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INTERNATIONAL SEMINAR ON FISH AND FISHERIES SCIENCES (ISFFS) 2021

Preface

The International Seminar on Fish and Fisheries Sciences (ISFFS) with the theme "Science and innovative technologies for ensuring the long-term sustainability of fisheries towards Society 5.0" was conducted virtually on July 13-14, 2021 due to the ongoing COVID-19 pandemic. The seminar was organized by the Indonesian Ichthyological Society (Masyarakat Iktiologi Indonesia), in collaboration with the Faculty of Marine Science and Fisheries, Udayana University, Research Center for Fisheries, Ministry of Marine Affairs and Fisheries, Research Center for Biology, Indonesian Institute of Science, BIONESIA (Biodiversitas Indonesia), Faculty of Fisheries and Marine Sciences, IPB University and The Jakarta Technical University of Fisheries.

The opening keynote was given by the Minister of Marine Affairs and Fisheries, Republic of Indonesia, then continued by welcoming remarks from the Governor of Bali Province, Rector of the Udayana University, and Chairman of the Indonesian Ichthyological Society. Our four plenary speakers were sure to inspire participants with their broad experiences in their particular field. Prof. Dr. Nicolas Hubert (IRD, France) talked on DNA barcoding and biogeography of Sundaland freshwater fishes, Prof. Dr. Dr. habil. Sven M. Bergmann (Institute of Infectiology, Friedrich-Loeffler-Institut (FLI), Germany) delivered speak about Global warming and viral diseases – Tilapia Lake Virus (TiLV) on tilapia, common carp, crucian carp, and rainbow trout. Dr. Allen (Smithsonian Institution, USA) presented an excellent topic Towards a comprehensive barcode database for fishes of the US EEZ, and Prof. Dr. Teguh Peristiwady (Research Centre for Oceanography, Indonesia) shared the recent biodiversity of marine fishes from Indonesia.

A total of 148 manuscripts was presented in a two-day event, both in oral and poster presentations. More than 400 participants, including researchers, academicians, government and non-government officials, and graduate and undergraduate students from 9 countries, were involved in fruitful discussion and knowledge sharing. The submitted manuscripts have been through conscientious review and process to meet the qualifications of the international publication standard.

The proceedings are a compilation of the accepted articles based on their originality and significance to the aim of ISFFS 2021. All the accepted papers are grouped into five topic areas: Biodiversity, Fisheries Biology and Conservation, Aquaculture, Fish Capture and Fishing Gear, Post-harvest and Fish Processing Technology, and Fisheries Social, Economics, and Extension.

As chairman of the ISFFS 2021, I would like to express my sincere gratitude to plenary speakers, authors, reviewers, scientific editors, and all technical committee members who made the International Seminar on Fish and Fisheries Sciences was running well. Then the conference proceedings are ready to be published with E3S Web of Conferences. Last but not least, I also want to thank the Indonesian Ichthyological

Society, Faculty of Marine Science and Fisheries, Udayana University, Research Center for Fisheries, Ministry of Marine Affairs and Fisheries, Research Center for Biology, Indonesian Institute of Science (LIPI), BIONESIA- Biodiversitas Indonesia, Faculty of Fisheries and Marine Sciences, IPB University and the Jakarta Technical University of Fisheries for a good collaboration. Special thanks go to USAID through PEER Program BIONESIA and JAPFA, for their contribution to funding this seminar.

Chairman of ISFFS 2021,

Dr. Charles P. H. Simanjuntak

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Date and editor's signature **October, 28th 2021** **Prof. Dr. Endi S. Kartamihardja (Editor-in-Chief)**

All issues ▸ Volume 322 (2021)

Previous issue Table of Contents Next issue

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E3S Web of Conferences

Volume 322 (2021)

International Seminar on Fish and Fisheries Sciences (ISFFS 2021)

Bogor and Bali (Virtual), Indonesia, July 13-14, 2021

E.S. Kartamihardja, T. Peristiwady, S.M. Bergmann, E. Setyobudi, A. Collins, Alimuddin, C.P.H. Simanjuntak, N. Hubert, S.B. Andi Omar, Djumanto, P.G. Sasmita and D.F. Mokodongan (Eds.)

