



IOP Conference Series: Earth and Environmental Science

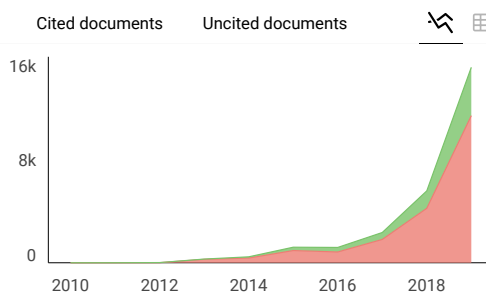
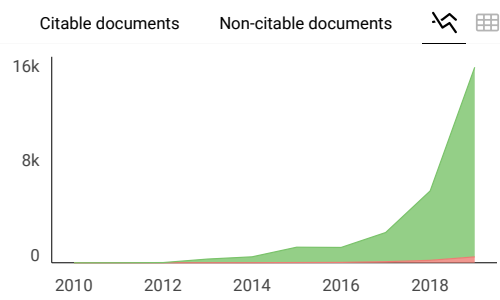
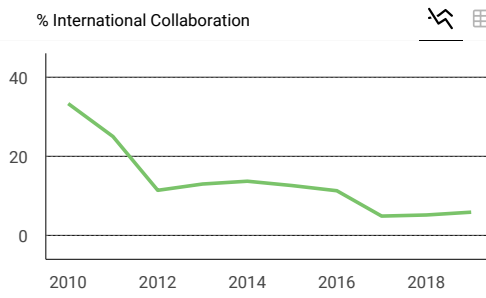
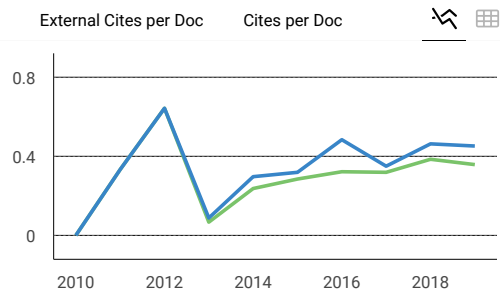
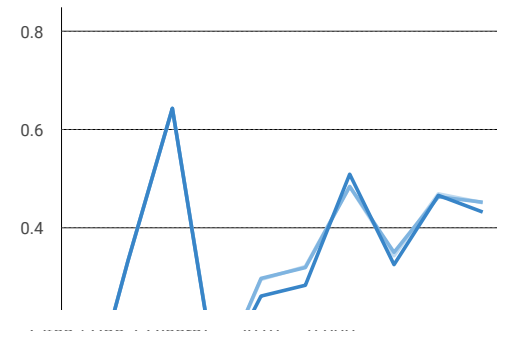
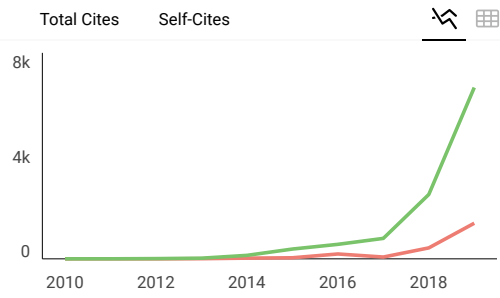
COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
<p>United Kingdom</p>  <p>Universities and research institutions in United Kingdom</p>	<p>Earth and Planetary Sciences Earth and Planetary Sciences (miscellaneous)</p> <p>Environmental Science Environmental Science (miscellaneous)</p>	IOP Publishing Ltd.	18
PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Conferences and Proceedings	17551315, 17551307	2010-2020	<p>Homepage</p> <p>How to publish in this journal</p> <p>ees@ioppublishing.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](#)

Ad closed by Google



IOP Conference Series: Earth and Environmental...

Not yet assigned quartile

SJR 2019
0.18

powered by scimagojr.com

← Show this widget in your own website

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

```
<a href="https://www.scimaç
```

Ad closed by Google

Metrics based on Scopus® data as of April 2020

PAPER • OPEN ACCESS

Preface

To cite this article: 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **589** 011001

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



240th ECS Meeting ORLANDO, FL

Orange County Convention Center Oct 10-14, 2021



Abstract submission due: April 9

SUBMIT NOW

Preface

3rd International Conference of the Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA 2018)

1. About TREPSEA 2018

The International conference of the Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA) aims to conduct integrative research of interactions between natural environment and human-social systems in Southeast Asia to solve the environmental problems in Southeast Asia. Its scope thus includes topics of geoscience, environmental science, engineering, medicine, economy, culture, education, and administration.



Transdisciplinary Research (TDR) is defined as research efforts conducted by investigators from different disciplines and non-academic participants working jointly to create new conceptual, theoretical, methodological, and translational innovations. Related stakeholders include sponsoring intuitions, governments, development organizations, business and industries, civil society (inhabitant, NGO's etc.), and the media.

Our vision of TREPSEA conference is to become a unique and leading international conference on transdisciplinary research studies in varieties of environmental problems of Asia's countries especially ASEAN countries. And our Mission is to share, discuss and exchange knowledge, experience and outcome of transdisciplinary research on environmental problems with various stakeholders.

The 3rd international conference of the Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA 2018) was held on August 11 – 12, 2018 at State University of Gorontalo's Hotel TC Damhil UNG in Gorontalo city, Sulawesi, Indonesia.



TREPSEA 2018 conference featured oral and poster presentations and workshop, and participants presented, shared and discussed their experience on the following topics:

4 Main Topics of TREPSEA 2018

<p>1. Disaster Mitigation:</p> <ul style="list-style-type: none"> ○ Volcanic Eruption ○ Flood ○ Earthquake ○ Tsunami ○ Landslide ○ Groundwater 	<p>2. Sustainable Development and Environmental Preservation:</p> <ul style="list-style-type: none"> ○ Heavy Metal Problem ○ Conversion of Waste to Energy ○ Renewable Energy
<p>3. Measure and Improvement to Urban Environmental Problems:</p> <ul style="list-style-type: none"> ○ Urban Management and Community Development ○ Urban Transportation Planning ○ Traffic Control and Surveillance System ○ Garbage Problem ○ Waste Water Problem 	<p>4. Food and Human Security:</p> <ul style="list-style-type: none"> ○ Food ○ Security problems

2. TREPSEA 2018 General Committee

Prof. Masayuki Sakakibara, Ph. D.
Chairperson
Research Institute for Humanity and Nature (RIHN) & Ehime University

Prof. Dr. Fenty Usman Puluhalawa, M.Hum,
Vice-Chairperson
State University of Gorontalo

