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

**KGU Madumali1\*, BMVS Basnayake2, PK Dissanayake1**

*1Department of Export Agriculture, Sabaragamuwa University of Sri Lanka, Belihuloya,*

*2Molecular Virology Division, Plant Virus Indexing Centre, Gabadawatta, Homagama, Sri Lanka*

*\***uthpalamadumali95@gmail.com*

Papaya (*Carica papaya* L*.)* is a fast-growing semi-woody tropical herb that 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 including Sri Lanka. The 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. Efficient *in vitro* regeneration protocol needs to regenerate these transgenic papayas. The present investigation aimed to develop an efficient *in vitro* protocol for regeneration of transgenic papaya (*Carica papaya* L*.*) using somatic embryogenesis. Three weeks old embryogenic 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 different concentrations of poly ethylene glycol (60 mg/L, 50 mg/L, and 40 mg/L), Kanamycin 50 mg/L, Cefotaxime 500 mg/L. Another experiment was done using embryogenic callus with matured somatic embryos. After *Agrobacterium* mediated callus transformation and co-cultivation, the callus was inoculated in to MS medium with different concentrations of poly ethylene glycol (60 mg/L, 50 mg/L, and 40 mg/L), Kinetin 2 mg/L and antibiotics. Number of highest transformed callus was obtained from embryogenic callus which have matured somatic embryos. The highest callus area was recorded in MS medium which contained PEG 60 mg/L with average 28.55%. Highest numbers of regenerated callus were recorded in 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. Embryogenic callus which have matured somatic embryos were more suitable for *Agrobacterium*-mediated co-cultivation.

**Keywords**: *polyethylene glycol, regeneration, transgenic papaya*