Piyaporn Sritrabutra. 2000. ***STUDIES ON CALLUS AND SOMATIC EMBRYOS INDUCTION FROM FERTILIZED OVULES, COTYLEDONS AND HYPOCOTYL CULTURE OF Carica papaya L.*** Master of Science Thesis in Biology, Graduate School, Khon Kaen University. [ISBN 974-678-194-4]

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Abstract

Embryos of *Carica papaya* L. cv. Kaekdum Thaphra were cultured to induce callus and somatic embryos. Seeds were surface-sterilized and then cultured on MS medium supplemented with 0.1 mg/l NAA and 0.1 mg/l BA for 4 weeks. When seedlings were about 5-8 cm tall, the cotyledons and hypocotyl were cultured for 12 weeks. Callus derived from embryo cultures could develop to somatic embryos. Cotyledons and hypocotyl were cut and cultured on MS medium supplemented with different concentrations and combinations of NAA and BA or kinetin. The percentage of callusing was 100% in cotyledons cultured on medium supplemented with 0.5 mg/l NAA and 0.5 mg/l BA or 1.0 mg/l NAA and 0.1-8.0 mg/l BA or 2.0 mg/l NAA and 0.5 mg/l BA. Callusing was maximum on medium supplemented with 1.0 mg/l NAA and 4.0 mg/l BA. An average fresh weight of callus were about 2.82 g. The percentage of callusing was also 100% in cotyledons cultured on medium supplemented with 1.0 mg/l NAA and 0.1-8.0 mg/l kinetin. Callusing was maximum on medium supplemented with 1.0 mg/l NAA and 4.0 mg/l kinetin. An average fresh weight of callus was 0.72 g. The percentage of callusing was 100% in hypocotyl cultured on 0.5 mg/l NAA and 0.5 mg/l and 1.0 mg/l BA or 1.0 mg/l NAA and 0.1-8.0 mg/l BA or 2.0 mg/l NAA and 1.0 mg/l BA. An average fresh weight of callus were about 0.49 g. The percentage of callusing was also 100% in hypocotyl cultured on medium supplemented with 0.1 mg/l NAA and 0-0.1 mg/l kinetin or 1.0 mg/l NAA and 0.1-8.0 mg/l kinetin or 5.0 mg/l NAA and 1.0 mg/l kinetin. Callusing was maximum on medium supplemented with 5.0 mg/l NAA and 1.0 mg/l kinetin. An average fresh weight of callus were about 1.24 g.

Cotyledons, hypocotyl and ovules of immature fruits were cultured on $\frac{1}{2}$MS or MS medium supplemented with different concentrations and combinations of sucrose and 2,4-D to induce somatic embryos. Cotyledons cultured on modified $\frac{1}{2}$MS medium supplemented with 15 mg/l 2,4-D in the light produced 60% of somatic embryos. Hypocotyl cultured on the same medium could not produce somatic embryos but it could produce 64% of somatic embryos when cultured on $\frac{1}{2}$MS medium supplemented with 60 g/l sucrose and 1.2 mg/l 2,4-D in the dark. Ovules of 4-14 cm long immature fruit were cultured. Ovules with 14 cm long when cultured on modified $\frac{1}{2}$MS medium supplemented with 60 g/l sucrose and 10 mg/l 2,4-D in the dark could produce 11% of somatic embryos. Somatic embryos were induced to regenerate plantlets. Somatic embryos derived from hypocotyl cultures could regenerate shoot and root when cultured on MS medium supplemented with 0.1 mg/l NAA, 0.1 mg/l BA, 80 mg/l adSO_4 and 170 mg/l $NaH_2PO_4.H_2O$.