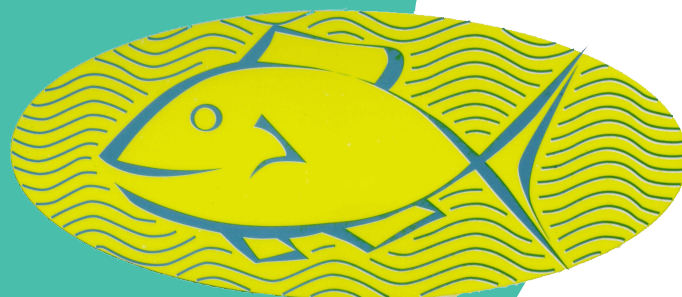


INDONESIAN FISHERIES RESEARCH JOURNAL



**CENTER FOR FISHERIES RESEARCH
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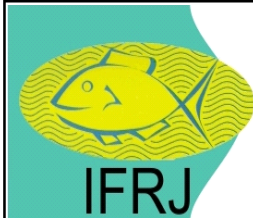
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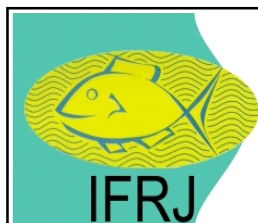
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PREFACE

Indonesian Fisheries Research Journal (IFRJ) in 2020 entered the Volume 26. The process of publishing this journal is funded by Research Center for Fisheries of the fiscal year 2020. All submissions should be published through the process of evaluation by the Editorial Board, Peer-Reviewers and editing by Editorial Office.

The IFRJ Volume 26 Number 2, 2020 presented six fisheries research articles: Study on Species Composition of Juvenile Tuna Caught by Purse Seine Fleet Landing in Tamperan Fishing Port, South Java, Indonesia; Community Structure and Trophic Status of Reef Fish in Natuna Waters; DNA Barcoding Using COI Gene Sequences of Wild Betta Fighting Fish From Indonesia: Phylogeny, Status and Diversity; Investigation on Tuna Fisheries Associated With *Fish Aggregating Devices* (FADs) in Indonesia FMA 572 and 573; Catchability and Diversity of Fish Species Captured by Gill Net in New Calabar River, Nigeria; Reproductive Biology of Longtail Tuna (*Thunnus tonggol*) in The Java Sea.

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
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ABSTRACT

STUDY ON SPECIES COMPOSITION OF JUVENILE TUNA CAUGHT BY PURSE SEINE FLEET LANDING IN TAMPERAN FISHING PORT, SOUTH JAVA, INDONESIA

Raymon R. Zedta
IFRJ, Vol. 26 No. 2, Page: 61-67

ABSTRACT

Juvenile yellowfin tuna (*Thunnus albacares*) and bigeye tuna (*T. obesus*) are very similar in morphological characteristics, hence it is difficult to distinguish between these two species, especially when they are landed in frozen or defect conditions. The presence of juvenile bigeye tuna in yellowfin catch was first noticed in the 1980s from pole and line fisheries in Maldives. We analyzed the monthly composition structure of juvenile tuna caught by purse seine fleet operating in the South Indian Ocean. Tamperan fishing port was chosen for benchmarking to other small-scale fisheries. The result is expected to be used as an index for increasing the accuracy of juvenile tuna proportion for national catch statistics. A total of 4760 juvenile tunas were examined during monitoring activities. The length ranged 19-65 cm FL with median 40 cm FL for juvenile yellowfin tuna and 44 cm for juvenile bigeye. The whole weight of juvenile tuna ranged from 5 to 7 kg. The length-weight conversion for both species are $W = 0.0184 \cdot FL^{3.0086}$ ($R^2 = 0.95$, $n = 4144$) for juvenile yellowfin tuna and $W = 0.018 \cdot FL^{3.0047}$ ($R^2 = 0.93$, $n = 346$) for juvenile bigeye tuna. It can be inferred from the study that in terms of catch proportion of juvenile tuna, it consists of ratio 10:1, whereas for every 10 kg of juvenile tuna contains approximately one kg of bigeye tuna. Besides, the length-weight equation for both species is interchangeable, which means either equation can be performed to convert length to weight for both juvenile yellowfin and bigeye tuna.

