

UNIVERSITI TEKNOLOGI MARA

**ANTIMICROBIAL ACTIVITY OF ENDOPHYTIC
FUNGAL EXTRACTS (11-R3, 11-L2, 11-S1)**

NURUL BALQIS BT ABD AZIZ

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

Faculty of Pharmacy

October 2007

ACKNOWLEDGEMENTS

Alhamdulillah, all praise to Allah S.W.T, the Most Merciful and the Most Gracious. With His helps and blessings, this study has been completed successfully. Praises to our Prophet Muhammad, the greatest creation who brought light and peace throughout the universe.

I would like to express my deep and sincere gratitude to my thesis supervisor, Dr Sadia Sultan for always being there for me to offer her time, knowledge, guidance, and advices which are very important and supportive.

I owe my special appreciation to my co-supervisor, Professor Dr. J.F.F Weber Abdullah, for his detailed and constructive comments which have been of great value throughout completing this thesis.

Acknowledgements are also made to the staff of Institute of Chemistry of Herbal Remedies (iKUS) for their excellent guidance and technical assistance during the laboratory work.

My warmest gratitude goes to my family and friends for their loving support and patience in tolerating my absence physically and emotionally. Lastly, thank you to all those who gave me the possibility to complete this thesis.

TABLE OF CONTENTS

TITLE	PAGE
APPROVAL FORM	
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LISTS OF TABLES	vi
LISTS OF FIGURES	vii
ABSTRACT	viii
CHAPTER ONE (INTRODUCTION)	
1.1 Nature as important source in drug discovery	1
1.2 The need of novel drug	2
1.3 Brief information on fungi and endophytes	2
1.4 Some important discoveries from endophytic fungi	3
CHAPTER TWO (LITERATURE REVIEW)	
2.1 Natural products as major source of bioactive compounds	5
2.2 Overview of <i>Cordyceps sinensis</i>	5
2.3 Biologically active compounds generated by <i>Cordyceps sinensis</i>	
2.3.1 Nucleosides	6
2.3.2 Polysaccharides	7

ABSTRACT

The major objective of this project is to determine the antimicrobial activity of endophytic fungal strains 11-R3, 11-L2, and 11-S1 in three different conditions, which are solid agar, static broth and shaken broth. In order to accomplish this objective, few steps were taken accordingly. First step was growing the endophytic fungal strains on solid agar, static broth and shaken broth media. This was followed by extraction of the cultures with several solvents and apparatuses. The resulting extracts were then used in the last stage, the antimicrobial activity testing against selected bacteria and fungi by disc diffusion method. Throughout the whole stages, fungi were observed macroscopically and microscopically. The observations were recorded and shall be included into the database developed by Faculty of Pharmacy, UiTM.

CHAPTER 1

INTRODUCTION

1.1 Nature as important source in drug discovery

Natural products are naturally derived metabolites from microorganisms, plants or animals. For thousands of years, natural products have been exploited as chief source of compounds used for medicine. In recent times, about 40% of prescription drugs are natural-products based-compounds (Strobel, G., 2003). Microorganisms which cover almost half of the number of species in nature had played a remarkable role in drug discoveries so far. The search for new drugs from fungi started with the discovery of penicillin, an antibiotic by Fleming from *Penicillium notatum* (Md. Hossain Sohrab, 2005). Nowadays, with the increasing needs of new drugs, fungi are still among the most astonishing sources. Recently, endophytic fungi species showed some promising outcomes in drug discovery. There are more than 1.5 million fungal species, but only about 10% have been discovered. Dreyfuss and Chapela estimated there may be at least 1 million species of endophytic fungi alone. Thus, it is presumed that endophytes may contribute most in uncharacterized fungal diversity (Strobel, G., 2003). Their ability to generate the same biologically active substances as their host plant makes endophytes worth to be explored.