

Table of contents

Volume 679

2021

◀ Previous issue Next issue ▶

The 1st International Conference on Biotechnology and Food Sciences 11 September 2020, Surabaya, Indonesia

Accepted papers received: 08 February 2021

Published online: 26 February 2021

Open all abstracts

Preface

OPEN ACCESS 011001

The 1st International Conference on Biotechnology and Food Sciences (INCOBIFS)
Surabaya Indonesia, 11 September 2020

+ Open abstract  View article  PDF

OPEN ACCESS 011002

Conference Photographs

+ Open abstract  View article  PDF

OPEN ACCESS 011003

Organizing Committee

+ Open abstract  View article  PDF

OPEN ACCESS 011004

Peer review declaration

+ Open abstract  View article  PDF

Papers

OPEN ACCESS 012001

Converting husbandry waste into liquid organic fertilizer using probiotic consortiums
(*Lactobacillus* sp., *Rhodopseudomonas* sp., *Actinomycetes* sp., *Streptomyces* sp.)

S Amrullah, M. Amin and M Ali

+ Open abstract  View article  PDF

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



OPEN ACCESS

OPEN ACCESS

A review: bioactive compounds of macroalgae and their application as functional beverages

012002

S G Widyaswari, Metusalach, Kasmianti and N Amir

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012003

Improvement quality of sugar cane bagasse as fish feed ingredient

L H Suryaningrum and R Samsudin

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012004

The Growth and Yields of Shallot (*Allium Wakegi* Araki) CV. lembah palu Growing under Hydroponic Substrate Systems

R Yusuf, S A Lasmini, M Sandi, A Rahim and I Wahyudi

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012005

Application of glycerol on bioplastic based carrageenan waste cellulose on biodegradability and mechanical properties bioplastic

S N Fauziyah, A S Mubarak and D Y Pujiastuti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012006

Gill and skin pathology of hybrid grouper (*E. fuscoguttatus* x *E. lanceolatus*) infested *Zeylanicobdella arugamensis* worms in different infestations degree

M Nisa, G Mahasri and L Sulmartiwi

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012007

Growth performance of tambaqui (*Colossoma macropomum*) supplemented with honey prebiotic in stagnant peat ponds

H Silalahi, R Djauhari and S S Monalisa

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012008

The Concentration of polyethylen glycol (PeG) 400 on bioplastic cellulose based carrageenan waste on biodegradability and mechanical properties bioplastic

D S Maulana, A S Mubarak and D Y Pujiastuti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012009

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



Fish oil extraction as a by-product of Tilapia (*Oreochromis* sp.) fish processing with dry rendering method

S H Suseno, A K Rizkon, A M Jacob, Kamini and D Listiana

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012010

Optimization of Extraction Time on The Characteristic of Gelatin from Scales of Red Snapper (*Lutjanus* sp.)

I Safi'i, W Tjahjaningsih and E D Masithah

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012011

Screening acetylcholinesterase inhibitors from marine-derived actinomycetes by simple chromatography

M Kamaruddin, I Marzuki, A Burhan and R Ahmad

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012012

Assessment of Heavy Metal Lead (Pb) Contents in Canned Crab Products by Atomic Absorption Spectrophotometry (AAS)

M Agustina, Mulyono and W Tjahjaningsih

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012013

The concentration of sorbitol on bioplastic cellulose based carrageenan waste on biodegradability and mechanical properties bioplastic

M D Arief, A S Mubarak and D Y Pujiastuti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012014

Identification photoprotective activity of marine seaweed: *Eucheuma* sp

R D Kasitowati, A Wahyudi, R Asmara, D Aliviyanti, F Iranawati, M A P Panjaitan, D C Pratiwi and S Arsad

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012015

Analysis of the density and intensity of metallothionein in *Crassostrea cucullata* oyster hulls in the coastal fishing port of Mayangan Probolinggo, East Java using immunohistochemical techniques

W Isoni, N Maulida and M I Mubarogi

[+ Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more,

[see our Privacy and Cookies policy.](#)

012016 

The effect of different bait on the catch of traps in the waters of the tip of Pangkah Gresik Regency, East Java