Keyword: Juvenile tuna; length-weight; length-structure; purse seine

COMMUNITY STRUCTURE AND TROPHIC STATUS OF REEF FISH IN NATUNA WATERS

Isa Nagib Edrus
IFRJ, Vol. 26 No. 2, Page: 69-82

ABSTRACT

A field research on reef fish-community structures in Natuna waters was carried out in November 2015. This research aimed to obtain the trophic composition of reef fishes and its correlation to diversity, density, and biomass. Underwater visual census on several transect

areas was used to collect data. Results show that the identified reef fishes were about 100 species of target-reef fish belonging to 18 families and 23 species of indicator-reef fish of the Chaetodontidae family. The mean species number of target reef fish and indicator reef fish were 42 and 7 species, respectively. The mean density of the target reef fish and indicator reef fish were 0.4 and 0.05 individual per m^2 respectively. The mean of the reef fish relative stock was 0.6 ton/ha. The composition of the herbivores mostly found in the resilient coral reefs was 46.45 % and the omnivores and planktivores as marketable targeted fishes were 18.64 % and 14.28 %, respectively. The most predominant or major families were from herbivorous, carnivorous, planktivorous, and corallivorous fishes, including Scaridae (i.e. *Scarus* spp), Lutjanidae (i.e. *Lutjanus* spp.), Caesionidae (i.e. *Caesio cuning* and *Pterocaesio caerulea*), and Chaetodontidae (i.e. *Chaetodon baronessa* and *Chaetodon octofasciatus*). The results suggested that the community structures were quite prospectively implemented for fisheries; however, it may not be promising for coral resilience. Furthermore, the coral health status was at moderate level in regard to the high numbers of corallivorous butterflyfishes.

Keywords: Reef fishes; structure community; biomass

DNA BARCODING USING COI GENE SEQUENCES OF WILD BETTA FIGHTING FISH FROM INDONESIA: PHYLOGENY, STATUS AND DIVERSITY

Melta R. Fahmi
IFRJ, Vol. 26 No. 2, Page: 83-96

ABSTRACT

The wild betta fish is a potential ornamental fish export commodity normally caught by traders or hobbyists in the wild. However, the population of wild betta in nature has declined and become a threat for their sustainability. This research was conducted to analyze the genetic diversity, phylogenetic relationships, and molecular identification through DNA COI gene sequence of Indonesian wild betta fish. A total of 92 wild betta fish specimens were collected in this study. Amplification of COI genes was carried out using Fish F1, Fish R1, Fish F2, and Fish R2 primers. The genetic diversity and phylogenetic relationships were analyzed using MEGA version 5 software program. Species identification of the specimen was conducted using BLAST program with 98-100% similarity value of the DNA sequences to indicate the same species. Phylogenetic tree construction showed seven monophyletic clades and

showed that *Betta smaragdina* was the ancestral species of genus *Betta* in Indonesian waters. Genetic distance among species ranged from 0.02 to 0.30, whereas intra-species genetic distance ranged from 0 to 6.54.

