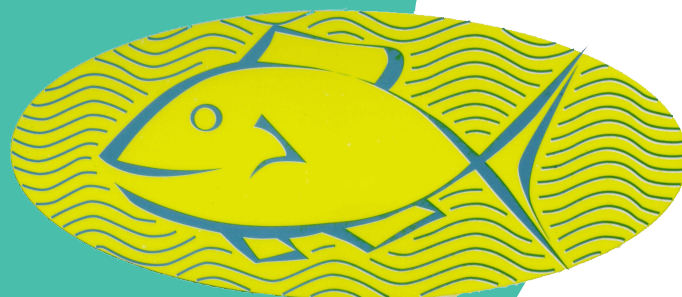


# INDONESIAN FISHERIES RESEARCH JOURNAL



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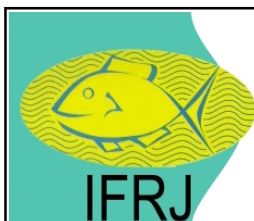
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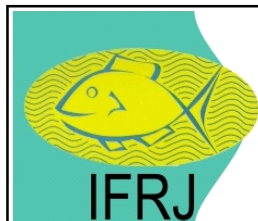
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## PREFACE

Indonesian Fisheries Research Journal (IFRJ) in 2019 entered the Volume 25. The process of publishing this journal is funded by Research Center for Fisheries of the fiscal year 2019. All submissions should be published through the process of evaluation by the Editorial Board, Peer-Reviewers and editing by Editorial Office.

The IFRJ Volume 25 Number 2 2019 presented six fisheries research articles: Coral Reef Condition in Relation to Coral Reef Fish Abundances Before Mass Bleaching Event in Simeulue Islands, Aceh; Southern Bluefin Tuna (*Thunnus maccoyii*) Caught by Indonesia's Tuna Longliners in the Spawning Area; Biological Reference Points of Painted Spiny Lobster *Panulirus versicolor* (Latreille, 1804) in Karimunjawa Waters, Indonesia; Some Biological Stock Indicators of Bullet Tuna (*Auxis rochei*, Risso 1810) From Banda Sea and Its Adjacent Waters; Estimation of Growth, Mortality, and Exploitation Status of Nurse Tetra (*Brycinus nurse*) and True Big Scale Tetra (*Brycinus nurse*) From the New Calabar River, Nigeria; Diagnostic and Description of Asian Pangasiid Catfish Genus *Helicophagus* from Southeast Asia.

Those scientific papers are expected to contribute to policy makers and managers of fisheries resources in Indonesia. Editor would deliver sincere thanks to reseachers from the Resarch Center for Fisheries and outside for their active participation in this edition.

**Editor in Chief**

**INDONESIAN FISHERIES RESEARCH JOURNAL**  
**Volume 25 Number 2 December 2019**

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# INDONESIAN FISHERIES RESEARCH JOURNAL

## Volume 25 Number 1 June 2019

### ABSTRACT

#### CORAL REEF CONDITION IN RELATION TO CORAL REEF FISH ABUNDANCES BEFORE MASS BLEACHING EVENT IN SIMEULUE ISLANDS, ACEH

Ulung J. Wisha  
IFRJ, Vol. 25 No. 2, Page: 65-74

#### ABSTRACT

Bordered with the Indian Ocean, Simeulue Islands is one of the outermost islands in Indonesia located in the west part of Aceh Province. Simeulue waters are productive areas due to the unpolluted water condition and great biomass. Three regions were particularly observed, those are Simeuluecut, Ganting, and Labuhan Bajau. At those there areas, the existing marine tourism activities might affect to coral reef ecosystem. This study aimed to evaluate the condition of coral and coral reef fish in those three particular regions before mass bleaching event in 2016 triggered by ENSO. Point Intercept Transect (PIT) method was employed to record the percentage cover of coral, species diversity, and coral reef fish. Ganting waters was a moderate ecosystem area which the percentage cover of coral was up to 45.62%. However, in Simeuluecut and Labuhan Bajau waters, the coral reef communities were excellent with coral coverage reached 83.12% and 81.25 %, respectively. The highest abundance genera of coral reef fish was observed in Simeuluecut waters. This condition was changed oppositely in 2016 when the mass bleaching event occurred in Simeulue waters caused by temperature anomaly triggered by ENSO. The temperature raised almost 3°C for 6 months that undoubtedly induced bleaching whereby about 50% of coral colonies were dramatically declined in coral coverage and coral recruitment.

