



UNIVERSITI PUTRA MALAYSIA

***TOPICAL EFFECTS OF HARUAN (CHANNA STRIATUS BLOCH)
BASED CREAM ON INFLAMMATION IN RATS AND MICE***

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**TOPICAL EFFECTS OF HARUAN (*CHANNA STRIATUS BLOCH*) BASED
CREAM ON INFLAMMATION IN RATS AND MICE**

By

SADEGH ABEDI

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

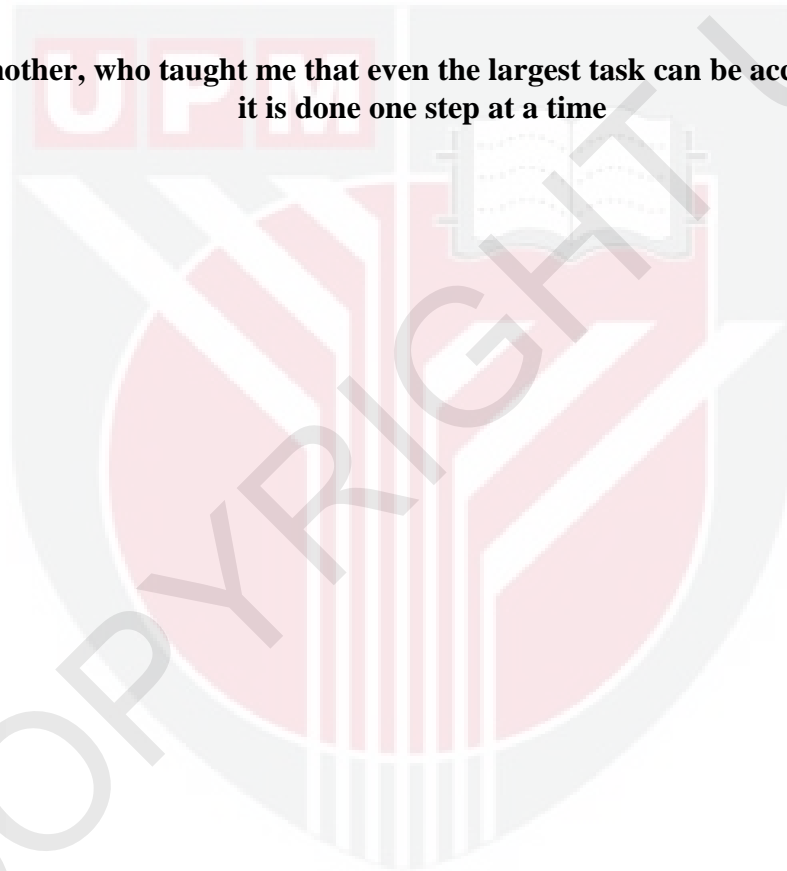
JULY 2012

DEDICATION

This work is dedicated to my wife, Fatemeh E.F., without whose caring support it would not have been possible,

And

To my mother, who taught me that even the largest task can be accomplished if it is done one step at a time



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

TOPICAL EFFECTS OF HARUAN (*CHANNA STRIATUS BLOCH*) BASED CREAM ON THE INFLAMMATION IN RATS AND MICE

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July 2012

Chairman: Professor Abdul Manan Mat Jais, PhD

Faculty: Medicine and Health Sciences

Natural treatments with little side effects can be very good substitutes as chemical therapeutics. Haruan (*Channa striatus*, *Channidae*) is a striped snakehead, tropical, freshwater, carnivorous, and air breathing fish species, indigenous to Malaysia. The main objective of the current study was to study the topical anti-inflammatory properties of haruan (*Channa striatus*) based cream in acute and chronic inflammation induced animals. Changes in ear weight, thickness, and myeloperoxidase level in croton oil-induced mice ear edema were measured as acute anti-inflammatory activities, and changes in right hind paw volume in complete Freund's adjuvant-induced arthritis was measured as chronic anti-inflammatory activity of haruan based cream. Hydrocortisone 1 % cream and diclofenac 1% cream were applied as reference drug in acute and chronic phases; respectively. At 24 hours, the treatment dosages of haruan based cream reduced ear edema by 68 %, 78 %, and 98 %, respectively, whereas hydrocortisone is 92 %. Data also showed that haruan based cream of 10 %, at 24 hours was significantly ($p < 0.05$) more effective than 5% in inhibiting ear edema. Mean mass of ear punch biopsies in