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Fish Capture and Fishing Gear

- *Biodiversity, Fisheries Biology and Conservation*

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Length-weight relationship and condition factor of Hamilton's thryssa fish (*Thryssa hamiltonii*) from Pabean Bay, West Java, Indonesia 01001

Ade Sunaryo

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DOI: https://doi.org/10.1051/e3sconf/202132201001

PDF (252.2 KB) | References | NASA ADS Abstract Service

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The length-weight relationships and condition factor of an endemic *Marosatherina ladigesi* Ahl, 1936 in Walanae Cenranae River Watershed, South Sulawesi, Indonesia 01002

Adiara Firdhita Alam Nasyrah, Muhammad F. Rahardjo, Charles P. H. Simanjuntak and Muhammad Nur

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132201002

PDF (385.7 KB) | References | NASA ADS Abstract Service

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The metal concentrations in several fish species on the coast of Muara Gembong, Bekasi Regency, West Java, Indonesia 01003

Adriani S. Nastiti, Dimas A. Hediato, Masayu R. A. Putri and Krismono

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132201003

PDF (335.5 KB) | References | NASA ADS Abstract Service

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Molecular barcoding of marine ornamental fish from the southern coast of West Java validates conventional identification 01004

Agus Nuryanto, Kusbiyanto Kusbiyanto and Dian Bhagawati

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DOI: https://doi.org/10.1051/e3sconf/202132201004

PDF (434.3 KB) | References | NASA ADS Abstract Service

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Cadmium (Cd) concentration in the carp (*Cyprinus carpio*) organs at Lau Kawar Lake, Karo Regency, North Sumatra 01020

Khatrin Melda Malau, Syafruddin Ilyas and Ternala Alexander Barus

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DOI: https://doi.org/10.1051/e3sconf/202132201020

PDF (314.5 KB) | References | NASA ADS Abstract Service

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Length-weight relationship and condition factor of tropical sand goby, *Acentrogobius caninus* (Valenciennes 1837) from Pabean Bay, West Java, Indonesia 01021

Lenny S. Syafei

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DOI: https://doi.org/10.1051/e3sconf/202132201021

PDF (450.5 KB) | References | NASA ADS Abstract Service

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Heavy metal contents of Hg, Cd, Pb, and Cu in splendid ponyfish *Eubleekeria splendens* (Cuvier, 1829) meat in Banten Bay, Indonesia 01022

Lisbet Sagala, Sulistiono and Djamar T.F.L. Batu

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DOI: https://doi.org/10.1051/e3sconf/202132201022

PDF (1.111 MB) | References | NASA ADS Abstract Service

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Identification of the spaghetti eels (*Moringua* Sp) at Pelabuhan Ratu, Indonesia using mtDNA control region sequences 01023

Melfa Marini

Published online: 11 November 2021

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PDF (362.9 KB) | References | NASA ADS Abstract Service

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Length-weight relationships Silver barb (*Barbonymus gonionotus*) in Mamberamo River, Papua 01024

Mirna Dwirastina and Marson

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Open Access

Detoxification mechanisms in oxidative stress and Reactive Oxygen Species (ROS) in gills of gambusia fish (*Gambusia affinis*) exposed to Cadmium 01025

Moh. Awaludin Adam, Ach. Khumaidi, Ramli, Ira Mei Widiastuti, Ernawati, Era Insivitawati and Agoes Soegianto

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DOI: https://doi.org/10.1051/e3sconf/202132201025

PDF (371.7 KB) | References | NASA ADS Abstract Service

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Fish fauna of the Batetangnga River, West Sulawesi, Indonesia 01026

Muhammad Nur, Fajriani, Tenriware, Charles P.H. Simanjuntak, Adiara Firdhita Alam Nasyrah, Neri Kautsari and Syainullah Wahana

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Composition of reef fish as a success indicator of the bio-transplants method in Tunda Island, Serang Regency, Banten Province 01027

Mujiyanto, A. R. Syam and Adriani. S. Nastiti

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DOI: https://doi.org/10.1051/e3sconf/202132201027

PDF (874.1 KB) | References | NASA ADS Abstract Service

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Reassessment of the mitochondrial 12S-rRNA gene for DNA barcoding of museum specimens of shelled marine gastropods from Japan 01028

