



UNIVERSITI PUTRA MALAYSIA

***IN VITRO* ANTIBACTERIAL ACTIVITY OF HARUAN (*Channa striatus*
Bloch) FILLET EXTRACTS**

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**IN VITRO ANTIBACTERIAL ACTIVITY OF HARUAN (*Channa striatus*
Bloch) FILLET EXTRACTS**

By

ADIBAH MAHIRAH BINTI MOHAMED

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirement for the Degree of Master of Science**

December 2012

DEDICATION

This thesis is dedicated to the most special person in my life who has endured a great deal of tenderness and happiness beside me along the way to complete up this course.

To my parents – thank you for believing in me.

To my husband – thank you for his endless love and keeping me tough.

To my daughter and my son – thank you for reminding me not to give up.

To my family – thank you for their support.

To my supervisor and co-supervisors – thank you for trusting me.

“Your sacrifice and supports is highly appreciated”

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

IN VITRO ANTIBACTERIAL ACTIVITY OF HARUAN (*Channa striatus* Bloch) FILLET EXTRACTS

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December 2012

Chairman : Professor Abdul Manan Mat Jais, PhD

Faculty: Medicine and Health Sciences

The use of antibacterial agent has become a standard means of treatment in management of curing diseases. Usage of antibacterial agent in health care management and curing disease is a normal and standard procedure. Many of the agents are natural products, including a highly promising one from local freshwater air breathing carnivorous fish Haruan (*Channa striatus*). There are several products derived from Haruan available in market and commonly consumed after surgical intervention and caesarian mother. Nowadays the Haruan product comes out with various forms such as in tablet (Har-One brand), soup (Rizza brand) and essence of Haruan (Maspati, Harwany and Polleney brands). The species is an ethno-pharmacology for wound healing, and this study was conducted to investigate antibacterial activity of the fish through in vitro systems, as part of a research development drug discovery program. This study focuses on antibacterial activity of

five different extracts from Haruan fillet against selected pathogenic and good bacteria using disc diffusion, agar well and broth microdilution assay.

The antibacterial test using Haruan Traditional Extract Upper Phase (HTEA), Haruan Traditional Extract Lower Phase (HTEL) and Haruan Aqueous Extract (HAE) showed significant result ($P < 0.05$) compared to commercial standard antibiotics through disc diffusion assay and agar well assay against *Helicobacter pylori* ATCC 43579, *Salmonella typhimurium* ATCC 14028 and *Escherichia coli* ATCC 25922. The broth microdilution assay revealed moderate to strong activity with minimum inhibition concentration (MIC) and minimum inhibition concentration required to inhibit 50 percent of bacteria (MIC_{50}) values through HTEA, HTEL and HAE. The HTEA gave the greatest MIC values with 25 $\mu\text{g/ml}$ against *H. pylori* ATCC 43579. On the other hand, the same extract also showed the highest antibacterial effect against *H. pylori* ATCC 700824 and *H. pylori* ATCC 43579 with MIC_{50} values were 73.54 and 66.89 $\mu\text{g/ml}$. Furthermore, the HAE gave moderate effects with 93.15 and 77.19 $\mu\text{g/ml}$ of MIC_{50} values on the same bacteria. In contrast, the other extracts such as Haruan Chloroform Extract (HCE) and Haruan Methanol Extract (HME) showed very mild activity against bacteria tested. The outcome obtained from this study suggested that polar solvent aqueous extract of Haruan demonstrated good antibacterial activity and showed great potential in treatment of gastrointestinal infection disease cause by *H pylori* bacteria.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

AKTIVITI ANTIBAKTERIA TERHADAP FILET HARUAN (*Channa striatus* Bloch) MENGGUNAKAN SISTEM *IN VITRO*

Oleh

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Penggunaan ejen antibakteria telah menjadi satu cara rawatan piawai dalam pengurusan menyembuhkan penyakit. Penggunaan ejen antibakteria dalam pengurusan penjagaan kesihatan dan penyakit adalah prosedur biasa dan piawai. Kebanyakan ejen adalah terdiri daripada produk semulajadi, termasuk sumber tempatan dari ikan karnivor air tawar yang bernafas melalui udara iaitu Haruan (*Channa striatus*). Terdapat beberapa produk yang diperolehi daripada Haruan berada di pasaran dan biasanya ia diambil oleh pesakit selepas pembedahan dan ibu yang bersalin melau pembedahan. Kini produk Haruan boleh didapati dalam pelbagai bentuk seperti tablet (jenama Har-One), sup (jenama Rizza) dan pati ikan Haruan (jenama Maspati, Harwany dan Polleney). Spesis etno-farmakologi ini khusus untuk penyembuhan luka, dan kajian ini dijalankan untuk mengkaji aktiviti

antibakteria menggunakan ikan ini melalui sistem *in vitro*, sebagai sebahagian dari pembangunan program penyelidikan penemuan ubatan terkini.