W Isoni, N Maulida and M Huda

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012017

The Identification and Distribution Components of Polycyclic Aromatic Hydrocarbon Contaminants at the Port of Paotere, Makassar, South Sulawesi

I Marzuki, I Pratama, H E Ismail, I. Paserangi, M Kamaruddin, M. Chaerul and R Ahmad

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012018

Koi (*Cyprinus carpio*) Hatchery techniques: its performance in BBI Boyolali

M G Laksono, Sugianta and M B Santanumurti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012019

Ectoparasite infestation and survival rate of pacific white shrimp (*Litopenaeus vannamei*) that immunized with crude protein *Zoothamnium penaei* in intensive ponds

G Mahasri, A T Mukti, M Nisa, G C Prakosa and W H Satyantini

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012020

Study of crude extract yield and gonad maturity level of sea cucumber *Phylloporus dobsoni* correlation

S Andriyono, E D Masithah and D Winarni

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012021

Techniques of additional *Kappaphycus alvarezii* on seaweed face mask production

N R Prima and S Andriyono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012022

Ice cream properties affected by carrageenan from seaweed deference type drying methods

I Irawan and Fitriyana

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012023

The effect of washing on the making of surimi and kamaboko tilapia (*Oreochromis sp.*)

E Saputra, W Tjanjungsih and A A Abdillah

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012024

The effect of storage on the making of surimi and kamaboko tilapia (*Oreochromis* sp.)

E Saputra, W Tjahjaningsih and A A Abdillah

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012025

Molecular identification and prevalence of endoparasite worms in Silver pompano (*Trachinotus blochii*) in floating net cages of Mari-culture Center, Lampung

L N F Haryanto, S Subekti, H B Ardiyanti, M K Amiin, R E K Akbar, I Achmadi and M A Yudarana

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012026

Microbiology safety of green mussel, *Perna viridis* after treated with boiling and *sous vide*

A S Samsudin and N U Karim

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012027

The utilization of chitosan from Comb-pen shell (*Atrina pectinata*) as an emulsion stabilizer in the production of hand body cream

Y Supratin, L Sulmartiwi and E Saputra

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012028

The potential of chitosan from comb-pen (*Atrina pectinata*) shell waste on the characteristics of hand body cream

F Fauzi, L Sulmartiwi and E Saputra

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012029

Spawning technique of yellowfin tuna (*Thunnus albacares*) infloating nets cage

B Bramantya, Gunawan and L A Sari

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012030


Enlargement technique of humpback grouper (*Cromileptes altivelis*) with floating nets cage

G Y Pamungkas and L A Sari

[+ Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



-
- OPEN ACCESS** 012031
Microencapsulated fish oil powder by spray drying using combination of wall materials in Kasetsart University, Bangkok
I Aprilia, D Y Pujiastuti and W Klaypradit
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012032
Effect of deacetylation conditions on physicochemical properties of chitosan derived from shrimp shell and squid pen
A R Basarah, D Y Pujiastuti and Yaowapha Waiprib
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012033
Substitution of patin *Pangasius pangasius* flour in making sticks as an alternative of food high protein and source of calcium for autism patients
V Amelia, S Subekti and L Sulmartiwi
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012034
Antioxidant properties from seaweeds *Kappaphycus alvarezii*, *Euchema spinosum* and *Sargasum* sp. using different solvent
A A Abdillah, M A Alamsjah and N E Nasution Sugijanto
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012035
Effect of kappa-carrageenan on physicochemical properties of mantou (Chinese steamed bread)
M H C Putra and A A Abdillah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012036
The application of betacyanin microcapsules as natural food colorant on beverage model
S R Nurbaya, W D R Putri, E S Murtini and A Khamidah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012037
Microbial quality and diversity of *Caesio cunning* and *Scolopsis taenioptera* harvested by using trap and trawl fishing techniques
M Suhaimi and N U Karim
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012038
See our Privacy Policy and Cookies policy. 

