



UNIVERSITI PUTRA MALAYSIA

***COMPOSITION AND SEASONAL VARIATION OF SHRIMP POST
LARVAE AT MATANG MANGROVE ECOSYSTEM, PERAK***

NUR HAFIZA RAZALI

FP 2016 9

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for the degree of Bachelor of Agriculture (Aquaculture)**

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2016

**CERTIFICATION OF APPROVAL
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This is to certify that I have examined the final project report and all corrections have been made as recommended by the panel of examiners. This report complies with the recommended format stipulated in the AKU4999 project guidelines, Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia.

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ABSTRACT

An investigation on composition and seasonal occurrence of shrimp post larvae was conducted in the Matang Mangrove Reservation Forest Perak, Malaysia during wet season (November 2015 to January 2016) and dry season (June 2015 to August 2015). There were three sampling stations, Station 1 (MO) at Sungai Tiram Laut, which the least disturbed mangrove, Station 2 (MT) at Sungai Tinggi, moderately disturbed mangrove and Station 3 (MS) at Sungai Sepetang which considered as a most disturbed mangrove area. None of the water parameters showed significant difference ($p>0.05$) among stations except only for water salinity ($p<0.05$). In total of 11682 individual was observed during the study period. There were four major taxa were identified namely *Lucifer* (23%), *Acetes* (3.8%), *Mysid* (1.7%) and *Odontodactylus* (0.1%) and the rest is unidentified (66.32%). The overall mean density of shrimp post larvae (PL) was calculated as 18.36 individuals/100 m³ in the investigated area. None of the diversity indices showed significant variation among the stations ($p>0.05$). However, all diversity indices of shrimp post larvae in study area shows statistically significant ($p<0.05$) difference between the wet and dry season.

ABSTRAK

Satu kajian telah dijalankan ke atas komposisi dan kejadian bermusim pos-larva udang di Hutan Bakau Pemuliharaan Matang Perak, Malaysia semasa musim hujan (November 2015 sehingga Januari 2016) dan musim panas (Jun sehingga Ogos). Terdapat 3 stesen persampelan untuk kajian ini Stesen 1 (MO) terletak di Sungai Tiram Laut yang dikategorikan sebagai kawasan paya bakau yang kurang terancam, Stesen 2 (MT) terletak di Sungai Tinggi dikategorikan sebagai kawasan paya bakau sederhana terancam dan dikategorikan sebagai dan Stesen 3 (MS) yang terletak di Sungai Sepetang dikategorikan sebagai kawasan paya bakau paling terancam. Parameter air menunjukkan tiada perbezaan statistical ($p > 0.05$) diantara stesen kecuali parameter kemasinan air ($p < 0.05$). Terdapat sebanyak 11682 individu dalam pemerhatian sepanjang jangka masa kajian. 4 tangkapan yang telah dikenalpasti terutamanya adalah *Lucifer* (23%), *Acetes* (3.8%), *Mysid* (1.7%) dan *Odontodactylus* (0.1%), selebihnya tidak dikenalpasti 66.32%). Purata kepelbagaian pos-larva udang adalah 18.36 individu/100 m³. Kesemua indeks diversiti menunjukkan tiada perbezaan statistical diantara stesen ($p > 0.05$). Namun begitu, kesemua indeks diversity pos larva udang di kawasan kajian menunjukkan perbezaan statistical ($p < 0.05$) diantara musim hujan dan musim panas.

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LIST OF ABBREVIATIONS/ SYMBOLS

ANOVA	Analysis of variance
CalCOFI	California Cooperative Oceanic Fisheries Investigations Net
D	Family Richness
DO	Dissolve Oxygen
FAO	Food and Agriculture Organization
H	Shannon- Weiner of diversity
J	Pielou's Evenness index
PRIMER	Plymouth Routine Multivariate Ecological Research
SE	Standard Error
SPSS	Statistical Package for Social Science
°C	Temperature Unit in Celcius
%	Percentage
>	More than
<	Less than

CHAPTER 1

INTRODUCTION

1.1 Background of the study

Indeed, the studies on the species composition, abundance, spatial and temporal distribution of shrimp post larvae on a specific area will shows up as a key to the fertility and provides on the fishery potential. According to Deshmukh and Kagwade (1987) claim that indication of breeding season of existing prawn species on certain areas are from the study of occurrence and abundance of the shrimp post larvae.

