UNIVERSITI PUTRA MALAYSIA

BLOOD CLOTTING PROFILES OF HARUAN FISH (*CHANNA STRIATUS SP.*) AQUEOUS EXTRACT

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By

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Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirements for the Degree of Master of Science

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Faculty: Medicine and Health Sciences

Introduction: Dietary therapy is the practical application of nutrition to prevent or treat disease. It has been introduced to maintain a normal haemostatic function, as a complement to drug therapy. Among all, *Channa striatus sp.* fish is traditionally used as dietary treatment in ameliorating wound lesions in post partum involution. Although studies have been done to prove that *Channa striatus sp.* fish is able to enhance remodeling and proliferation of tissue (second and third stage of wound healing), its effects towards haemostasis are not fully understood (first stage of wound healing). Thus, this study aims to identify the effects of aqueous extraction of *Channa striatus sp.* fish towards haemostasis. **Experimental design:** This study has been approved by ethical committee of Universiti Putra Malaysia. 10 ml blood sample is collected from 9 (platelet aggregation assay), 16 (coagulation assay) and 21 (coagulation factor assay)

healthy male or female respondents aged between 16-36 years and weighed between 40 to 70 kg. Written consent is obtained. **(A) Aggregation test,** whole blood is withdrawn from 9 respondents and each is divided into 4 groups. Group 1, 2, 3 and 4 consist of negative control, 0.25mg/ ml, 1.25mg/ ml and 2.50mg/ ml concentration of aqueous extraction of *Channa striatus sp.* fish is used in group 1, 2, 3 and 4, respectively. Responses of each group towards platelet agonists (ADP, collagen, arachidonic acid and ristocetin) are tested. **(B) Coagulation assay,** the platelet poor plasma is used. The plasma is withdrawn out from 16 respondents and is divided into 5 groups. 0%, 10%, 20%, 30% and 40% of aqueous extraction of *Channa striatus sp.* fish is used in group 1, 2, 3, 4 and 5 respectively; activated partial thromboplastin time (APTT) and prothrombin time (PT) are carried out. **(C) Coagulation factor assay,** platelet poor plasma is withdrawn from 21 respondents and is divided into 4 groups. 0 mg/ ml, 0.25mg/ ml, 0.50mg/ ml, 0.75mg/ ml concentration of aqueous extraction of *Channa striatus sp.* fish is used in group 1, 2, 3 and 4 respectively. Percentage activities of coagulation factor II, fibrinogen, V, VII, VIII, X, XI, XII, after each group of treatment are analyzed. Data interpretations: Results were expressed in means (± s.e.m.) and analyzed statistically by using paired-t test for all the experiments. Correlations between concentration of HTE and its effects towards haemostasis marker are done. **Results:** The extract showed significant effects in inhibiting the platelet aggregation induced by platelet agonist adenosine diphosphate (ADP), collagen, arachidonic acid and ristocetin, but did not show significant effects in activating the coagulation pathway and coagulation factor activity.

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

PROFIL PEMBEKUAN DARAH BAGI EKSTRAK AKUES IKAN HARUAN, *CHANNA STRIATUS SP.*

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Pengenalan: Rawatan pemakanan adalah aplikasi nutrisi untuk mengelak atau merawat penyakit. Ia telah diperkenalkan untuk mengekalkan fungsi hemostasis yang normal dan untuk melengkapi fungsi terapi perubatan. Antara rawatan pemakanan yang diperkenalkan, ikan Haruan (*Channa striatus sp.*) telah digunakan sebagai rawatan traditional untuk pemulihan luka selepas kelahiran anak. Walaupun kajian telah dilakukan untuk menunjukkan ikan Haruan berupaya untuk meningkatkan pemodelan semula tisu dan pembahagian tisu, namun, kesan ikan haruan terhadap hemostasis masih belum difaham dengan sepenuhnya. Dengan itu, kajian ini bertujuan untuk mengkaji kesan ekstrak akues Haruan (HTE) terhadap hemostasis. **Eksperimen**: Kajian ini telah diluluskan oleh jawatankuasa etika dari Universiti Putra Malaysia. 10 ml sampel darah dikumpul daripada 9 (ujian penggumpalan), 16 (ujian koagulasi) and 21

(ujian faktor koagulasi) responden lelaki dan perempuan yang sihat, berumur antara 16- 36 tahun dan mempunyai berat antara 40- 70 kg. Surat persetujuan untuk penyertaan kajian diperolehi. **(A) Ujian penggumpalan**, darah diperolehi daripada 9 respondents dan dibahagi kepada 4 kumpulan. Kumpulan 1, 2, 3 and 4 menerima rawatan kawalan negatif, 0.25 mg/ ml, 1.25mg/ ml, 2.50mg/ ml ekstrak akues Haruan, masing- masing. Tindak balas setiap kumpulan terhadap agonis platelet (ADP, kolagen, asid arakidonik, ristosetin) telah dikaji. **(B) Ujian koagulasi**, plasma kurang platelet digunakan. Plasma diperolehi daripada 16 respondents dan dibahagi kepada 5 kumpulan. 0%, 10%, 20%, 30%, 40% ekstrak akues haruan telah dicampur ke dalam kumpulan 1, 2, 3, 4 dan 5, masing- masing. Ujian PT dan APTT dijalankan. **(C) Ujian faktor koagulasi**, plasma kurang platelet digunakan. Plasma diperolehi daripada 21 respondents dan dibahagi kepada 4 kumpulan. Kawalan negatif, 0.25 mg/ ml, 0.50mg/ ml, 0.75mg/ ml ekstrak akues Haruan dicampur ke dalam kumpulan 1, 2, 3 dan 4 masing- masing. Peratusan aktiviti untuk faktor koagulasi II, fibrinogen, V, VII, VIII, X, XI, XII untuk setiap kumpulan telah dianalisis. Pentafsiran data: keputusan ditunjukkan dalam format nilai purata $\pm$ sisihan piawai dan dianalisis dengan menggunakan ujian t pasangan untuk semua eksperimen. Hubungan antara kepekatan ekstrak akues haruan dengan kesannya terhadap ujian telah dianalisis. **Keputusan**: Keputusan kajian mencadangkan bahawa ekstrak akues haruan menunjukkan kesan ketara dalam penyekatan penggumpalan platelet yang diransangkan oleh ADP, kolagen, asid arakidonik dan ristosetin, tetapi tidak menunjukkan kesan ketara dalam mengaktifkan koagulasi darah dan tidak

menunjukkan kesan ketara dalam meningkatkan aktiviti faktor koagulasi darah.

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I certify that a thesis examination committee has met on 10 May 2012 to conduct the final examination of Soo Kuan Meng on his thesis entitled “Clotting profile of Haruan (*Channa striatus sp.* fish) aqueous extract” in accordance with the universities and University 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 hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that is has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

SOO KUAN MENG

Date: 10 May 2012

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