Characteristics physicochemical of melanin from squid ink (*loligo sp.*) extracted by ethanol

F Abidin, L Sulmartiwi and E Saputra

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012039

Analysis of fluctuating asymmetry of black strain tilapia *oreochromis niloticus* and red strain tilapia *Oreochromis niloticus* in Kabat Fish Hatchery Center Banyuwangi, East Java

D Kurniawan and A H Fasya

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012040

Utilization of fermented Seligi leaf flour *Phyllanthus buxifolius* toward the specific growth rate, daily growth rate and survival rate of siam catfish (*Pangasius pangasius*)

Y G Budiman, M Lamid, B S Rahardja and M Amin

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012041

Improving crude protein and crude fat content of Seligi leaf (*Phyllanthus buxifolius*) flour through probiotic fermentation

A K Nisa, M Lamid, W P Lokapirnasari and M Amin

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012042

Addition of turmeric in feed on growth and survival rate of Nilasa red tilapia (*Oreochromis sp.*)

R Cahyani, W H Satyantini, D D Nindarwi and Y Cahyoko

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012043

Characterization of semi-refined kappa-carrageenan from *Kappaphycus alvarezii* with different solvents in Tanjung Sumenep

H M Noor, M A Alamsjah and S Andriyono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012044

The substitution effect of bone fish flour milkfish (*Chanos chanos*) physical and chemical characteristics of cookies

I Muzaki, H Suprpto and R Kusdarwati

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012045

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



Identification and the prevalence of fungal gouramy (*Osphronemus gouramy*) in modern market Surabaya

M S Andreas, R Kusdarwati and H Suprpto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012046

Substitution of commercial feed with maggot meal (*Hermetia illucens*) to the growth rate, feed conversion ratio and feed efficiency catfish (*Pangasius pangasius*)

M Ulumiah, M Lamid and K T Pursetyo

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012047

Correlation between water quality with prevalence of black tiger shrimp (*Penaeus monodon*) infested by ectoparasite protozoa in traditional ponds of Wonorejo, Surabaya

M A Luthfi, S Subekti and G Mahasri

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012048

Study of nitrogen (N) and phosphorus (P) in the land of mangrove sediments in ecotourism area Wonorejo Surabaya and coastal area of Jenu Tuban

N Pradipta, M A Alamsjah and E D Masithah

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012049

Corellation of water quality to the prevalence of ectoparasite in milkfish (*Chanos chanos*) in Sedati District, Sidoarjo

H Irawan, Kismiyati and G Mahasri

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012050

Effect of soaking time of blood cockle (*Anadara* sp.) shells powder with hydrochloric acid on the characteristics of nano calcium

D S Herlina, L Sulmartiwi and E D Masithah

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012051

Addition of crude fish oil (CFO) in feed toward fat and energy retention of mud crab (*Scylla serrata*)

S Hadijah, Agustono and W P Lokapirnasari

[+ Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.

012052

Effectiveness of giving clove oil as an anaesthetic for survival rate and number of leucocytes in cantang grouper (*Epinephelus* sp.) in the closed transportation

S Nurkomaria, H Suprpto and Sudarno

[+](#) [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012053

Effect of the addition of crude fish oil (CFO) in feed to the content of EPA and DHA in mud crab (*Scylla serrata*)

T Wijaya, Agustono and M A A Arif

[+](#) [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012054

The effectiveness combination of maggot (*Hermetia illucens*) flour with commercial feed on growth rate, feed conversion ratio, and feed efficiency of tilapia (*Oreochromis niloticus*)

V Indriawati, B S Rahardja and Prayogo

[+](#) [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012055

Depuration of heavy metals Pb and Cd content in blood cockles (*Anadara antiquata*) with different filters

W Arifin, B S Rahardja and K T Pursetyo

[+](#) [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012056

Substitution of commercial feed with fermented banana peel flour (*Musaceaea* sp.) and fish meal to feed consumption level, specific growth rate, feed efficiency, fat retention, and energy retention in siam catfish (*Pangasius hypophthalmus*)

A Aisyah, A S Gustiningrum, Agustono and M A Al-Arif

[+](#) [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012057

The effect *Moringa oleifera* leaf extract and *Lactobacillus acidophilus* supplementation on crude protein and crude fat retention in Tambaqui, *Colossoma macropomum*

R A Pitri, E Suyanti, S Septayani, Agustono and W P Lokapirnasari

[+](#) [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012058

Molecular identification and prevalence of ectoparasite worms in barramundi (*Lates calcarifer*) in Lampung Waters

I Achmadi, S Subekti, H B Ardiyanti, M K Amiin, L N F Haryanto, R E K Akbar and M A Yudarana

[+](#) [Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).