General Committee Members

Prof. Dr. Dwia Aries Tina Pulubuhu, M.A.
Hasanuddin University

Prof. Dr. Emmy Suparka
Bandung Institute of Technology

Prof. Dr. Syamsu Qamar Badu, M.Pd.
Rector of State University of Gorontalo

Dr. Arif Satria, SP, M.Si
Bogor Agricultural University

Prof. Dr. H. Gufran Darma Dirawan, M. EMD.,
State University of Makassar

Scientific Committee Members

Ir. Benjamin Sapiie, *ITB*
Prof. Budu, *UNHAS*
Dr. Hayati Sari Hasibuan, *UI*
Dr. Heriansyah Putra, *IPB*
Prof. Hiroki Kasamatsu, *EU*
Dr. Eng. Imam Achmad Sadisun, *ITB*
Prof. Katsuya Tanaka, *RCSE, SU*
Prof. Mai Trong Nhuan, *VNUH*
Dr. Lukman AR Laliyo, *UNG*
Dr. rer. nat. Mohamad Jahja, *UNG*
Prof. Dr. Muh. Nadjib Bustan (MD), *UNM*
Dr. Zaenal Abidin, *IPB*

Local Committee Members

Head: Dr. Sc.Yayu Indriati Arifin, *UNG*
Secretary: Deasy Natalia Botutihe, M.Si, *UNG*
Lanto Ningrayati Amali, Ph.D, *UNG*
Novriyanto Napu, Ph.D, *UNG*
Dr. Lilan Dama, *UNG*
Dr. Sunarty Eraku, *UNG*
Raflin Hinelu, M.Si, *UNG*
Intan Novianti Manyoe, MT, *UNG*

Abbreviation

EU: Ehime University
IPB: Bogor Agricultural University
ITB: Bandung Institute of Technology
RCSE, SU: Research Centre for Sustainability and Environment, Shiga University
UI: University of Indonesia
UNG: State University of Gorontalo
UNHAS: Hasanuddin University
UNM: State University of Makassar
VNUH: Vietnam National University, Hanoi

3. Special Guest

- Prof. Dr. Syamsu Qamar Badu, M.Pd.
Rector of State University of Gorontalo (UNG)

4. Keynote and Invited Speakers

- Prof. Dr. Ir. Nelson Pomalingo, M.Pd
The Regent of Gorontalo Regency
- H. Hamim Pou, S.Kom, MM
The Regent of Bone Bolango Regency
- Prof. Dr. Ir. Mahludin H. Baruwadi, M.P
*Vice Rector for Academic Affairs
State University of Gorontalo (UNG)*
- Ms. Kana Furusawa
*Vice Secretary General,
The Japanese Geoparks Network*

5. Organizers

- Research Institute for Humanity and Nature (RIHN), Japan
- State University of Gorontalo (UNG), Indonesia
- Ehime University (EU), Japan
- Bandung Institute of Technology (ITB), Indonesia
- Muhammadiyah University of Gorontalo (UMGo), Indonesia

6. Manuscripts for TREPSEA 2018

Although more than 120 abstracts were received and presented in TREPSEA 2018 conference, 52 manuscripts were accepted for reviewing processes. Only 37 manuscripts were finally accepted for the publication process.

7. TREPSEA 2018 Photos



TREPSEA2018's Ice Breaking Dinner



TREPSEA2018's Ice Breaking Dinner



TREPSEA2018's Event Photos



TREPSEA2018's Event Photos



TREPSEA2018's Event Photos



TREPSEA2018's Event Photos



TREPSEA2018's Event Photos



TREPSEA2018's Event Photos

PAPER • OPEN ACCESS

The Effect of Chitosan of Ark Clam Shells to Reduce Pb and Hg Level and Amount of Bacteria in the Blood Cockles Meatball

To cite this article: Margaretha Solang *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **589** 012036

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



240th ECS Meeting ORLANDO, FL

Orange County Convention Center Oct 10-14, 2021



Abstract submission due: April 9

SUBMIT NOW

The Effect of Chitosan of Ark Clam Shells to Reduce Pb and Hg Level and Amount of Bacteria in the Blood Cockles Meatball

Margaretha Solang¹, Djuna Lamondo¹, Syam S Kumaji¹, Novri Y Kandowangko¹

¹Department of Biology, Faculty of Mathematics and Natural Science, Gorontalo State University, Indonesia

Corresponding Author: margarethasolang@ung.ac.id

Abstract. Chitosan of ark clams shell is regarded as untapped waste; it has potential as a heavy metal chelating agent and anti-bacterial. The objective of this research is to examine the effect of chitosan of the ark clams shell as a chelating agent to decrease of Pb and Hg level in the blood cockles meatball. This research is also aimed at exploring the capability of chitosan of the shell in decreasing the bacteria within blood cockle meatball. This research conducted complete randomized design with the provision of five-level of chitosan concentration, i.e., 0%, 0.5%, 1%, 1.5%, 2.0%. Atomic-Absorbent Spectrophotometric (AAS) method used to examine the level of Pb and Hg within the meatball, while the total of bacteria was determined by using Total Plate Count (TPC) method. The data were analyzed by using Analysis of Variance (ANOVA) and Least Significant Difference (LSD) test. The results reveal that the administration of chitosan of ark clam on blood cockle meatballs reduced Pb levels from 0.195 ppm to 0.168 ppm, while Hg levels reduced from levels of 0.018 to 0.008 ppm, and the number of bacteria from 2.4×10^2 to 1.4×10^2 colony/g. In conclusion, the chitosan of the ark clams shell can ensure the safety of the meatball product.

Keywords. Blood cockles; chitosan; Pb; Hg; bacteria

1. Introduction

Blood cockle (*Anadara granosa*) has red-coloured pigments which contain haemoglobin. Blood cockle can be found in the muddy part of the coastal area. Blood cockle is one of the sea products which is rich in protein. This protein content made blood cockle as an alternative food to fulfil the protein need of for the community. Blood clam or cockle can be processed to make meatballs. Meatballs are an alternative meal which can generally be found across Indonesia, including in Gorontalo. Meatballs made from blood cockle is a variation of the type of meatballs as meatball is usually made from beef, fish, and chicken.

In addition to having high protein content, blood cockle also contains heavy metals from the environment where the cell is found such as plumbum (Pb) and mercury (Hg) [1,2]. Besides, blood cockle is also vulnerable to bacteria contamination. Blood cockle which contains heavy metals and bacteria can cause health problems when it is consumed in a large proportion. Therefore, to maintain the food security of the blood cockle products, there is a need to reduce the heavy metal properties or bacteria within the product, hence the product made from blood cockle is safe to be consumed.



