IN VITRO PROPAGATION AND EXTRACTION OF SOME IMPORTANT ACTIVE INGREDIENTS OF SOME MEDICINAL PLANTS

BY

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B. Sc. Agric. Sc. (Agric. Production), Cairo University, 1985
M. Sc. Agric. Sc. (Ornamental Plants), Cairo University, 1996

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ABSTRACT

These procedures were developed for the micropropagation of *Artemisia dracunculus* L., *Balanites aegyptiaca, Ginkgo biloba* using shoot tip including one-nodal cuttings. Explants were obtained from young plants which were grown in the greenhouse for *Artemisia dracunculus* L. *and Balanites aegyptiaca* and soft cuttings were taken from mature tree of *Ginkgo biloba*. The shoot tip of the three plants were cultured on (MS, 1962), (B5, 1968), (WPM, 1980) and (White, 1963) media at different salt strengths (full strength, 3/4, 1/2, 1/4 and 1/8) as a basal medium without any growth regulators in the starting stage. Effect of BA, TDZ, IBA, and picloram were investigated at various concentrations (0.0, 0.05, 0.1, 0.2, 0.4, 0.8, 1.6 and 3.2mgl^{-1}) for each to study their effects on the growth and development of *Artemisia dracunculus* L., *Balanites aegyptiaca* and *Ginkgo biloba* shoots. Also the effect of BA at (0.5, 1.0, 1.5,2.0 and 2.5mgl^{-1}) was investigated to study its effect on the growth and development of *Ginkgo biloba* shoots in the multiplication stage. Effect of phloroglucinol on roots formation was investigated at various concentrations (162, 121, 081, and 40 mgl^{-1}) for each plant. Also IBA at 5.0, 10, 15 and 20 mgl^{-1} was investigated for *Ginkgo biloba*. Results showed that shoot growth at the starting stage required 3/4 MS control (basal free medium without any growth regulators) for each plant, and shoot multiplication required 3/4 MS medium supplemented with 0.2 mgl^{-1} BA or 0.8 mgl^{-1} IBA for *Artemisia dracunculus* L., 0.05 mgl^{-1} BA or 3/4 MS without any growth regulators for *Balanites aegyptiaca* and 2.0 mgl^{-1} BA for *Ginkgo biloba* .Shoot length was significantly affected by the presence of 0.8 mgl^{-1} IBA for *Artemisia dracunculus* L.,3/4 MS without any growth regulators for *Balanites aegyptiaca* and 2.0 mgl^{-1} BA for *Ginkgo biloba* . The rooting of shoots growth required 0.8 mgl^{-1} IBA or 162 mgl^{-1} phloroglucinol and 81 mg^{-1} Phl + 0.8 mg^{-1} IBA for *Artemisia dracunculus* L. and 3/4 MS without any growth regulators for *Balanites*

aegyptiaca. Rooted shoots were acclimatized and successfully transferred to the soil (peat moss: sand 1:1 v/v) with surviving percentage of 75 % for *Artemisia dracunculus* and with all types of substrates the shoots of *Balanites aegyptiaca* gave a survival percentage of 93.75 -100 %.

For callus formation 2,4-D at different concentrations were investigated (0.5,1.0,1.5,3.0,4.5,6.0and 7.5mgl^{-1}) and picloram at 0.05 ,0.1 ,0.2 ,0.4 , 0.8 ,1.6 and 3.2 mgl^{-1} was investigated for each plant .The results showed that the best callus for *Artemisia dracunculus* L. was formed on 3/4 MS supplemented with1.5 mgl^{-1} 2,4-D or 0.05 Pic mgl^{-1} . For *B. aegyptiaca* it was 7.5 mgl^{-1}2,4-D or 0.2 and 0.4 mgl^{-1} Pic .

For the determination of secondary metabolites, the determination of volatile oil from *Artemisia dracunculus* L., the determination of saponin from *Balanites aegyptiaca* and the determination of flavonoides (ginkgololides) were investigated. The percentage of volatile oil from the fresh plants of *Artemisia dracunculus* L. grown *in vitro* was 0.05% and from the *in vivo* plants was 0.0.43 %.The percentage of saponin in *Balanites aegyptiaca* from aerial parts and roots was 34.10 % and from the fruits was 62.30%. The percentage of flavonoides (ginkgololides) in *Ginkgo biloba* leaves from *in vitro* plants was 0.025 % and from the leaves of *in vivo* plants was 0.04 %.

Key words: *Artemisia dracunculus*, *Balanites aegyptiaca*, *Ginkgo biloba,* Micropropagation, Starting stage, Multiplication stage, Rooting stage, Adaptation, Callus formation, Secondary metabolites.

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