OPEN ACCESS

012059

Morphological profile of L2 *Anisakis typica* on Indian Mackerel (*Rastrelliger kanagurta*) from Sedati Fish Auction, Sidoarjo-East Java, Indonesia using Scanning Electron Microscope (SEM)

N Suryani, S Subekti, S Koesdarto and M K Amiin

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012060

Occurance of Anisakis of mackarel tuna (*Euthynnus affinis*) from Sendangbiru fishing auction place, East Java, Indonesia

R Bobsaid, P D W Sari and S Subekti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012061

The study of virus collation with the polymerase chain reaction (PCR) method in export fishery commodities

L Kurniawati and K T Pursetyo

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012062

Effect of Culture Combination on Growth and Carrageenan Content of *Kappaphycus alvarezii* Green and Red Variety

A A Abdillah and J Triastuti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012063

Nitrate and phosphate dynamics of phytoplankton abundance in Kanceng River, Sepuluh, Bangkalan, East Java, Indonesia

D D Nindarwi, S H Samara and M B Santanumurti

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012064

Assessment of Seasonal Waters Quality Based on Abundance, Diversity, and Domination of Phytoplankton in Bajulmati Reservoir

E W Pertiwi, E D Masithah and Suciyono

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012065

Effect of sublethal dose organophosphate pesticides on embryogenesis and hatching rate of silver rasbora eggs (*Rasbora argyrotaenia*)

A B Prastika, L Sulmartiwi and L Lutfiyah

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.

[+ Open abstract](#) [View article](#) [PDF](#)



OPEN ACCESS

012066

The correlation between temperature and intensity of *Zeylanicobdella arugamensis* on cantang grouper (*E. fuscoguttatus* × *E. lanceolatus*) from traditional ponds in the Kampung Kerapu Lamongan East Java Indonesia

D D Afifah, G Mahasri and W H Satyantini

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012067

Utilization of *Nitrosomonas* sp and *Nitrobacter* sp probiotic towards total suspended solid and ammonia level in Nile tilapia culturing using aquaponic system

K H Dwiardani, Prayogo and B S Rahardja

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012068

The administration of *Caulerpa racemosa* extract on total bacteria and survival rates of white shrimp (*Litopenaeus vannamei*) after infected by *Vibrio parahaemolyticus*

A F Pratiwi, W H Satyantini, G Mahasri, L Sulmartiwi, A T Mukti and Sudarno

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012069

Examination of Taura Syndrome Virus (TSV) in white shrimp (*Litopenaeus vannamei*) and tiger prawn (*Penaeus monodon*) with Polymerase Chain Reaction (PCR) method

A N Fadilah and A H Fasya

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012070

Potential utilization of kombucha as a feed supplement in diets on growth performance and feed efficiency of catfish (*Clarias* sp.)

H U Ramadhan, Prayogo, H Kenconoajati, B S Rahardja, M H Azhar and D S Budi

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012071

Application of edible film from chitosan as biodegradable packaging

E Saputra, W Tjahjaningsih and A A Abdillah

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012072

Substitution of commercial feed with fermented banana peel flour (*Musaceaea* sp.) and fish meal to crude protein, energy, crude lipid and organic matter of meat in siamese catfish (*Pangasius hypophthalmus*)

R Z Darmawan, S M Ghaisani, Agustono and M A Al-Arif

[+ Open abstract](#) [View article](#) [PDF](#)
This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



OPEN ACCESS

012073

The effect of garlic (*Allium sativum*) and turmeric (*Curcuma longa*) extract addition in commercial feed on feeding rate, feed efficiency and feed conversion ratio of gouramy fish (*Osphronemus gouramy*)

D Afifah, M Arief and M A Al-Arif

[+ Open abstract](#)[View article](#)[PDF](#)**OPEN ACCESS**

012074

The Variability in Population Structure of Gastropods in Sedati Waters, Sidoarjo Regency, East Java

S Fadliyah, L A Sari, K T Pursetyo, A Zein, M H Idris and Y Cahyoko

[+ Open abstract](#)[View article](#)[PDF](#)**OPEN ACCESS**

012075

The effect of pH and incubation time on crude protease enzymes activity of *Bacillus mycoides* from anchovy isolates (*Stolephorus* sp.)

