

INTRODUCTION

In vitro propagation techniques are now being developed and applied successfully in the field of commercial exploitation for some fruit species like as banana. However, with the palms earlier culture works were directed toward developing and establishing an *in vitro* propagation system for clonal regeneration could be used as an applicable method, but progress was very slow due to the excessive difficulties that facing horticulturists to be surmounted. In this regard the heavy infection which made obtaining cultures free microorganisms was usually so difficult particularly when roots were the source material used. Moreover, once aseptic cultures were established the very slow rate of callus growth and the great variations between explants from the same tissue, as well as between similar explants from different palms are representative of a considerable problems could be met in this connection. Many years were spent in improving the culture systems for oil and coconut palm tissues to obtain callus which could be grown and subcultured, as well as several more years were also required before it became possible to obtain somatic embryos (Black, 1983). Accordingly, with having information available on oil and coconut palms, the large-scale production of clonal plants through tissue culture technique is most advanced with oil palm (Jones, 1983). The story is very complicated with date palm, however a relative successful was also achieved, regarding its clonal regeneration through system of callus and somatic embryogenesis (Tisserat, 1984a). This may be mainly due to that much informations will be probably not be freely available in the future attributed to its proprietary nature and commercial importance. Consequently, on the assumption that clonal propagation of the palms will continue to use a

callus system, the following topics appear to be the key areas that needing further studies in order to obtain maximum success :-

- 1- Determining the most suitable responsive explants.
- 2- Achieving the optimal media to initiate callus which will proliferate through incubation of explants.
- 3- Determination of factors by which organization could be completely or approximately controlled.
- 4- Investigation of factors affecting development of embryoids into normal plantlets.
- 5- Determination of conditions for controlled multiplication of embryoids.
- 6- Successful establishment of clonal plants in the nursery and field.
- 7- Determination of genetic uniformity within clones.

Thus, the present work was oriented toward the first four aspects of the above mentioned ones which dealing with these factors related to the first stages of clonal propagation through callus formation and development system, i.e. somatic embryogenesis, whereas explant source "segments of shoot tip, sub-shoot tip, leafy lateral bud, leaf primordia and cotyledonary sheath", both forms and rates of auxins, some preculturing treatments and supplementary substances, as well as other factors were included in this study. Besides, other systems namely; a)- direct vegetative proliferation *in vitro* "using the whole plant organs, i.e., shoot tip and leafy lateral bud" and b)- androgenesis "tissue cultured pollen grains" were also included. Since, the main purpose aimed to solve some difficulties could be met using of the tissue culture technique for clonal propagation to replace the slower method, i.e. transplanting of offshoots. Because of the date palm tree produces a limited number of offshoots through its whole lifetime.