Nao Fukunaga, Moe Shimizu, Shinnosuke Teruya, Nazifa Naziha Razali, Satoko Nakashima, Naoto Tomobuchi, Takenori Sasaki and Davin H. E. Setiamarga

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PDF (628.1 KB) | References | NASA ADS Abstract Service

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Spatial distribution and abundance of *Channa* striata Bloch1793 in Sempor Reservoir, Kebumen Central Java 01029

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The length-weight relationship and condition factor of Toothpony (*Gazza minuta* Bloch, 1795) from Pabean Bay, Indramayu, West Java 01030

O. D. Soebhakti Hasan

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PDF (462.9 KB) | References | NASA ADS Abstract Service

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Analysis of the economic impact of covid-19 on local community income on Natsepa Beach ecotourism in Central Maluku Regency 01031

Renoldy L. Papilaya and Costansa G. Lessil

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DOI: https://doi.org/10.1051/e3sconf/202132201031

PDF (786.1 KB) | References | NASA ADS Abstract Service

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Tropical marine fish from Celukan Bawang Port, Buleleng, Bali, Indonesia 01032

Rizkyanti Aulia, Riskha Hanifa, Nassa Arfiantinosa, Aris Mahmudi and Mohamad Nurul Huda

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DOI: https://doi.org/10.1051/e3sconf/202132201032

PDF (1.024 MB) | References | NASA ADS Abstract Service

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Effects of different wavelength from Light Emitting Diodes (LEDs) on growth and development in zebrafish (*Danio rerio*) embryos and larvae 01033

Shafira Septriani, Anley Teferra Kiddane, Gun Do Kim and Christopher L. Brown

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DOI: https://doi.org/10.1051/e3sconf/202132201033

PDF (1.976 MB) | References | NASA ADS Abstract Service

Open Access

Efficiency of suspended solid removal from tofu production using Rotating Biological Contractor (RBC) 01034

Shafira Septriani, Norman Arie Prayogo, Asrul Sahri and Christopher L. Brown

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Open Access

The edu-tourism fisheries as an alternative to the development of tourism in Gunung Salak village Selemadeg Timur District Tabanan Regency, Bali Province 01040

Yenni Nuraini, Diah Ayu Meriana Sari and Abdul Hanan

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PDF (1009 KB) | References | NASA ADS Abstract Service

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Improvement of livebearer fish reproductive performance using Oocyte Developer (OODEV) 02001

Andri Iskandar, Muhammad A. Rafiuddin and Agus O. Sudrajat

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Ectoparasite infestation and *Vibrio alginolyticus* bacterial infection in super-intensive ponds with high ammonia levels of *Penaeus vannamei* 02002

Aprillia Deriyanti, Gunanti Mahasri and Kismiyati

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Development potential of native fish in Batang Toru Watershed, North Sumatra, Indonesia: discussion on the impact of dam development and aquaculture efforts 02003

Dadang Shafrudin, Sulistiono, Charles P. H. Simanjuntak, M. Fadjar Rahardjo, Dudi M. Wildan, Totok Hestiranoto, Thomas Nugroho and Agus Joko Ismanto

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Mariana Lusiastuti

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Effect of Different Stocking Density of Snakehead Fish (*Channa striata*) Cultured in Recirculation Aquaculture System 02005

Dewi Puspaningsih, Lies Setijaningsih, Eri Setiadi and Imam Taufik

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DOI: https://doi.org/10.1051/e3sconf/202132202005

PDF (1.545 MB) | References | NASA ADS Abstract Service

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The effects of differences in water exchange on the productivity of glass eel stage in *Anguilla bicolor* bicolor culture 02006

Eri Setiadi, Adang Saputra and Imam Taufik

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PDF (805.4 KB) | References | NASA ADS Abstract Service

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Study of the utilization of *Azolla microphylla* as alternative feed by *Tilapia farmers in* Panjalu Ciamis, West Java Province, Indonesia 02007

Ganjar Wiryati

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Potentially new emerging diseases on two species of Indonesian freshwater aquaculture: giant gourami (*Osphronemus gourami*) and Asian catfish (*Pangasius hypophthalmus*) 02008

