UNIVERSITI TEKNOLOGI MARA

EVALUATION OF VARIOUS TOXIC COMPOUNDS ON FUNGI AS SELCTION TOOLS

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

Faculty of Pharmacy

Nov 2009

Acknowledgement

Foremost, I would like to express my sincere gratitude to my supervisor Prof. Dr. Jean-Frederic Faizal Weber Abdullah for the support he gave in this research. His patience, motivation, enthusiasm, immense knowledge and encouragement helped me during the process of the research and thesis writing. I could not have imagined having a better supervisor for my research paper.

Apart from the main supervisor, I would like to thank my co-supervisor also, Dr. Sadia Sultan who gave plenty of advises and helped me to finish this project.

I am also indebted to the staff of Institute of Chemistry of Herbal Remedies, IKUS due to their help and willingness to share their knowledge for this project. During this work, I have collaborated with many colleagues for whom I have great regard, and I wish to extend my warmest thanks to all those who have helped me with my work in the IKUS.

Last but not least, I am most thankful to my beloved family and friends for their tolerance for my absence both in physically and emotionally. I am blessed by their unconditional love which has indeed given me the strength and motivation to stay focused and positive in completing this project.

TABLE OF CONTENTS

ABSTRACT

In this project, 24 fungi species were used in order to observe if any of them could grow in the presence of toxic compounds. Five toxic compounds were used namely benzene, ethanol, dimethyl sulfoxide (DMSO), naphthalene and 1,2-epoxybutane. A fungus is said to be resistant when it could grow in presence of toxic compounds. The objectives are; to expose a series of fungi species to five toxic compounds, to evaluate the efficiency of the toxic compounds as a selection tools and also to evaluate the metabolic changes in the surviving fungi with the presence of the toxic compound. The inoculation of fungi species into a Potato Dextrose Agar (PDA) media were conducted in a biohazard safety cabinets. The purpose of it is to prevent contamination by other microorganisms. 9cm and 20 cm of the plates were used in this project. The surviving strains then were re-cultured into 9cm plate with the presence as well as absence of the toxic compounds. These plates were incubated for two and four weeks before the extraction was done. We used HPLC as a tool to determine the presence of any new metabolites in the culture. Results showed there was several species of the fungi found to be resistant to a few of toxic compounds after it has been exposed to it. This kind of fungi may produce a secondary metabolite that was used by them to escape from being inhibited by the toxic compounds. Therefore, we have chosen benzene and naphthalene as a selection tools as it caused a relatively fungal growth with presence of it. The 1,2-epoxybutane was not chosen because it was relatively toxic to the fungi.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Fungi belong to a species group called eukaryotic. They have the same ability as animals in secreting hydrolytic enzymes which are responsible for breaking down biopolymers such as carbohydrates and proteins to smaller units which can be absorbed for nutrition. Fungi lives in their own food supply and simply grow into new food as the local environment becomes depleted in nutrient.

The organisms of the fungal lineage consists of mushrooms, rusts, puffballs, truffles, morels, molds, and yeasts, as well as many less well known organisms (Alexopoulos *et al.*, 1996). More than 70,000 species of fungi have been described; however, some estimates of total number suggest that 1.5 million species may exist (Hawksworth, 1991; Hawksworth *et al.*, 1995). Aflatoxins, like all mycotoxins, are metabolites produced by many fungi under certain conditions. Factors including plant stress, physical damage, nutrition deficiencies, and insect infestation will affect fungal growth.