STUDIES ON THE PROPAGATION OF SOME ORNAMENTAL PLANTS BY TISSUE CULTURE

BY

FAISAL MOHAMED ABDEL ALEAM SAADAWY
B. Sc. Agric. Sci. (Horticulture), Ain Shams Univ., 1965
M. Sc. Agric. Sci. (Floriculture), Al-Azhar Univ., 1975

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Abstract

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Orchid flowers are the most fascinating and beautiful of all flowers. They are of highest value as cut-flowers and can be grown in garden beds, pots, hanging baskets, and indoor containers. Cultivation of orchid plants, both for plant sale as well as cut-flower production, has become a very profitable occupation. In spite of their commercial value, orchids have not yet gained the attention and popularity they deserve in Egypt.

Two orchid species, *Laelia anceps* and *Cymbidium devonianum* were used in this study. Results of this study could be abstracted in the following :

1 - For the multiplication of *Laelia anceps* and *Cymbidium devonianum* orchids by tissue culture technique it is better to use MS medium supplemented with 6-benzyl adenine (BA) at 1 ppm in order to encourage explant multiplication to get a lot of shoots.

2 - Rooting of the induced shoots could be achieved by growing these shoots on MS medium supplemented with naphthalene acetic acid (NAA) at 10 ppm.

3 - In order to reduce the high expenses of the tissue culture technique for economic purposes, MS Medium could be substituted by some natural, cheap and easily available products such as broad bean, wheat corn or rice flour. Chemical and hormonal analyses of these substances unveiled their richness of almost all elements represented in

the standard MS medium, in addition to their content of a naturally balanced phytohormones. Corn starch could be the source of sugars needed for the explants to grow, and it can be used to some extent instead of the expensive agar.

4 - To avoid great losses caused by contamination. 8-hydroxyquinoline sulphate (8-HQS) at 150 ppm could be used incorporated in MS medium. This procedure eliminate contamination and abolish the need to autoclave media. Besides its effectiveness in controlling contamination, it proved to have some beneficial effects on the multiplication and rooting of the plant material. The biochemical finger print showed that the dissimilarity coefficient between the 8-HQS-treated plantlets and the control was very small, indicating that this substances did not induce somaclonal variations.

5 - A lot of differences were found between the two orchids used, *Laelia anceps* and *Cymbidium devonianum*. The former was more responsive and easily to propagate than the later.

Key words: Orchids, *Laelia*, *Cymbidium*, BA, kinetin, IBA, NAA, media, natural complexes, 8-HQS, Physan 20. vilamen, cortex, stele, pith.

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1 . Introduction

Orchids are the most fascinating and beautiful of all flowers. They exhibit a wide range of diversity in form, size, color, and texture of flowers. Growing orchid is a fascinating hobby throughout the world. There is joy in watching new growths and roots, waiting for an offshoot to become a mature plant and seeing the new hybrids in flower. Orchids are excellent items for garden and can be grown in beds, pots, hanging baskets, split hollows of bamboo pieces and many other kinds of containers. They are the most beautiful items for indoor decoration. Orchids, having flowers of wonderful beauty and very good keeping qualities, are of highest value as cut-flowers. Some orchid flowers last for 1-3 month if remain attached to the plant, and as cut-flowers they remain fresh for 1-6 weeks.

Cultivation of orchids, both for plant sale as well as cut-flower production, has become a very profitable occupation, millions of dollars worth, to many south east Asian countries. Development of new hybrids and commercial production of cut-flowers in orchids have expanded tremendously in Europe, USA, South America, Thailand, Singapore, Malaysia, Japan and Sri Lanka. In spite of their commercial value, orchids have not yet gained the attention and popularity they deserve in Egypt. They are almost confined to a number of amateurs interested in growing these lovely plants in their small private greenhouses by the conventional propagation methods.

Orchids belong to the monocotyledonous family “Orchidaceae”, the second largest family in the plant kingdom. They are perennial herbs of varying habits. In tropical regions they are found frequently on trees and shrubs and sometimes