

**UNIVERSITI TEKNOLOGI MARA**

**BIOACTIVITIES OF SELECTED  
LICHENS**

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## ABSTRACT

The aim of this study is to investigate *in vitro* free radical scavenging, antimicrobial, cytotoxicity and anticancer activities of the methanol and acetone extracts of the lichens *Ramalina sp.*, *Usnea sp.*, *Heterodermia sp.*, and *Telochistes sp.* Free radical scavenging activity was evaluated by DPPH radical scavenging assay. Of the lichens tested, both acetone and methanol extracts of *Ramalina sp.* had highest free radical scavenging activity (72.27 %) and (84.43 %) of inhibition at a concentration of 1mg/ml, respectively, which are nearly as potent as the standard antioxidants controls; ascorbic acid (96.45%), trolox (91.9 %), and BHA (94.44 %). Total phenolic content was determined as gallic acid equivalent (GAE). The highest total phenolic content was identified in the lichen *Ramalina sp.* in both acetone and methanol extracts ( $179.3 \pm 0.104$ ) and ( $142.9 \pm 0.006$ ) mg of GAE/g of lichen extract respectively. The strong relationship between total phenolic content and the DPPH radical scavenging activity was observed. The antimicrobial activities were estimated by disc diffusion method and determination of minimal inhibitory concentration (MIC). *Ramalina sp.* had the strongest antibacterial activity. Cytotoxicity and anticancer activity was tested against NIH3T3 (mouse embryo fibroblasts) and Caco-2 (human colon colorectal adenocarcinoma) cells respectively using Neutral Red Uptake assay. Lichen of *Ramalina sp.* showed good cytotoxic activity towards NIH3T3 cells and have anticancer properties. The present study shows that extracts of *Ramalina sp.* exhibited strong free radical scavenging, antimicrobial and anticancer effects suggesting that lichens have the potential as natural antiradical, antimicrobial and anticancer agents.

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# TABLE OF CONTENTS

	<b>Page</b>
<b>CONFIRMATION BY PANEL OF EXAMINERS</b>	<b>ii</b>
<b>AUTHOR'S DECLARATION</b>	<b>iii</b>
<b>ABSTRACT</b>	<b>iv</b>
<b>ACKNOWLEDGMENTS</b>	<b>v</b>
<b>TABLE OF CONTENT</b>	<b>vi</b>
<b>LIST OF TABLES</b>	<b>x</b>
<b>LIST OF FIGURES</b>	<b>xii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xiii</b>
<b>CHAPTER ONE: INTRODUCTION</b>	<b>1</b>
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Significance of Study	3
1.4 Objectives	3
1.5 Scope and Limitation	4
<b>CHAPTER TWO: LITERATURE REVIEW</b>	<b>5</b>
2.1 Lichens	5
2.1.1 Introduction	5
2.1.2 Morphology	6
2.1.3 Diversity	7
2.1.4 Taxonomy and Classification	8
2.2 Lichens In Malaysia	10
2.2.1 Distribution	10
2.3 Uses of Lichen	12
2.3.1 Medicinal	12
2.3.2 Dye and Perfume	15
2.3.3 Food	21
2.3.4 Air Quality Indicator	22

2.3.5 Lichenometry	23
2.4 Bioactive Compounds of Lichens	25
2.4.1 Biosynthetic Pathways	25
2.4.1.1 Acetyl Polymalonyl Pathway	26
2.4.1.2 Shikimic Acid Pathway	26
2.4.1.3 Mevalonic Acid Pathway	26
2.4.2 Lichen Substances	27
2.4.2.1 Aliphatic Acids	27
2.4.2.2 Pulvinic Acid Derivatives	28
2.4.2.3 Hydroxybenzoic Acid Derivatives	29
2.4.2.4 Depsides	29
2.4.2.5 Depsidones	30
2.4.2.6 Dibenzofuran Derivatives	31
2.4.2.7 Anthraquinones and Related Compounds	32
2.5 Bioactivities of Lichens	33
2.5.1 Antioxidant Activities	34
2.5.2 Antibacterial Activities	35
2.5.3 Antifungal Activities	38
2.5.4 Cytotoxic and Anticancer Activities	39
2.5.5 Antiviral Activities	42
2.5.6 Anti-Inflammatory Activities	43
2.5.7 Anti-Herbivore and Anti-Insecticidal Activities	44
2.5.8 Enzyme Inhibitors	45
<b>CHAPTER THREE: RESEARCH METHODOLOGY</b>	<b>47</b>
3.1 Collection of Samples	47
3.1.1 Morphology Identification	47
3.2 Extraction of Lichen Samples	47
3.3 Gas Chromatography Mass Spectrometry (GCMS) Analysis	48
3.4 Free Radical Scavenging Activity	48
3.4.1 Determination of Total Phenolic Content	48
3.4.2 DPPH Free Radical Scavenging Assay	49
3.5 Antibacterial Activities	50