One of the alternatives to reduce the heavy metal content and bacteria is by utilizing the ark clam shell into chitosan that can be applied in the food processing. Chitosan is the chitin that has been rid of its acetyl compound through deacetylation process. Previous research showed that the utilization of 2% chitosan from white shrimp could reduce the effect of Pb in tofu clam [3]. Besides, chitosan also has antioxidant and anti-bacterial properties [4-6].

One of the residues from the clam shell that can be utilized as chitosan is the shell of ark clam. This utilization of ark clam shell as chitosan is also an alternative for waste management into a product of economic value. This study was aimed at evaluating the effect of chitosan derived from ark clam shell as a chelating agent for Pb and Hg, as well as reducing the number of bacteria in the meatball made from blood cockle.

2. Materials and Methods

The ingredients of meat meatball are blood cockle, spices (salt, pepper, turmeric, onion, and garlic), tapioca starch, rice flour, egg, and water. Blood cockles were taken from the Boalemo regency of Gorontalo province. The ingredients to create chitosan are ark clam shell, NaOH, HCl, distilled water, HNO₃. The ingredients to check the number of bacteria are Plate Count Agar (PCA), acetate acid 1%, alcohol 70%, *aquades*, BPW (Buffered Peptone Water 0,1%), and spiritus. Research tools consist of AAS (Atomic absorption spectrophotometer), glass equipment, microwave tube, and Nessler tube, desiccator, oven, boiling pan, stove, knife, cutting plate, lab cloth, spoon, and bowl. This research used completely randomized design with 5 types of chitosan concentrates (0%; 0.5%; 1%; 1.5%; and 2.0%) which applied into the meatball mixture. The measurement of Pb and Hg level was measured using the AAS from ZEE nit 700. The level of Hg and Pb were measured in mg/kg. Whereas, the level of microbes were calculated using the TPC. Amount of microbes are calculated in cell/mL. The data of the Pb and Hg and bacteria level were analyzed using the ANOVA and least significance difference (LSD).

3. Result and Discussion

3.1. Level of Pb in blood cockle meatball

The result of the ANOVA test showed that the level of Pb in blood cockle meatball supplemented with the chitosan from the ark clam shell was significantly reduced ($p = 0.000$). The level of Pb in meatball supplemented with chitosan from the ark clam shell with the concentrate of 0%; 0.5%; 1%; 1.5%, and 2% in sequence are 0.195 ppm, 0.182 ppm, 0.176 ppm, 0.169 ppm, 0.168 ppm (see Table 1). The LSD test showed that supplementation of 0.5% chitosan was able to reduce the level of Pb in blood cockle meatball.

Table 1. Level of Pb in blood cockle meatball supplemented with chitosan derived from ark clam

No	Formula	Level of Pb (ppm)	The maximum level of pollutant SNI 7387:2009
1	Meatball without chitosan	0.195	
2	Meatball with 0.5% chitosan	0.182	1.5 ppm
3	Meatball with 1% chitosan	0.176	
4	Meatball with 1.5% chitosan	0.169	
5	Meatball with 2% chitosan	0.168	

Indonesian National Standard (SNI) 7387:2009: on the level of Pb in fish and fisheries product including molluscs, crustacean, echinoderms, amphibian, and reptile.

Administration of chitosan made from ark clam reduced the Pb level in blood cockle meatball. Similar research showed that the concentrate and length of soaking of the chitosan from white shrimp

also significantly influenced the reduction of Pb in the meat of the tofu clams [3]. Reduction of Pb level in blood cockle meatball due to the administration of chitosan from ark clam is suspected due to the chitosan which has an amino group and hydroxyl chains, hence made chitosan to have a high chemical reaction and caused the polyelectrolyte of the cation. This cation polyelectrolyte character caused the chitosan to have a role as an ion exchanger and functioned as heavy metal (Pb) absorbent.

The amino group can bond with heavy metal Pb. The amino group as a chelating agent will bind the Pb. The Pb that binds with the amino group (NH₂) will form Pb (NH₂)₂. In this condition the heavy metal that is bound in amino group will stabilize the Pb, thus, the toxic property of this heavy metal Pb will be reduced. The higher the chitosan concentration administered to the mixture the higher the number of an amino group (NH₂) that will be able to bind the level of heavy metal Pb.

Pb level in meatball where chitosan from ark clam is administered range between 0.168 – 0.182 ppm. The lowest level of Pb (0.168 ppm) is obtained through the administration of highest level of chitosan, 2%. Level of Pb in meatball supplemented with chitosan from ark clam is below the level of maximum Pb pollutant standard set by SNI 7387:2009, that is 1.5 ppm (for fish and fisheries product, including molluscs, crustacean, echinoderms, amphibian, and reptile) [7]. This study showed that chitosan derived from the shell of ark clam has potential as a food security-keeper for a claims-based meal.

3.2. Level of Hg in blood cockle in meatball

The ANOVA test showed that the level of Hg for blood cockle meatball which receives chitosan from ark clam had experienced significant reduction ($p = 0,000$) of its Hg level. The average Hg for blood cockle meatball supplemented with chitosan derived from ark clam shell with the concentrate of 0%; 0,5%; 1%; 1,5%; and 2% in sequence are 0.018 ppm, 0.009 ppm, 0.008 ppm, 0.008 ppm, 0.008 ppm (Table 2).

The result of the LSD test showed that the administration of chitosan with different concentration resulted in a significant difference in mercury level in the meatball that receives no chitosan administration. However, the administration of various chitosan concentrate resulted in a similar mercury level.

Table 2. Level of Hg (ppm) in blood cockle meatball with the administration of chitosan derived from ark clam

No	Formula	Levels of Hg (ppm)	Maximum allowed level of pollutant SNI 7387:2009
1	Meatball without chitosan	0.018	1 ppm
2	Meatball with 0.5% chitosan	0.009	
3	Meatball with 1% chitosan	0.008	
4	Meatball with 1.5% chitosan	0.008	
5	Meatball with 2% chitosan	0.008	

Indonesian National Standard (SNI) 7387:2009: Level of Hg on fish and fisheries products including molluscs, crustacean, echinoderm, amphibian, and reptile.

