MOHAMAD BADRUL BIN MOHAMAD KHAIRUL SAHIMI

MASTER OF SCIENCE

2018

ASSESSMENT OF *Melaleuca cajuputi* (Powell) METHANOLIC LEAVES EXTRACT ENRICHED DIET ON THE GROWTH PERFORMANCE AND BLOOD PARAMETER OF *Macrobrachium rosenbergii* (De Man, 1879)

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Thesis Submitted in Fulfillment of the Requirement for the Degree of Master of Science
in the Institute of Tropical Aquaculture (AKUATROP)
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2018

DEDICATION

To my beloved mother, Umai Kalsom and dearest father, Khairul Sahimi, who always give me a great support throughout my studies periods to see me achieved this success.

To my lovely brothers and sister who always give encouragement and have big faith on me which strengthen my spirit to overcome the hardship and struggles.

To my beloved friends for all their helps and supports.

Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfillment of the requirement for the degree of Master of Science

ASSESSMENT OF *Melaleuca cajuputi* (Powell) METHANOLIC LEAVES EXTRACT ENRICHED DIET ON THE GROWTH PERFORMANCE AND BLOOD PARAMETER OF *Macrobrachium rosenbergii* (De Man, 1879)

MOHAMAD BADRUL B MOHD KHAIRUL SAHIMI

2018

Main Supervisor : Associate Professor Marina Hassan, Ph.D.

Co-Supervisor : Professor Mohd Effendy B Abd Wahid, Ph.D.

Institute : Institute of Tropical Aquaculture (Akuatrop)

Melaleuca cajuputi leaves possessed various medicinal properties which make it a potentially valuable natural feed additive to the aquaculture industry. Four diets containing different dosages of *M. cajuputi* leaves extracts; 0g/kg (C), 5g/kg (T1), 10g/kg (T2) and 15g/kg (T3) were added to the diet to investigate the effects of the respective treatments on the growth performance and blood parameter of *Macrobrachium rosenbergii* (mean weight of 3.17±0.46g). After the 45 days of feeding, prawns fed the diet containing 15g/kg of *M. cajuputi* leaves extracts significantly enhanced growth performance, which showed that weight gain (WG) and specific growth rate (SGR) was the highest amongst all treatments ($P<0.05$). Blood parameters (total hemocyte count (THC), differential hemocyte count (DHC), plasma glucose level, protein concentration and resistance against *Aeromonas hydrophila)* were examined 60 days post-feeding period. The results showed that prawns fed with the highest dosage of *M. cajuputi* (15g/kg) enriched diet showed an increment of THC and DHC significantly at ($p<0.05$) compared to the control group. On the contrary, the plasma glucose level was higher significantly ($p<0.05$) in control group compared to all the treatment of prawns fed with *M. cajuputi* enriched diet. The clearance efficiency in prawns fed with *M. cajuputi* enriched diet showed significantly ($p<0.05$) higher compared to the control group in which demonstrated the optimization of the immune response toward *A. hyrophila*

infection. It was concluded that enrichment of *M. cajuputi* in the diet can be used as a growth promoter and a natural immunostimulant which increase the immune ability as well improved the resistance toward *A. hydrophila* infection in giant freshwater prawn.

Abstrak tesis yang dikemukan kepada Senat Universiti Malaysia Terengganu sebagai memenuhi keperluan untuk Ijazah Sarjana Sains.

PENILAIAN DIET DIPERKAYA EKSTRAK METANOLIK DAUN *Melaleuca cajuputi* (Powell) TERHADAP PRESTASI TUMBESARAN DAN PARAMETER DARAH *Macrobrachium rosenbergii* (De Man, 1879)

MOHAMAD BADRUL B MOHD KHAIRUL SAHIMI

2018

Penyelia Utama : Associate Professor Marina Hassan, Ph.D.

Penyelia Bersama : Professor Mohd Effendy B Abd Wahid, Ph.D.

Institut : Institut Akuakultur Tropika (Akuatrop)

Daun *Melaleuca cajuputi* yang memiliki pelbagai ciri-ciri perubatan menjadikan ia berpotensi sebagai makanan tambahan yang berharga kepada industri akuakultur. Sebanyak empat jenis makanan yang mengandungi dos berbeza ekstrak daun *M. cajuputi*; 0g/kg (C), 5g/kg (T1), 10g/kg (T2) dan 15g/kg (T3) dimasukkan ke dalam makanan untuk mengkaji kesan makanan tersebut terhadap prestasi tumbesaran dan parameter darah pada *Macrobrachium rosenbergii* (berat 3.17 ± 0.46g). Selepas 45 hari tempoh pemberian makanan, udang yang diberi makan diet mengandungi 15g/kg ekstrak daun *M. cajuputi* menunjukkan peningkatan prestasi tumbesaran pada tambahan berat (WG) dan kadar pertumbuhan tertentu (SGR) adalah yang tertinggi di antara kumpulan rawatan ($P < 0.05$). Parameter darah (jumlah sel darah (THC), bilangan pembezaan sel darah (DHC), paras glukosa plasma, kepekatan protein dan ketahanan terhadap *Aeromonas hydrophila*) diperiksa pada hari ke 60 selepas tempoh pemberian pemakanan. Keputusan menunjukkan bahawa udang yang diberi makan dengan dos tertinggi ekstrak *M. cajuputi* (15g/kg) menunjukkan kenaikan THC dan DHC dengan ketara ($p<0.05$) berbanding kumpulan kawalan. Sebaliknya, tahap glukosa plasma ketara lebih tinggi ($p<0.05$) pada kumpulan kawalan berbanding dengan semua rawatan udang yang diberi makanan diperkaya ekstrak *M. cajuputi*. Kecekapan pembasmian bakteria pada udang yang diberi makan dengan diet diperkaya dengan *M. cajuputi* adalah ketara ($p<0.05$) lebih tinggi

dibandingkan dengan kumpulan kawalan yang menunjukkan peningkatan tindak balas terhadap infeksi *A. hyrophila*. Kesimpulanya, penambahan *M. cajuputi* dalam diet boleh digunakan sebagai penambahbaik pertumbuhan dan perangsang imunisasi semula jadi yang meningkatkan keupayaan pada daya tahan terhadap jangkitan *A. hydrophila* pada udang galah.