

also developed by scimago:



SCIMAGO INSTITUTIONS RANKINGS

SJR

Scimago Journal & Country Rank

Enter Journal Title, ISSN or Publisher Name

Home

Journal Rankings

Country Rankings

Viz Tools

Help

About Us

IOP Conference Series: Earth and Environmental Science

<p>COUNTRY</p> <p>United Kingdom</p> <p>Universities and research institutions in United Kingdom</p> <p>Media Ranking in United Kingdom</p>	<p>SUBJECT AREA AND CATEGORY</p> <p>Earth and Planetary Sciences └ Earth and Planetary Sciences (miscellaneous)</p> <p>Environmental Science └ Environmental Science (miscellaneous)</p> <p>Physics and Astronomy └ Physics and Astronomy (miscellaneous)</p>	<p>PUBLISHER</p> <p>IOP Publishing Ltd.</p>	<p>H-INDEX</p> <p>41</p>
<p>PUBLICATION TYPE</p> <p>Conferences and Proceedings</p>	<p>ISSN</p> <p>17551315, 17551307</p>	<p>COVERAGE</p> <p>2010-2022</p>	<p>INFORMATION</p> <p>Homepage</p> <p>How to publish in this journal</p> <p>ees@iopublishing.org</p>

SCOPE

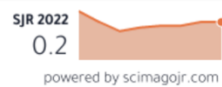
The open access IOP Conference Series: Earth and Environmental Science (EES) provides a fast, versatile and cost-effective proceedings publication service.

Join the conversation about this journal



IOP Conference Series: Earth and Environmental...

