



**UNIVERSITI PUTRA MALAYSIA**

***TEMPORAL VARIATION OF FISH AND SHRIMP ASSEMBLAGES IN  
MERBOK RIVER ESTUARY, TANJUNG DAWAI, KEDAH***

**ANAS AL-ANSARI BIN AZIZAN**

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**This project is submitted in partial fulfilment of the requirements for the  
degree of Bachelor of Agriculture (Aquaculture)**

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**2012**

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

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## ABSTRACT

The temporal variation and assemblage composition of fish and shrimps species caught by estuarine set bag net (ESBN) in Tanjung Dawai estuarine, Tanjung Dawai, Kedah, Malaysia were investigated based on the data from May to September 2012. *Stolephorus tri* was the most abundant fish caught by ESNB in Tanjung Dawai (1.1%), while *Acetes* sp. was the most abundant shrimps (92.18%). The highest percentage of species occurrence caught by ESNB in Tanjung Dawai estuary was found in August (70.0%), and the lowest was in May (50%). The percentage of numerical abundance of all fish and shrimp species caught by ESNB was the highest in July (51.17%) and the lowest in August (7.04%). The length-weight relationship analysis displayed that four species have a positive allometric growth and seven of them have a negative allometric growth. The average monthly catch per unit effort (CPUE) of the ESNB observed was 2.914 kg/net/hour. Since that the abundance percentage of juvenile fish caught by ESNB is low (2.42%), the use of ESNB in Tanjung Dawai estuarine, Merbok River, Kedah was concluded as a non-destructive fishing gear.

## ABSTRAK

Variasi bermusim dan komposisi himpunan spesies ikan dan udang yang ditangkap menggunakan pompang (ESBN) di Tanjung Dawai, muara Sungai Merbok, Kedah, Malaysia telah dikaji berdasarkan data yang diperoleh dari bulan Mei sehingga September 2012. *Stolephorus tri* merupakan spesies ikan terbanyak yang ditangkap menggunakan pompang (ESBN) di Tanjung Dawai (1.1%), manakala *Acetes* sp. pula merupakan spesies udang terbanyak yang ditangkap (92.18%). Peratusan kehadiran ikan dan udang yang ditangkap menggunakan pompang (ESBN) adalah yang tertinggi pada bulan Ogos (70.0%), dan terendah pada bulan Mei (50%). Peratusan bilangan spesies ikan dan udang yang ditangkap menggunakan pompang yang tertinggi adalah pada bulan Julai (51.17%) dan yang terendah adalah pada bulan Ogos (7.04%). Bagi analisis hubungan panjang-berat, empat spesies telah menunjukkan pembesaran alometrik positif, dan tujuh spesis lagi menunjukkan pembesaran alometrik negatif. Purata bulanan untuk hasil tangkapan per unit usaha (CPUE) bagi pompang (ESBN) di Tanjung Dawai adalah sebanyak 2.914 kg/pompang/jam. Oleh sebab peratusan bilangan ikan juvenil yang ditangkap menggunakan pompang adalah rendah (2.42%), ianya dapat disimpulkan bahawa penggunaan pompang tidak merosakkan populasi ikan juvenil di Tanjung Dawai.



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## LIST OF ABBREVIATIONS / SYMBOLS

ESBN	Estuarine Set Bag Net
EPN	Estuarine Push Net
MSBG	Marine Set Bag Net
%	percent
cm	centimeter
kg	kilogram
g	gram
b	growth coefficient
SE	standard error
SE (b)	standard error of (b)
PAG	positive allometric growth
NAG	negative allometric growth
CPUE	catch per unit effort
N	total number of counts

## CHAPTER 1

### INTRODUCTION

By general definition, estuaries are transitional zones between the sea and fresh water bodies which offer protection for resident and migrating species (Blaber, 2000). This is because estuaries have mangrove trees and seagrasses which offer protection for spawning and shelter for small fishes. As boundaries between watershed and seas, estuaries exhibit environmental gradients that favour the recruitment of various species with diverse physical and trophic structures (Sanchez and Raz-Guzman, 1997).

Japar *et al.* (2006) had described that seagrasses provide conditions for the growth and abundance of invertebrates and fish that many local coastal communities collect and catch for their livelihood. Besides that, Hena and Khan (2009) had also stated that the estuarine water body along mangrove plants is the most productive region for zooplankton especially for shrimps and prawns. Therefore, supported by their previous studies, the presence of these floras is nonetheless becoming a contributing factor to the abundancy and variation of species that would be habitating the Merbok River estuarine areas.

Naturally, estuarine habitats are highly productive (Nixon *et al.*, 1986) and their role as nursery grounds for fishes is well acknowledged (Powles *et al.*, 1984). According to Gunter (1961), the occurrence and habitat of fish and shrimps in

estuaries are affected by several biotic and abiotic factors such as salinity, temperature, turbidity, dissolved oxygen (DO), depth, hydrography and many others. However, the biodiversity in estuaries may also be heavily affected by the toxic substances produced by the organic and inorganic wastes, as stated by Md. Rashed-Un-Nabi *et al.* (2011) in the study about the temporal and spatial distribution of fish and shrimps in Bakkhali river estuary, Bangladesh.

The estuarine of Merbok River, Tanjung Dawai, Kedah is well known for the fishery activities. This area is a fishermen village, where the local people depends on fisheries as their source of economy to support living. Nevertheless, people of different races including Malays and Chinese had established their fishery business to gain profit from the exploitation of marine production. The Fisheries Development Authority of Malaysia (LKIM) is a contributor that supports Association of Fishermen Tanjung Dawai, a local association that is actively involved in fish marketing and production at Tanjung Dawai. The involvement of government authority in the fishery activities has enhanced the attraction towards fisheries there from time to time.

Amani *et al.* (2011) had reported that the Estuarine Set Bag Net (ESBN) had been used by the local fishermen in the estuarine of Merbok River for capturing shrimps. There are certain advantages of ESBN which render the popular use of it among fishermen in that estuarine area; ESBN is *Acetes* selective and does not cause significant great impact to the local fish and their habitat. In the same journal, they had investigated about the composition and temporal variation of

*Acetes* shrimps caught by the Estuarine Set Bag Net (ESBN). Based on their report, there is undoubtedly an abundance of juvenile fishes and shrimps inhabiting the coastal water areas, in which the total catches vary between the months.

In conjunction with that, there is no specific report available on the temporal variation of fish and shrimp assemblage caught by ESBN in the coastal waters of Tanjung Dawai, although other biological aspects were earlier reported by Amani *et al.* (2012) about the feeding habits of *Acetes japonicus*. Therefore, this study was established to address the following objectives:

- i) To identify the fish and shrimps species found in the estuarine of Merbok River, Tanjung Dawai, Kedah, Malaysia.
- ii) To determine the Malaysia composition and temporal variation of the fish and shrimp species.
- iii) To estimate the catch per unit effort (kg/net/hour) of Estuarine Set Bag Net (ESBN).

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