**Keywords:** Coral monitoring; coral reef fish; Simeuleu Islands; mass coral bleaching; ENSO

#### SOUTHERN BLUEFIN TUNA (*Thunnus maccoyii*) CAUGHT BY INDONESIA'S TUNA LONGLINERS IN THE SPAWNING AREA

Fathur Rochman  
IFRJ, Vol. 25 No. 2, Page: 75-90

#### ABSTRACT

Southern Bluefin Tuna in spawning area of the Eastern Indian Ocean where the Indonesian's longliners operated has a specific character in term of size, age, sex-specific growth rate and the population. The aims

of this study are to determined changes in size/age, sex-specific growth rate and virtual population analysis of Southern Bluefin Tuna (SBT) in the spawning area. This study is important to find out the successful management of SBT in spawning area by looking at the catch at age/size movement, sex-specific growth analysis and the estimation of the population by virtual population analysis. In this study, we were used 452 pairs of otolith with fish sized from 134-196 cmFL and fish aged from 8-20 years. The growth equation was  $L_t = 191 (1 - e^{-0.167(t+1.081)})$ . Catch at age structure was distributed from 5-22 years with mean and mode of age were 9.63 and 9 years. The distribution of mode changed from year to year shifting to a younger fish. In 2012, the mode was 10 years but entering 2013-2014 the mode was shifted to 6 years. In 2015-2017, the mode was increased from 7 years (2015) to 8 years (2016) and 9 years (2017). The fishing pressure happened in the age group under 20 years. In 2012 to 2014, the highest fishing pressure respectively obtained in the age group of 13 to 11 years with an average length of 167 to 174 cmFL. Entering 2015 and 2016, the highest fishing pressure obtained in the age group of 6 years with an average length of 138 cmFL. The exploitation rate ranged from 0.14/year to 0.25/year meaning that the exploitation was in optimal condition.

**Keywords:** Southern Bluefin Tuna; spawning area; otolith, catch at age structure, virtual population analysis

#### BIOLOGICAL REFERENCE POINTS OF PAINTED SPINY LOBSTER *Panulirus versicolor* (Latreille, 1804) IN KARIMUNJAWA WATERS, INDONESIA

Tri Ernawati  
IFRJ, Vol. 25 No. 2, Page: 91-101

#### ABSTRACT

A biological reference point is a term used to explain of stock status using a biological approach as a basis of fisheries management. Biological reference points of painted spiny lobster *Panulirus versicolor* are limited in Karimunjawa waters. This study aims to investigate the stock status of *P. versicolor* and management options to ensure the sustainability of the resources. The research was conducted in Karimunjawa islands of the Java Sea by collecting lobster from local fishers from March to November 2016. A total of 495 lobster were measured, weighed, and their maturity status assessed to allow the size at maturity and selectivity of the fishery to be estimated. The size at maturity  $L_{50}$  (62.2 mm CL) and  $L_{95}$  (82.0 mm CL) were larger than  $SL_{50}$  (48.2 mm CL) and  $SL_{95}$  (75.0 mm CL), respectively. Natural mortality ( $M$ ) which was 0.579 year<sup>-1</sup> is lower than fishing mortality ( $F$ ). The current spawning potential ratio (SPR) of *P.*

*versicolor* is 19% at the current  $F$  of 0.82, which is below SPR limit of 20% and target reference point of 40%. Hence, to increase SPR level to 40%, the fishing mortality should be reduced by about 40% to 60%. Closed season, legal size, and defining no take zone are options to consider by fishery manager with appropriate surveillance control. Single or combining those measures can reduce its fishing mortality and take back the stocks to the level of target reference point.

**Keywords:** Painted spiny lobster; size at maturity; mortality; SPR

### SOME BIOLOGICAL STOCK INDICATORS OF BULLET TUNA (*Auxis rochei*, Risso 1810) FROM BANDA SEA AND ITS ADJACENT WATERS

Khairul Amri

IFRJ, Vol. 25 No. 2, Page: 103-112

#### ABSTRACT

Bullet tuna is considered as one of the important species for tuna purse seine fisheries in Indonesia, especially in archipelagic waters. However, little is known about its biological characteristics which proven to be pivotal in stock assessment. The purpose of this research was to determine some of the biological stock indicators for bullet tuna (*Auxis rochei*) from Banda Sea and its adjacent waters. The study was conducted from February to November 2016. The length of the bullet tuna caught were in between 18.5-32.7 cmFL (mode=24 cmFL). Growth pattern was isometric with  $b=3.01$  and  $R^2=0.84$ . Sex ratio was balanced between male and female (1:1). The spawning season allegedly from June to November. The length at 50% mature ( $L_{50}$ ) was 23.6 cmFL. A good indicator for the fisheries, where at least 75% of the mature fish caught were already spawned. The asymptotic length ( $L_{\infty}$ ) was 33.63 cmFL, with coefficient of growth ( $K$ ) around 0.73/year. Natural mortality ( $M$ ) estimated at 1.87/year, fishing mortality ( $F$ ) estimated at 2.20/year and total mortality ( $Z$ ) was 4.07/year. The exploitation level ( $E$ ) was estimated to be at maximum level ( $E=0.54$ /year), for precautionary purpose, the number of efforts should be reduced down to 8% from current effort.