Keywords: Wild Betta; Indonesian Waters; DNA Barcoding; Ornamental Fish

INVESTIGATION ON TUNA FISHERIES ASSOCIATED WITH FISH AGGREGATING DEVICES (FADs) IN INDONESIA FMA 572 AND 573

Agustinus Anung Widodo
IFRJ, Vol. 26 No. 2, Page: 97-105

ABSTRACT

The use of anchored fish aggregating devices (a-FADs) in the Indonesia-Indian Ocean has increased rapidly. Since 2004, the Government of Indonesia has issued various FAD related fisheries regulations; however, its implementation was difficult, largely due to the lack of such information. As an endeavor to improve the management of tuna fisheries associated with FADs in this area, an Indonesia–Australia research collaboration project conducted a port sampling program from November 2013 to December 2015 in three key fishing ports in the western Indonesia, i.e., Pelabuhanratu (West Jawa), Muara Padang (West Sumatera), and Bungus (West Sumatera). Data were collected through daily enumeration and interviews with skippers, which consisted of catch, trip duration, biological data, and number of FADs visited. These data were analyzed to estimate catch rate, success rate, and length frequency distribution. The success rate of hand line/trolling line (HL/TR) at Muara Padang showed much lower than that at Pelabuhanratu. This may be due to more a-FADs or higher density in the Padang region, competing with purse seine (PS) boats operating in the same area, than those in the Pelabuhanratu region. The species composition caught by HL/TR and PS associated a-FADs in Indonesian FMA 572 and 573 include skipjack (SKJ, *Katsuwonus pelamis*), yellowfin (YFT, *Thunnus albacares*) and bigeye tuna (BET, *T. obesus*). A large proportion of the SKJ, YFT and BET caught at both Indonesian FMA 572 and 573 were juvenile fish, below the reported length at maturity (L_m) for those species.

Keywords: Tuna Fisheries; FAD; Indonesia FMA 572-573

Abstract

CATCHABILITY AND DIVERSITY OF FISH SPECIES CAPTURED BY GILL NET IN NEW CALABAR RIVER, NIGERIA

Olaniyi Alaba Olopade
IFRJ, Vol. 26 No. 2, Page: 107-117

ABSTRACT

The aim of this study was to analyze fish species caught by gill nets and fish diversity of the New Calabar River. Three sampling stations were set based on the coverage situation of the river and ichthyofauna associated with gill nets were sampled twice monthly from February to July 2018. A total of 3,251 fish specimens, representing 11 orders, 15 families, and 28 species, were captured. The order Perciformes was identified as the most abundant representing five families while the remaining had one family each. The fish family Cichlidae was the most represented with seven species, and other notable families were Alestidae, Clupeidae, and Mugilidae, representing three species each. Prominent among the fish caught monthly included *Liza falcipinnis*, *Mugil cephalus*, *Sarotherodon melanotheron*, *Sarotherodon galilaeus*, *Coptodon guineensis*, and *Sardinella maderensis*. The mean catch per unit effort (CpUE) ranged from 3.15 ± 0.2 to 4.85 ± 0.2 kg unit⁻¹ day⁻¹. Results of diversity indices revealed that Shannon-Wiener index values varied between 2.64 and 2.82, Simpson diversity ranged from 0.07 to 0.10, and Pielou's evenness index values ranged from 0.85 to 0.95. The values obtained in this study showed that the status of fish diversity in New Calabar River was stable.

Keywords: Ichthyofauna; gill nets; diversity indices; catch per unit effort; New Calabar River

REPRODUCTIVE BIOLOGY OF LONGTAIL TUNA (*Thunnus tonggol*) IN THE JAVA SEA

Thomas Hidayat
IFRJ, Vol. 26 No. 2, Page: 119-131

ABSTRACT

Longtail tuna (*Thunnus tonggol*) is one of common economically important pelagic fish species in Indonesia. The objective of this study is examining the biology of reproduction, consisting of length of weight relationship, sex ratio, maturity stage, gonado somatic index (GSI), length at first capture, and length at first

Abstract

maturity and spawning pattern. A total of 633 longtail tuna, ranging 29-58 cmFL and consisting of 293 males and 340 females, were collected from the Java Sea between April 2018 and March 2019. The results showed that the longtail tuna growth pattern was isometric. The sex ratio was not significantly different between male and female. The length of first capture longtail tuna of drift gillnet (43.2 cmFL) was bigger than the length at first maturity (42,3 cmFL). This indicates that the most of

longtail tuna caught by drift gillnet have already spawned. The peak's spawning season occurred in May and November, with fecundity ranging from 783,597 - 1,579,160 eggs. Longtail tuna has multiple spawning pattern.

Keywords: **Biology; *Thunnus tonggol*; spawning season; the Java Sea**