use of plant produced cellulolytic enzymes in biofuel research and submergence tolerance in rice and transformation in pulses.

sadhul@icgeb.res.in

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