

UNIVERSITI TEKNOLOGI MARA

**THE GROWTH OF *DENDROBIUM DRACONIS* PLANTLETS AND
CYTOTOXIC ACTIVITY OF *GRAMMATOPHYLLUM SCRIPTUM*
EXTRACTS AGAINST BREAST CANCER (MCF-7) CELL LINE**

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Dissertation submitted in partial fulfillment of the requirement for the
Degree in Bachelor of Pharmacy

Faculty of Pharmacy

2014

ACKNOWLEDGEMENTS

In the name of Allah, the Most Gracious and the Most Merciful. Alhamdulillah, all praises to Allah for His blessing and strength He give to me, I am able to complete this final year research project.

First of all, special thanks go to my supervisor, Madam Noor Anilizawatima binti Sulong for all the guidance she gives to me through all the difficulties in completing this research project from the beginning until the end. I would also like to thank my co-supervisor, Dr. Hasseri bin Halim for all his guidance and his willingness to help me in completing the research on the cell culture part.

I would also like to thank my parents for all their continuous supports and prayers, my research partner, Siti Khadijah binti Mohd Zahidi, for her great help and always being with me, through thick and thin. I also acknowledge the postgraduate students and the members of Plant Tissue Culture Laboratory and Cell Culture Laboratory of Faculty of Pharmacy, UiTM Puncak Alam for their guidance, helps and encouragements.

Without all of these people, I would not be able to finish this research project successfully on time. Thanks to Allah for letting me to meet with many beautiful hearted people during this research project.

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ABSTRACT

Orchids are well known as ornamental plant but not for its medicinal value. *Dendrobium draconis* and *Grammatophyllum scriptum* are among of the orchids that have the medicinal value. Thus, there is a remarkable interest in developing methods to promote growth of medicinal orchids. In this study, the effect of 6-benzylaminopurine (BAP) on the growth of *D. draconis* was investigated. While, for *G. scriptum*, a study was conducted to investigate its cytotoxic activity against breast cancer (MCF-7) cell line. *D. draconis* plantlets were grown on Murashige and Skoog medium supplemented with different concentrations of plant growth hormone, BAP (concentration of 0.0, 0.5, 1.0, 2.0 mg/L). The observed parameters are multiple shoot production and height growth. Whereas, for *G. scriptum*, the crude extracts (methanol) of *in-vitro* orchid and various part of natural derived orchid; the leaves, pseudobulb and root; were screened for cytotoxic activity. For the micropropagation of *D. draconis*, the highest number of shoots production was observed from the MS medium supplemented with 2.0 mg/L BAP. Meanwhile, there was no effect of different concentration of BAP on the height growth of plantlets after 12 week in culture. On the other hand, for preliminary study of *G. scriptum* extracts, the root part exhibited the greatest cytotoxic activity among the extracts with the IC_{50} value of 61.29 ± 2.05 μ g/ml. The naturally derived *G. scriptum* exhibited greater cytotoxic effect compared to *in-vitro* *G. scriptum*. In conclusion, BAP does give great effects on the growth of *D. draconis*. The extracts of *G. scriptum* do have anti-proliferative property towards MCF-7 cell line.

CHAPTER 1

INTRODUCTION

1.1 Background of study

The Orchidaceae is known as the largest family of the plant kingdom, which roughly consists of 750 genera and more than 30 000 species in those genera. There are terrestrial, saprophytic and epiphytic species of Orchidaceae (Kong et al., 2003). *Dendrobium draconis* is an epiphytic type of orchid that commonly found in Thailand (H. Kamemoto et.al, 1999). Meanwhile, *Grammatophyllum scriptum* is also a type of epiphytic orchid that usually can be found in Indonesia, Philippines and South Africa islands. The genus of *Grammatophyllum* is frequently related to the giant orchid (Hodgson et al., 1991).

Dendrobium draconis which is known as Ueang Ngoen among Siamese, exhibits many medicinal values (Wongsatit Chuakul, 2002). In Thailand, the stem of this orchid was used in tea preparation for the hematinic property. 5-Methoxy-7hydroxy-9,10-dihydro-1,4-phenanthrenequinone, together with the stilbenoids batatasin III, gigantol, hircinol, and 7-methoxy-9,10-dihydrophenanthrene-2,4,5-triol, have been isolated from the tea. From the study, the stilbene derivatives exhibited the antioxidant activity in the DPPH-free radical assay (Sritularak et.al, 2011). Besides, Siamese also used this type of orchid for the antipyretic property (Wongsatit Chuakul, 2002).