Kajian ini memberi tumpuan kepada aktiviti antibakteria terhadap lima ekstrak yang berlainan dari filet Haruan terhadap patogen terpilih dan bakteria baik menggunakan ujian resapan disk, agar berlubang dan pencairan mikro. Ujian antibakteria menggunakan Lapisan Atas Ekstrak Haruan Tradisional (HTEA), Lapisan Bawah Ekstrak Haruan Tradisional (HTEL) dan Ekstrak Akueus Haruan (HAE) menunjukkan hasil yang signifikan ($P < 0.05$) jika dibandingkan antibiotik standat komersial melalui asai resapan disk dan asai agar berlubang terhadap *Helicobacter pylori* ATCC 43579, *Salmonella typhimurium* ATCC 14028 dan *Escherichia coli* ATCC 25922. Asai pencairan mikro menunjukkan aktiviti yang bagus dan sederhana dengan dengan nilai kepekatan perencatan minimum (MIC) dan kepekatan perencatan minimum yang diperlukan untuk menghalang 50 peratus bakteria (MIC_{50}) diperolehi melalui HTEA, HTEL dan HAE. HTEA memberikan nilai MIC yang paling tinggi dengan 25 $\mu\text{g/ml}$ terhadap *H. pylori* ATCC 43579. Selain itu, ekstrak yang sama juga menunjukkan kesan antibakteria terhadap *H. pylori* ATCC 700824 dan *H. pylori* ATCC 43579 dengan MIC_{50} nilai 73.54 dan 66.89 $\mu\text{g/ml}$. HAE juga memberikan kesan yang sederhana dengan nilai MIC_{50} 93.15 dan 77.19 $\mu\text{g/ml}$ terhadap bakteria yang sama. Sebaliknya, ekstrak lain seperti Ekstrak Haruan Kloroform (HCE) dan Ekstrak Haruan Metanol (HME) menunjukkan aktiviti yang sangat lemah terhadap bakteria yang diuji. Hasil yang diperolehi daripada kajian ini mencadangkan bahawa ekstrak Haruan dari pelarut akueus menunjukkan aktiviti antibakteria yang baik dan berpotensi dalam rawatan jangkitan gastrousus disebabkan oleh bakteria *H. pylori*.

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“In the name of Allah S.W.T., the most benevolent and Merciful.

All gratification is referred to ALLAH S.W.T.”

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I certify that a Thesis Examination Committee has met on 13 December 2012 to conduct the final examination of Adibah Mahirah Binti Mohamed on her thesis entitled "*In Vitro* Assessment of Antibacterial Activity of Haruan (*Channa striatus*) Fillet Extracts" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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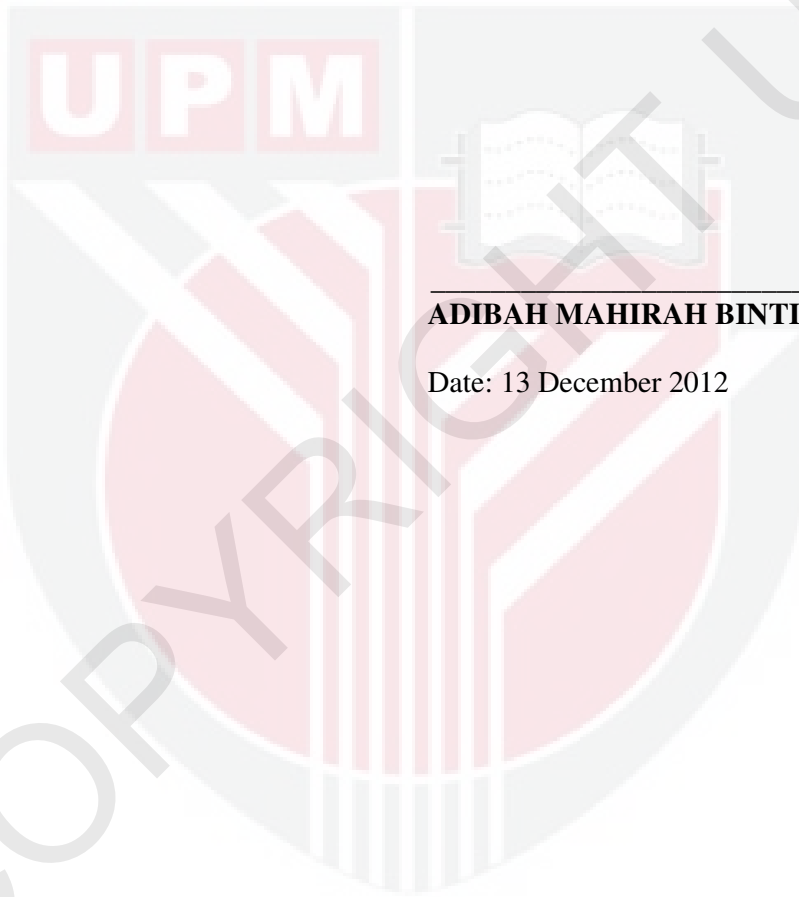
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DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.



