**Development of Efficient *In vitro* Regeneration Protocol for Transgenic Papaya (*Carica papaya* L*.*)**

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**ABSTRACT**

Papaya (*Carica papaya* L*.)* is a fast-growing semi-woody tropical herb which belongs to the family Caricaceae. *Papaya ring spot virus* is a serious disease that affects the papaya production in most of the countries in the world as well as in Sri Lanka. Development of transgenic papaya through *Agrobacterium*-mediated transformation of somatic embryos is a successful method to control the damage of *papaya ring spot virus* disease. To regenerate these transgenic papayas, need an efficient *in vitro* regeneration protocol. The present investigation aimed to develop an efficient *in vitro* protocol for regeneration of transgenic papaya (*Carica papaya* L*.*) using somatic embryogenesis by supplementing different concentration of poly ethylene glycol. Three weeks old callus was used for *Agrobacterium* mediated callus transformation and co-cultivation. The transformed callus was selected with Kanamycin 50 mg/L in co cultivation medium. Then the co-cultivated callus was inoculated on new Murashige and Skoog medium with Kanamycin 50 mg/L and Cefotaxime 500 mg/L. Another experiment was done using eight weeks old embryonic callus. After *Agrobacterium* mediated callus transformation and co-cultivation, the callus was inoculated in to regeneration medium which contained different concentrations of poly ethylene glycol, Kanamycin 50 mg/L and Cefotaxime 500 mg/L. Number of highest transformed callus was obtained from eight weeks old embryonic callus. The highest callus area growth rate was recorded in full strength MS medium which contained PEG 60 mg/L with average 28.55%. Both highest number of somatic forming callus and matured somatic forming callus was recorded in full strength MS medium which contained PEG 60 mg/L. As a conclusion, a protocol for *in-vitro* regeneration of putative transgenic papaya (*Carica papaya* L*.)* was developed. Poly ethylene glycol 60 mg/L is the most suitable concentration for somatic embryogenesis. Eight weeks old embryonic callus was more suitable for *Agrobacterium*-mediated co-cultivation.

**Key words***: poly ethylene glycol, regeneration, transgenic papaya*