Not yet assigned quartile



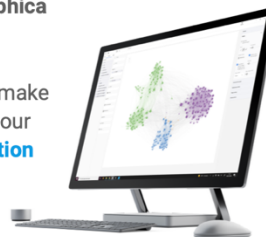
Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimagojr.com">
```

SCImago Graphica

Explore, visually communicate and make sense of data with our new data visualization tool.



Metrics based on Scopus® data as of April 2023



FACULTY OF MARINE SCIENCE AND FISHERIES HASANUDDIN UNIVERSITY

- HOME
- PROFILE ▾
- STUDY PROGRAM ▾
- FIKP LECTURER ▾
- ACADEMIC SERVICES ▾
- ACTIVITY CENTER ▾
- INFORMATION ▾
- DOCUMENT ▾

THE 2nd INTERNATIONAL SYMPOSIUM MARINE AND FISHERIES

🕒 June 22, 2019 👤 Arham Rahim 📁 Uncategorized @en 0



The 2nd International Symposium Marine and Fisheries, Faculty of Marine Science and Fisheries Universitas Hasanuddin were held on June 22, 2019, at Makassar City, Indonesia. The theme of this symposium is Managing Aquatic Resources for sustainable development. Furthermore, the topics of symposium were consist of 13 parts namely Aquatic Biodiversity, Aquatic Ecology and Conservation, Marine and Fisheries Biotechnologi, Sustainable Aquatic, Sustainable Fisheries, Fisheries Processing Technology and food Culture, Marine Tourism, Marine and Fisheries Low and Development Policy, Marine and Fisheries Geographical Information Systems, Marine Technology, Nature Disaster Mitigation and Adaptation, and Marine and Fisheries Outreach and Community Service.

SEARCH ...

LANGUAGES

- 🇬🇧 English
- 🇮🇩 Indonesia

FIKP UNHAS PROFILE



ALUMNI

- Registration Form
- Data and Information

LABORATORIES

Marine Gespatial and Fisheries Information System Lab.

The international speakers who come from several countries such as Dr. Marea Beger (University of Leeds, UK), Prof. Tamiji Yamamoto (Hiroshima University Japan), Mr. Ichiro Namura (JICA, Japan), Prof. Ikhwanuddin (Universitas Malaysia Terengganu, Malaysia) and Dr. Dewi Yanuarita (Universitas Hasanuddin). On the other hand, the participant takes part in this symposium from many universities in Indonesia.



This post is also available in: [Indonesian](#)



« **PREVIOUS**
PUBLIC LECTURE
OF DIRECTORATE
GENERAL OF
CAPTURE
FISHERIES

NEXT »
THE JUDISIUM OF
PERIOD IV, JUNE
2019



BE THE FIRST TO COMMENT

Leave a Reply

Your email address will not be published.

Comment

Name *

Email *

Website

POST COMMENT

Marine Ecology Lab.

Fish Hatchery Lab.

Sea Ranching and Ecosystem
Rehabilitation Lab.

Productivity and Water
Quality Lab.

Physiology of Aquatic
Animals Lab.

Marine Microbiology Lab.

Marine Biology Lab.

Fisheries Biology Lab.

Fisheries Resources
Management and
Conservation Lab.

Nutrition and Feed
Management Technology Lab.

Fish Product Technology Lab.

Fishing Technology Lab.

Fish Parasites and Diseases
Lab.

Fishing Gear Construction
and Design Lab.

Oseanografi Physics
Laboratory and Coastal
Geomorphology Lab.

Chemical Oceanography Lab.

Marine Ecotoxicology Lab.

LOCAL APP

Pengusulan Karya Imiah

Pengusulan Ujian

LINK

FOREWORD

Their great diversity and potential makes the development of marine and fisheries resources a priority for Indonesia, and a key orientation of long-term development planning. The development of valuable maritime and fishery resources has been encouraged by the government as a means to achieve food security and economic independence.

These abundant marine and fisheries resources are the mainstay of Indonesia's efforts to achieve Sustainable Development Goal (SDG) number 14: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development".

As a contribution towards achieving SDG 14, each year the Faculty of Marine Science and Fisheries at Universitas Hasanuddin holds a national and international marine and fisheries symposium. The theme of the 2019 Symposium is "**Managing Aquatic Resources for Sustainable Development**". This symposium will provide opportunities for participants to exchange information, knowledge and experience, as well as to initiate partnerships for research and outreach activities in the field of marine science and fisheries. These exchanges and partnerships will contribute towards enhancing the potential, development and utilization of marine and fishery resources in sustainable ways.

A warm welcome to the researchers and participants from a wide cross-section of the marine and fisheries sector and thank you for coming to taking part in this Universitas Hasanuddin Marine Science and Fisheries Symposium. A heartfelt thank you is also due to the many people and organisations that have provided support or contributed in any way towards the successful realisation of this Symposium. May all the contributions made during this event provide valuable input to support marine and fisheries development in Indonesia.

Makassar, 5 September 2019
Dean,

Dr.Ir.St Aisjah Farhum, MSi



Organizing Committee

Steering	: Dr. Ir. St. Aisjah Farhum, M.Si.
Person in charge	: Prof. Dr. Ir. Rohani AR., M.Si
Coordinator	: Dr. Sri Suro Adhawaty, SE., M.Si.
Secretary for international Symp	: Dr. Yuyu Anugrah La Nafie, ST., M.Sc.
Secretary for national symp	: Dr. Nursinah Amir, S.P.i., MP
Treasure	: Syafri Amma, SE

Event and logistic division

- Dr. Nita Rukminasari, S.Pi., MP.
- Dr. Alfa F.Nelwan, M.Si
- Dr. Ir. Nadiarti, M.Sc.
- Dr. Wasir Samad, S.Si., M.Si.
- Dr. Ir. Mardiana E. Fachry, MS.
- Dra. Husni Husain, MAP
- Resky Dwiyantri Risa B., S.Pi., M.Si

Registration and full paper division

- Dr. Supriadi, ST., M.Si.
- Dr. Ir. Siti Aslamyah, MP.
- Dr. Marlina Achmad, S.Pi., M.Si.
- Dr. Ir. Khusnul Yaqin, M.Sc.
- Dr. Amir Hamzah Muhiddin, M.Sc
- Kasmianti, STP., MP. Ph.D.
- Moh. Tauhid Umar, S.Pi., MP.
- Arham, S.Kom.

Financial division :

- Asmi Citra Malina, S.Pi., M.Agr., Ph.D
- Prof. Dr. Ir. Chair Rani, M.Si
- Dr. Siti Fakhriyah, S.Pi, M.Si
- Prof. Dr. Amran Saru, ST., M.Si.
- Suriani, SE.

Equipment and transportation division

- Fahrul, S.Pi, M.Si
- Ir. Ilham Jaya, MM
- Ridwan, S.Sos., MM.
- Khaerunnisa Rahman, SE. M.Ak.
- Lini Hendrinita Samiadji, S.TP
- Muh. Nur, SE
- Sunardi, S.Sos.
- Rahmat Hidayat, S.Pi
- Sahabuddin



PAPER • OPEN ACCESS

Statement of Peer Review

To cite this article: 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **370**

All papers published in this volume of IOP Conference Series: Earth and Environmental Science (EES) (ISSN: 1755-1315) have been peer reviewed through processes administered by the proceeding Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceeding journal published by IOP Publishing



