

***In vitro* hardening of date palm cv. Medjool vitroplants affects growth in the nursery**

(Received: 01. 06. 2014; Accepted: 05. 07 .2014)

Hegazy, A. E.

Genetic Engineering and Biotechnology Research Institute (GEBRI), Plant Biotech. Dept., Sadat City Univ., Egypt.

ABSTRACT

In vitro hardening of date palm (*Phoenix dactylifera* L.) cv. Medjool shoots were accomplished as pre-acclimatization using ascorbic acid 0, 50,100,150 or 200 mg/l in the MS rooting medium. Positive response occurred with ascorbic acid (150 mg/l) which scored the highest significant values of root length (11.66 cm) and root circumference (1.93 mm) after 8 weeks of incubation. Subsequently this affects saplings cultured in growing mixture containing compost and perlite (1:1, v/v) which raised saplings survival from 80 to 93.33 % after 12 weeks in acclimatization as well as reflected significant values of total chlorophyll (2.93 mg/g D.W.), total soluble sugars (29.33 %) and ascorbic peroxidase activity (1102.33 Units/g, F. W.). Results revealed that plastic leggy bags [20 cm (w) X 40 cm (h)] filled with the growing mixture sand + coarse sawdust (2:1, v/v) and fertigated with Stimifol (0.5 g/l) once a week for 9 months under greenhouse conditions in the nursery, recorded the highest significant values of total leaves no. (7.3), pinnate leaves no. (5.5), plant height (57.0 cm), leaf width (5.3 cm) and stem circumference (2.7 cm). This was accompanied by the highest significant values of dry weight (15. 79 %), T.H. Carbohydrate (38.99 %), lipids content (4.48 %). Also this was accompanied by a consequence higher value of total soluble phenol (0.85 g / g protein) and the highest significant values of crude protein (36.15 %) and PAL activity (220 nkat / g protein). However, using a mixture containing sand + foam recorded the lowest values of all growth characters and chemical analysis under study. Results may be considered very helpful to the researchers and highly supportive to the nurseries at the commercial level, as it introduces effective and cheapest natural raw materials to fulfillment of the huge demand of insufficient big quantities required. In addition, it has great beneficial effect to the national environment through implementation of rice shell and coarse sawdust as a good practical recycling and environmental bioremediation and finally reduces production costs.

Key words: *Phoenix dactylifera* L., Tissue culture, Micropropagation, ex vitro, Phenylalanine ammonialyase (PAL), Environmental bioremediation, Waste recycling.

INTRODUCTION

Somatic embryogenesis is one of the most important technologies for plant regeneration. There are two morphogenetic pathways ensuring the

production of somatic embryos. The first pathway is direct somatic embryogenesis, which is yet to be fully developed for massive plant regeneration in date palm (Sudharsan *et al.*, 1993; Hegazy *et al.*, 2006 b and Hegazy and Aboshama, 2010). The second pathway is