Administration of chitosan made from the shell of ark clam on the blood cockle meatball has proven to reduce the level of Hg from 0.018 ppm to 0.008 ppm. The lowest level of mercury is obtained through the administration of 2% of chitosan. The reduction of Hg in blood cockle meatball is parallel to the increase of chitosan concentration administered to the meatball. The reduction of Hg level in the

meatball is suspected due to the group N in chitosan which reaction is by binding the pollutant metal [8].

Level of mercury in meatball supplemented with chitosan derived from ark clam is below the allowed standard of Hg set by the SNI 7387:2009, that is 1 ppm (for fish and fisheries products including molluscs, crustacean, echinoderms, amphibian, and reptile) [7]. This means that the chitosan made from the shell of the ark clam has the potential to reduce the Hg in the meatball, thus, safe to be consumed.

3.3. Quantity of bacteria in the blood cockle meatball

The results showed that administration of chitosan derived from ark clam significantly ($p = 0.000$) reduced amount of bacteria in the blood cockle meatball. The average amount of bacteria in the meatball constantly reduced along with the increase of chitosan concentration administered to the blood cockle meatball. Based on the results of TPC analysis show that a total value of bacteria in the blood cockle meatball which receive the chitosan treatment with the following concentration 0%, 0.5%, 1%, 1.5%, and 2% in sequence were: 2.4×10^2 colony/g, 1.8×10^2 colony/g, 1.8×10^2 colony/g, 1.6×10^2 colony/g, and 1.4×10^2 colony/g (see Table 3).

The LSD test showed that an amount of bacteria in meatball that receive chitosan made from ark clam shell is significantly different with a number of bacteria in blood cockle meatball with no chitosan administration. This result also showed that the 0.5% concentrate of chitosan was able to reduce the amount of bacteria in the meatball.

Table 3. Total bacteria (colony/g) in blood cockle meatball that receive ark clam chitosan.

No	Formula	Total bacteria (colony/g)	Limit TPC value (SNI No. 7388: BPOMRI 2016)
1	Meatball without chitosan	2.4×10^2	
2	Meatball with 0.5% chitosan	1.8×10^2	5×10^5 colony/g
3	Meatball with 1% chitosan	1.8×10^2	
4	Meatball with 1.5% chitosan	1.6×10^2	
5	Meatball with 2% chitosan	1.4×10^2	

Note: Indonesian National Standard (SNI) 7388:2009; Drug and food security control agency of the Republic of Indonesia (BPOMRI), 2016: maximum level of allowed pollutant bacteria in fish and fisheries products including steamed or boiled and or fried molluscs, crustacean, and echinoderm.

An average amount of bacteria decreased following the increase of chitosan concentrate. The average amount of bacteria in blood cockle meatball was 2.4×10^2 colony/g to 1.4×10^2 colony/g. The smallest amount of bacteria exists in the administration of 2% chitosan. The result from other research showed that the concentration of pure chitosan influenced the total log of the microbes, texture (mucus), fungus appearance, smell, and visual acceptance of the wet noodle [9]. Besides, the chitosan from the sampling clam of 0.01 $\mu\text{g}/\text{disk}$ and 0.02 $\mu\text{g}/\text{disk}$ [10] and chitosan made from the shrimp skin with the concentrate of 1.5% reduce the number of *kamaboko* bacteria in *kurisi* fish [11].

The chitosan made from the ark clam shell has the ability to reduce the number of bacteria in blood cockle meatball as it has positive polycation that is able to inhibit the growth of bacteria and fungus [12]. Chitosan has amino group (NH_2), which in its further reaction would be protonated to become NH^{3+} which will be able to bind the negative load within the membrane of the bacteria in amino group (NH^{3+}) owned by the chitosan will was able to formed a strong bond with the characteristics of the membrane

of the microbe that has negative load. This creates depolarization of the membrane of the microbe cell, hence disturb the integrity of the microbe cell. Thus, the membrane of the cell becomes unable to regulate the circulation of the substance to and from the cell. As a consequence, the membrane of the cell was destroyed and experienced lysis hence; the metabolism activity will be inhibited and caused death for the microbe [13,14].

The amount of bacteria in blood cockle meatball is below the maximum allowed Indonesian National Standard (SNI) for steam or boiled and or fried fish and fisheries product including molluscs, crustacean, and echinoderms that is 5×10^2 colony/g [7,15]. This study showed that the chitosan made from the shell of the ark clam has the potential to be used for food safekeeping from bacteria.

4. Conclusions

Chitosan made from the shell of the ark clam has the ability to significantly reduce the level of Pb, Hg, and bacteria in the blood cockle meatball. Therefore, administration of chitosan made from the shell of the ark clam to blood cockle meatball can produce safer to be consumed.

References

- [1] Selpiani L., Umroh, Rosalina D., 2015. Konsentrasi Logam Berat (Pb, Cu) Pada Kerang Darah (*Anadara Granosa*) di Kawasan Pantai Keranji Bangka Tengah dan Pantai Teluk Kelabat Bangka Barat. *OSEATEK* 9 (01). 21-34.
- [2] Pratama A. G., Pribadi R., Maslukah L., 2012. Kandungan Logam Berat Pb dan Fe pada Air, Sedimen, dan Kerang Hijau (*Perna viridis*) Di Sungai Tapak kelurahan Tugurejo Kecamatan Tugu Kota Semarang. *Journal Of Marine Research*,1, (1), 118-122.
- [3] Riswanda, T., Fida R., Sunu, K. 2014. Pemanfaatan kitosan udang Putih (*Lithopannaeus Vannamei*) sebagai Bioabsorben logam berat timbale (Pb) pada daging kerang tahu dimuara sungai Gunung Anyar. *Lentera Bio.* (3), 266-271.
- [4] Guibal E., 2004. Interactions of metal ions with chitosan-based sorbents: a review. *Separation and Purification Technology.* (38). 43-74.
- [5] Ngo, D. H., Vo, T. S., Ngo, D. N., Kang, K. H., Je, J. Y., Pham, H. N. D., Kim, S. K. (2015). Biological effects of chitosan and its derivatives. *Food Hydrocolloids.* (51), 200-216.
- [6] Yuan, G., Chen, X., Li, D., 2016. Chitosan films and coatings containing essential oils: The antioxidant and antimicrobial activity, and application in food systems, *Food Research International.* 89 (1), 117-128.
- [7] SNI (Indonesian National Standard), 2009. *Batas maksimum cemaran logam dalam pangan.* Bandar Standardisasi Nasional, SNI 7388:2009.
- [8] Aranaz I., Mengibar M., Harris R., Paños I., Miralles B., Acosta N., Galed G., and Heras Á., 2009. Functional Characterization of Chitin and Chitosan. *Current Chemical Biology* (3), 203-230.
- [9] Satyajaya W., Nawansih O., 2008. Pengaruh konsentrasi *chitosan* sebagai bahan pengawet terhadap masa simpan mie basah. *Jurnal Teknologi dan Industri Hasil Pertanian* 13 (1).
- [10] Sulistiyoningrum R. S., Suprijanto J dan Sabdono A., 2013. aktivitas anti bakteri kitosan dari cangkang kerang simping pada kondisi lingkungan yang berbeda : kajian pemanfaatan limbah kerang simping (*Amusium* sp.). *Journal of Marine Research* 2 (4), 111-117. Online di: <http://ejournal-s1.undip.ac.id/index.php/jmr>
- [11] Nirmala D., Masithah E.D., Purwanto D. A., 2016. Kitosan Sebagai Alternatif Bahan Pengawet Kamaboko Ikan Kurisi (*Nemipterus nematophorus*) pada Penyimpanan Suhu Dingin. *Jurnal Ilmiah Perikanan dan Kelautan*, 8(2), 109-125.
- [12] Wardaniati R.A., Setyaningsih S., 2009. Pembuatan Chitosan dari Kulit Udang dan Aplikasinya untuk Pengawetan Bakso. *Skripsi.* Universitas Diponegoro. Semarang.
- [13] Nicholas T. A., 2003. Antimicrobial Use of Native and Enzymatically Degraded Chitosans for Seafood Applications. *Electronic Theses and Dissertations*, The University of Maine Digital Commons @UMaine, 5-1-2003.
- [14] Kong, M., Chen, X. G., Xing, K., Park H., 2010. Antimicrobial Properties of Chitosan and Mode