treatment groups 1, 2, and 3, and hydrocortisone were 1.63 ± 0.08 , 1.57 ± 0.06 , 1.32 ± 0.01 , and 1.50 ± 0.05 mg (mean \pm SEM), respectively, compared to 2.19 ± 0.17 mg (mean \pm SEM) in vehicle group. Mean MPO concentration of biopsies taken from ears treated with hydrocortisone cream 1% and haruan based cream at 1%, 5%, and 10% were 3.20 ± 0.080 , 3.74 ± 0.110 , 3.44 ± 0.060 , and 2.72 ± 0.025 ng/ml (mean \pm SEM), respectively. Average of paw volume changes at 21 days after inducing arthritis, in animals treated with diclofenac sodium cream 1%, and haruan based cream 1%, 5%, and 10% were 0.390 ± 0.122 , 0.465 ± 0.080 , 0.535 ± 0.190 , and 0.043 ± 0.016 ml (mean \pm SEM), respectively. In comparison with vehicle group (2.76 ml), all three treatment groups and reference group had significantly reduced paw edema ($p < 0.05$). As conclusion, it is suggested that the topical anti-inflammatory effects of haruan based cream is contributed by its bioactive substances content especially fatty acids and amino acids.

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

KESAN TOPIK KRIM BERASASKAN HARUAN (*CHANNA STRIATUS BLOCH*) PADA RADANG DALAM TIKUS DAN MENCIT

Oleh

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Rawatan semulajadi dengan kesan sampingan yang kecil akan menjadi penganti sebagai terapi kimia. Haruan (*Channa striatus*, Channidae) adalah snakehead berjalur, tropika, air-tawar dan spesies ikan bernafas diudara, adalah indigenous Malaysia. Objektif utama penyelidikan ini adalah untuk mengkaji sifat anti-radang secara topikal krim berasaskan haruan (*C striatus*) pada haiwan yang diaruh dengan radang akut dan kronik. Perubahan dalam berat telinga, ketebalan dan aras myeloperoksidase dalam minyak-teraruh croton telinga edema tikus telah diukur sebagai aktiviti anti-radang akut, dan perubahan isipadu tapak kaki kanan belakang dalam Freund adjuvant aruhan arthritis penuh diukur sebagai aktiviti anti-radang kronik krim berasaskan haruan. Krim Hydrocortisone 1% dan diclofenac 1% digunakan sebagai dadah rujukan dalam fasa akut dan kronik, masing-masingnya. Pada 24 jam, dos krim berasaskan haruan mengurangkan edema telinga sebanyak 68%, 78%, dan 98% masing-masing, manakala hydrocortisone dilakukan adalah 92%. Data juga telah menunjukkan bahawa krim berasaskan haruan 10%, pada 24 jam, adalah lebih efektif signifikan daripada 5% dalam merencat edema telinga (p

<0.05). Purata jisim biopsi ear-punch punch dalam rawatan telinga kumpulan 1, 2, dan 3, dan hydrocortisone adalah 1.63 ± 0.08 , 1.57 ± 0.06 , 1.32 ± 0.01 , dan 1.50 ± 0.05 mg (mean \pm SEM), masing-masing berbanding dengan 2.19 ± 0.17 mg (min \pm SEM) dalam kumpulan rujukan. Purata kepekatan MPO biopsi diambil dari telinga yang dirawat dengan krim hydrocortisone adalah 1% dan krim berasaskan haruan pada 1%, 5% dan 10% adalah 3.20 ± 0.080 , 3.74 ± 0.110 , 3.44 ± 0.060 dan 2.72 ± 0.08 , 1.57 ± 0.06 , 1.32 ± 0.01 , dan 1.50 ± 0.025 ng/ml (mean \pm SEM), masing-masing. Purata perubahan isipadu tapak kaki pada hari - hari ke-4, 8, 14, dan 21 selepas mengaruh arthritis, pada haiwan yang dirawat dengan krim krim diclofenac sodium 1%, dan krim berasaskan haruan 1%, 5% dan 10% adalah 0.390 ± 0.122 , 0.465 ± 0.080 , 0.535 ± 0.190 dan 0.043 ± 0.016 ml (mean \pm SEM), masing-masing. Sebagai perbandingan dengan kumpulan vehicles (2.76 ml), kesemua tiga kumpulan rawatan dan kumpulan rujukan yang banyak mengurangkan edema tapak kaki ($p < 0.05$). Sebagai kesimpulan, adalah dicadangkan kesan anti-radang topikal krim berasaskan haruan disumbangkan oleh kandungan bahan bioaktif khas lemak dan asid amino.

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I certify that a Thesis Examination Committee has met on 16 July 2012 to conduct the final examination of Sadeh Abedi on his thesis entitled "Topical effects of haruan (*Channa striatus* bloch)-based cream on inflammation in rats and mice" 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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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.



SADEGH ABEDI

Date: 16 July 2012

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