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3rd International Conference on Tropical and Coastal Region Eco Development 2017

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FOREWORD FROM THE CHAIR OF THE 3RD ICTCRED 2017



On behalf of the Organizing Committee, I would like to extend our warmest welcome to you at the International Conference on Tropical and Coastal Region Eco Development (ICTCRED) 2017. This annual conference is the third event after the second has been successfully conducted in 2016 at Bali. This conference is organized by Research and Community Services Institute (LPPM), Diponegoro University. The conference aims to provide a forum for researchers, academicians, professionals, and industries to expose and exchange innovative ideas, methods, and experience in the areas related to tropical life sciences and coastal development. This conference also provides forum for researchers and scientists to exchange ideas and their current achievements.

In this year, 215 abstracts from various universities and research centers from many countries have been received. However, after in-depth review, only 147 high quality papers are accepted for oral and poster presentation in this conference. In addition, we cordially invite seven highly respected researchers in various fields as keynote speakers in this conference, to share their knowledge and expertise. I am grateful of each one of them for setting aside their valuable time to participate in this conference.

Moreover, I would like to announce that the ICTCRED 2017 Committee has signed an agreement with the Institute of Physics (IOP) to publish the conference proceeding in their Scopus-indexed *IOP Conference Series: Earth and Environmental Sciences (EES)* after a series of review. We do hope that the collaboration with IOP will increase the visibility of this conference papers to international levels which also give benefits to authors and also their institutions.

Finally the success of this conference lies not only in the quality of papers but also on the dedicated team efforts of the organizing committee. We thanks to the keynote speakers for the participation in this conference. I would like to acknowledge Institute of Physics (IOP) for the collaboration in publishing the conference proceedings. Indeed, I would like to thank the Scientific Committee members for their effort in reviewing and evaluating the papers for maintaining the quality of the conference. Last but not least, all staffs of The Research and Community Services Institute, Diponegoro University, deserves our great appreciation for their unlimited supports.

To all delegates, I hope that the 3rd ICTCRED 2017 event will be memorable not only from the scientific perspective but in the joy of meeting with other scientists for mutual collaboration. I wish you enjoy the conference as well as the beautiful nature and great traditions of Yogyakarta.

Chair,
Organizing Committee of ICTCRED 2017

Dr. Agus Trianto



FOREWORD OF THE DIRECTOR



Dear distinguished speakers, delegates, ladies, and gentlemen

I am very pleased to welcome you all to this international conference, Tropical and Coastal Region Eco-development, which acts as a forum for those interested in tropical and coastal development issues. Diponegoro University commits to provide an opportunity for scientific society to always play important role in disseminating ideas and research results especially in the area of coastal and tropical development, which is the main research field of our university. Hence, this conference offers a platform for extensive sharing and exchange of knowledge for the development of coastal and tropical areas.

The topics presented in this conference cover marine biodiversity, sustainable marine utilization and development, climate change on coastal and marine ecosystems and coral reef ecosystems and coastal management. In the tropical field, this conference deals with relevant ideas and knowledge addressing vital life sciences, tropical health and nutrition, tropical diseases and tropical food and energy. In addition, this conference also covers socio-economic aspects such exploration of tropical rainforests, deforestation, rising immigration, etc. Thus, it is clear that the International Conference on Tropical and Coastal region eco-development is a unique blend of coastal and tropical that nicely fits the current interest among the community concerned with sustainable coastal and tropical ecosystems.

Finally, we would like to express our gratitude to our distinguished keynote speakers, Prof. Susilo Wibowo, Dr. Hadiyanto, Prof. Gerard Pals, Prof. Junichi Tanaka, Dr. Roel H. Bosma, Prof. Tao Liu, and Prof. Soottawat Benjakul, who had been traveling all the way to Yogyakarta. Certainly we will have an important benefit of preparing the next generation of Indonesian scientists with international exposure. We thank our participants to present their research papers, to share extensively and exchange of ideas thoughts and discussions so that this conference facilitates the formation of networks among participants. We thank all invited guests who have shown their interests in coastal and tropical region development field. Many thanks to the organizing and scientific committee of ICTCRED 2017 who have work very hard to run the conference.

I wish you all a productive and successful conference.

Yours sincerely
Director of Research and Community Services Institute
Diponegoro University

Prof. Heru Susanto

WELCOME ADDRESS OF THE RECTOR OF DIPONEGORO UNIVERSITY



It's a great pleasure and honour for our University to be the host of the 3rd International Conference on Tropical and Coastal Region Eco Development 2017 organized by Research and Community Service Institute, Diponegoro University. The special acknowledgement, I address to the distinguished speakers Prof. Susilo Wibowo and Dr. Hadiyanto from Diponegoro University-Indonesia, Prof. Gerard Pals from VU University Medical Center – Netherlands, Prof. Junichi Tanaka from University of the Ryukyus – Japan, Dr. Roel H. Bosma from Wageningen University – Netherlands, Prof. Tao Liu from Ocean University of China, and Prof. Soottawat Benjakul from Prince of Songkla University. Thank you for the valuable time to deliver knowledge and share scientific information at this conference. I believe that this opportunity will provide the valuable information for us and deliberate some new research ideas for participants of this conference. For all the participants, I would also like to welcome you at this conference.

The origin of the conference theme is reflected from the idea of our Center of Excellence (CoE) which was established in 2012 representing our priority as a research university. Since the declaration of Diponegoro University as a research university, the main theme of every research result will be enhanced to the level of international benchmarking.