of Action: A State of The Art Review. *International Journal of Food Microbiologi* 144(1): 51-63.

- [15] Badan Pengawas Obat Dan Makanan Republik Indonesia (BPOM), 2016. Kriteria Mikrobiologi Dalam Pangan Olahan. Peraturan Kepala Badan Pengawas Obat Dan Makanan Republik Indonesia Nomor 16. Jakarta.

Acknowledgments

The author would like to thank the LPPM of Gorontalo State University that has assisted with funding from PNBP funds to carry out this research.

Table of contents

Volume 589

2020

◀ Previous issue Next issue ▶

The 3rd International conference of the Transdisciplinary Research on Environmental Problems in Southeast Asia 11-12 August 2018, Negeri Gorontalo, Indonesia

Accepted papers received: 29 September 2020

Published online: 18 November 2020

Open all abstracts

Preface

OPEN ACCESS 011001

Preface

+ Open abstract  View article  PDF

OPEN ACCESS 011002

Peer review declaration

+ Open abstract  View article  PDF

01 - Disaster Mitigation

OPEN ACCESS 012001

Study on Influence of Joint Orientation on Rock Engineering Properties for Mining and Infrastructure Design

Purwanto, Djamaluddin, Sabrianto Aswad, Dedi Eka Wahyuwibowo, Nirmana Fiqra Qaidahiyani and Hideaki Yasuhara

+ Open abstract  View article  PDF


OPEN ACCESS 012002

Geology and 2D modelling of magnetic data to evaluate surface and subsurface setting in Bongongoayu geothermal area, Gorontalo

I N Manyoe, D A Suriamihardja, U R Irfan, S S Eraku, S S S Napu and D D Tolodo

+ Open abstract  View article  PDF

OPEN ACCESS 012003

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. 

Sediment material potential of Bone River as a prevention of silting and flood of Bone River estuary, Gorontalo

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

OPEN ACCESS

012004

Flood Points Distribution Mapping for the Determination of Evacuation Routes and Disaster Posts in Gorontalo City

Indrawan and Daud Yusuf

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

OPEN ACCESS

012005

Characteristic of the Mount Colo Volcano, Una-Una Island, Central Sulawesi Province: Tectonic Evolution and Disaster Mitigation

Purnama Sendjaja, Emmy Suparka, Chalid I. Abdullah and IGB Eddy Sucipta

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

OPEN ACCESS

012006

Geochemical Exploration of Geothermal Manifestations: Study Case of Bajawa Volcanic Complex, Flores Island, East Nusa Tenggara Province

H H Herzegovina, M Abdurrachman, M Hafidh and M Divi

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

OPEN ACCESS

012007

Facies Study of Lake Deposits Formation (Qpl) To Determine Deposition Environment of Ancient Limboto Lake: a Preliminary Result

A K M A Amin, M Sakakibara, Y I Arifin and N Akase

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

OPEN ACCESS

012008

Geophysical survey of landslide movement and mechanism in Gorontalo Outer Ring Road, Gorontalo

F C A Usman, I N Manyoe, R F Duwingik and D N P Kasim

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

OPEN ACCESS

012009

Landslide disaster and its prevention works in Shikoku region of Japan

Kazunari Kimura, Tomohiro Nagata and Shuya Kan

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

OPEN ACCESS

012010

Volcanostratigraphy of Krakatoa Islands, South Lampung District, Lampung Province

Taufik Ismail, Mirzam Abdurrachman, Yan Rizal and Kumala Hardjawidjaksana

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](#) [PDF](#)



OPEN ACCESS 012011
The Influence of Rock Resistance for Geomorphology of Krakatau Islands, South Lampung District, Lampung Province
Taufik Ismail, Mirzam Abdurrachman, Yan Rizal, Kumala Hardjawidjaksana and Rahmawati Arbie
[+ Open abstract](#) [View article](#) [PDF](#)

02 - Sustainable Development and Environmental Preservation

OPEN ACCESS 012012
Enhanced removal of heavy metals using sorbent and *Phragmites australis*
Nguyen Quoc Bien and Nguyen Thi Hoang Ha
[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012013
Mercury exposure from small scale gold mining activities and neurological symptoms on inhabitants and miners: a case study in Bolaang Mongondow, North Sulawesi Province, Indonesia
Yayu Indriati Arifin, Masayuki Sakakibara, Koichiro Sera, Puluhalawa Fenty Usman and Fitryane Lihawa
[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012014
Distribution of heavy metals in sediment along the Southern coast of Vietnam
Nguyen P C Tu, Nguyen N Ha, Nguyen N Tri and Nguyen V Dong
[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012015
Socioeconomic and Mercury Exposure to The Goldsmiths in Manggal Subdistrict of Urban Artisanal Gold Mining (UAGM) Area in Makassar, South Sulawesi, Indonesia
Hasriwiani Habo Abbas, Masayuki Sakakibara, Koichiro Sera, Lukmanul Hakim Arma and Mansur Sididi
[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012016
Regional Geochemical Map of West Java, Indonesia: Evaluation for Environmental and Mineral Resources
Purnama Sendjaja and Ari Kusniadi
[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012017
Liquefaction Resistance of Sand Improved with Enzymatically Induced Calcite Precipitation based on Laboratory Investigation
Minson Simatupang



