INTERODUCTION

Palms belong to family palmacea (Arecaceae) **(Corner, 1996)** which contain several members, such as date palm *(Phoenix dactylifera* L.), cocount palm *(Cocos nucifera* L.), and oil palm (*Elasis guineesis Tacq)* are widely cultivated for their fruit crop products in addition, numerous fenoum important crops such as filer, fuel and furniture.

Palms have called the "tree of life" because of their indispensable utilization in the economy and domestic life of inhabitants of palm-growing countries .

Date palm is considered one of the most important commercial crops in the Arab world. Date palm fruits have large percentage of sucrose up to 80% and some amounts of fiber, protein , fat, vitamins and minerals.

In addition, date palms have been proven to be one of the most salt tolerant fruit crops ,therefore, have the potential to help conbat desertification processes **(Bauchireb and Clark, 1997).**

Date palm is a monocot and dioecious fruit tree that is vegetatively propagated through offshoots. However, there are many problems associated with this system **(Popenoe, 1973).** The availability of offshoots is limited because the number produced by each palm tree is low, very erratic and can not be successfully controlled. In addition, the methods of excision is complicated, time consuming and the percentage of offshoots successfully established in soil is variable (30- 80 %).

Tissue culture micropropagation, has been employed to aid in the clonal propagation of numerous plant species

(De-ossard, 1976) the inherent advantage of tissue culture over field propagation in the greatest plant production potential from a single plant. Tissue culture techniques, may offer a plausible method to produce large numbers of genetically uniform palms in a short period of time .

Therefore, the development of micropropagation protocols is very important. Rapid propagation of date palm through tissue culture is the most promising technique for production of sufficient plant materials (offshoots) and obtaining high quality, high yielding and pest-free varieties.

To satisfy increasing demand in international markets, it is necessary to develop alternative of vegetative propagation to produce large numbers of plants from selected genotype. Several attempts have been made to establish micropropagation protocols based on either somatic embryogenesis or organogenesis **(Sharma *et* a1.,1990 and Tisserat,1991).**

On the other hand , somatic embryogenesis is a process by which somatic cells undergo differentiation to form a bipolar structure containing both root and shoot axes .

Micropropagation of plants by somatic embryogenesis has the potential for the highest rates of plant production. Thousands of somatic embryos can be produced in a single flask, Embryonic callus has been obtained from ovules and zygotic embryos as well as shoot tips and buds excised from offshoots.

In addition , producing of date palm through organogenesis process should be clonal and less risk of genetic variation than callus derived plantlets **(Belal and El-Deep, 1997).**

The genetic, biochemistry, physiology and morphogenesis of tree crops are neglected compared to herbaceous species. Tree crop such as the date palm are difficult to study due to their long life. *In vitro* techniques appear to be promising tools to study palm growth and development compared to field and greenhouse experimentation (Tisserat, 1983).

Phoenix dactylifera, L. cv. Zaghloul is an elite cultivar of date palm. Its clonal propagation is much desired in the moderate climate regions which are suitable for soft varieties. In the newly reclamated area of Egypt such as El-Ewinate; Toshka and North of Sinai growing such cultivars would have an economical impact. Thus the need for propagation protocol which insures the mass production of true to type plants becomes very necessary.

This investigation began as an attempt to micropropagate the desirable cultivars begining from segments of explants, to achieve date palm plants grown in greenhouse (3 months- old). For this purpose, a study was carried out to define micropropagation protocols bassed on direct somation embryogenesis and indirect somatic embryogenesis .

The objective of this study was to investigate two *in vitro* micropropagation systems of date palm through either direct somatic embryogenesis by enhancing the production of axillary buds formation from shoot apices of offshoot, explant or indirect somatic embryogenesis by obtaining embryonic callus from shoot apices of offshoot explant and germination of somatic embryos from embryonic callus.

In addition, the aim of this research was to throw some lights by which a better understanding of the physiological states

of explant and its developmental stages (several morphological forms of callus, embryo development and plantlet growth) via embryogenesis could be achieved. So, we attempt to relate the results obtained to growth mechanisms occurring during the *in vitro* proliferation of date palm cultivars and the best condition of growth.

Moreover, study the new technique for root formation and pre-acclimatization aims to attain the best rooting plants within growth chamber able to transfer to the environment of the greenhouse, where the lower relative humidity, higher light levels, autotrophic growth and specific environment, that are characteristics of the greenhouse.