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

IOP Conference Series: Earth and Environmental Science

Table of contents

Volume 370

November 2019

[◀ Previous issue](#) [Next issue ▶](#)

The 2nd International Symposium on Marine Science and Fisheries (ISMF2) - 2019 22 June 2019, Makassar, Indonesia

Accepted papers received: 08 October 2019

Published online: 03 December 2019

[Open all abstracts](#)

Preface

OPEN ACCESS 011001

Foreword

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

OPEN ACCESS 011002

Organizing Committee

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

OPEN ACCESS 011003

Statement of Peer Review

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

Papers

OPEN ACCESS 012001

Meristic characters and length-weight relation of climbing perch (*Anabas testudineus*) from wetlands in Sigi District, Central Sulawesi, Indonesia

S Ndobe, Rusaini, A Masyahoro, N Serdiati, Madinawati and A M Moore

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

-
- OPEN ACCESS** 012002
Environmental Geochemistry of Heavy Metals and Plagioclase Background Enrichment Factor in Coastal Sediments at Lumpue - Parepare, South Sulawesi, Indonesia
A Tonggigiroh, A M Imran and S Haerany
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012003
Participatory mapping and unmanned aerial vehicle (UAV) images for developing village level coastal geoinformation
N Nurdin, D F Inaku, A R Rasyid, A R Jalil, A Alimuddin, Agus, M Akbar As and S Q Al Azizi
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012004
Mapping distribution patterns of skipjack tuna during January-May in the Makassar Strait
M Zainuddin, M I Amir, A Bone, S A Farhum, R Hidayat, A R S Putri, A Mallawa, Safruddin and M Ridwan
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012005
Production of Pacific whiteleg shrimp, *Litopenaeus vannamei* through implementation of rapid biofloc technology
N A Kasan, A S Kamaruzzan, A I A Rahim, A N Ishak, I Jauhari and M Ikhwanuddin
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012006
Physico-chemical characteristics and amino acid profile of fermented sauce made from tuna loin by-product
M R Wenno and C R M Loppies
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012007
Preliminary note on the morphological characters of *penja* (amphidromous goby postlarvae) in West Sulawesi and Gorontalo Bay
Nurjirana, A Haris, F M Sahami, P Keith and A I Burhanuddin
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012008
Effect of oceanographic conditions on skipjack tuna catches from FAD versus free-swimming school fishing in the Makassar Strait
A R S Putri, M Zainuddin, M Musbir, M A Mustapha and R Hidayat
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS**

- Quality of giant clam (*Tridacna derasa*) juveniles as non-target organisms after exposure to clove oil in concentrations suitable for anaesthetising ornamental fish 012009
S W Rahim, K Yaqin, L Fachruddin and H Kudsiah
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012010
Biological condition and carapace width frequency distribution of blue swimming crabs (*Portunus pelagicus*) in Gresik and Lamongan, East Java
M A Rahman, F Iranawati, A B Sambah and D G R Wiadnya
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012011
The effect of commercial feed enrichment with *Piper betle* leaf extract on the growth and survival rate of tilapia (*Oreochromis niloticus*)
S S Agustina
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012012
A Microcosm Multitrophic Aquaculture System
A Tuwo, I Yasir, J Tresnati, Mutmainnah, R Aprianto, A Yanti, A D Bestari and M Nakajima
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012013
The stability of mangrove ecosystems for edu-tourism based on macrozoobenthos ecological indicators in the educational fish ponds of Hasanuddin University
A Saru, M Lanuru, S Mashoreng, Y Jubhari and M Ilham
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012014
Species diversity of wrasses caught by fishermen in the Spermonde Islands, South Sulawesi, Indonesia
I Yasir, J Tresnati, A Yanti, P Y Rahmani, R Aprianto and A Tuwo
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012015
Long-Term Monitoring of Parrotfish Species Composition in the Catch of Fishermen from the Spermonde Islands, South Sulawesi, Indonesia
J Tresnati, I Yasir, R Aprianto, A Yanti, P Y Rahmani and A Tuwo
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012016
Maturity stages of the redbreasted wrasse *Cheilinus fasciatus*

J Tresnati, I Yasir, A Yanti, R Aprianto, P Y Rahmani and A Tuwo

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

OPEN ACCESS 012017

Cultivated seaweed carbon sequestration capacity

S Mashoreng, Y A La Nafie and R Isyrini

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

OPEN ACCESS 012018

Morphological and genetic analysis of *Gracilaria* sp. cultured in ponds and coastal waters

N I S Arbit, S B A Omar, E Soekendarsi, I Yasir, J Tresnati, Mutmainnah and A Tuwo

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

OPEN ACCESS 012019

Comparative study on the growth, carotenoid, fibre and mineral content of the seaweed *Caulerpa lentillifera* cultivated indoors and in the sea

R Syamsuddin, H Y Azis, Badraeni and Rustam

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

OPEN ACCESS 012020

Enrichment of commercial feed for striped snakehead fry (*Channa striata*) with golden snail (*Pomacea* sp.) flour

S Ndobe, S F Mangitung, R Bardi, Madinawati, D T Tobigo and A M Moore

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

OPEN ACCESS 012021

Analysis of coral reef benthic cover changes around Kapoposang Island, Pangkep Regency, South Sulawesi using multi-temporal remote sensing imagery

A Faizal, A F Raazy and A Rasyid

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

OPEN ACCESS 012022

Perspectives on seagrass ecosystem services from a coastal community

R Ambo-Rappe, Y A. La Nafie, A A Marimba, L C. Cullen-Unsworth and R K. Unsworth

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

OPEN ACCESS 012023

Design Viability of Purse Seiners Operating in Bone Regency, South Sulawesi, Indonesia

S A Farhum, M Zainuddin, A F P Nelwan, A A Pangera and R D Risa