Hessy Novita, Septyan Andriyanto, Tuti Surniati and Taukhid

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132202008

PDF (376.9 KB) | References | NASA ADS Abstract Service

1 & 2) vaccines on tilapia, *Oreochromis niloticus* 02014

Taukhid, Angela M. Lusiastuti, Septyan Andriyanto, Desy Sugiani, Tuti Sumiati and Achmad Suhermanto

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PDF (304.6 KB) | References | NASA ADS Abstract Service

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Use of minute duckweed (*Lemna perpusilla*) for supplemental feed in catfish (*Clarias* sp.) culture: determination of the optimal proportion using powersim simulation 02015

Tjandra Chrismadha, Livia Rossila Tanjung and Sutrisno

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DOI: https://doi.org/10.1051/e3sconf/202132202015

PDF (379.5 KB) | References | NASA ADS Abstract Service

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Effects of the microbiome manipulation on survival and GI tract development of larval zebrafish (*Danio rerio*) 02016

Uthpala Padeniya, Shafira Septriani, Arjay Pataueg and Christopher L. Brown

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PDF (416.5 KB) | References | NASA ADS Abstract Service

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The effect of rearing media salinity on survival, growth, and blood glucose of juvenile mahseer (*Tor soro*) 02017

Yohanna R. Widyastuti, Eri Setiadi and Yosmaniar

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PDF (589.8 KB) | References | NASA ADS Abstract Service

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Vulnerability level of target and by-catch species on tuna hand line (HL-TR) fishery in Indonesian Fisheries Management Area I-FMA 573 based at Sadeng Fishing Port 03001

DOI: https://doi.org/10.1051/e3sconf/202132203001

PDF (672.7 KB) | References | NASA ADS Abstract Service

Open Access

The effect of escape gaps of cylinder folding traps on fish catch at the coastal waters of Tuban Regency 03002

Farrel Nafis Adyatama, Ghassan Nurul Huda, Nahla Alfiatunnisa, Faizal Rachman, Supardjo Supardi Djasmani, Riza Yuliratno Setiawan, Suwarman Partsuwiryo, Djumanto and Eko Setyobudi

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132203002

PDF (407.6 KB) | References | NASA ADS Abstract Service

Open Access

Estimated production, catch per unit effort, biological aspects of tuna, skipjack, and small tuna in North Sumatra 03003

Gussasta Levi Arnenda, Fathur Rochman, Arief Wujdi and Roy Kurniawan

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132203003

PDF (439.4 KB) | References | NASA ADS Abstract Service

Open Access

Comparison of handline tuna catches in Indian Ocean and Banda Sea waters 03004

Ignatius Tri Hargiyatno, Regi Fiji Anggawangsa, Moh. Natsir, I. Gede Bayu Sedana, Agustinus Anung Widodo and Wudianto

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132203004

PDF (810.4 KB) | References | NASA ADS Abstract Service

Open Access

Does *cantrang* trawl fishing become more efficient after the partial trawl ban? a case study of technical efficiency of *cantrang* fishery in the Java Sea – Indonesia 03005

Kamaluddin Kasim, Duto Nugroho, Umi Muawanah, Setiya Triharyuni and Andrias S. Samusamu

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132203005

PDF (692.9 KB) | References | NASA ADS Abstract Service

Open Access

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DOI: https://doi.org/10.1051/e3sconf/202132203006

PDF (772.0 KB) | References | NASA ADS Abstract Service

Open Access

Fish catches diversity of the glass eel fishery in Cikaso and Cimandiri estuaries, Sukabumi, Indonesia 03007

Shafira Bilqis Annida, Zulkarnain, Ronny Irawan Wahju, Charles P.H. Simanjuntak, Faqih Baihaqi, Tri Prabowo and Muhammad Syarif Budiman

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PDF (2.700 MB) | References | NASA ADS Abstract Service

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Open Access

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Ernawati, Moh. Awaludin Adam, Irawati Mei Widiastuti and Era Insivitawati

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Open Access

Proofing banana blossom (*Musa acuminata*) water-soluble extract as histamine forming antibacteria 04002

Hartati Kartikaningsih, I. Yahya, Lina Asmara Wati, Supriyadi Supriyadi, Rhytia Ayu Christianty Putri and Rika Kurniaty

