

# Growth of Date Palm Callus as Affected by Growth Regulators, Sugars as Carbon Source and Amino Acids as Organic Nitrogen Source

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## ABSTRACT

Fresh weight, dry weight and growth rate of callus derived from leaf primordia explants of date palm were determined as affected by casein hydrolysate, growth regulators, soluble sugars, and amino acids. MS-medium that contained kinetin 0.5 mg/L with 2 mg/L 2,4-D was the best combination of growth regulators in callus production. It was found that BA and kinetin gave the best growth, but 2,4-D failed to stimulate callus growth. The results of soluble sugars showed that, fresh weight of callus was increased with sucrose, fructose and glucose, and decreased with mannitol. The results revealed that all amino acid treatments steadily decreased both fresh and dry weights of calli compared with the control, while they were gradually increased with casein hydrolysate.

**Key words:** Tissue culture, *Phoenix dactylifera* L., casein hydrolysate, glutamic acid, phenylalanine, tryptophane, ornithine, methionine, arginine, alanine, glucose, fructose, sucrose, mannitol, cytokinins, auxins.

## INTRODUCTION

Cultured cells are normally capable of synthesizing all of the required amino acids. Yet, the addition of an amino acid or amino acids mixture may be used to stimulate cell growth and facilitate plant regeneration (Mohamed, 1996). L-glutamine can serve as the sole source of nitrogen which can be taken more rapidly than inorganic nitrogen (Thom *et al.*, 1980). Hussein *et al.*, (1994) studied the effect of some amino acids on the growth of *Datura*

*stramonium* cultured on MS-medium with 1 mg/L of both 2,4-D and kinetin and subcultured on fresh medium containing some amino acids. They found that the fresh and dry weights of calli were reduced. Abou El-Nil (1989b) indicated that amino acids stimulated callus growth and ranked as follows: glutamine, asparagine, arginine, serine, glycine and alanine. Glutamine doubled callus growth compared to control.

Zenk *et al.*, (1975) found that when tobacco callus culture medium was supplemented with casein hydrolysate at a level greater than 4 g/L, callus growth was