D Nirmala, P Yudha and D Cahyanto

[+ Open abstract](#)[View article](#)[PDF](#)**OPEN ACCESS**

012076

The influence of garlic (*Allium sativum*) and turmeric (*Curcuma longa*) extract as attractant in commercial feed on feeding rate and fat retention in gouramy (*Osphronemus gouramy*)

G Y Pamungkas, M Arief and M A A Arif

[+ Open abstract](#)[View article](#)[PDF](#)**OPEN ACCESS**

012077

Beardless barb *Cyclocheilichthys apogon* (Valenciennes, 1842) (*Cypriniformes*, *Cyprinidae*): Distribution extension and first record from South Bali

V Hasan, A Wijayanti, M B Tamam, R A Islamy and M S Widodo

[+ Open abstract](#)[View article](#)[PDF](#)**JOURNAL LINKS**[Journal home](#)[Journal scope](#)[Information for organizers](#)[Information for authors](#)[Contact us](#)[Reprint services from Curran Associates](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).



PAPER • OPEN ACCESS

Assessment of Seasonal Waters Quality Based on Abundance, Diversity, and Domination of Phytoplankton in Bajulmati Reservoir

To cite this article: E W Pertiwi *et al* 2021 *IOP Conf. Ser.: Earth Environ. Sci.* **679** 012064

View the [article online](#) for updates and enhancements.

You may also like

- [Multivariate analysis of phytoplankton community structure in Changli Gold Coast National Nature Reserve of Hebei Province in Spring, 2019](#)
Xiaqing Guo, Yang Yu, Haoran Zhu et al.
- [Decomposing the effects of ocean warming on chlorophyll a concentrations into physically and biologically driven contributions](#)
D Olonscheck, M Hofmann, B Worm et al.
- [Unusual abundance of bloom forming *Aulacoseira* spp. diatom populations in an anthropogenically impacted stretch of lower part of the River Ganga](#)
Chakresh Kumar, Anwesha Ghosh, Yash et al.



244th Electrochemical Society Meeting

October 8 – 12, 2023 • Gothenburg, Sweden

50 symposia in electrochemistry & solid state science

Abstract submission deadline:
April 7, 2023

Read the call for papers &
submit your abstract!

Assessment of Seasonal Waters Quality Based on Abundance, Diversity, and Domination of Phytoplankton in Bajulmati Reservoir

E W Pertiwi¹, E D Masithah², Suciyono^{2*}

¹ Faculty of Fisheries and Marine, Campus Banyuwangi, Universitas Airlangga Indonesia

²Department of Fish Health Management and Aquaculture, Faculty of Fisheries and Marine, Universitas Airlangga, Kampus C Jalan Mulyorejo, Surabaya 60115, East Java, Indonesia

*Corresponding author: suciyono@fpk.unair.ac.id

Abstract. Water quality assessment can be carried out through physical, chemical, and biological analyses. Phytoplankton is a biological microorganism that is usually used as indicators to assess surface water quality, specifically primary productivity. Bajulmati Reservoir is located in Banyuwangi, East Java, which functions as irrigation for agricultural and fisheries land. The purpose of this study was to analyze the productivity of reservoir waters based on phytoplankton abundance. The method used is purposive sampling with four sampling point stations from the entire reservoir area. The phytoplankton found were nine genera, consisting of 5 genera from the Cyanophyceae class, and one genus from each class, namely the Chlorophyceae, Bacillariophyceae, Euglenophyceae, and Dinophyceae classes. The productivity of the Bajulmati reservoir is included in the eutrophic category, with an average abundance of phytoplankton of 15.215 ind.L⁻¹. Meanwhile, the diversity index shows that the distribution of stable individuals and communities is low, namely 0.87. Despite this, the Cyanophyceae class is dominating with the dominance index was 0.52.