-
- OPEN ACCESS** 012018
Development of Bioadsorbent Chitosan from Shrimp Shell Waste to Mercury Absorption Efficiency
Astin Lukum, Yoseph Paramata, Deasy N Botutihe, Jefrin Akume, Kostiawan Sukamto and Arfiani Rizki Paramata
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012019
Temperature dependence for purification of leachate containing heavy metals by phytoremediation using the artificial channel
K Okazaki, T Kurahashi, S Yamazaki and M Sakakibara
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012020
Sociodemographic Attributes and Dependency on Artisanal and Small-scale Gold Mining: the Case of Rural Gorontalo, Indonesia
Satoru Komatsu, Katsuya Tanaka, Masayuki Sakakibara, Yuyu Indriati Arifin, Sri Manovita Pateda and Intan Noviantari Manyoe
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012021
Chemical content analysis of coral limestone as prospecting of extractive development in Gorontalo City
W Annisa, I N Manyoe, A K Mubarak, S S S Napu, I G S Pratama and S Fatimah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012022
Environmental Risk and Health Hazardous Substances in Artisanal Small-Scaled Gold Mining in Sekotong, West Nusa Tenggara, Indonesia
S Novianti, M Abdurrachman, D Claudia and NI Basuki
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012023
Geodiversity of the Togean Islands National Park, Central Sulawesi Province for Geopark Assessment
Purnama Sendjaja, Emmy Suparka and M U Botjing
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012024
The nature of ultramafic rocks from Sulawesi, Indonesia and their suitability for CO₂ sequestration



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

OPEN ACCESS

012025

"Gunung Api Purba Nglanggeran" welcomes UNESCO Global Geopark Reassessment in 2019

Nabila Novasari Soviana, Budi Brahmantyo, Mirzam Abdurrachman and Firman Sauqi Nur Sabila

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

03 - Measure and Improvement to Urban Environmental Problem

OPEN ACCESS

012026

Eco-Biger (Ecopreneur Biodigester) is Right Digester Innovation for Household to Increase People's Welfare in Indonesia

A K Syahroni, W T Roby and T Rahmanda

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

OPEN ACCESS

012027

Customary Practices of Musyawarah Mufakat: An Indonesian Style of Consensus Building

Citra Anggita and Tsuyoshi Hatori

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

04 - Food and Human Security

OPEN ACCESS

012028

The Development of Earthquake Risk Reduction Curriculum for 4-6 Years Old Children in Gorontalo

P P Ardni, I N Arifin, H Syahputra and B Pupala

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

OPEN ACCESS

012029

Measuring the Relationship among Personal Network with Japanese Language Skill and Fit Well with Life in Japan

Vita Fajriani Ridwan and Nobuhiko Matsumura

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

OPEN ACCESS

012030

Monitoring and Evaluation of Fish Quality Standard Compliance

Faiza A Dali and Rahim Husain

[+ 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](#).

012031

Analysis on quality improvement of used cooking oil with young pineapple (*Ananas comosus*) using Taguchi Method

Muhammad Arfan, Wahyu Supartono and Henry Yuliando

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

OPEN ACCESS

012032

Transformation of Fallow Yard Become Potential for Agribusiness of Dragon Fruit

Dewa Oka Suparwata and Moh. Muchlis Djibran

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

OPEN ACCESS

012033

Concentration of Pb, Sn and Fe Metals on Milk Products and Canned Fish in Gorontalo City

Wiwin Kunusa Rewini, Nurain Thomas, Doly Prima Silaban, Hendrik Iyabu and Muhammad Taupik

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

OPEN ACCESS

012034

Preliminary Study of Clinical Antidiabetic Activity of Salam Leaves (*Eugenia Polyantha*) and Sambiloto Leaves (*Andrographis Paniculata*) In Type 2 Diabetic Patients

N I Ischak and D N Botutihe

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

OPEN ACCESS

012035

Utilization of Corncob Cellulose Isolate (*Zea mays*) as Adsorbent of Heavy Metal Copper and Cadmium

Ishak Isa, Eka Setiawati, Erni Mohammad and Wiwin Kunusa

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

OPEN ACCESS

012036

The Effect of Chitosan of Ark Clam Shells to Reduce Pb and Hg Level and Amount of Bacteria in the Blood Cockles Meatball

Margaretha Solang, Djuna Lamondo, Syam S Kumaji and Novri Y Kandowangko

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

OPEN ACCESS

012037

The potential of isolates endophytic fungi from the leaves of henna plant (*Lawsonia inermis*) toward the growth of *Candida albicans* and *Staphylococcus aureus*

A M Hasan, W D Uno and S Baruwadi

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

JOURNAL LINKS

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](#).



[Information for organizers](#)

[Information for authors](#)

[Contact us](#)

[Reprint services from Curran Associates](#)



PAPER • OPEN ACCESS

The Effect of Chitosan of Ark Clam Shells to Reduce Pb and Hg Level and Amount of Bacteria in the Blood Cockles Meatball


Margaretha Solang¹, Djuna Lamondo¹, Syam S Kumaji¹ and Novri Y Kandowangko¹

Published under licence by IOP Publishing Ltd

IOP Conference Series: Earth and Environmental Science, Volume 589, The 3rd International conference of the Transdisciplinary Research on Environmental Problems in Southeast Asia 11-12 August 2018, Negeri Gorontalo, Indonesia

Citation Margaretha Solang *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **589** 012036margarethasolang@ung.ac.id¹ Department of Biology, Faculty of Mathematics and Natural Science, Gorontalo State University, Indonesia<https://doi.org/10.1088/1755-1315/589/1/012036>

Buy this article in print

 Journal RSS[Sign up for new issue notifications](#)[Create citation alert](#)

Abstract

Chitosan of ark clams shell is regarded as untapped waste; it has potential as a heavy metal chelating agent and anti-bacterial. The objective of this research is to examine the effect of chitosan of the ark clams shell as a chelating agent to decrease of Pb and Hg level in the blood cockles meatball. This research is also aimed at exploring the capability of chitosan of the shell in decreasing the bacteria within blood cockle meatball. This research conducted complete randomized design with the provision of five-level of chitosan concentration, i.e., 0%, 0.5%, 1%, 1.5%, 2.0%. Atomic-Absorbent Spectrophotometric (AAS) method used to examine the level of Pb and Hg within the meatball, while the total of bacteria was determined by using Total Plate Count (TPC) method. The data were analyzed by using Analysis of Variance (ANOVA) and Least Significant Difference (LSD) test. The results reveal that the administration of chitosan of ark clam on blood cockle meatballs reduced Pb levels from 0.195 ppm to 0.168 ppm, while Hg levels reduced from levels of 0.018 to 0.008 ppm, and the number of bacteria from 2.4×10^2 to 1.4×10^2 colony/g. In conclusion, the chitosan of the ark clams shell can ensure the safety of the meatball product.