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

-
- OPEN ACCESS** 012024
Nursery Performance of Sandfish *Holothuria scabra* Juveniles in Tidal Earthen Pond Using Different Types of Cage
M Firdaus and L F Indriana
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012025
Livelihood Features of Seaweed Farming Households: A Case study from Bungin Permai Village, South Konawe, South East (SE) Sulawesi, Indonesia
M Rahim, L O M Aslan, Ruslaini, S A A Taridala, N I Wianti, A Nikoyan, Budiyanto and H Hafid
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012026
Use of Common Lantana (*Lantana camara* Linn) Extract to Prevent Ice-ice Disease and Trigger Growth Rate of the Seaweed *Kappaphycus alvarezii*
R S Patadjai, I Nur and S Kamri
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012027
Structural relationship among steroids from Sulawesi Tenggara's sponge *Clathria* sp. and their radical scavenger activity
I Sahidin, Baru Sadarun, La Ode M. Aslan, Wahyuni, M. Hajrul Malaka and Adryan Fristiohady
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012028
Coral Disease Prevalence on Scleractinian Corals at Prigi Bay, Trenggalek, East Java
Rosdianto and O M Luthfi
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012029
The effect of *Melastoma malabathricum* leaf extract on growth and spawning of blue swimming crab (*Portunus pelagicus*)
N Alam, Y Fujaya, Haryati, D K Sari, M Achmad, M Rusdi and N Farizah
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012030
Chemical composition and antibacterial activity of honey collected from East Nusa Tenggara, Indonesia on pathogenic bacteria in aquaculture
Y Salosso
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012031

Habitat characteristics and distribution of flyingfish in Fak-Fak and surrounding waters

P Boli, I Luhulima, F Simatauw, S Leatemia, S Tabay, D Parenen and A S Ananta

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

OPEN ACCESS

012032

Antioxidant, antibacterial and antifungal activity of edible coating chitosan-galactose complex

Rieny Sulistijowati, Rahim Husain, Muhammad Cakra Datau and Kusbidinandri

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

OPEN ACCESS

012033

The Effect of Dosage Combination and Feeding Frequency on Growth and Survival Rate of Vannamei Shrimp Juveniles in Ponds

Z Zainuddin, S Aslamyah, K Nur and Hadijah

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

OPEN ACCESS

012034

Diversity of attached marine life in different types of artificial timber reefs

J F Alam, T Yamamoto, T Umino, S Nakahara and K Hiraoka

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

OPEN ACCESS

012035

Osteological study of Titan Trigger fish, *Balistoides viridescens* (Bloch and Schneider, 1801) (Balistidae: Tetraodontiformes) from the Spermonde Archipelago Waters

M Afrisal, Nurjirana, Irmawati and A I Burhanuddin

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

OPEN ACCESS

012036

Analysis of biological aspects of Scottish seine net catches in Mamuju waters, West Sulawesi

Najamuddin, M Palo, A Assir, A Asni and Busman

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

OPEN ACCESS

012037

The effect of initial weight of seedlings grafted from tissue-cultured and local strain seedlings on growth and carrageenan content of the Red Seaweed (*Kappaphycus alvarezii*) using a grafting method

A L Embi, L O M Aslan, W Iba, A B Patadjai and E Sulistiani

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

OPEN ACCESS

012038

Comparing skipjack tuna catch and oceanographic conditions at FAD locations in the Gulf of Bone and Makassar Strait

R Hidayat, M Zainuddin, A Mallawa, M A Mustapha and A R S Putri

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

OPEN ACCESS

012039

Evisceration rate of sandfish *Holothuria scabra* during transportation

A Tuwo, I Yasir, J Tresnati, R Aprianto, A Yanti, A D Bestari, Syafuddin and M Nakajima

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

OPEN ACCESS

012040

Biological aspects of Indian scad (*Decapterus russelli* Ruppell, 1830) in south site of Madura Strait Waters, East Java

G Bintoro, T D Lelono, Rudianto and N D Utami

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

OPEN ACCESS

012041

The introduced Banggai cardinal fish (*Pterapogon kauderni*) population in Ambon Island, Indonesia

K Wibowo, U Y Arbi and I B Vimono

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

OPEN ACCESS

012042

Water bird habitat suitability analysis in an urban coastal wetland (case study: Lantebung mangrove ecotourism area)

A Purify, N Nurdin, R I Maulani and M Lanuru

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

OPEN ACCESS

012043

Grafting of *Kappaphycus alvarezii* seedlings using different seedling sources in Sasara Coastal Waters, Buton Utara, Southeast (SE) Sulawesi, Indonesia

Armin, L O M Aslan, A B Patadjai, W Iba, Yusnaeni and W H. Muskita

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

OPEN ACCESS

012044

The Effect of Different Oblique Incision Length in Slide-Slipped Grafting using Tissue Cultured and Local Seedlings on the Growth of Seaweed (*Kappaphycus alvarezii*) in Sasara Coastal Waters, Kulisusu Bay, Buton Utara, SE Sulawesi, Indonesia

R Hasriah, L O M. Aslan, W Iba, A B Patadjai, Ruslaini, M Balubi and E Sulistiani

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

OPEN ACCESS

012045

The Fishing Ground of Large Pelagic Fish during the Southeast Monsoon in Indonesian Fisheries Management Area-713

Safuruddin, B Aswar, M Rijal Ashar, R Hidayat, Y K Dewi, M. T Umar, S. A Farhum, A Mallawa and M Zainuddin

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

OPEN ACCESS 012046

Biodiversity of lobster larvae (*Panulirus* spp.) from the Indonesian Eastern Indian Ocean

A Setyanto, Soemarno, D G R Wiadnya and C Prayogo

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

OPEN ACCESS 012047

The effect of differences in feed protein raw materials on the glycogen content, metamorphosis rate of mangrove crab larvae (*Scylla olivacea*) and feed price

Haryati, Y Fujaya and E Saade

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

OPEN ACCESS 012048

The association of economically important fish with mangroves in Maumere Bay, Indonesia