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132204002

PDF (951.3 KB) | References | NASA ADS Abstract Service

Open Access

The expression patterns of HSP70 and HSP90 genes of abalone (*Haliotis squamata*) using 2-phenoxyethanol as an anaesthetic during transportation 04003

Ngurah S. Yasa, Lutfi Anshory, Winarno and Pande Gde Sasmita Julyantoro

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132204003

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DOI: https://doi.org/10.1051/e3sconf/202132204004

PDF (267.5 KB) | References | NASA ADS Abstract Service

Open Access

The effect of hydrolysis duration on the antibacterial activity of swamp eel head protein hydrolysate produced by papain against histamine-producing bacteria 04005

Witya Hafifani, Indun D. Puspita and Masagus M. P. Putra

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132204005

PDF (436.6 KB) | References | NASA ADS Abstract Service

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Open Access

Small scale fisheries performance: comparative analysis before and during the Covid-19 pandemic in Indonesia 05001

Alimudin Laapo, Dietriech G. Bengen, Kamsina, Taryono Kodiran and Dafina Howara

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PDF (317.0 KB) | References | NASA ADS Abstract Service

Open Access

Condition of shrimp culture ponds in the South Coast of Cilacap Regency, Central Java, Indonesia 05002

Ardhana Reswari Utami, Bambang Widigdo and Sulistiono

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132205002

PDF (555.3 KB) | References | NASA ADS Abstract Service

Open Access

Characteristic and evaluation of sustainability artisanal bonito (*Auxis* spp.) fisheries in the Prigi Bay and surrounding waters 05003

Arief Wujdi, Bram Setyadji, Hety Hartaty and Ririk Kartika Sulistyaningsih

Published online: 11 November 2021

DOI: https://doi.org/10.1051/e3sconf/202132205003

PDF (638.2 KB) | References | NASA ADS Abstract Service

Northeastern Indian Ocean 05004

Bram Setyadji, Hety Hartaty, Arief Wujdi and Ririk K. Sulistyaningsih

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DOI: https://doi.org/10.1051/e3sconf/202132205004

PDF (405.8 KB) | References | NASA ADS Abstract Service

Open Access

Utilization rate and length-weight relationship of shortfin scad (*Decapterus macrosoma*) in Bali Strait Indonesia 05005

Gatut Bintoro, Ledhyane I. Harlyan, Tri D. Lelono and Nofita A. Andini

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DOI: https://doi.org/10.1051/e3sconf/202132205005

PDF (479.9 KB) | References | NASA ADS Abstract Service

Open Access

Performance analysis and mentoring strategy of fish farmers groups in Muntilan Sub District, Magelang Regency, Central of Java Province 05006

Ina Restuwati and Achmad K. A. Munif

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PDF (850.6 KB) | References | NASA ADS Abstract Service

Open Access

Business analysis of black soldier fly (BSF) as an alternative feed for fish cultivation in Bogor City, West Java 05007

M. Harja Supena, Asnawi, Sobariah, Suratman, Ganjar Wiryati and A. Subagio

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DOI: https://doi.org/10.1051/e3sconf/202132205007

PDF (240.3 KB) | References | NASA ADS Abstract Service

Open Access

Population structure of tropical eel (*Anguilla bicolor bicolor*) in Cikaso River, West Java 05008

Masayu Rahmia Anwar Putri and Tati Suryati Syamsudin

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PDF (609.1 KB) | References | NASA ADS Abstract Service

Pariaman Regency of West Sumatera, Indonesia 05009

Mustika Firdaus, Sulistiono and Bambang Widigdo

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DOI: https://doi.org/10.1051/e3sconf/202132205009

PDF (373.9 KB) | References | NASA ADS Abstract Service

Open Access

Community Empowerment through Processed Diversification and Marketing Strategy of the *Wanita Gemari Polkahsar* in Pemalang District 05010

Nayu Nurmalia, Tatty Yuniarti and Mauliddyane Zidhane

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DOI: https://doi.org/10.1051/e3sconf/202132205010

PDF (394.9 KB) | References | NASA ADS Abstract Service

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Otolith shape as a tool for representing different growth in young and adult yellowfin tuna (*Thunnus albacares*, Bonnaterre, 1788) 05011

Ririk Kartika Sulistyaningsih, Bram Setyadji, Hety Hartaty and Arief Wujdi

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PDF (464.9 KB) | References | NASA ADS Abstract Service

