Identification of fatty acid composition in epidermal mucus and skin of bluestreak cleaner wrasse (Labroides dimidiatus) / Maziidah Ab. Rahman.

IDENTIFICATION OF FATTY ACID COMPOSITION IN EPIDERMAL MUCUS AND SKIN OF BLUESTREAK CLEANER WRASSE (*Labroides dimidiatus*)

By

Maziidah binti Ab. Rahman

Research Report submitted in partial fulfillment of
The requirements 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:

Maziidah, A.R. 2009. Identification of Fatty acid Composition in Epidermal Mucus and Skin of Bluestreak Cleaner wrasse (*Labroides dimidiatus*). Undergraduate thesis, Bachelor of Science Agrotechnology (Aquaculture), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.46p.

Borang Pengakuan dan Pengesahan Laporan Akhir Projek Ilmiah I dan II

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:

Identification of Fatty Acid Composition in Skin and Epidermal Mucus of Bluestreak Cleaner Wrasse (*Labroides dimidiatus*)

oleh Maziidah binti Ab. Rahman, No.Matrik UK13311 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.

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DECLARATION

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

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ACKNOWLEDGEMENT

My appreciation goes to the Almighty Allah S.W.T for His bounteously throughout my studies. For most, I would like to thank my supervisor Dr. Nur Asma binti Ariffin for her supervision, assistance, guidance and comments that enable this project run smoothly. Sincere thanks to Puan Fadlina, Puan Norhayati whose contributed useful information and suggestions in actualize this project and also thank to Puan Faridah, En. Sharol and En. Aswadi for his and her permission to use facilities in the laboratory.

To Prof. Dr. Faizah binti Shaharom, I say thank you for all your useful ideas and suggestions. Special thanks to my teamwork Wan Mohd Redhuan, Noor Aisyah, and Norita who supported me completing this research in a partial fulfillment of the requirement of the degree of Bachelor of Science in Agrotechnology (Aquaculture).

Appreciation is extended to all my friends especially my coursemates from Bachelor of Science in Agrotechnology (Aquaculture) students. To my family especially my mother and my father, highly indebted to you for all the supports, encouragement and prays you gave me throughout my three years in UMT. You always saw the best in me and helped me too. God bless you for the good work.

ABSTRACT

This study was performed to determine the fatty acid composition from epidermal mucus and skin of Bluestreak Cleaner wrasse (*Labroides dimidiatus*) by using gas chromatography (GC) technique. The mucus and the skin samples were collected and 15 types of fatty acid were successfully found in this study. The mucus and skin extract was found to contain a high butyric acid (C4:0) composition, which contributed approximately 28.78% of total fatty acids. The other major fatty acids in the extract were palmitic acid (C16:0), elaidic acid (C18:1n9t), oleic acid (C18:1n9c), linoledaidic acid (C18:2n6t) and myristoleic acid (C14:1) which accounted for 10.46%, 11.82%, 12.84%, 16.23 and 8.53% of total fatty acids, respectively. The highest percentage of butyric acid (C4:0) in the extract, was found to show the ability of *L. dimidiatus* to have a rapid cell proliferation in terms to initiate wound healing process in the body. Meanwhile, the presence of lauric acid (C12:0) was claimed to give antimicrobial effects to this fish in order to defense from secondary infection of bacteria. Interestingly, the ability of this fish to survive in parasitic environment maybe due to the establish composition ratio of myristic acid: oleic acid that will trigger cell function by decreasing the fluidity of the membrane, give structural rigidity and be a mechanism for tolerating parasitic environment. This is the first report on fatty acid profile from skin mucus of *L. dimidiatus* and it is concluded that the mucus and skin extract of *L. dimidiatus* contains most of the fatty acids required to play a potential role of its defense mechanism. In the future, we can isolate genes that codes for fatty acid that contribute to defense mechanism of *L. dimidiatus* , apply in recombinant DNA without using this fish anymore and target to increase aquaculture management health strategies.

ABSTRAK

Kajian dijalankan untuk menentukan komposisi asid lemak daripada mukus epidermis dan kulit ikan Bluestreak Cleaner Wrasse (*Labroides dimidiatus*) dengan menggunakan teknik kromatografi gas. Sejumlah 15 asid lemak telah dikenalpasti dalam sampel mukus epidermis dan kulit. Hasil kajian mendapati ekstrak mukus dan kulit *L. dimidiatus*, mempunyai komposisi asid butrik (C4:0) yang sangat tinggi iaitu 28.78% daripada keseluruhan asid lemak. Asid lemak lain yang banyak diperoleh ialah asid palmitik (C16:0), asid elaidik (C18:1n9t), asid oleik (C18:1n9c), asid linoledaidik (C18:2n6t) dan asid myristoleik (C14:1) yang merangkumi 10.46%, 11.82%, 12.84%, 16.23 dan 8.53% masing-masing. Kandungan asid butrik (C4:0) yang tinggi dalam ekstrak mukus dan kulit *L. dimidiatus*, menunjukkan kulit dan mukus *L. dimidiatus* berupaya menjalankan proses pembahagian sel dengan cepat. Manakala kehadiran asid laurik (C12:0) pula didapati terlibat dalam fungsi sistem pertahanan iaitu bagi mengelak jangkitan bakteria. Kadar komposisi di antara asid myristik dengan asid oleik yang diperoleh dikenalpasti terlibat dalam pengubahsuaian fungsi sel bagi penyesuaian diri dan bertoleransi dengan jangkitan. Hasil kajian ini mendapati ekstrak mukus epidermis dan kulit *L. dimidiatus* mempunyai hampir kesemua asid lemak yang berpotensi dalam mekanisma pertahanan badan *L. dimidatus*. Ini merupakan laporan pertama mengenai komposisi asid lemak dari mukus *L. dimidiatus* dan hasil kajian mendapati ekstrak mukus dan kulit *L. dimidiatus* mempunyai asid lemak yang berpotensi dalam mekanisma pertahanan jangkitan patogen.