1. Introduction

The reservoir is a body of stagnant water (tapering) created through a river dam, generally extending to follow the river bed [1]. Bajulmati Reservoir is one reservoir that functions as an irrigation reservoir. However, there is still no information regarding the condition of the waters, especially the assessment of fertility in the Bajulmati Reservoir. Water conditions can be carried out through physical, chemical, and biological analyses [2]. According to [3], phytoplankton is a biological parameter that can be used as an indicator to evaluate the quality and fertility of a water surface. Based on the [4] that phytoplankton was used as a bioindicator to determine the fertility status of water quality and water in the Sempor dam, Kebumen, Central Java. The results showed that the inlet area was a moderately eutrophic location because of its high nutritional content. Besides, [5] on the composition of phytoplankton during the rainy season on Mount Sukabumi, which shows that the Cyanophyceae class dominates during the rainy season. Moreover, [6] was also researched on the structure of phytoplankton communities during the rainy season in Lake Bromo Yogyakarta. This research shows that the ecosystem in Lake Bromo is unstable and varies so that there is dominance. The purpose of this study is to determine the fertility level of the reservoir Bajulmati based on abundance, diversity, and dominance of phytoplankton in the rainy season.



2. Material and methods

2.1. Study area

This research was conducted in March and April 2019 in Reservoir Bajulmati, Wongsorejo sub-district, Banyuwangi, East Java. The research location was divided into four stations where the determination point is purposive sampling was to determine the appropriate sample point representation of reservoir conditions based on ease of access roads and selection. The sampling coordinates marked with a global positioning system(GPS) sampling stations can be seen following (Figure 1).



Figure 1. Study site and stations sampling

2.2. Collect data

Measurement of temperature, brightness, and dissolved oxygen was carried out directly (in situ). While nitrogen and phosphate measurements were carried out in the laboratory, by taking a water sample of 250 ml and stored in a cool box. On the other hand, phytoplankton sampling was done by filtering 100 liters of sample water using a 25 μ size plankton net and stored in a dark 200 ml bottle given 5% Lugol. Furthermore, the observation of phytoplankton using a binocular microscope Nikon E 100 at a magnification of 100 - 400x. Phytoplankton identification used the book [7,8]. Meanwhile, abundance is calculated using the Sedgewick Rafter with calculations according to [9].

$$N = n \times \frac{Vr}{Vo} \times \frac{1}{Vs}$$

Where:

N = abundance of plankton (ind / m³)

n = number of individuals observed (ind)

Vr = volume of the filtered water sample (ml)

Vo = volume of water into deposited in Sedgewick Rafter (1 ml)

Vs = volume of filtered water sample (l)

2.3. Data analysis

Descriptive analysis was taken to describe the resulting quality of water measurement on each station sampling. Meanwhile, the phytoplankton data were analyzed by calculating the Important Value Index (IVI) to the determination of diversity index (H'), following calculation by Shannon-Wiener index [10]. Meanwhile, the phytoplankton dominance index (C) was calculated using the formula of Simpson's Index of Dominance.

$$H' = \sum Pi \ln Pi$$

Where:

H' = Diversity Index

$P_i = n_i/N$, the number of individuals of each species/number of individuals of all types

\ln = natural logarithm

$$C = \sum (n_i/N)^2$$

Where:

C = Dominance Index

n_i = Total individual Every Type

N = Total Individual All Types

3. Result and discussion

3.1. Results

We found nine genera scattered in reservoir waters with the distribution of 5 genera from the Cyanophyceae class, and one genus each from the Chlorophyceae class, Bacillariophyceae, Euglenophyceae, and Dinophyceae. The average abundance of phytoplankton in the Bajulmati reservoir was 15,215 ind.L⁻¹. The highest quantity of phytoplankton at station 2 was 17,300 ind.L⁻¹, while the lowest abundance at station 4 was 14,220 ind.L⁻¹, presented in accordance in (Table 1). The highest phytoplankton diversity index was at station 2 of 0.95, while the lowest abundance was at Station 1 of 0.83. On the other hand, the diversity index at stations 3 and 4 has the same value, namely 0.85, which was presented in (Figure 2). Furthermore, the dominance index value (C) was the highest at station 4, with a value of 0.55, and the lowest dominance index is at station 2 with a value of 0.49. The dominance index for each study station was presented in (Figure 2). The results of measurements of physical and chemical parameters of water consist of temperature, brightness, DO, nitrogen, and phosphorus was presented in (Table 2).

