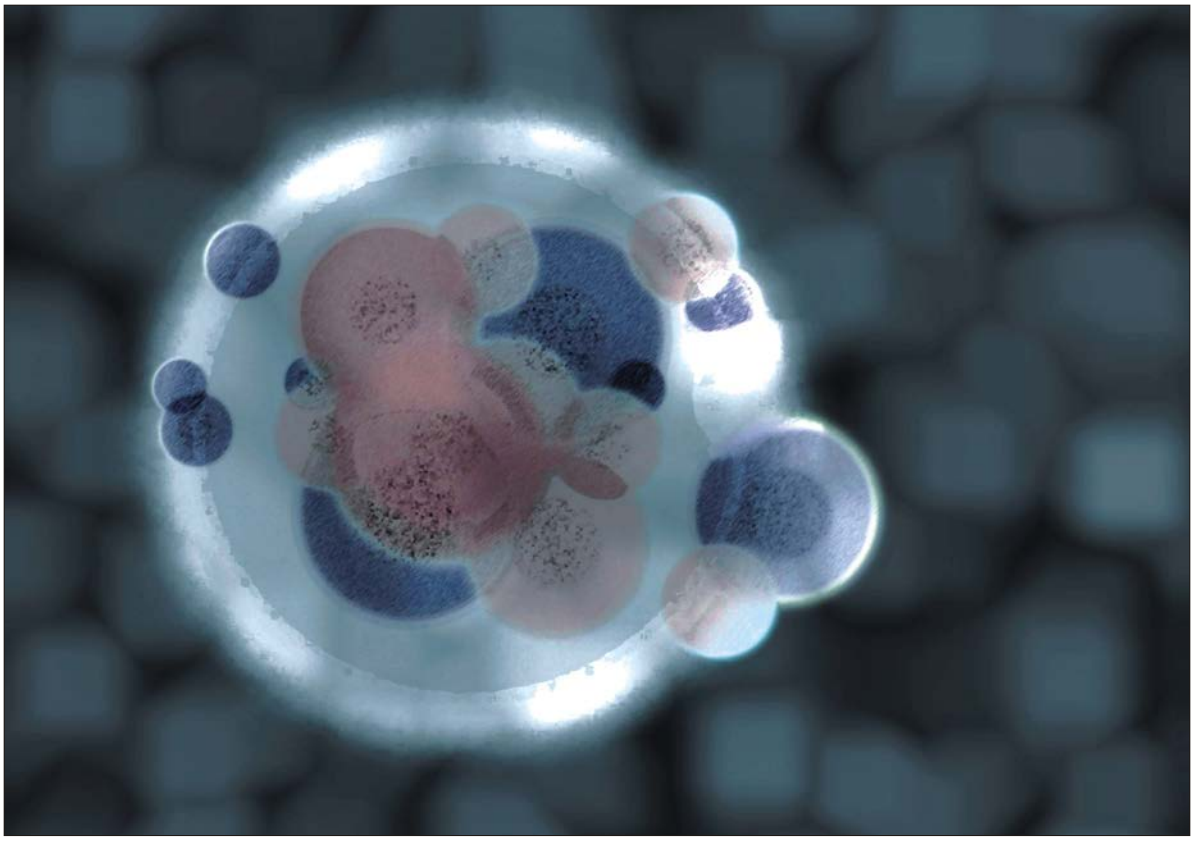

Journal of Biological Sciences

ISSN 1727-3048

science alert

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Journal of Biological Sciences 10 (3): 247-250, 2010
ISSN 1727-3048

Catch Composition of Estuarine Set Bag Net Fishery in the Coastal Area of Pontian, Johor, Peninsular Malaysia

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Abstract: Catch composition of Estuarine Set Bag Net (ESBN) in coastal waters of Pontian, Johor, Peninsular Malaysia was investigated based on the catch data during June to November 2007. The total catches comprised of three major groups were *Acetes* shrimps (89%), juvenile fishes (9%) and other shrimps (2%). Among the *Acetes* shrimps, three species were recorded from the study area viz., *Acetes indicus* (74%), *Acetes serrulatus* (24%) and *Acetes japonicus* (2%). The nine juvenile fishes species were identified as *Setipinna brevicep*, *Trichiurus lepturus* (ribbon fish), *Lutjanus malabaricus*, *Epinephelus diacanthus*, *Cynoglossus bilineatus*, *Secutor ruconius*, *Lactarius lactarius*, *Atelopus japonicus* and *Ilisha kampeni.* Other shrimps were constituted of two families as Penaeidae (70%) and Thalassocaridae (30%). This study revealed that there is no bad impact of ESBN on juvenile fishes.

Key words: Catch composition, estuarine set bag net, Peninsular Malaysia

INTRODUCTION

The genus *Acetes* forms the basis of small scale fisheries in south-east Asia, Asia, Africa and South America and accounts for at least 13.5% of the worlds total crustacean fisheries production, thereby comprising the largest zooplankton based fishery in the world (Xiao and Greenwood, 1993). Fishing grounds are usually located in calm, muddy, near intertidal zones where waters are shallower than 5 m (Omori, 1975). *Acetes* swarms seasonally and fishing seasons usually coincide with swarming seasons. The fishing gear is relatively simple and usually manually operated and includes various kinds of push net (sungkor), bag net, stake-trap, beach seine and small purse seine (Omori, 1975; Pathansali, 1966). The small size of the individuals is compensated by the great abundance in which they are taken (Omori, 1975).

