BACTERIOLOGICAL STUDY IN ASSOCIATION WITH HEAVY METAL
TOLERANCE AND ANTIBIOTIC RESISTANCE PATTERN OF
BACTERIAL POPULATION OF FRESHWATER
GIANT PRAWN POST LARVAE

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UNIVERSITI MALAYSIA TERENGGANU
2009

BACTERIOLOGICAL STUDY IN ASSOCIATION WITH HEAVY METAL TOLERANCE AND ANTIBIOTIC RESISTANCE PATTERN OF BACTERIAL POPULATION FROM FRESHWATER GIANT PRAWN POST LARVAE (*Macrobrachium rosenbergii*)

By
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the requirements for the degree of
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PROJEK ILMIAH I DAN II

Adalah ini diakui dan disahkan bahawa laporan ilmiah bertajuk:

..Bacteriological study in association with heavy metal tolerance and antibiotic resistance ..

..pattern of bacterial population from freshwater giant prawn post larvae *(Macrobrachium* ..

..*rosenbergii)*...

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DECLARATION

I hereby declare that the work in this thesis is my own except
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ABSTRACT

50 sample bacterial isolates were isolated from *Macrobrachium rosenbergii* post larvae at marine hatchery of Universiti Malaysia Terengganu. This study were performed to investigate and quantify bacteria colonies, antibiogram, heavy metal and to correlate the relationship of antibiotic and heavy metal resistance with regards to bacterial isolates. There are several agar such as non-selective agar, Trypticase Soy Agar (TSA) and five selective agar which are MacConkey , Thiosulfate Citrate Bile Sucrose (TCBS), Eosin Methylene Blue (EMB),Glutamate Starch Pseudomonas (GSP) and Xylose Lysine Deoxycholate (XLD) were used to isolate the bacteria from post larvae. Results have been showed that bacterial isolates were mostly resistant to Ampicillin and Amoxycillin in antibiotics test by using 15 antibiotics. Based from the total of multiple antibiotic resistant (MAR) Index ; 0.6, had shown that the environment were highly expose to the antibiotics environment such as in water quality. Heavy metal test showed Mercury was successfully can tolerate with all the isolates than Copper. Copper showed the lowest tolerance with the isolates. Bacterial isolates were resistant to antibiotic and heavy metal. The study may provide basis knowledge about the occurrence of heavy metal and antibiotic resistant bacterial strains which may raise preventive measurement on use of antibiotic and awareness on hatchery management.

ABSTRAK

Sebanyak 50 sampel isolat bakteria yang diambil daripada *Macrobrachium rosenbergii* yang terdapat di pusat penetasan air masin di Universiti Malaysia Terengganu. Projek ini dijalankan dengan tujuan untuk mengkaji, mengira dan menilai koloni bakteria, antibiogram, logam berat dan juga untuk mengkaji perkaitan ketahanan antara antibiotik dan logam berat dalam isolat *flora*. Terdapat beberapa jenis agar yang digunakan untuk isolat bacteria dalam kajian projek ini iaitu seperti agar bukan selektif, Trypticase Soy Agar (TSA) dan 5 jenis selektif agar seperti MacConkey, Thiosulfate Citrate Bile Sucrose (TCBS), Eosin Methylene Blue (EMB), Glutamate Starch Pseudomonas (GSP) dan Xylose Lysine Deoxycholate (XLD). Merujuk kepada hasil kajian yang diperolehi, daripada 15 jenis antibiotik yang diuji, antibiotik Ampicillin dan Amoxycillin menunjukkan tahap ketahanan paling tinggi dan antibiotik Flumequine menunjukkan daya ketahanan yang paling rendah. Nilai MAR Index yang diperolehi juga iaitu sebanyak 0.6 menunjukkan bahawa persekitaran pusat penetasan air masin tersebut terdedah kepada persekitaran yang mengandungi antibiotik. Bagi ujian ke atas logam berat pula, Merkuri diklorida mempunyai daya ketahanan paling tinggi dengan isolate bakteria berbanding Kuprum. Kajian projek ini sangat penting dalam membantu menyediakan pengetahuan dalam pengurusan dan kawalan terhadap bakteria yang tahan kepada antibiotik dan logam berat di sesebuah pusat penetasan.