

## REGENERATION AND TRANSFORMATION OF BANANA CULTIVAR GRAND NAINE

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### ABSTRACT

Genetic transformation of banana (*Musa sp.*) by particle bombardment has been achieved only in a few laboratories worldwide. In general, transformation frequencies are reported to be cultivar dependent. Thus, there is a need to adapt and optimize transformation protocols for a particular banana cultivar. Establishment of a highly efficient and widely used tissue culture system for banana will accelerate the application of transformation technology in breeding programmes. Standardization of growth regulator concentration for callus induction from male inflorescence buds, regeneration from callus and multiple shoot regeneration from *in-vitro* shoot cultures for the Grand Naine cultivar of banana was carried out. 2, 4-D ( $3.0 \text{ mgL}^{-1}$ ) produced friable white calli with higher per cent of calli (40 %) in MS media. This calli was suitable for biolistic transformation. Regeneration efficiency was high (36.11 %) in TDZ at  $2.0 \text{ mgL}^{-1}$  followed by BAP at  $4.0 \text{ mgL}^{-1}$  (34.10 %) in MS media. TDZ at  $0.8 \text{ mgL}^{-1}$  produced an average of 11 shoots per explant from the *in-vitro* shoot cultures. Multiple shoot induction was highest (81.60 %) with  $0.8 \text{ mgL}^{-1}$  TDZ. In this study, the Biolistic transformation method was followed and the effect of Target Cell Distance (TCD) on transformation frequency was investigated in Grand Naine *sp.* (AAA) banana cultivar. Efficiency of Biolistic transformation was found to be high at the Target Cell distance of 9 cm (stage 3) with 48.35 % *GUS* positive calli, while shoot tip cultures showed 45.88 % *GUS* positive cultures at the same distance.

**KEYWORDS:** Grand Naine, Male Inflorescence, Explant, Callus Induction, *in-vitro* Shoot Tip Culture, Genetic Transformation, Particle Bombardment,  $\beta$ -glucuronidase, Histochemical Assay