Export citation and abstract

[BibTeX](#)[RIS](#)

Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

PDF



PAPER • OPEN ACCESS

Peer review declaration

To cite this article: 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **589** 011002

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



240th ECS Meeting ORLANDO, FL

Orange County Convention Center Oct 10-14, 2021



Abstract submission due: April 9

SUBMIT NOW

Peer review declaration

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

- **Type of peer review: Single-blind / Double-blind / Triple-blind / Open / Other (please describe)**

Single-blind

- **Conference submission management system:**

TREPSEA 2018 Conference submission had been managed under the supervision of the Committee of TREPSEA 2018. The Committee of TREPSEA 2018 accepted potential abstracts as well as full papers related to its topics to be presented at the Conference. In order to ensure for publication of the manuscripts, TREPSEA 2018 Committee managed the numerous processes including scope checking, looking for relevant SME (Subject Matter Experts such as University Professors, Scientists, and Researchers) and then requested them as reviewers/referees to review the submitted manuscripts under single-blinded peer-reviewing method. Finally, the manuscripts considered by the recommendation of peer reviewers and editorial board were accepted for publication process. The Committee of TREPSEA 2018 declares that the submitted manuscripts have not been published before nor submitted to another journal for the consideration of publication.

- **Number of submissions received:**

Although more than 120 abstracts were received and presented in TREPSEA 2018 conference, 52 manuscripts were accepted for reviewing processes. Only 37 manuscripts were finally accepted for the publication process.

- **Number of submissions sent for review:**

52 manuscripts for reviewing process.

- **Number of submissions accepted:**

37 manuscripts were finally accepted for the publication process.

- **Acceptance Rate (Number of Submissions Accepted / Number of Submissions Received X 100):**



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.

71%

- **Average number of reviews per paper:**

Each manuscript was reviewed by 2 - 3 reviewers, and underwent the additional revising processes approximately for 1 - 3 times based on the feedback of reviewers.

- **Total number of reviewers involved:**

23 reviewers

- **Any additional info on review process:**

NA

- **Contact person for queries:**

Professor Masayuki Sakakibara
Chairperson, TREPSEA 2018
Current Vice – Chairperson, TREPSEA 2021

Project Leader SRIREP Project / Mercury Project
Research Institute for Humanity and Nature (RIHN) &
Ehime University
Email: sakaki@chikyu.ac.jp / sakakibara.masayuki.mb@ehime-u.ac.jp

Myo Han Htun
Research Associate
SRIREP Project / Mercury Project
Research Institute for Humanity and Nature (RIHN)
Email: myo@chikyu.ac.jp / myohanhtun@gmail.com

Please call us during office hours (08:30 – 17:00) except weekend and public holidays
075-707-2357 (Japanese Speaking) 075-707-2344 (English Speaking)



Q trepsea



Tulis

Kotak Masuk 1.202

- Berbintang
- Ditunda
- Penting
- Terkirim

Draf 11

Meet

- Rapat baru
- Rapat saya

Hangout



+

Tidak ada chat terbaru
Mulai yang baru

TREPSEA Conference <trepsea2018@gmail.com>
kepada saya

Inggris Indonesia Terjemahkan pesan

Dear Dr. Margaretha Solang, Universitas Negeri Gorontalo

Thanks for your full paper submission. Currently, we are still in the processes for your paper.

Thanks and regards

TREPSEA Committec

Margaretha Solang <margarethasolang@ung.ac.id>
kepada TREPSEA

Thank you for your response.

Margaretha Solang <margarethasolang@ung.ac.id>
kepada TREPSEA



Q trepsea



Tulis

Kotak Masuk 1.202

Berbintang

Ditunda

Penting

Terkirim

Draf 11

Meet

Rapat baru

Rapat saya

Hangout



Margaretha



Tidak ada chat terbaru
Mulai yang baru

Category	Researchers with presentation
Payment Amount	2,000,000 Rupiah (Two Million Rupiah)

Bank Account Information (INDONESIA)	
Bank (Bank)	Bank Syariah Mandiri
Nama (Name)	TREPSEA COMMITTEE 2018
No. Rekening (Account No)	7117564651
Alamat (Address)	Jl. Jend Sudirman No 06

Important Notice

Please keep your payment receipt and send us a photo or a scanned copy of it to the following email addresses trepsea2018@gmail.com(CC: trepsea2018@yahoo.com)

The fees for Students with Presentation or Stakeholders with Presentation is 1,000,000 Rupiah (One Million Rupiah). Therefore, if you are currently studying as a student, please submit a photo or a scanned copy of your student ID and show as an evidence to make the payment of Students with Presentation or Stakeholders with Presentation.

For more information about registration fees, please visit <https://trepsea.org/registration-fees/>

Looking forward to seeing you at this important event,



Q trepsea



Tulis

TREPSEA Conference <trepsea2018@gmail.com>

kepada saya

Kotak Masuk 1.202

Berbintang

Inggris

Indonesia

Terjemahkan pesan

Ditunda

Dear Dr. Margaretha Solang, Universitas Negeri Gorontalo

Penting

We have been waiting from one reviewer for very long time. Hence, here are the reviewers comments on your paper. Please correct and send us before March 14, 2020.

Terkirim

Draf 11

Hence, we do apologize for the delay as many reviewers seemed busy as we had received several manuscripts for

Meet

thanks, and best regards

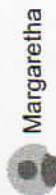
Rapat baru

TREPSEA Committee

Rapat saya

Hangout

2 Lampiran



Margaretha

+

Tidak ada chat terbaru
Mulai yang baru





trepsea



Tulis

(tanpa subjek)

Kotak Masuk 1.202

Berbintang



Margaretha Solang <margarethasolang@ung.ac.id>
kepada TREPSEA

Ditunda

Penting

Dear: Committee TREPSEA Conference

We have compiled this article according to the paper format guidelines and placed the text accordingly!