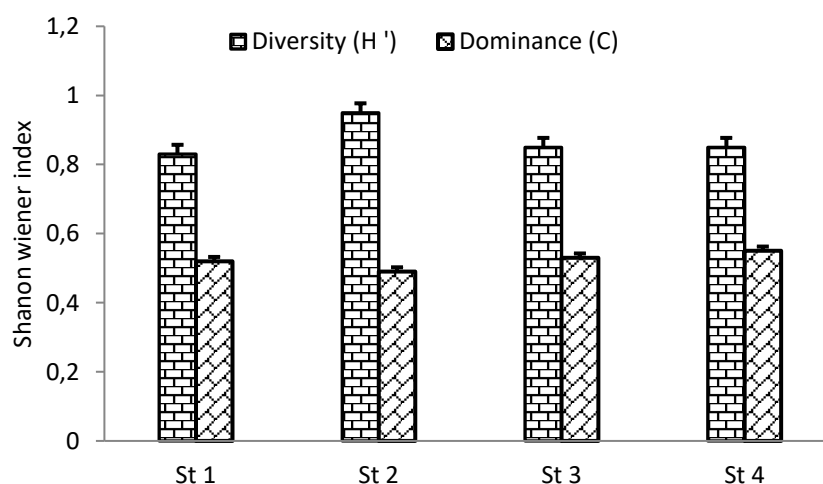


Figure 2. Dominance Index Value of each research station

Table 1. Phytoplankton Abundance each station

Station	Abundance (ind/ L)	Category (Landner, 1978)
St 1	14,660	oligotrophic
St 2	17,300	eutrophic

St 3	14,680	oligotrophic
St 4	14 220	oligotrophic

3.2. Discussion

The highest phytoplankton abundance was at station two, which was classified as eutrophic. The difference in phytoplankton abundance at each station was caused by differences in nutrient content. The abundance of phytoplankton is directly proportional to the nitrogen content. Nitrogen is a nutrient that acts as a limiting factor in photosynthesis and phytoplankton growth [11]. Nitrogen and nitrate are the macronutrients needed most by phytoplankton in photosynthesis besides carbon and oxygen. This causes differences in phytoplankton abundance [12]. The highest diversity index value is 0.95, and the lowest was 0.83. However, based on the value of the Shannon-Wiener index [10], the value of the diversity index is still in the low category where $H' < 1$. This shows that these waters have low genus diversity and the number of individuals and community stability. This is under the results of research by [13] in Tapak Tugurejo Semarang with low diversity values of 0.73 - 1.95 and [14] in the Ciliwung river with a range of 0.39 - 1.02.

The low diversity index is thought to be due to increased water turbidity due to rainwater flow [15]. The increase in turbidity causes a decrease in sunlight penetration, which affects the photosynthesis process. In addition, each type of phytoplankton has a different response to nutrient ratios, especially nitrogen and phosphorus, in a water body [16]. Furthermore, the Cyanophyceae Class was found to dominate at each station with 0.55. This class was also found to dominate the waters of Telaga Bromo Yogyakarta during the rainy season. According to [17], the dominance of Cyanophyceae in waters was caused by the entry of natural organic matter. The phytoplankton community structure changes place and time. These changes will reflect the overall development, both diversity and productivity [18].