A Vincentius, M N Nessa, J Jompa, A Saru, M Hatta and N Rukminasari

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

OPEN ACCESS 012049

Evaluating Ecotourism Development in Bontang: Water Quality, Compatibility, and Carrying Capacity

Aspiany, Sutrisno Anggoro, Frida Purwanti and Bambang Indratno Gunawan

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

OPEN ACCESS 012050

Preliminary study: human trampling effects on seagrass density

N Nurdin, Y La Nafie, M T Umar, M Jamal and A Moore

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

OPEN ACCESS 012051

Macroscopic characteristics of the gonad maturity stages of dusky parrotfish *Scarus niger*

A Yanti, I Yasir, P Y Rahmani, R Aprianto, A Tuwo and J Tresnati

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

OPEN ACCESS 012052

Exploring Biodiversity and Monitoring Genetic Resources of Aquatic Plants in Manado, North Sulawesi, Indonesia

M F I Nugraha, R Koneri, A Julzarika, Reflinur, W Enggarini, R Yunita, M A Radjamuddin and H Novita

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

-
- OPEN ACCESS** 012053
Model of investment reconstruction post moratorium of *Cantrang* fishing gear (case study: Makassar Strait Waters and Bone Bay in Indonesia)
Sri Suro Adhawati and Achmar Mallawa
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012054
Population dynamics and feeding habits of *Euthynnus affinis*, *Auxis thazard*, and *Auxis rochei* in South Coast of East Java waters
Tri Djoko Lelono and Gatut Bintoro
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012055
Histopathological changes in the intestine of *Channa micropeltes* infected with the cestode *Senga rostellariae*
Marina Hassan, Muhammad Syafiq Izzuddin Abdul Hadi, Mohd Fazrul Hisam Abd Aziz, Wahidah Wahab, Farizan Abdullah, Shuhaimi Deraman, Kismiyati and Mohd Ihwan Zakariah
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012056
Bridging a new concept of fisheries subsidies policy to support sustainable fisheries in Indonesia
Muhammad Nur
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012057
The productivity and the pattern of yellowfin tuna (*Thunnus albacares*) fishing season in Morotai Island waters
Titien sofiati and Djainudin Alwi
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012058
Development strategy and increased production of seaweed in Takalar District
Hamzah Tahang, Gunarto Latama and Kasri
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012059
Effects of increasing temperature and nitrate concentration on cell abundance, growth rate, biomass and free fatty acid of *Tetraselmis* sp
Nita Rukminasari, Sharifuddin Bin Andy Omar and Muhammad Lukman
[+ View abstract](#) [View article](#) [PDF](#)

-
- OPEN ACCESS** 012060
Seasonal variation in growth and carrageenan yield of *Kappaphycus alvarezii* (Doty)
Doty farmed using mass selection in Bungin Permai Coastal Waters, South Konawe District,
Southeast (SE) Sulawesi, Indonesia
La Ode M. Aslan, Rahmad S. Patadjai, Ruslaini, Irwan J. Effendy, Abdul H. Sarita, Siti Amina, Nuraeni and
Armin
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012061
Inhibitory activity of *Sargassum hystrix* extract and its chloroform fractions on inhibiting
the α -glucosidase activity
Rosiana Nafilatul Azizah, Amir Husni and Siti Ari Budhiyanti
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012062
Sungkur rolling ship with pushing operation method for fish and shrimp catching in the
coastal waters
Rusmilyansari, Erwin Rosadi, Iriansyah and Aulia Azhar Wahab
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012063
Distribution patterns of gregarine parasitism of wild marine bivalve, *Anadara cornea*
(reeve, 1844) concerning seasonality and water quality
Mohd Ihwan Zakariah, Hassan Mohd Daud, Reuben Sunil Kumar Sharma, Mhd. Ikhwanuddin and Marina Hassan
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012064
Blue-forest in mangrove area at Kuri Caddi hamlet, Nisombalia Village, Maros Regency,
South Sulawesi, Indonesia
Andi Hurul Auni Usman, Meta Dilianti Palimbunga, Basran Nur Basir, Aswar, Ma'rifa Baharuddin and
Ira Taskirawati
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012065
Impact of tsunami Sunda Strait to coastal tourism in Tanjung Lesung Special Economic
Zone Pandeglang Regency Banten Province
LS Mulyawati, L Adrianto, K Soewandi and HA Susanto
[+ View abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012066
Exploitation level of shortfin scads fish (*Decapterus macrosoma*) caught with purse seine
in Bulukumba waters, South Sulawesi
Andi Asni, Ihsan, Najamuddin and Mohammad Tauhid

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

OPEN ACCESS 012067

Environmental characteristics and management challenges of brackishwater fish ponds in Cirebon Regency, West Java Province, Indonesia: a fine-scale GIS Approach

Tarunamulia, Hasnawi, R Asaf and A Faizal

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

OPEN ACCESS 012068

Satellite image analysis and GIS approaches for tsunami vulnerability assessment

A B Sambah, L Tri Djoko and R Bayu

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

OPEN ACCESS 012069

Projective mapping and descriptive analysis of commercial fish floss in Yogyakarta Region

Wahdan Fitriya and Nurfitri Ekantari

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

OPEN ACCESS 012070

Law enforcement for fisheries crime (illegal fishing) through a transcendental approach

Muhammad Amin Hanafi, Absori and Khuzafah Dimiyati

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

OPEN ACCESS 012071

Implementation of Participatory Policy through Quality Awareness and Quarantine Community Movement (Gemasatukata) in Untia Village, Makassar City

Wahdania Suardi and Mardiansyah

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

OPEN ACCESS 012072

Enhancing small-scale community for coastal management in Puntondo Bay, Indonesia

Achmad Zamroni, Tenny Apriliani, Risna Yusuf and Nendah Kurniasari

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

OPEN ACCESS 012073

Fisheries cooperative as a catalyst for economic improvement of fishermen society

B A J Gosari, A Wahid, Firman and A S Cangara

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

OPEN ACCESS 012074

Syirkah of Catfish, Profit or Loss?

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