Both east and west coast of the Peninsular Malaysia are known to be very rich in *Acetes*. The fishery is based mainly on *A. indicus* and *A. japonicus* (Amin *et al*., 2009a, b; Omori, 1975). *Acetes erythraeus*, *A. serrulatus*, *A. sibogae* and *A. vulgaris* also occurred and is confined mainly to the west coast from Perlis to Johor (Arshad *et al*., 2008; Johnson, 1976). In 2004 the annual catch in west coast of Johor exceeded 1,300 tons and constitutes 17.41% of its total landing in Malaysia. Though small in the amount annually landed, *Acetes* constitute a valuable and important seafood commodity. *Acetes* are converted into a variety of preparations including belacan, petis udang, sambal, trassi udang and chincalok. Surplus shrimps are used in the preparation of animal or fish food, fed to poultry, or converted into shrimps powder used as a fertilizer (Johnson, 1976).

Estuarine Set Bag Net (ESBN) has been using from decades but its catch composition is still unknown so far. Despite great demand of *Acetes* in Malaysia, the catch composition and status of this fishery is poorly known in Johor state, Peninsular Malaysia. Although, some studies on population biology of the genus *Acetes* have been reported (Amin *et al*., 2008a-c, 2009a-c; Arshad *et al*., 2007, 2008), there have been no published reports on the catch composition of Estuarine Set Bag Net (ESBN) fisheries in Malaysia. Therefore, an attempt was made to study the catch composition of estuarine set bag net in the coastal waters of Pontian, Johor Bahru, Peninsular Malaysia.

MATERIALS AND METHODS

Sampling method: Monthly samples were collected from the fisherman which fished by Estuarine Set Bag Net (ESBN) from June to November 2007 in the coastal area of

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Fig. 1: Geographical location of the sampling area ( ) in coast waters of Pontian, Johor, Peninsular Malaysia

Pontian (Lat. 0°16.13N°, Long. 103°28.34E°) Johor, Peninsular of Malaysia (Fig. 1). This gear is operated mostly within 10 m depth along the coast. The fishing gear is 21 m in length and divided into three main parts which is mouth (mesh size: 13 cm), middle (4 cm) and cod end (0.5 cm). Samples were preserved with 10% formalin immediately after collection.

Sample process: In the laboratory, 100 g of sub-samples were taken with three replicates from the original samples of each month. Then sub-samples were classified into three major groups like as *Acetes* shrimps, juvenile fishes and other shrimps.

Species identification: Identification for juvenile fishes and other shrimps were done based on the study of Mokhsin and Ambak (1996) and Lovett (1981). *Acetes* species was identified under a dissecting microscope (Nikon-122764, Japan) according to Omori (1975).

Data analysis: After that each separated groups were counted individually. Average percent composition of different groups was calculated from monthly sub sample data. Statistical software Excel was used for data analysis.

RESULTS

Catch category: There were three major groups of the species observed from the catches of ESBN in the coastal waters of Johor. The dominant group was *Acetes* shrimp (89%), followed by juvenile fishes (9%) and other shrimps (2%). Higher catches of *Acetes* shrimp were observed every month during the study period (Fig. 2). On the other hand, juvenile fishes and other shrimps only showed highest catch in the month of August and October (Fig. 2).

Composition of *Acetes* shrimps: Three species of sergestid shrimps (*Acetes indicus, Acetes serrulatus* and *Acetes japonicus*) were found in coastal waters of Pontian, Johor (Table 1). The overall percentage composition of *A. indicus, A. serrulatus* and *A. japonicus* were found to be 74, 24 and 2%, respectively. Highest densities (more than 70%) of *A. indicus* were recorded almost all of the month (Fig. 3) in the investigated area. The occurrence of *A. japonicus* was only observed in November.

Composition of juvenile fishes: Nine species of juvenile fishes were identified from the study area (Table 1). They were *Septipinna brevicep*, *Lutjanus malabaricus*,

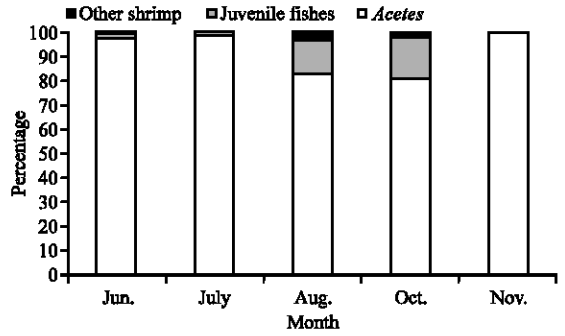

Fig. 2: Monthly percentage variation in catch composition of ESBN in the coastal water of Pontian, Johor, Malaysia