Table 2. Results of water quality in the Bajulmati reservoir

Parameters	Unit	Station				Standard	Reference
		1	2	3	4		
Temperature	°C	30.33 ± 0.67	30.50 ± 0.65	29.63 ± 1.44	30.93 ± 1.44	20-30	Effendi (2003)
Brightness	cm	57.00 ± 4.68	69.67 ± 5.65	52.33 ± 3.21	77.67 ± 6.35	<200	Effendi (2003)
DO	mg.L ⁻¹	7.40 ± 0.44	7.90 ± 0.85	7.40 ± 0.62	7.97 ± 1.01	> 6	Retnani (2001)
Nitrogen	mg.L ⁻¹	2.39± 0.08	2.52± 0.19	2.48± 0.22	2.64± 0.16	> 20	(Novotny and Olem, 1994)
Phosphor	mg.L ⁻¹	0.02± 0.01	0.01	0.01± 0.01	0.02± 0.01	0.02 to 5	PP 82 (2001)
N:P ratio	mg.L ⁻¹	119.5	252	284	103.2	16: 1	Sanders (2004)

On the other hand, *Spirulina* is a species of the genus Cyanophyceae that dominates in these waters. According to [19], in water conditions with low N content, Cyanophyceae can bind N to free air so that this type of phytoplankton will grow faster than other classes. This is consistent with the N content in the waters of the Bajulmati Reservoir, which was included in the oligotrophic category ($N < 10$).

4. Conclusion

Bajulmati Reservoir has a high abundance of phytoplankton, which is 15,215 ind.L⁻¹ (included in the eutrophic category) consisting of nine genera. Also, it has a stable distribution of individuals with a diversity index value of 0.87. Furthermore, Cyanophyceae is a class that dominates in these waters with a value of 0.52.

5. References

- [1] Sun Z, Zhang H, Wei Z, Wang Y, Wu B, Zhuo S, & Yang H 2018. *J of Natur Gas Sci and Engin*, **51**, 27-36
- [2] Junshum, P., and Traichaiyaporn S 2007. *Mj. Int. J. Sci. Tech.*, **2** (01), 24-36.
- [3] Amengual-Morro, C., Niell, G. M., & Martínez-Taberner, A. 2012. *J of Enviro Manag* 95, S71-S76.
- [4] Shaleh F R. 2015. *Jurnal Perikanan*, **6**(1), 22-27.
- [5] Ramadan F, Rijaluddin A F and Assuyuti 2016. *J of Bio* **9**(2), 95-102.
- [6] Kusumaningrum A, Sudarsono and Suhartini 2017. *J of Bio* , 6.
- [7] Suthers I, Bowling L, Kobayashi T, & Rissik D 2009. *A Guide to Their Ecology and Monitoring for Water Quality*, 73 page.
- [8] Swanepoel A, du Preez H, Schoeman C, Janse van Vuuren S, & Sundram A 2008. *Report to the Water Research Commission BY Rand Water*, 117p.
- [9] Fachrul M F 2007. *Sampling Method. Biotechnology*. Jakarta.
- [10] Odum EP 1993. Gadjah Mada University. Yogyakarta.
- [11] Hirose K, and Hitomi K 2003. *J of Ocean* , **59**, 149-161.
- [12] Neneng N, and Octarina P 2012. *J of Agri* , **1** (2), 3-9.
- [13] Lathifaf N, Hidayat J F and Muhammad F. 2017. *Biome*, **19**(2), 164-169
- [14] Jasmine F F, Ediyono S H and Wulandari M 2005. *Biodiversity*, **9**(4), 296-300.
- [15] Kusumaningrum A, & Sudarsono S 2017. *Biologi-SI*, **6**(2), 65-74.
- [16] Warsa A, Lismining P A, Andriani S N K 2006. *Proceedings of the National Fish IV. Ikhtiologi Indonesian society*. Research Center for Biology-LIPI. Jakarta. 177-185.
- [17] Prihantini, NB, Ward, W. and Hendrayanti, D. 2008. *Makara Science*, **12** (1): 44-54.
- [18] Suciyono, Sabil A A, Masithah E D, Nindarwi D D, Azhar M H & Ulkhaq M F 2019. *J The Ind Veter* , **96**(09), 31 - 36.
- [19] Pliński M A R C I N, & Józwiak T O M A S Z 1999. *Ocean* , **41**(1), 73-80.

6. Acknowledgement

Special thanks to the Faculty of Fisheries and Marine, Airlangga Universities for facilitating our research. The author also thanks the Banyuwangi Campus Laboratory, Airlangga University, and all the teams so that this research can be completed.