OPEN ACCESS 012075

Catching flying fish (*Hirundichthys oxycephalus*) in the central Makassar Strait fishing ground using drifting gillnet

M Palo, Najamuddin, M Zainuddin, S A Farhum and A A Marimba

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

OPEN ACCESS 012076

Optimization of temperature and time in carrageenan extraction of seaweed (*Kappaphycus alvarezii*) using ultrasonic wave extraction methods

Mahyati and Abdul Azis

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

OPEN ACCESS 012077

Catch marketing analysis of Frigate tuna (*Auxis thazard*): caught by lift-net at Bone District, South Sulawesi Province-Indonesia

Nurdin Kasim, Budiyati and Khairudin Isman

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

OPEN ACCESS 012078

Histopathology of liver and intestine of pangkulan bare fish (*Oryzias matanensis*) Polluted by nickel and iron in Lake Matano, South Sulawesi

Ummi Fahmi, Irma Andriani, Shelly Salmah, Triany Hastuti Hatta, Sharifuddin Bin Andi Omar and Dwi Kesuma Sari

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

OPEN ACCESS 012079

Stability of chocolate bars fortified with nanocapsules carotenoid of *Spirulina platensis*

Nurfitri Ekantari, Siti Ari Budhiyanti, Wahdan Fitriya, Asep Bayu Hamdan and Ciacia Riaty

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

OPEN ACCESS 012080

Implementation of coral propagation for coral reef garden in Nusa Dua, Bali

E E Ampou, P Hutasoit, N Janetski, S Yusuf, A Damar, C Petta and A A Hutahaean

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

OPEN ACCESS 012081

Repair technique for wooden fishing boats using fibreglass

Sunardi, Sukandar, E Sulkhani Y and M A Rahman

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

Economically important sea cucumber processing techniques in South Sulawesi, Indonesia

R Aprianto, N Amir, Kasmiati, Matusalach, Fahrul, Syahrul, J Tresnati, A Tuwo and M Nakajima

[+ View abstract](#)

[View article](#)

[PDF](#)

JOURNAL LINKS

[Journal home](#)

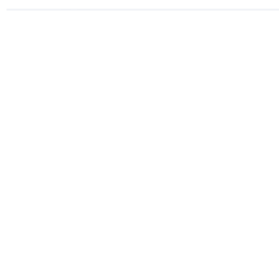
[Information for organizers](#)

[Information for authors](#)

[Search for published proceedings](#)

[Contact us](#)

[Reprint services from Curran Associates](#)



IOP Conference Series: Earth and Environmental Science

PAPER • OPEN ACCESS

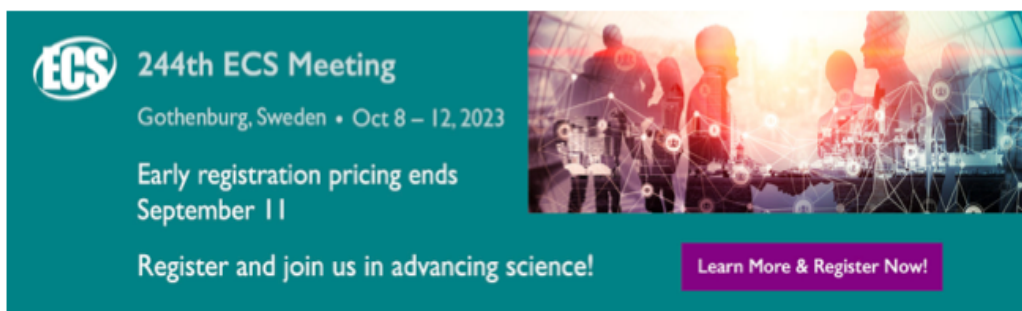
Optimization of temperature and time in carrageenan extraction of seaweed (*Kappaphycus alvarezii*) using ultrasonic wave extraction methods

To cite this article: Mahyati and Abdul Azis 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **370** 012076

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

You may also like

- [Carrageenan characteristics of *Kappaphycus alvarezii* from various harvest ages](#)
Muhamad Firdaus, Rahmi Nurdiani, Asep Awaludin Prihanto et al.
- [Investigation of seaweed derivative iota-carrageenan based biopolymer electrolytes with lithium trifluoromethanesulfonate](#)
R Chitra, P Sathya, S Selvasekarapandian et al.
- [Development and characterization of bamboo fiber reinforced biopolymer films](#)
H P S Abdul Khalil, Hazwan C I Che Mohamad, A R Khairunnisa et al.



ECS 244th ECS Meeting
Gothenburg, Sweden • Oct 8 – 12, 2023

Early registration pricing ends
September 11

Register and join us in advancing science!

Learn More & Register Now!

Optimization of temperature and time in carrageenan extraction of seaweed (*Kappaphycus alvarezii*) using ultrasonic wave extraction methods

Mahyati^{1,2} and Abdul Azis¹

¹Chemical Engineering Department, Ujung Pandang State Polytechnic, Indonesia
E-mail: mahyatikimia@poliupg.ac.id

²Center of Excellent for Development and Utilization of Seaweed Universitas Hasanuddin (CEDUS-UNHAS), Indonesia

E-mail: mahyatikimia@poliupg.ac.id

Abstract. Carrageenan is a hydrocolloid compound from *Rhodophyceae* extraction of *K. alvarezii* using alkali solvents. Conventional extraction methods that have been using certain solvents in large volumes require a long time and low yields resulting in high production costs and large amounts of waste which pollute the environment. These adverse effects can be minimized by extraction with the help of ultrasonic waves which will provide an intensive stirring effect to damage the cell walls of seaweed so that the process of mass transfer will be faster. The extraction temperature greatly influences the quantity and quality of carrageenan which is often carried out in conventional extraction. In carrageenan extraction activities from *K. alvarezii* with the help of ultrasonic waves, the effects of temperature and time on these two parameters will also be studied. This activity was conducted to determine the time and temperature of carrageenan extraction from *K. alvarezii* seaweed using an ultrasonic frequency of 40 kHz with temperature variations of 30, 40, 50, 60, and 70 °C, and time variations of 20, 25, 30, 35 and 40 minutes. The results of extraction of *K. alvarezii* seaweed with a time variation of 40 minutes and temperature variation is 70 °C, with the optimum value of temperature and extraction time is 70 °C for 30 minutes which produces carrageenan as much as 44.46%. The carrageenan quality test produced water content ranging from 6.27-14.18%, ash content 12.33-13.69%, viscosity of 10.4-27.9 cP and gel strength ranged from 926.26 to 4945.99 dyne / cm².

1. Introduction

Seaweed is one of the commodities that acts as a major contributor to the production of the aquaculture sector. Every year Indonesian seaweed production continues to increase, from 2.574 million tons in 2009 to 3.082 million tons in 2010 so that Indonesia is also the largest producer of carbonated seaweed in the world, around 90% of the world market has been controlled by Indonesia [1]. Currently, the use of seaweed has progressed, which is made into agar-agar, alginate, carrageenan, and furselaran which are important raw materials for the food, pharmaceutical, cosmetics, and others. One type of seaweed that dominates Indonesia's exports is *Kappaphycus alvarezii*. [2].

K. alvarezii seaweed is leading commodity-producing carrageenan which is widely used in the paper, textile, photography, fish, and pasta canning industries. Indonesian carrageenan production reached 80%