Terkirim

Thank you and best regards

Draf 11

Margaretha Solang

Meet

Rapat baru



Virus-free. www.avast.com

Rapat saya

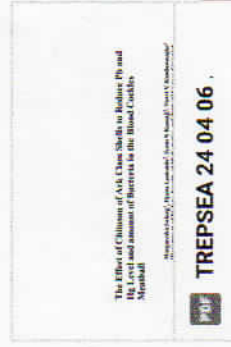
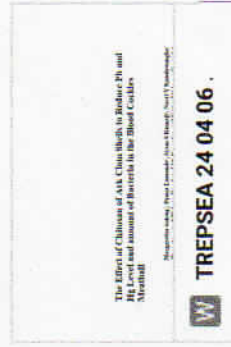
Hangout



+

Tidak ada chat terbaru
Mulai yang baru

2 Lampiran





trepsea



Tulis

www.avast.com

Kotak Masuk 1.202

Berbintang

Ditunda

Penting

Terkirim

Draf 11

Meet

Rapat baru

Rapat saya

Hangout



Margaretha



Tidak ada chat terbaru
Mulai yang baru

Margaretha Solang <margarethasolang@ung.ac.id>

kepada TREPSEA

Dear: Committee TREPSEA Conference

We send back the articles arranged according to the template

Thank you and best regards

Margaretha Solang



Virus-free. www.avast.com





Q trepsea



Tulis

Kotak Masuk 1,202

Berbintang

Ditunda

Penting

Terkirim

Draf 11

Meet

Rapat baru

Rapat saya

Hangout



Margaretha +

Tidak ada chat terbaru
Mulai yang baru

TREPSEA2018 : Acceptance Letter for Publication to Dr. Margaretha

Kotak Masuk x



TREPSEA Conference <trepsea2018@gmail.com>

kepada saya, 柁原, Jomae, myo

Inggris Indonesia Terjemahkan pesan

Dear Dr. Margarctha Solang and co-authors,
Gorontalo State University, Indonesia

Herewith, International Conference of Transdisciplinary Research on Environmental Problems in South East Asia (TREPSEA2018) is happy to inform you that the peer-reviewed draft manuscript under the title "*The effect of Chitosan of Ark Clan bacteria in the Blood Cockles Meatball*" submitted by Margaretha Solang (Corresponding Author), Djuna Lam and at TREPSEA2018 has been exceptionally accepted and considered for publishing in Proceedings of the 3rd Triennial International Conference on Earth and Environmental Science (EES) in Southeast Asia (TREPSEA2018) at IOP Conference Series: Earth and Environmental Science (EES).

Hence, we would like to give our sincere apology to the authors for the delay in our processes. We received the conference. The following processes: 1) seeking peer-reviewers with specific backgrounds, 2) their responses or between reviewers and authors, and 4) the processes with publication company took and may take prolonged period of time. We sincerely apologize for the delay.

Once again, we are very glad to say "Congratulations!" for your great efforts for your research paper.

Hence, we would like to request you to follow the standard guideline of publisher's criteria regarding their manuscript format. Please send us your final formatted version of manuscript before March 20, 2020.



Q trepsea



Tulis

Publication status of your TREPSEA 2018 manuscript and informati

Kotak Masuk x

Kotak Masuk 1.202

Berbintang

Ditunda

Penting

Terkirim

Draf 11

Meet

Rapat baru

Rapat saya

Hangout



Margaretha

+

Tidak ada chat terbaru
Mulai yang baru



TREPSEA Conference <trepsea2018@gmail.com>
kepada saya

Inggris Indonesia Terjemahkan pesan

Dear Professor Margaretha Solang and co-authors

First of all, we would like to inform the publication status of your manuscript which was submitted at TREPSEA 20

We had published your manuscript entitled "**The Effect of Chitosan of Ark Clam Shells to Reduce Pb and Hg I Cocksles Meatball**" at the IOP Conference Series: Earth and Environmental Science.

Please visit <https://iopscience.iop.org/article/10.1088/1755-1315/589/1/012036>

You can also view your colleagues or other TREPSEA 2018 published manuscripts at <https://iopscience.iop.org/ii>

Secondly, we also would like to give you information regarding our 4th international conference of the Transdiscipl Southeast Asia "TREPSEA 2021" which will be going to hold September 16-18, 2021 at Emersia Hotel & Resort, t

TREPSEA 2021 is organized by 1) University of Lampung, 2) Research Institute for Humanity and Nature (RIHN), Earth

The aim of TREPSEA 2021 is to address important themes of Managing Ecological Risks and Natural Disasters ir Public Health, and Economic Welfare.



Proceeding of 3rd International Conference of Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA2018)

Acceptance Letter for Publication

Dear Dr. Margaretha Solang and co-authors,
Gorontalo State University, Indonesia

Herewith, International Conference of Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA2018) committee members are happy to inform you that the peer-reviewed draft manuscript under the title "*The effect of Chitosan of Ark Clam Shells to reduce Pb and Hg level and amount of bacteria in the Blood Cockles Meatball*" submitted by Margaretha Solang (Corresponding Author), Djuna Lamondo, Syam S Kumaji, and Novri Y Kandowangko and at TREPSEA2018 has been exceptionally accepted and considered for publishing in Proceedings of the 3rd Transdisciplinary Research on Environmental Problems in Southeast Asia (TREPSEA2018) at IOP Conference Series: Earth and Environmental Science (EES).

Hence, we would like to give our sincere apology to the authors for the delay in our processes. We received varieties of papers from different disciplines during the conference. The following processes: 1) seeking peer-reviewers with specific backgrounds, 2) their responses on each paper, 3) additional waiting time of responses between reviewers and authors, and 4) the processes with publication company took and may take prolonged periods than we expected. Therefore, please accept our sincere apology for the delay.

Once again, we are very glad to say "Congratulations!" for your great efforts for your research paper.

Hence, we would like to request you to follow the standard guideline of publisher's criteria regarding their format. Therefore, please check the attached files for the format. Please send us your final formatted version of manuscript before March 20, 2020.

For more information regarding the matter of your paper and publication, please email my secretaries: Mr. Myo Han Htun myo@chikyu.ac.jp and Ms. Jomae Kyoko jomae.kyoko.mb@ehime-u.ac.jp.

Thanks, and regards

Prof. Masayuki Sakakibara
TREPSEA2018 Chairperson