

UNIVERSITI TEKNOLOGI MARA

**CHEMICAL SCREENING OF ENDOPHYTIC
FUNGI EXTRACTS BY USING HPLC (TO CREATE
A LIBRARY OF ENDOPHYTIC FUNGI EXTRACTS)**

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**Dissertation submitted in partial fulfillment of the requirements for the
degree of Bachelor of Pharmacy (Hons)**

Faculty of Pharmacy

November 2008

ACKNOWLEDGEMENTS

Praise to Allah the Almighty for His blessing made this study completed successfully. It would be virtually impossible to thank all of the individuals who have helped me to complete this study but, firstly I would like to express my deep and sincere gratitude to my dedicated supervisor, Dr. Sadia Sultan for her time, knowledge and guidance which are very important for me in completing this study. My special appreciation goes to my co-supervisor, Professor Dr. J.F.F. Weber Abdullah for his comments and ideas which have been of great value. Special thanks to Miss Siti Hajar Sadiran (post-graduate student), whose knowledge, time and effort were very much appreciated. Acknowledgements are also made to the staff of Institute of Chemistry of Herbal Remedies (iKUS) for their cooperation. My warmest gratitude goes to my family for their emotional support and encouragement. To all my lab mates, their helps and ideas were greatly appreciated. Last but not least, to those who are not stated here, thank you. Without all of the supports, this study would not have been possible.

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ABSTRACT

This study was aimed to carry out a high performance liquid chromatography analysis of endophytic fungi extracts to determine their secondary metabolites pattern. In a gradient elution at a flow rate of 1 mL/minute, using a mixture of water-ACN as a mobile phase, reverse phase column as a stationary phase and automated injections of 10 μ L of samples, secondary metabolites were eluted with retention time from 5 min to 30 min. Diode array detection at 210 nm was used to analyse the HPLC chromatograms of the extracts. The chromatograms obtained demonstrated that some of the extracts present at least one unique unknown secondary metabolite that could be of interest. Fraction collections of extracts were also done in this study. Fractions were collected by time (every 0.5 minutes) between the retention time of 5 min and 30 min to yield 46 fractions. This will be useful in further study regarding these fungi extracts. The extracts were tested against selected bacteria and fungi by using disc diffusion method to determine their antimicrobial activities. All the data collected were included into the database in order to create a library of endophytic fungi extracts to be used in further research.

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Fungi are eukaryotic microorganisms that are mostly invisible to the naked eyes. They live for the most part in soil, dead matter and as symbionts of plants and animals. Animals, soil, and plants serve as the reservoir for untold number of fungi which is known as endophytes. Endophytes live in close association with living plant tissue. By definition, endophytic fungi are microorganisms that reside in the tissues of plants without causing apparent and immediate harm to the plant host (Aly *et al.*, 2008).

Endophytic fungi are well known to be important sources of biologically active secondary metabolites (Aly *et al.*, 2008). Among the secondary metabolites produced, there will be the “talented” compounds that have the potential for novel drug discovery especially in a search for newer and better antimicrobial compounds. This is because endophytes are known to be the sources of antimicrobial compounds (Strobel, 2003). *Penicillium* genus is an example of fungi that lead to the discovery well known penicillin antibiotic and other useful biologically active metabolites.

Novel drug discovery require identification of biologically active secondary metabolites produced by “talented” endophytic fungi. This can be achieved through chemical