BIOCHMICAL STUDIES ON JOJOBA PLANT USING TISSUE CULTURE TECHNIQUES

By

SHIMAA ABD ALLA SALEM
B.Sc. Agric. Sci. (Biochemistry), Fac. Agric., Cairo Univ., 2010

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Date: 18 / 7 /2018

SUPERVISION SHEET

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DEDICATION

This work is dedicated to my kind mother, father, my sweety sister ***Hagar****, my lovely brothers (****Mohammed, Khaled****) and* ***Ali****" Allah's mercy upon him.*

I also dedicate it to my best friend ***Naglaa Ezzat*** *for sincere help.*

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ABSTRACT

This work was carried out in the tissue culture laboratory of Zohriya Garden, Department of Ornamental Plant Research, Horticulture Research Institute, Agricultural Research Center, Giza, Egypt during the period from 2013 to 2016. Simmondsin production and its effect on hepatic cancer and breast carcinoma cells was investigated through jojoba tissue culture. Lateral buds were excised from jojoba female plants grown in Zohriya Garden. As clorox was found to be ineffective in a preliminary trial, an experiment was carried out to investigate the effect of mercuric chloride $HgCl_2$ (MC). Three MC concentrations, 0.1, 0.2 and 0.3 g/l were applied. Buds were subjected to each concentration for three different exposure times, i.e. 5, 7 and 9 min. Survived explants that responded positively were used in another trial where they were inoculated on MS medium at different strengths, I.e. quarter, half, 3 quarters and full strength treatments. The best explant on basel media was determined and the physiological effect on various cell line hep,Breast and anti-microbial effect on *Candida albicans, Bacillis subtilis, Escherichia Coli* were studied. Two growth regulators kinetin and 6-Benzylamino purine (Kin and BAP) at 0.5, 1.0 and 1.5 mg/l were used to proliferate "in vitro shoots" from teh established explants on the medium cotained 5, 10 and 15 mg/lmalt extraction. Callus cultures were induced using pieces of $1cm^2$ *in vitro* leaves of jojoba clone and cultured on MS basal medium supplemented with 0.5, 1.0 and 1.5 mg/l2,4-Dichlorophenoxyacetic acid, Naphthalin acitic acid individually and with combination.The best growth medium composition was MS salts at full strength in all experiments. Furthermore, multiplication of *in vitro* jojoba shoots number, shootlets length and leaves number could be highly achieved (7.67 shootlets/explants, 4.67 cm and 9.4 leaves) by 1.5 mg/l BAP combined with 15g/l malt extract. 2,4D at 1.5 with 2ip 0.5 mg/lrespectively induced callogenesis (98.67 %) with fresh weight 4.4 g while NAA at 1.0 mg/lplus 2ip 1.5 mg/l respectively enhancedcallogensis production .the forming callus from leaves expsosed to various elicitor materials (riboflavine,glutamine and $AgNo_{3)}$. Also, the effect of MeOH extract and Oil on cancer cell line were recorded 40.78%and 81.94%for 500mg/lfor Hepatocellular carcinoma cancer cell line. Whileasey at thisvalue (500mg/l) was scored (67.21) and (90.65) for Breast carcinoma cancer cell line.

Key words: Jojoba, tissue culture, callus, *Simmondsia chinensis*.

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