ADIBAH MAHIRAH BINTI MOHAMED

Date: 13 December 2012

TABLE OF CONTENTS

| | Page |
|------------------------------|---|
| DEDICATION | ii |
| ABSTRACT | iii |
| ABSTRAK | v |
| ACKNOWLEDGEMENTS | vii |
| APPROVAL | ix |
| DECLARATION | xi |
| TABLE OF CONTENTS | xii |
| LIST OF FIGURES | xiv |
| LIST OF TABLES | xvii |
| LIST OF ABBREVIATIONS | xviii |
| CHAPTER | |
| 1 | INTRODUCTION 1 |
| | 1.1 Justification of the Study 3 |
| | 1.2 Objectives of the Study 4 |
| 2 | LITERATURE REVIEW 5 |
| | 2.1 Marine Natural Product Remedy 5 |
| | 2.2 Haruan (<i>Channa striatus</i>) 7 |
| | 2.2.1 Fish Background 7 |
| | 2.2.2 Haruan-Fish Based Traditional Remedies 9 |
| | 2.2.3 Previous Study 10 |
| | 2.3 Bacteria 13 |
| | 2.3.1 Bacteria as Human Pathogens 13 |
| | 2.4 Possible Antibacterial Agents and Mode of Action 15 |
| | 2.5 Lipids as Antibacterial Agents and Mode of Action 16 |
| 3 | MATERIALS AND METHODS 18 |
| | 3.1 Introduction of Disc Diffusion Test 18 |
| | 3.2 Introduction of Broth Microdilution Test 19 |
| | 3.3 Preparation of Fresh Fillet 21 |
| | 3.4 Preparation of Haruan Traditional Extract (HTE) 21 |
| | 3.5 Preparation of HARuan Aqueous Extract (HAE) 22 |
| | 3.6 Preparation of Haruan Chloroform Extract (HCE) and Haruan Methanol Extract (HME) 22 |
| | 3.7 Extract-Impregnated Discs Preparation 23 |
| | 3.8 Bacteria Preparation for Kirby-Bauer Dis DiffusionTest 23 |
| | 3.8.1 <i>Helicobater pylori</i> 23 |
| | 3.8.2 <i>Lactobacillus casei</i> 25 |
| | 3.8.3 <i>Escherichia coli</i> , <i>Salmonella typhimurium</i> and <i>Staphylococcus</i> 26 |

| | | |
|----------|---|-----|
| 3.9 | Disc Diffusion Test (Kirby-Bauer Method) | 26 |
| 3.10 | Agar Well Test | 27 |
| 3.11 | Positive and Negative Control | 27 |
| 3.12 | Statistical Analysis | 28 |
| 3.13 | Broth Microdilution Test | 31 |
| 4 | RESULTS | |
| 4.1 | Comparison of Antibacterial Activity on the Haruan Extracts (diameter of inhibition zones in mm) using Disc Diffusion Assay | 34 |
| 4.2 | Comparison of antibacterial activity on the Haruan Extracts (diameter of inhibition zones in mm) using Agar well assay. | 43 |
| 4.3 | Qualitative result of minimum inhibition concentration (MIC) of Haruan extracts through broth microdilution assay | 50 |
| 5 | DISCUSSIONS | 66 |
| 6 | CONCLUSIONS | 76 |
| | REFERENCES | 78 |
| | APPENDICES | 85 |
| | BIO DATA OF STUDENT | 101 |