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CATCH PER UNIT EFFORT (CPUE) AND POPULATION DYNAMICS OF HARDTAIL SCAD (Megalaspis cordyla) AT COASTAL AREA OF SUNGAI BESAR, SELANGOR

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

DEPARTMENT OF AQUACULTURE

FACULTY OF AGRICULTURE

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DEPARTMENT OF AQUACULTURE

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LIST OF ABBREVIATIONS

%	=	Percentage
Cm	=	Centimetre
K	=	Growth co-efficient
M	=	Natural mortality
F	=	Fishing mortality
Z	=	Total mortality
E	=	Exploitation level
φ'	=	Growth performance index
Kg	=	Kilogram
L	=	Litre
g	=	Gram
L∞	=	Asymptotic length
tl	=	Total length

Abstract

In Malaysia, carangid group of fishes contribute to large amount of marine fish capture and *Megalaspis cordyla* is one of them. The exploitation of the fish lately has given impact to the natural stock of the fish. The objectives of this study are to know the population dynamic of *Megalaspis cordyla* that was captured at coastal area of Sungai Besar, Kuala Selangor, Selangor and to know the catch per unit effort (CPUE) that the fisherman uses to catch the fish. Survey and collecting sample data of *Megalaspis cordyla* were done at Pengkalan Jeti Pendaratan Ikan Sungai Besar, Kuala Selangor, Selangor. Samples were collected once every month from January 2013 to October 2013. The total length (tl) in centimeter (cm) and the weight in gram (g) of each individual was taken and measured. Then the data had been analyses by using FiSAT. The population parameters, asymptotic length ($L\infty$) in cm and growth co-efficient (K/year) are 41.48 and 0.430 respectively. Natural mortality (M/year), the fishing mortality (F/year) and total mortality (Z/year) are 0.9534, 1.8346, and 2.788 respectively. The exploitation level (E), was 0.658. The recruitment pattern of *Megalaspis cordyla* was continuous throughout the year and the major peak was during July- August. The length-weight equation calculated was $W= 0.0151TL^{2.9017}$ ($r^2=0.9544$). The CPUE for the fish are 0.0001875 kg h^{-1} L^{-1}. These result shows unbalance position in the stock and indicate that *Megalaspis cordyla* in that area was over exploited.

Abstrak

Di Malaysia, kumpulan ikan dari jenis carangid menyumbang kepada jumlah hasil tangkapan laut yang banyak dan *Megalaspis cordyla* merupakan salah satu daripada ikan jenis tersebut. Sejak kebelakangan ini, eksploitasi ikan ini telah memberi impak terhadap stok ikan dalam laut. Objektif kajian ini adalah untuk megetahui populasi dinamik *Megalaspis cordyla* yang ditangkap di kawasan perairan, Sg. Besar, Selangor dan untuk mengetahui usaha per unit tangkapan yang digunakan oleh nelayan untuk menangkap ikan tersebut. Tinjauan dan pengumpulan data ikan *Megalaspis cordyla* dilakukan di kawasan Pengkalan Jeti Pendaratan Ikan Sungai Besar, Kuala Selangor, Selangor. Pengumpulan data dilakukan sekali setiap satu bulan bermula dari Januari 2013 sehingga Oktober 2013. Setiap individu sampel diambil timbangan berat dan panjang keseluruhan. Data yang telah dikumpul seterusnya dianalisis menggunakan program FiSAT. Parameter populasi, panjang asimptot ($L\infty$) dalam cm dan koefisien pertumbuhan (K) adalah masing-masing 41.48 cm per tahun dan 0.430. Kematian semula jadi (M), kematian tangkapan (F) dan kematian keseluruhan (Z) adalah masing 0.9534 setahun, 1.8346 setahun, dan 2.788 setahun. Tahap eksploitasi (E) adalah 0.658. Pola pengambilan berlangsung sepanjang tahun dan kemuncaknya adalah pada bulan July-Ogos. Persamaan panjang – berat adalah $W= 0.0151TL^{2.9017}$ ($r^2=0.9544$). Nilai CPUE adalah 0.0001875 kg^{-1} L^{-1} . Hasil daripada data yang dianalisis menunjukkan kedudukan stok ikan yang tidak seimbang berlaku dan menunjukkan *Megalaspis cordyla* di kawasan tersebut telah dieksploitasi secara berlebihan.

CHAPTER 1

INTRODUCTION

Megalaspis cordyla is known as Hardtail Scad, Torpedo scad or Horse Macarel. According to Standard Statistical Classification of Common Malaysian Marine Fishes, *M. cordyla* was listed under Division Group of Species of Sauries same as other commercial marine fishes such as Cobia (*Rachycentron canadum)* and Yellowtail scad (*Atule mate).* This species is easily distinguished from other carangid as no other species of Carangidae has the combination of lateral line with very large scutes and posterior soft dorsal and anal fin rays consisting of a series of detached finlets (Bal and Rao, 1984). *M. cordyla* was categorized under commercial pelagic finfishes that provide protein source for human consumption. According to (Sivakami, 1996) carangid group of fishes is one of most demanded commercial marine fish for consumption especially in Indian coast. Same as in Malaysia, carangid group of fishes contribute to large amount of marine fish capture and *M. cordyla* is one of them. In the world's total catch of marine species, the top 10 of the fish species caught are pelagic fish and the pelagic fishery itself contributes more than 50% to the total world's marine fish landings (FAO 2006).

Most of the pelagic fisheries are seasonal and exclusively harvested by vessels that operate purse seines, pelagic trawls and driftnets (Anon 2008a). *M. cordyla* are harvested by different types of crafts and gears all around the world trough out the year. Tuna purse seines are used to capture free-swimming schools of large pelagic fish, including small tunas, torpedo scad (*M. cordyla*), yellowtail scad (*Caranx mate*), etc. (Supongpan and Saikliang, 1987). Normally in Malaysia, *M. cordyla* was captured using trawling net or purse seine net with other marine capture.

According to Sreenivasan (1974) *M. cordyla* diet was on smaller fish and *Acetes* spp. These types of diet that consist lots of protein will make the flesh composition of *M. cordyla* rich in protein thus make it a good source of protein for human. Fish are a vital source of animal protein in many developing countries such as the Philippines and Malaysia, over 60% of the animal protein comes from fish (Barut *et al.,* 2003). However, with the increasing of prices, fish are potentially becoming less available to the poor who cannot afford to buy the fish (Ahmed *et al.,* 1999).The exploitation of the fish lately has given impact to the natural stock of the fish. The high demand for the fish may be vary but usually in the peek time such as near the festive day the demand will be high and at normal time the demand will be stable.

To estimate stock of fish in the wild, catch per unit effort (CPUE) can be used (Petrere *et. al.,* 2010). According to (Petrere *et. al.,* 2010). CPUE can be defined as

the relationship of the catch and the effort value which are strictly proportional (linear) through the origin value. This research is done to know these following objectives:

1) To know the population dynamic of *M. cordyla* that was captured at coastal area of Sungai Besar, Kuala Selangor, Selangor.
2) To know the catch per unit effort (CPUE) that the fisherman use to catch the fish.

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