(3,896 tons) and exported 3,156 tons in 2002. Whereas in 1996–2004, the value of Indonesia's carrageenan exports was relatively constant, with growth ranging from 2.49-2.92% per year [3].

Seeing the use and needs of carrageenan in various fields that are increasing, carrageenan production needs to be improved. There are various ways to produce carrageenan, one of which is the extraction process. In the last ten years, several alternative extraction techniques were introduced, including ultrasonic extraction [1]. The biggest advantage of carrageenan gel formation using ultrasonic extraction method is to maintain the quality of the gel texture, and the process is safer, simpler, effective and efficient. The use of waves with a frequency of 20-40 kHz can increase the texture properties of carrageenan gel, such as gel hardness. Whereas when using conventional extraction at the same yield it takes 3 hours and the amount of solvent and temperature is higher. In this study carrageenan extraction from *K. alvarezii* with the help of ultrasonic waves will be continued by optimizing contraction temperature and time and analyzing the effect of temperature and time on carrageenan quality on seaweed ratios with solvents 1: 30. quality carrageenan gel with characteristics and characteristics that are in accordance with the quality standards of carrageenan [3].

2. Methods

The method used is the extraction method using ultrasonic waves from two different sonication devices, namely, Elma sonicator. In the process of carrageenan extraction, the fixed variable for each extraction method used was pH 8.5-9, the frequency of ultrasonic waves 20-40 kHz and *K. alvarezii* seaweed were used as many as 15 grams in each experiment. [4].

Extraction with ultrasonic waves is carried out at a frequency of 40 kHz with variations in extraction: temperatures of 30, 40, 50, 60, and 70 °C; and time 20, 25, 30, 35 and 40 minutes to determine the optimum temperature which gives the maximum yield.

3. Result and discussion

3.1. % yield

% yield obtained with carrageenan quality based on FCC standards (Food Chemicals Codex), EEC (European Economic Community), FAO (Food Agriculture Organization) and Commercial analysis of water content, ash content, viscosity, and gel strength.

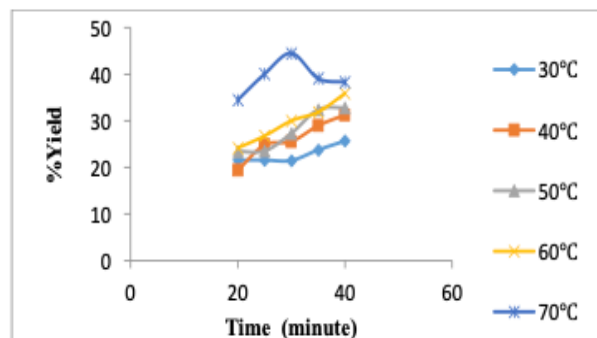


Figure 1. Relationship between time variation and extraction temperature with% of agency yield

In figure 1 it can be seen that the increase in temperature can cause an increase in yield, this is because the higher the extraction temperature, the termination of the polysaccharide chain bond becomes carrageenan. The extraction process with ultrasonic waves with a frequency of 40 kHz in this experiment showed that the highest carrageenan yield was achieved at temperatures and extraction times of 70°C for 30 minutes, namely 44.45% and the lowest carrageenan yield reached at temperatures and extraction times of 40°C for 20 minutes ie, 34% Compared to the minimum standard of carrageenan yield determined by the trade department (1989) [5] (by 25%), the results still do not meet the standards.

3.2. Water content

Determination of water content contained in carrageenan powder products from *K. alvarezii* seaweed produced in this activity was carried out gravimetric according to the procedure issued by AOAC, (1984).

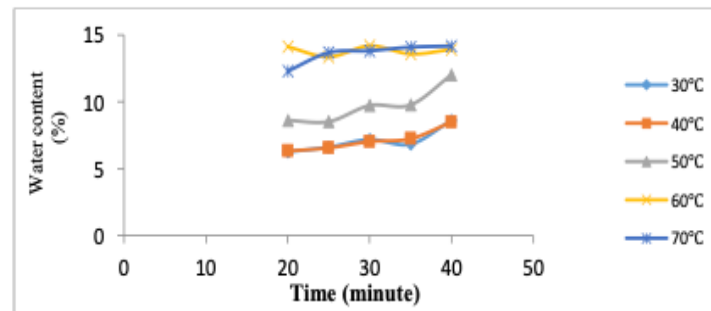


Figure 2. Relationship between variations in temperature and time extraction to water content

The carrageenan water content of *K. alvarezii* seaweed in this activity tended to increase with increasing time and extraction temperature, the highest water content was found in the temperature and extraction time of 70 °C for 40 minutes which was 14.18% and the lowest was at the extraction temperature and time 30 °C for 20 minutes which is 6.27%. The value of water content obtained meets the standard of carrageenan quality for commercial but based on carrageenan quality according to the FCC, EEC and FAO has exceeded the maximum water content of 12%. Increasing the moisture content of the temperature and extraction time can be caused by the extraction time giving enough time for the solvent to penetrate the cell wall and pull out the compounds contained in the material, resulting in yields with high water content.

3.3. Ash content

The value of ash obtained by carrageenan quality standards according to the FCC (Max. 35%) but based on carrageenan quality according to EEC (15-40%) and FAO (15-40%) are not included in the standard.

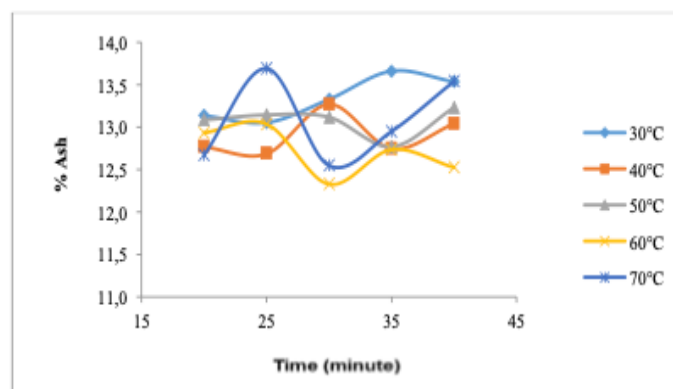


Figure 3. Relationship between temperature and time extraction variations to ash content

The carrageenan ash content of *K. alvarezii* seaweed in this activity tends to be stable even though with increasing time and extraction temperature, the highest ash content is found at temperature and

extraction time of 70 °C for 25 minutes which is 13.69% and the lowest is at temperature and time 60 °C for 40 minutes which is 12.52%.

3.4. Viscosity

Based on the results of the analysis of increasing time and extraction temperature does not affect the levels of carrageenan ash produced because the value is close to each other. Ash content is produced by burning organic matter and is closely related to the number of minerals in a material. The ash content is around 12.52-13.69%, this indicates that the amount of minerals contained in seaweed is relatively low.

The content of ash indicates the amount of mineral content in carrageenan which is not burned during the process of ignition. Seaweed includes food that contains high enough minerals such as Na, Ca, K, Cl, Mg, Fe, S, and trace elements, especially iodine [6].

Viscosity testing was carried out to determine the level of carrageenan viscosity on extraction time and temperature. Determination of the viscosity contained in carrageenan powder from *K. alvarezii* seaweed produced in this activity was carried out according to the procedure issued by AOAC, 1984, FMC Corp., 1977 using a Viscometer Brookfield.

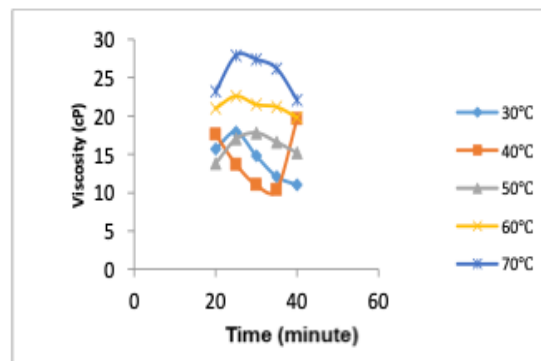


Figure 4. Relationship between temperature and time extraction variations to viscosity