Open Access

Financial analysis of catfish cultivation feeding with black soldier fly (maggot) at fish-farmers' group TPS3R Kayumanis, Bogor, West Java, Indonesia 05012

Sobariah

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PDF (289.2 KB) | References | NASA ADS Abstract Service

Open Access

Utility of Batang Toru River (North Sumatra, Indonesia) for fishery activities of the local communities: a study on fisheries socioeconomic condition 05013

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The length-weight relationship and condition factor of Toothpony (*Gazza minuta* Bloch, 1795) from Pabean Bay, Indramayu, West Java

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Abstract. The purpose of this study is to specify the length-weight relationship and to evaluate the relative condition factor of toothpony (*Gazza minuta* Bloch 1795) in Pabean Bay, Indramayu, West Java. The fish collection was carried out monthly from January 2016 to December 2016, and a total of 190 individual fishes were caught using gillnet with mesh sizes varying from 1 to 2 inches. The fish samples ranged from 30 – 138mm in length and 0.41 – 35.83 g in weight. The length-weight relationship was $W= 1.51\ 10^{-4}\ L^{2.388,}$ and the condition factors of fish varied from 1.1 ± 0.22 to 2.03 ± 2.29. These results indicate that the growth pattern of toothpony (*Gazza minuta* Bloch 1795) in Pabean Bay was allometric negative.

1 Introduction

Pabean bay is located in the northern part of Indramayu, West Java, Indonesia. Roughly 78 species from 39 families have been reported caught in Pabean bay, and one of them is the *Leiognathidae* family[1]. *Gazza minuta* (Bloch 1975) from the family Leiognathidae is a small-sized (< 300 mm in standard length) body frame oval and particularly compressed; dorsal and ventral profiles similarly convex, reasonably deep. Mouth pointing ahead while protracted, with a wonderful caniniform tooth in each jaw[2, 3]. *Gazza minuta* Bloch, 1795 is known locally as peppered fish, and these species are often encountered in Pabean Bay. However, information about the biological characteristics of these species is very limited.

One important factor in the study of fish biology is the length-weight relationship and condition factor to providing information on the stock condition in fisheries management[4]. Fish biomass is often calculated from abundance by length using the length-weight relationship in the yield assessment [5–7]. The tools for analyzing growth or morphometric that used which many researchers have used the length-weight relationship of fish in an area/water for an individual species such as *Mystus nigriceps, Tilapia mossambica, Johnius belangerii,* and *Sardinella lemuru* Bleeker[8–11].

The length-weight relationship provides an overview of the growth pattern and the fish body status condition [12]. The fish body that increases in all dimensions in the same proportion of growth is called isometric allometric. In contrast, negative allometric growth

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means that the fish's body becomes leaner as it gains weight while the fish becomes relatively fatter or deeper due to increasing length is called positive allometric[13].

Condition factor is a value that indicates fish fatness, which can be used as an instrument to show changes in fish condition throughout the year, thereby contributing to fish management activities[14]. This conditioning factor measures various ecological and biological factors on the environment concerning the feeding condition. The higher condition factor means the fish condition is better. Factors that affect the condition of fish such as fish biology (size, age, and sex)[15], season[16, 17], water quality parameters[13, 18], and availability of feeds [19]. The objectives of this study are the length-weight relationship and evaluating conditional factors of toothpony (Gazza minuta Bloch 1795) in Pabean Bay.

2 Materials and methods

The study was conducted in Pabean bay Indramayu district West Java Province, Indonesia (Figure 1). *Gazza minuta* Bloch, 1795 (Figure 2)[20], was carried out monthly from January 2016 to December 2016. Data were taken from a total of 190 individual fishes by measuring each fish's length-weight, and sampling was grouped according to the time of data collection on a quarterly using digital scales respectively were caught using gillnet with mesh sizes varying from 1 to 2 inches.

