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Effect of selected plant growth regulators in callus induction of papaya (*Carica papaya* L. CV Horana Hybrid- 01) from immature leaves

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Abstract

Carica papaya, a member of the *Caricaceae* family, has gained immense popularity as a tropical fruit owing to its remarkable characteristics such as rapid growth, high yield, prolonged fruiting season, and outstanding nutritional and therapeutic benefits. Horana Hybrid - 1 is the first papaya hybrid variety in Sri Lanka and is a high yielder. Tissue culture techniques are important to produce clonal plants as well as in crop improvement programs of papaya. The aim of this study was to evaluate the effect of hormone combination for callus induction of Horana Hybrid- 1 papaya cultivar and to introduce the best surface sterilization procedure for immature leaf explant. A protocol was developed for surface sterilization with 20% of Sodium Hypochlorite (NaOCl), 70% of Alcohol and 0.1% of Mercuric Chloride (HgCl₂). Three different hormone types in different combinations were studied separately in Factorial Completely Randomized Design-(FCRD) with four replicates. Immature leaf explants were established in Murashige and Skoog (MS) medium with five level of 6-Benzylaminopurine (BAP) (0.5, 1, 1.5, 2, 2.5 mg/L) and 2,4- Dichlorophenoxyacetic acid (0.1, 0.5, 1, 1.5, 2 mg/L). Explants were established on MS medium with five level of 6- Benzylaminopurine (BAP) (0.5, 1, 1.5, 2, 2.5 mg/L) and Naphthalic acetic acid (NAA) (1, 1.5, 2, 2.5, 3 mg/L). Number of survived explants were recorded one month after establishment. Best sterilization procedure was treatment 02, which is 20% of Sodium Hypochlorite (NaOCl) for 20 minutes, 70% of Alcohol for 2 minutes and 0.1% of Mercuric Chloride (HgCl₂) for 1minute. Immature leaf explants cultured on 1.5 mg/L BAP and 0.1 mg/L 2,4- D combination where most suitable for quality callus induction. The immature leaf explants cultured on 0.5 mg/L BAP and 1.5 mg/L NAA combination where most suitable for better callus induction. By utilizing a combination of two primary hormones, successful initiation of callus from immature leaf explants in papaya was achieved.

Keywords: Callus Induction, Immature Leaf, Selected Plant Growth Regulators, Surface Sterilization

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