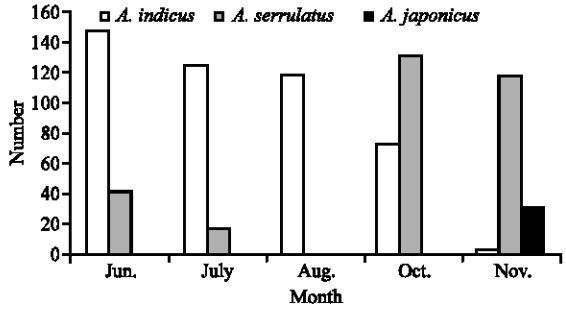

Fig. 3: Monthly variation in abundance of *A. indicus*, *A. serrulatus* and *A. japonicus* in the coastal water of Pontian, Johor, Peninsular Malaysia

Table 1: Monthly catch composition (No. of individuals/100 g) in ESBN in the coastal water of Pontian, Johor, Peninsular Malaysia

Major groups/species	Jun./07	Jul./07	Aug./07	Oct./07	Nov./07
Acetes					
Acetes indicus	147	124	118	73	3
Acetes serrulatus	42	17	-	131	118
Acetes japonicus	-	-	-	-	31
Juvenile fishes					
Setipinna brevieps	4	5	66	1	-
Lutjanus malabaricus	-	-	1	-	-
Epinephelus diacanthus	-	-	4	-	-
Cynoglossus bilineatus	-	-	1	-	-
Secutor ruconius	-	-	1	-	3
Lactarius lactarius	1	-	4	-	-
Atelopus japonicus	-	-	-	7	-
Ilisha kampeni	-	-	-	5	-
Trichiurus lepturus	-	-	-	-	1
Other shrimp					
Penaeidae	-	-	7	3	-
Thalassocaridae	-	-	2	1	-

Epinephelus diacanthus, *Cynoglossus bilineatus*, *Secutor ruconius*, *Lactarius lactarius*, *Atelopus japonicus*, *Ilisha kampeni* and *Trichiurus lepturus*. The species *Septipinna brevicep* showed the highest number as a by catch in the ESBN during the study period. Highest number of juvenile fishes was observed in the month of August (Table 1).

Family Engraulididae (*Septipinna brevicep*) showed the highest number of by catch for juvenile fishes in the ESBN while family Trichiuridae (*Trichiurus lepturus*) showed the lowest occurrence compared to other families (Table 1).

Composition of other shrimps: Other shrimps group comprised two families. The family Penaeidae constituted 70% compared to Thalassocaridae which contributed only 30% of the catch.

DISCUSSION

Estuarine Set Bag Net (ESBN) is widely used to catch *Acetes* shrimps in the coastal waters of Pontian, Johor, Peninsular Malaysia. Since this gear is only used when tidal currents run, fishing is limited to the two periods of spring tides of 7-8 days in every lunar month. According to the lunar calendar, fishing days were from the 27th or 28th up to the 4th or 5th and from 12th or 13th to 21st or 22nd (Lam, 1975). In present study, *Acetes* shrimps showed the highest constitution of the total catch with the highest percentage (89%) while juvenile fishes (9%) and other shrimps (2%) contributed very less. This is similar to the findings of Amin *et al.* (2008a) in their study on catch per unit effort of estuarine push net with emphasis on occurrence and abundance of *Acetes* shrimps in the coastal waters of Malacca, Peninsular Malaysia, where *Acetes* shrimps (90%) was the main catch followed by juvenile fishes (9%) and other shrimps (1%). According to Khan *et al.* (1994), estuarine push net production is less than bag net fishery, but the value of its catch is higher than estuarine bag nets in Bangladesh. Chen *et al.* (1997) reported the catch composition and seasonal variation of set net fisheries in the Yellow and Bohai Seas. The catch composition comprised the following: fish (54.4%), crustaceans (40.3%), cephalopoda (4.2%) and medusa (1.1%). For crustaceans, *A. chinensis* constituted 40.6% of the total fisheries yield in the region. Despite smaller mesh size (2 mm) used, the differences in catch composition may be attributed to geographical variation.

In comparison to the push net, three species of *Acetes* shrimps (*A. indicus*, 87%, *A. japonicus*, 12% and *A. intermedius*, 1%) were recorded in the coastal waters of Malacca (Amin *et al.*, 2008a) which have very similar trend with the percentage composition of *Acetes* in the present study are *A. indicus* (74%), *A. serrulatus* (24%) and *A. japonicas* (2%). This study indicated that the estuarine set bag net is an efficient fishing gear used by the coastal fishermen for the harvesting of *Acetes* shrimps. Push net is the most common traditional fishing gear employed in

Acetes fishing in east coast of Peninsular Malaysia. The catch efficiency of bag net and push net is similar despite the difference in fishing operation and fishing area covered. It is important to note that the cod ends of both nets are equal in size (0.5 cm). Both the traditional gears have been shown to be equally efficient for capturing the *Acetes* resources in the shallow coastal waters of Peninsular Malaysia. It could be concluded that the ESBN is not posing any damaging effect to juvenile fishes in the investigated area.

ACKNOWLEDGMENT

This study was supported by the Ministry of Science, Technology and Innovation (MOSTI) with grant number 05-01-04-SF0613.

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