THE POTENTIAL OF CINNAMON (*Cinnamomum* sp.) AS ANESTHETIC AGENT IN AQUACULTURE

By
Amirulizan Bin Hamzah

Research Report submitted in partial
fulfillment of the requirement for the degree of
Bachelor of Agrotechnology Science (Aquaculture)

Department of Fisheries Science and Aquaculture
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE
UNIVERSITI MALAYSIA TERENGGANU
2009

This project report should be cited as:

Amirulizan, H. 2009. The potential of cinnamon (*Cinnamomum* sp.) as anesthetic agent in aquaculture. Undergraduate thesis, Bachelor of Agrotechnology Science (Aquaculture), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu, Terengganu. 31p.

BORANG PITA 8

FAKULTI AGROTEKNOLOGI DAN SAINS MAKANAN
UNIVERSITI MALAYSIA TERENGGANU

PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK ILMIAH I DAN II

Adalah ini diakui dan disahkan bahawa laporan ilmiah bertajuk:
Potensi Kayu Manis (*Cinnamomum* sp.) sebagai Bahan Pelali dalam Akuakultur
(The Potential of Cinnamon (*Cinnamomum* sp.) as Anesthetic Agent in Aquaculture)
oleh Amirulizan Bin Hamzah, No.Matrik UK14409 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Perikanan dan Akuakultur sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Agroteknologi (Akuakultur), Fakulti Agroteknologi dan Sains Makanan, Universiti Malaysia Terengganu.

Disahkan oleh:

.....

Penyelia Utama

Nama: LIEW HUN JUNG

Cop Rasmi: Lecturer
Institute Of Tropical Aquaculture
Universiti Malaysia Terengganu (UMT)
21030 Kuala Terengganu

Tarikh: 28 APRIL 2009

.....

Penyelia Kedua (jika ada)

Nama: DR. HII YII SIANG

Cop Rasmi: Pensyarah
Jabatan Sains Perikanan dan Akuakultur
Fakulti Agroteknologi dan Sains Makanan
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Tarikh: 29 APR 2009

DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

Signature : .....

Name : AMIRULIZAN BIN HAMZAH

Matric No : UKUEH09

Date : 02TH APRIL 2009

ACKNOWLEDGEMENT

This study benefited from the expert Head of Research Officer of AKUATROP Universiti Malaysia Terengganu, Mr. Liew Hon Jung for supervised and supporting in all field of this research activities. The author would like to thanks to Dr. Hii Yii Siang and Dr. Chuah Tse Seng for supervised and help in all field including in statistical analyses. Also thanks to all staff of AKUATROP, Marine Hatchery and Biodiversity Laboratory for fish donation and facilities used for this study. Lastly a lot of thanks give to my family and all my friends for all contribution and support for this study.

ABSTRACT

Eugenol-based organic anesthetic commonly obtain from clove oil has become a popular fish anesthetic for invasive fisheries producer, but there was no study on potential of cinnamon, one of the other source of eugenol component as an anesthetic agent. In this study, juvenile hybrid red tilapia were used as a model species to examine the potential cinnamon as anesthetic agent in four gradation of cinnamon concentration (2.5 gL^{-1}, 5.0 gL^{-1}, 7.5 gL^{-1} and 10.0 gL^{-1}) and compare with MS-222 (0.08 gL^{-1}) anesthetic agent commonly used as fish sedation. Induction time, recovery time and fish behaviors have were observed to determine the stage of anesthesia. All cinnamon concentration showed a result of stage 3 of anesthesia similar to MS-222 result which indicates cinnamon extraction also can be an effective anesthetic agent at concentration of 2.5 gL^{-1}. Anesthesia stage 3 was the optimum level for fish sedation especially for fish transportation and handling. Cinnamon extraction showed significant effectiveness as MS-222 which indicated that cinnamon extraction can be utilized in handling related husbandry practices for aquaculture.

ABSTRAK

Pelali ikan berasaskan bahan organik eugenol telah banyak digunakan oleh para penternak terutama daripada sumber bunga cengkih, namun belum ada kajian dijalankan keatas sumber eugenol yang lain seperti ekstrak kayu manis sebagai agen pelalian. Kajian ini telah menggunakan juvenil ikan tilapia merah hibrid sebagai spesies percubaan untuk menentukan potensi ekstrak kayu manis sebagai bahan pelali. Empat kepekatan ekstrak kayu manis yang berbeza digunakan (2.5 gL^{-1}, 5.0 gL^{-1}, 7.5 gL^{-1} dan 10.0 gL^{-1}) untuk dibandingkan dengan MS-222 (0.08 gL^{-1}) iaitu pelali yang biasa digunakan untuk pelalian ikan. Masa untuk pelalian dan kembali pulih serta tindak balas perilaku ikan telah direkodkan untuk menentukan peringkat pelalian. Kesemua kepekatan ekstrak kayu manis telah menunjukkan keputusan pada peringkat ke-3 sama seperti keputusan pelali perbandingan iaitu MS-222. Keputusan terbaik telah ditunjukkan pada kepekatan 2.5 gL^{-1}. Peringkat ke-3 adalah paras terbaik dan optimum untuk pelalian ikan terutamanya dalam permindahan dan pengurusan ikan. Ekstrak kayu manis telah menunjukkan kesan yang efektif sama seperti MS-222 dimana ia boleh digunakan oleh para penternak dalam pengurusan ternakan.