Physiological studies on the initiation and development of date palm somatic embrayos

Ahmed Ibrahim Ahmed Badawi

This investigation was conducted in the Tissue Culture Unit, Horticulture Department, Faculty of Agriculture, Moshtohor, Zagazig University during the period from 1999 to 2003 to study the best ways for maximizing callus production and enhancing callus development as well as increasing somatic embryos differentiation, plantlets regeneration and proliferation of some date palm cultivars. This study was done as a part of Universities Linkage Project. This project was done as Linkage between Egyptian Universities (Zagazig University) and American Universities (California University at Davis) supervised by Supreme Council of Universities, Foreign Relation Unit.Offshoots from Zaghloul, Hayany, Samany, Selmy, Eraby, Sewy, Sakkoti, Malakaby and Gendila date palm cultivars were taken from the tissue culture nursery in Horticulture Department, faculty of Agriculture Moshtohor. These offshoots were cleaned, prepared, immersed in antioxidant solution for two hours, and sterilized. The excised explants (shoot tip quarters and leaf primordial) were evaluated to find out the best explant, cultivar, auxin type, 2,4-D concentration, cytokinin type, Zip concentration, culturing date and additives that enhanced the highest callus production. Also, the effect of organic addenda, auxin concentration and vitamin combination on callus induction was concerned. In addition, effect of hormonal balance and some promotor additives were studied. Besides, cytokinin type and ZipSUMMARY-110-concentration were tested on proliferation of some date palm. The obtained data could be summarized as follow: 5.1. Establishment Stage 5.1.A. Callus production1-Leaf primordia explant surpassed shoot tip in explant development and callus production.2-Sakkoti cultivar showed higher callus production when cultured on modified Murashige and Skoog medium.3-The higher concentration of 2, 4-D (100 mg/1) encouraged swelling and callus production and decreased necrosis.4-The concentration of 2-ip (3.0 and 4.0 mg/1) increased swelling and callus production and decreased necrosis.5-Culturing of date palm explants during the third and fourth periods (September to November) are the best time which encouraged both swelling and callus production.6-Supplementing the culture medium with glutamine plus asparagine at the rates of (100 + 200 mg/l) induced maximum swelling and callus production. 5.1.B. Callus development7-Using of Sakkoti cultivar explants enhanced production of higher number of lobes / callus and number of somatic embryo / callus.8-Malt extract was superior than other additives in maximizing callus induction as increase number of lobes / callus and somatic embryos/callus.SUMMARY -9-Supplementation of the culture medium with 2,4-D (40 mg/1) increased number of lobes / callus and number of somatic embryo / callus and reduce the necrosis.10-Addition of modified vitamins combination to the culture medium maximized callus production, number of lobes / callus, and number of somatic embryos / callus. 5.1.C. Plantlets regeneration11-Culturing of well developed callus from either sakkoti or Eraby cultivar on balanced hormone medium (1.0 mg/L auxin plus 1.0 or 2.0 mg/L cytokinin) encouraged plantlet regeneration, growth and greening to the highest level..12-Addition coconut milk surpassed adenine sulphate in encouraging number of regenerated plantlets, and greening. However, the control was more suitable for growth parameter. 5.2. Proliferation stage13-Sakkoti and Eraby cultivars surpassed Sewy cultivars in enhancing growth, proliferation greening parameters.14-Kinetin was more effective than both 2ip and BAP in enhancing greening, while, proliferation was maximized by using 2ip. However, both 2-ip and kinetin were effective in increasing growth parameters.15-The higher 2-ip

concentrations (6.0 and 8.0 mg/1) induced higher number of regenerated plantlets.