**Keywords:** Neritic tuna; population dynamics; biological parameters; purse seine tuna fisheries

### ESTIMATION OF GROWTH, MORTALITY, AND EXPLOITATION STATUS OF NURSE TETRA (*Brycinus nurse*) AND TRUE BIG SCALE TETRA (*Brycinus macrolepidotus*) (FAMILY: ALESTIDAE) FROM THE NEW CALABAR RIVER, NIGERIA

Olaniyi Alaba Olopade

IFRJ, Vol. 25 No. 2, Page: 113-122

#### ABSTRACT

This study aimed to determine the growth patterns, mortality, and exploitation status of two species of Alestidae in the New Calabar River, Nigeria. For this purpose, fish samples were collected monthly from three landing sites from the local fishermen using gill nets (mesh sizes: 15-25mm), beach seine (mesh sizes: 2.3-10mm), and cast nets (mesh sizes: 15 -25mm). The length-weight relationship revealed exponent "b" value for *Brycinus nurse* was 3.54 and 3.21 for *Brycinus macrolepidotus* while the condition factors were 1.08 and 1.02 for *Brycinus nurse* and *Brycinus macrolepidotus* respectively. The growth parameters of *Brycinus nurse* asymptotic length ( $L_{\infty}$ ) and growth coefficient ( $K$ ) were 24.46 cm and 0.52 yr<sup>-1</sup>, respectively, while those for *Brycinus macrolepidotus*  $L_{\infty}$  was 28.88 cm and  $K$  was 0.22 yr<sup>-1</sup>. The reproductive load ( $L_{50}/L_{\infty}$ ) ratio was found to be 0.59 and 0.61 for *B. nurse* and *B. macrolepidotus*, respectively. Exploitation rate ( $E$ ) for *B. nurse* was 0.26 and 0.11 for *B. macrolepidotus* while length-at-first capture ( $L_c$ ) was 14.49 cm for *B. nurse* and 17.64 cm for *B. macrolepidotus*. The natural mortality was greater than the fishing mortality for both species and Logistic regression of the probability of capture routine values recorded for *B. nurse* were higher than that of *B. macrolepidotus*. Maximum exploitation rate ( $E_{max}$ ) was less than 0.5 for both *B. nurse* (0.41) and *B. macrolepidotus* (0.42). These values were close to the maximum allowable limit; therefore, the species may be unsustainable when fishery intensifies in the future. To ensure sustainable exploitation of the two Alestid species in the area, fishing effort should be regulated.

**Keywords:** Alestid species; length-weight relationship; reproductive load; demographic structure; Nigeria

# DIAGNOSTIC AND DESCRIPTION OF ASIAN PANGASIID CATFISH GENUS *Helicophagus* FROM SOUTHEAST ASIA

Rudhy Gustiano  
*IFRJ, Vol. 25 No. 2, Page: 123-131*

## ABSTRACT

Pangasiid catfishes is an economic important catfish family for fishery. Nowadays, three species, *Pangasius hypophthalmus*, *P. boucorti*, and *P. djambal*, are used in aquaculture. Among the genera in Pangasiidae, *Helicophagus* was less studied. Although this genus was less preferred than other popular species in Pangasiidae, it still has high commercial price. The present study was conducted to clarify the differences of the exist species in the genus *Helicophagus* based on

## Abstract

biometric analyses. Twenty six specimens, collected from represent rivers in Southeast Asia, used for the material examined. Several type specimens deposited in museums were also added in the analyses. Thirty five characters were designed for measurement on the unique body conformation. Principal component analysis (PCA) was applied to distinguish different species and found strong characters for key identification and description. The results presented the data and information on the diagnosis, description, distribution, and ecology of each species. Key identification of each species are given. The three species (*Helicophagus typus*, *H. waandersii*, and *H. leptorhynchus*) enabled to show their differences based on eye diameter and vomerine toothplate length.

**Keywords:** Catfish; Pangasiidae; *Helicophagus*; biometric analysis