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INITIATION AND PROLIFERATION OF PAPAYA (*Carica papaya* L.) SOMATIC EMBRYOS FROM ZYGOTIC TISSUE

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ABSTRACT

The stufy on the initiation and proliferation of somatic embryos from papaya (*C. papaya* L.) zygotic embryo explants was undertaken. Best results regarding initiation of embryogenic callus formation was obtained with 90 days after pollination (DAP) zygotic embryos. The medium were liquid and solid MS (0.5) medium containing glutamine (2.7 mM), 2,4-D (9 μM) and sucrose (170 mM) at 6 and 10 weeks after the start of the cultures. In this condition 90% explains produced embryogenic callus formation. The best medium for proliferation of somatic embryos was a liquid MS (0.5) medium containing glutamine (2.7 mM), sucrose (170 mM) in the presence of 2,4-D (9 μ M). Using this medium, somatic embryos proliferated three times higher within two weeks.

INTRODUCTION

Papaya (*Carica papaya* L.) is a popular breakfast fruit, as a component of fruit salads and desert fruit. The production of papaya in Indonesia has been decreasing recently. An alternatives method to produce papaya is somatic embryogenesis.

The formation of somatic embryos on papaya has been reported previously (Litz and Conovers, 1982 ; 1983; Fitch and Manshardt, 1990, Rojas and Kitto, 1991. Fitch, 1993) however the mass production of somatic embryos, to produce content and good quality papaya remain difficult (Drew, Griffith Univ., Brisbane, personal communication). This problem of plant production prevent this method from being used for micropropagation of elite papaya germsplan. It is unknown if these techniques will work on Australia – Indonesia grown papaya cultivars.

The present study was undertaken to develop a reliable protocol for initiation and proliferation of somatic embryos from papaya zygotic embryos explants. The specific aims were to investigate the effect of a) adenine sulphate and 2,4 – D (experiment 1 and 2), b) explant age (experiment 2), c) sucrose concentration (experiment 3), d) medium constitution (Liquid as compared to solid, experiments 1 and 2) and e) plant growth regulator combinations and concentration (0 and 9 μM 2,4-D; 0.01 μM NAA; 0.05 μM BAP) (experiment 3) on somatic embryogenesis.

MATERIALS AND METHOD

The experiments were carried out at the Laboratory of Plant Molecular Biology, Department of Agriculture, The University of Queensland and Research Centre of Queensland Department of Primary Industries, Redlands, Cleveland, Australia from July 1994 to May 1995

Experiment 1

The sexual embryos (5 per vessel) were placed onto one of two basic culture medium type consisted of 0.5 MS nutrients, glutamine (2.7 mM), sucrose (87 mM), 2,4 – D (0, 9 or 45 μM) adenine sulphate (0 or 800 μM), agar (0.8%, Difco Laboratories, MI, USA) and was contained 20 ml medium in sterile plastic petri dishes (9 cm diam x 12 cm tall). The second medium type consisted of the same additives, but without agar, and contained (20 ml medium in conical flasks (200 ml), that were

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