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SOMPORN PRASERTSONGSKUN : PLANT REGENERATION FROM CALLUS AND PROTOPLAST OF COTTON (Gossypium spp.) THESIS ADVISOR : ASSO. PROF. SANHA PANICHAJAKUL, Ph.D. 166 pp. ISBN 974-581-629-9

Procedures for product somatic embryos in cell cultures were described for two species of cotton (Gossypium spp.). The suitable conditions for callus induction and initiation of cell suspension cultures from cotyledon and hypocotyl were defined on MS medium contained B5 vitamins supplemented with NAA and 2,4-D, kinetin and zeatin. The highest percent callusing and green compact cell mass callus were obtained, when these tissues (G. hirsutum cv. Si Samrong 2 and G. arboreum cv. Noi) were grown on the different combinations of NAA and kinetin (2 mg/l NAA, 1 mg/l kinetin and 4 mg/l NAA, 1 mg/l kinetin for cotyledon and hypocotyl, respectively). Replacing of NH_4NO_3 by 2 folds of KNO_3 with 0.5 mg/l kinetin and 15 mM glutamine caused root formation from calli.

Protoplasts were isolated from cotyledon, callus and cell suspension cultures of these two species of cotton. The enzyme solution for protoplasts production from cotyledon contained 0.5% cellulase R10, 0.5% macerozyme R10. Slight difference in enzyme concentration (2% cellulase R10, 0.6% macerozyme R10) were indicated for optimum production of protoplasts from callus and cell suspension cultures of these cotton species.

The purified protoplasts (floating three times on 21% sucrose) were cultured in the 1/2 MS liquid medium supplemented with 1 mg/l NAA, 0.5 mg/l 2,4-D, 0.2 mg/l kinetin and 0.2 mg/l zeatin. Addition of coconut water 10% was found essential for cell wall regeneration in 24 hours. Protoplasts isolated from callus began cell division after 2 days in culture medium. Division efficiency for G. arboreum was higher (12.6%) in comparison to G. hirsutum (3.0%).