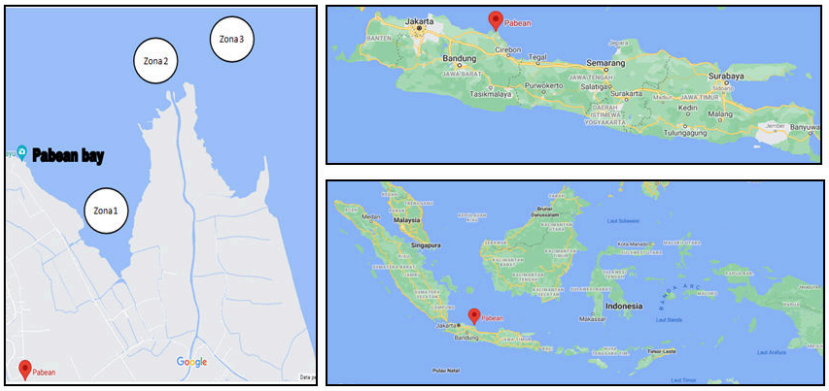

Fig. 1. The site for study in Pabean bay, Indramayu, Indonesia.

Fig. 2. Toothpony, *Gazza minuta* (Bloch 1795)[20].

The standard length (SL) and total length (TL) have a measurement accuracy of 1mm and standard weight with an accuracy of 0.1 g [21]. The Allometric equation used to determine the relationship between length and weight of fish expressed in the form [19]:

$$W = aL^b \quad (1)$$

where W means the total weight (g), a means the coefficient constant for the growth index, L means the total length (mm), and b means the slope for the growth coefficient. Biological factor expressed with b value; if a fish body that increases in all dimensions in the same proportion of growth or an equivalent shape and grows increases isometrically (b=3). It shows an allometric positive if the bodyweight increases more than length means that the fish becomes relatively fatter or deeper due to increasing length (b>3). It shows an allometric negative if the body length increases more than weight (b<3)means that the fish's body becomes leaner as it gains weight[21,22].

The equation below is used to evaluate the condition factor of fish[23]:

$$K = \frac{100\,W}{L^3} \quad (2)$$

where K means the condition factor, W means the total weight (g), L means the total length (cm), and 3 means the cubic length-weight relationship. The collected data is analyzed using descriptive statistics.

3 Results

The total sample fish of *Gazza minuta* (Bloch 1975) taken are 190 samples. The fish body sizes ranged from 30 – 138 mm in length and 0.41 – 35.83 g weight**.** All estimated data of body size, length-weight relationships, and condition factors of *Gazza minuta* (Bloch 1975) from Pabean bay are shown group quarterly in Table 1 and Table 2.

Table 1. Total length and weight of *Gazza minuta* (Bloch 1795) Pabean Bay.

Times	n	Total length (mm)			Weight (g)		
		Min	Max	Mean ± SD	Min	Max	Mean ± SD
January – March (Q1)	80	30	105	62.66 ± 18.24	0.52	15.62	4.73 ± 4.18
April – June (Q2)	25	34	121	63.28 ± 23.52	0.54	18.45	3.62 ± 4.70
July – September (Q3)	57	36	138	65.63 ± 21.76	0.52	35.83	4.44 ± 6.23
October – December (Q4)	28	34	112	57.79 ± 15.50	0.41	11.46	3.06 ± 2.44
Year (Y)	190	30	138	62.92 ± 19.75	0.41	35.83	4.15 ± 4.74

n = Number of fish samples, SD = standard deviation

Table 2. Length-weight relationship and condition factor of *Gazza minuta* (Bloch 1795) Pabean bay.

Times	n	a	b	AllometricPattern	K
					Mean ± SD
January – March (Q1)	80	$1.67\ 10^{-3}$	1.847	Negatif	2.03 ± 2.29
April – June (Q2)	25	$1.73\ 10^{-3}$	1.738	Negatif	1.27 ± 0.63
July – September (Q3)	57	$7.9\ 10^{-6}$	3.075	Positif	1.10 ± 0.22
October – December (Q4)	28	$1.7\ 10^{-5}$	2.937	Negatif	1.36 ± 0.35
Year (Y)	190	$1.51\ 10^{-4}$	2.388	Negatif	1.42 ± 0.89

n = Number of fish samples, SD = standard deviation, a = constant, b = slope, K = condition factor