The carrageenan viscosity value of *E. cottonii* seaweed in this activity tended to decrease with increasing extraction time and temperature, the highest viscosity was found in the temperature and extraction time of 70 °C for 25 minutes which was 27.9 cP and the lowest was at temperature and extraction time 35 minutes is 10.4 cP. The viscosity values obtained meet carrageenan quality standards according to the FCC, FAO and commercial values, namely a minimum of 5 cP.

Increasing the time and extraction temperature affects the viscosity. The use of higher extraction temperatures causes more sulfate content to emerge from seaweed, causing viscosity to decrease. The increase in extraction time causes viscosity to decrease, this is due to the nature of the carrageenan viscosity is directly proportional to the sulfate content, where the long extraction time can reduce the levels of carrageenan sulfate so that the viscosity value also decreases.

3.5. Gel strength

Determination of gel strength contained in carrageenan powder from *K. alvarezii* seaweed produced in this activity was carried out according to procedures issued by AOAC, 1984 and FMC Corp., 1977.

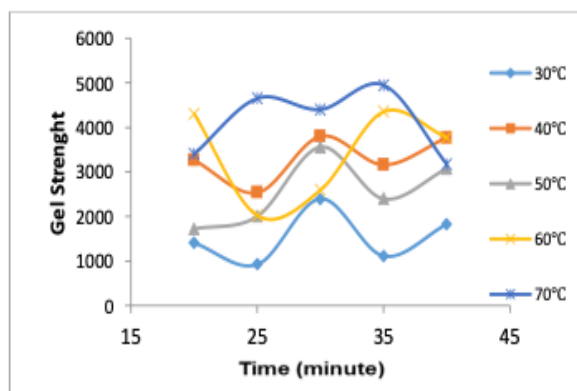


Figure 5. Relationship between temperature and time extraction variations on gel strength.

The value of *K. alvarezii* seaweed gel strength in this activity tends to increase with increasing time and extraction temperature, the highest value of gel strength is found at temperature and extraction time of 70 °C for 35 minutes which is 4945.99 dyne / cm² and the lowest is at temperature and time extraction of 30 °C for 25 minutes is 926.26 dyne / cm², the value of gel strength obtained exceeds the carrageenan quality standard of commercial value, namely 685 ± 13.43 [1].

Based on the analysis of gel strength, the values obtained by the unstable increase level at each time variation and extraction temperature are more likely to increase with increasing time and extraction temperature so that it can be said that the higher the extraction time and temperature, the higher the gel strength.

Increasing the value of gel strength is related to the extraction time where the longer the extraction time, the lower the sulfate content, the higher the strength of the gel and this indicates a significant correlation between sulfate content and gel strength.

Conclusion

The results of extraction of *K. alvarezii* are seaweed with a time variation of 40 minutes and the variable temperature is 70 °C, with the optimum value of temperature and extraction time is 70 °C for 30 minutes which produces carrageenan as much as 44.46%. The carrageenan quality test produced water content ranging from 6.27-14.18%, ash content 12.33-13.69%, viscosity of 10.4-27.9 cP and gel strength ranged from 926.26 to 4945.99 dyne /cm².

References

- [1] Bunga S M, Montolalu R I, Harikedua J, Montolalu L A D Y, Watung A H and Taher N 2013 Karakteristik Sifat Fisika Kimia Karaginan Rumput Laut *Kappaphycus alvarezii* Pada Berbagai Umur Panen Yang Diambil Dari Daerah Perairan Desa Arakan Kabupaten Minahasa Selatan *J. Media Teknol. Has. Perikan.* **1**
- [2] Kordi, K. M G H 2011 *Cultivation of Biota Aquatic for Food, Cosmetics and Medicine* (Yogyakarta: Lily Publisher)
- [3] Badan P P B air payau 2010 *Pelestarian Plasma Nutfah Rumput Laut Kappaphycus alvarezii (Doty) Melalui Induksi dan Embriogenesis Invitro* (Jakarta)
- [4] Mahyati, Yusuf M, Hikmah N and S A D 2018 Caragenan Extraction From *Kappaphycus Alvarezii* Seaweed With Ultrasonic Wave Extraction Methods *Proceedings of Research Result Seminar (SNP2M)* (Makassar: SNP2M)
- [5] Wenno M R 2009 Karakteristik fisiko-kimia karaginan dari *Eucheuma cottonii* pada berbagai

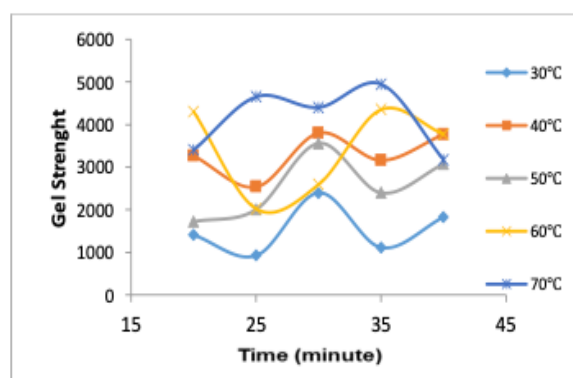


Figure 5. Relationship between temperature and time extraction variations on gel strength.

The value of *K. alvarezii* seaweed gel strength in this activity tends to increase with increasing time and extraction temperature, the highest value of gel strength is found at temperature and extraction time of 70 °C for 35 minutes which is 4945.99 dyne / cm² and the lowest is at temperature and time extraction of 30 °C for 25 minutes is 926.26 dyne / cm², the value of gel strength obtained exceeds the carrageenan quality standard of commercial value, namely 685 ± 13.43 [1].

Based on the analysis of gel strength, the values obtained by the unstable increase level at each time variation and extraction temperature are more likely to increase with increasing time and extraction temperature so that it can be said that the higher the extraction time and temperature, the higher the gel strength.

Increasing the value of gel strength is related to the extraction time where the longer the extraction time, the lower the sulfate content, the higher the strength of the gel and this indicates a significant correlation between sulfate content and gel strength.

Conclusion

The results of extraction of *K. alvarezii* are seaweed with a time variation of 40 minutes and the variable temperature is 70 °C, with the optimum value of temperature and extraction time is 70 °C for 30 minutes which produces carrageenan as much as 44.46%. The carrageenan quality test produced water content ranging from 6.27-14.18%, ash content 12.33-13.69%, viscosity of 10.4-27.9 cP and gel strength ranged from 926.26 to 4945.99 dyne /cm².

References

- [1] Bunga S M, Montolalu R I, Harikedua J, Montolalu L A D Y, Watung A H and Taher N 2013 Karakteristik Sifat Fisika Kimia Karaginan Rumput Laut *Kappaphycus alvarezii* Pada Berbagai Umur Panen Yang Diambil Dari Daerah Perairan Desa Arakan Kabupaten Minahasa Selatan *J. Media Teknol. Has. Perikan.* **1**
- [2] Kordi, K. M G H 2011 *Cultivation of Biota Aquatic for Food, Cosmetics and Medicine* (Yogyakarta: Lily Publisher)
- [3] Badan P P B air payau 2010 *Pelestarian Plasma Nutfah Rumput Laut Kappaphycus alvarezii (Doty) Melalui Induksi dan Embriogenesis Invitro* (Jakarta)
- [4] Mahyati, Yusuf M, Hikmah N and S A D 2018 Caragenan Extraction From *Kappaphycus Alvarezii* Seaweed With Ultrasonic Wave Extraction Methods *Proceedings of Research Result Seminar (SNP2M)* (Makassar: SNP2M)
- [5] Wenno M R 2009 Karakteristik fisiko-kimia karaginan dari *Eucheuma cottonii* pada berbagai

bagian thalus, berat bibit dan umur panen [tesis] *Bogor Inst. Pertan. Bogor*

- [6] N S 2006 *Karakteristik Alkali Tread cottonii (ATC) dan Carrageenan dari Seaweed Euchema cottonii pada Berbagai Umur Panen* (Bogor)