Extraordinary ecosystem of the single largest mangrove forest reserve in peninsular Malaysia (Matang Mangrove Reservation Forest, Perak) is vastly productive which provides great fisheries beneficial to the homegrown. By general definition, Blaber and Blaber (1980) wrote that estuaries are transitional zones between marine and the fresh water bodies that has offered beneficial protection for its resident and some migrating species. Similar to Alava (2005) proves mangroves gives ecological services and benefits to its ecosystem. The mangrove forest dominates most 40% of the mangroves in Peninsular and also known as the largest mangrove forest in Asia with its size of 41,711 ha. It is important to ensure the reserve forest ecosystem biodiversity are balanced for the sustenance in responsible for providing habitats rich in food and safe shelter, spawning grounds and nurseries for numerous numbers of flora and fauna. This prove as it was also stated in Hena and Khan (2009) writing, that estuaries water body along with the mangrove trees is the most productive

region for zooplankton that suit the meal especially for shrimps and prawns. Ecosystem of mangroves area and shrimps are both highly associated as evidence proves that juvenile shrimps that attracted towards mangroves cause by nutritive value of mangrove leaves stated in study by Ramesh and Kathiresan (1992).

The utilization of estuarine mangroves as nursery areas is an important phase of the life history for many marine organisms, including the commercially valuable shrimps and fishes (Staples, 1980; Haedrich, 1983; Mumby *et.al.*, 2004; Verweij, 2006). Mangrove zone waters aid as a crucial nursery site for juveniles of many species of prawns and shrimps too. Kathiresan and Bingham quote Vance *et.al.* (1996a) on their study that shrimp may also seek protection from dangerous predators by migrating with the tides when Vance observed that juvenile *P. merguiensis* are very mobile, moving substantial distances into the mangrove forest at high tide. Other than that, Macia (2004) and de Freitas (2011) said that, the juvenile *F. indicus* and *M. monoceros* inhabited turbid waters with reduced visibility to escape predators. Many studies prove abundances of the shrimp juveniles in the brackish or mangroves area higher compared to other environment of the non-mangrove site. Easo and Mathew (1989) reported activity capturing and culturing fisheries of prawns impressively influenced by relative abundance and seasonal variation of prawn seed in estuaries and backwaters. As reported by Pathansali (1966), there are 7 species of sergestid shrimps from the Indo-Malaysian water region.

The occurrence of this study based on the months of wet season (monsoon) and dry season (inter-monsoon). Malaysia Meteorological Department announcing Peninsular Malaysia generally have peak rainfall from October until November, which the study period conducted. Lowest peak of rainfall usually starting on April until July also period where the study was conducted. Also supported by Mahmood in 2008, the seasons in Malaysia are divisible into cycle where the wet seasons are in the months of September to December and dry seasons are vary from months of May to August. In between wet season and dry, there are also state by Mahmood (2008) that intermediate are from January to April.

Inclusively, flow of rainfall yields in greater fish catch and the consequence of rainfall on catch had been reported on both marine and estuarine species (Marten and Guluka, 1974; Chen *et.al.*, 1994; Esmaeili and Ishak Omar, 2003; Meynecke *et.al.*, 2006). Naturally, salinity reduces during monsoon season bring impact to the species diversity (Vance *et.al.*, 1985) as moderate salinity level is suitable for abundances of the juvenile shrimp occurred. Hoq *et.al.*, (2001) once again proves that moderate salinity suitable for the peak occurrence of the shrimp post larvae of *penaeid*. Moreover, Chong *et.al.*, (1996) knowledge that in tropical habitat, though some certain species of shrimp occur whole year round but seems there are seasonal pattern of shrimp. In 2006, Hoq *et.al.*, defined his finding where shrimp post larvae population is depending on water parameters and their tolerance to extreme environmental variables, tolerance towards these factors are said to be different among the shrimp post larvae species. In conjunction, generally there is no study information recently available on the species composition and occurrence of shrimp

post larvae in Matang Mangrove Reservation Forest, Perak. Therefore, present study conducted to provide information.

1.2 Problem statement

The study of composition and occurrence in mangrove area especially on post shrimp larvae are in a small scale of study in Malaysia. The foremost studies regarding the composition of post shrimp larvae are from Bangladesh and India. There is no previous research on composition and occurrence of shrimp post larvae in the investigated area. There is deficit of available information from Malaysia itself and therefore the present study were to provide information for Matang Mangrove Reservation Forest, Perak.

1.3 Objectives

The general objectives of the present study are to identify the shrimp post larvae and to provide information for other researcher to understand more on the composition and seasonal occurrence in Matang Mangrove Reservation Forest, Perak. Thus, the study was established to address the following specific objectives:

- i. To identify shrimp post larvae up to genus level and their different composition in different Matang, Perak mangrove ecosystems
- ii. To determine the shrimp post larval abundance in dry and wet season
- iii. To investigate the temporal variation of shrimp post larval abundance in 3 different ecosystems of Matang Mangrove

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