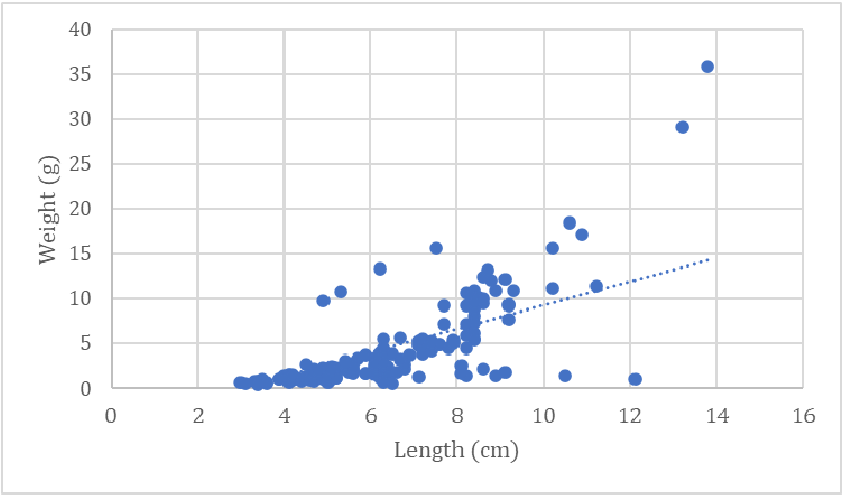

Fig. 3. The relationship between body weight and total length of *Gazza minuta* (Bloch 1795) from Pabean bay (annual growth pattern Y) that fish grew negatively allometric.

The collected data shown that the length-weight relationship equation for *Gazza minuta* (Bloch 1795) is expressed as follow $W_{Q1} = 1.67\ 10^{-3}\ L^{1.847}$, $W_{Q2} = 1.73\ 10^{-3}\ L^{1.739}$, $W_{Q3} = 7.9\ 10^{-6}\ L^{3.075}$, $W_{Q4} = 1.7\ 10^{-5} L^{2.937}$, and $W_{year} = 1.51\ 10^{-4}\ L^{2.388}$. The collected data shown that the length-weight relationship equation for *Gazza minuta* (Bloch 1795) is expressed as follow $W_{Q1} = 1.67\ 10^{-3}\ L^{1.847}$, $W_{Q2} = 1.73\ 10^{-3}\ L^{1.739}$, $W_{Q3} = 7.9\ 10^{-6}\ L^{3.075}$, $W_{Q4} = 1.7\ 10^{-5}\ L^{2.937}$, and $W_{year} = 1.51\ 10^{-4}\ L^{2.388}$.The result of the study shows, most of the time had negative allometric growth. The b value on Q1-Q4 except Q3 shown that b<3 likewise group Y. The b values on the length-weight relationship equation are subject to the shape and fatness of the *Gazza minuta* (Bloch 1795). It is also dependent on biological and environmental conditions, temporal sampling factors, season, water quality, and food availability [4,13,24–27].

4 Discussion

The results that are shown in figure 3 indicated that the length-weight relationship on annual growth (Y) was a significant positive correlation where coefficient r (R square) = 0.6315.

Several studies have been conducted for several fish species that temperature, spawning season, sex, and species diversity affect the condition factor [7,18,28,29]. The condition factor increases with weight when the temperature drops on the contrary, when the temperature rises, which affects the length-weight relationship [18,24]. These factors were not considered in the present study.

The past study showed that Pabean bay is an aquatic ecosystem with characteristics influenced by the environment[1]. Table 2 shows that the condition coefficient is used as an indicator of variability due to the growth coefficient (b), one of the standard fishery practices. The study shows that condition factor (K_{mean}) varied from 1.1 ± 0.22 to 2.03 ± 2.29 and most of the time had a condition factor K > 1. *Gazza minuta* (Bloch 1795) is a small to medium-sized fish with a short life span range from 1.5 to 1.8 years with small L and large K values. The past study showed that the short-lived species have a small L and a high K value, and long-lived species have a higher L with a low K value[24].

5 Conclusion

This study result provided the data about the relationship length and weight, evaluating condition factor for *Gazza minuta* species collected from the Pabean Bay, Indramayu, Indonesia. Almost all length-weight relationships showed a negative allometric growth of fish, indicating that the growth of this fish is getting leaner along with the increase in length and a slimmer body. This may be due to biological and environmental conditions or linked to morphological characteristics specific.

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