Rapid plant regeneration *in vitro* from four local rice varieties (*Oryza sativa* ssp. *indica*)

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Biotechnology provides approaches to develop higher yielding and more nutritive crop varieties through gene transformation. All rice varieties that are cultivated in Sri Lanka are *indica* varieties and are mostly recalcitrant to tissue culture. To utilize transformation techniques for improving rice varieties, a pre-requisite is consistent callus induction and regeneration. Rapid regeneration is essential to prevent somaclonal variation in the *in vitro* raised plantlets. The objective of the present study is to induce *in vitro* regeneration, from tissues of the rice embryo by exposing them for a short duration to 2, 4-D (2, 4-dichlorophenoxyacetic acid) and TDZ (Thidiazuron) followed by culturing on solid MS medium.

The varieties used in the study were Bg 300, Bg 357, Bg 304 and Pokkali. Combinations of the hormones 2,4 D (8.8 mg/ L, 4.4 mg/ L, and 2.2 mg/ L) and TDZ (0.44 mg/ L) were tested on the above varieties for competence to regenerate and produce plants. The regenerated plants were acclimatized and maintained in the greenhouse. Regeneration was observed without a visible callus phase in all four varieties and results were genotype specific. The highest percentage of regeneration was shown by Bg 300 (25.66 %) while Pokkali showed the lowest percentage (3.7 %) The observed regeneration was fastest in Bg 357 (38 days from date of culture). The optimal combination of plant growth regulator concentrations that gave response in this study was 4.4 mg/ L of 2,4 D and 0.44 mg/ L of TDZ. Panicle initiation was observed in regenerated plants of Bg 300 and Bg 357. The results indicated that rapid plant regeneration in the above local rice varieties was possible by optimizing the combination of 2,4 D and TDZ concentrations.

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