Diponegoro University, consists of 13 faculties, has strong human resources and research background related to the coastal development and tropical life sciences. It is also supported by integrated laboratory of marine and fisheries, which are located at Teluk Awur Jepara.

Coastal development and tropical life sciences are two important issues in Indonesia and need to be actualized by the government. The enormous potencies of Indonesia, large resources of marine area and their potential value of natural marine products extract, provide an opportunity to contribute for health energy and food. Recent issue has been arisen that the food and energy also can be exploited from the sea. Indeed, the exploration and exploitation of marine products must be considered on the impact of the environmental devastation. These issues are interesting topics which are reflected by large number of abstracts submitted to this conference. These interesting issues need to be discussed in this conference by sharing research finding and ideas. I am grateful to see that this conference has enormous responds from the participants either from domestic or from other countries such Japan, China, US, and France, as reported by organizing committee.

Number of publication indexed by reputable database has been set as an indicator for world university rank including Indonesia. Therefore, Diponegoro University also encourages all scientists and academic staffs to increase their publication records in these international reputation journals. Currently, Diponegoro University is in the 6th position among universities in Indonesia for the number of

publications in reputable International journals. I sincerely express appreciation to the organizing committee for their effort to realize this conference.

By the end of my short welcome address, I hope our foreign guests take advantage of their stay here to enjoy Yogyakarta and its wonderful places. It is a beautiful and historical city to visit with a wonderful and unique traditional art dance, stunning sunset, great sceneries and interesting shopping.

Once again, it is my great pleasure to welcome you all to the 3rd International Conference on Tropical and Coastal Region Eco Development 2017. I wish you a pleasant two fully scientific days of conferences and I hope you can get a fruitfull share with other scientists on current developed knowledge and perhaps seeking for potential collaboration of your interested field.

Thank you for your kind attention.

Prof. Yos Johan Utama
Rector

KEYNOTE SPEAKERS



Prof. Susilo Wibowo

Universitas Diponegoro – Indonesia

“Indonesia got obese; do we care? Genetics, epigenetic, and enviromental point of view”



Dr. Hadiyanto

Universitas Diponegoro – Indonesia

“Effects of sugar addition on the thermal degradation of phycocyanin from Spirulina sp.”



Prof. Gerard Pals

VU University Medical Center – Netherlands

“Cancer and the environment”



Prof. Junichi Tanaka

University of the Ryukyus – Japan

“Exploration of coral reef organisms for bioactive molecules and related issues”



Dr. Roel H. Bosma

Wageningen University& Research – Netherlands

“Investing in climate change mitigation and adaptation on mangrove and aquaculture doubles benefits.”



Prof. Tao Liu

Ocean University of China - China

“Research on complete mitochondrial genome of marine algae”



Prof. Soottawat Benjakul

Prince of Songkla University

“Valorization of fish processing by product”

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Table of contents

Volume 116

2018

◀ Previous issue Next issue ▶

**3rd International Conference on Tropical and Coastal Region Eco Development 2017 2–4
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Preface

OPEN ACCESS 011001
3rd International Conference on Tropical and Coastal Region Eco Development 2017

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OPEN ACCESS 011002
Note from Editors

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

OPEN ACCESS 011003
Peer review statement

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

Papers

OPEN ACCESS 012001
Social Cognitive Predictors of Interest in Research Among Life Sciences Academics

Dian R. Sawitri, Harlina Nurtjahjanti and Anggun R. Prasetyo

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

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Library Development Strategy for The Community at Coastal Areas

Putut Suharso, Bani Sudardi, Sahid Teguh Widodo and Sri Kusumo Habsari

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012003

The Effects of Treatments on Batu Banana Flour and Percentage of Wheat Substitution on The Resistant Starch, In Vitro Starch Digestibility Content and Palatability of Cookies Made with Banana (*Musa balbisiana* Colla) Flour

D Ratnasari, N Rustanti, F Arifan and DN Afifah

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012004

Stock Analysis of *Metapenaeus affinis* (H.Milne Edwards, 1837) on the North Coast of Central Java, Indonesia

Suradi Wijaya Saputra, Anhar Solichin and Wiwiet Teguh Taufani

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

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012005

Potential of L-fucose isolated from Brown Seaweeds as Promising Natural Emulsifier compare to Carboxymethyl Cellulose (CMC)

A N Al-Baarri, A M Legowo, Widayat, S B M Abduh, F P Lestari, D Desnasari and I P M Santoso

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012006

Copigmentation Of Anthocyanin Extract of Purple Sweet Potatoes (*Ipomea Batatas* L.) Using Ferulic Acid And Tannic Acid

I Susanti, H Wijaya, F Hasanah and S Heryani

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012007

Growth Performance of Catfish (*Clarias Gariepinus* Burchell, 1822) Cultured in High Density on the Biofloc System

Fajar Basuki, Tristian Yuniarti, Dicky Harwanto and Titik Susilowati

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012008

Sex Diversity Approach of Spiny Lobster (*Panulirus* spp) to Marine Oil Spill Pollution in Southern Waters of Java

F E D Haryono, Ambariyanto and I Sulistyono

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012009

Effect of The Phytase Enzyme Addition in The Artificial Feed on Digestibility of Feed, Feed Conversion Ratio and Growth of Gift Tilapia Saline Fish (*Oreochromis niloticus*) Nursery Stadia I

Diana Rachmawati, Istiyanto Samidjan and Tita Elfitasari

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012010

Engineering Technology Of Fish Farming Floating Nets Cages On Polka Dot Grouper (*Cromileptes Altivelis*) Used Artificial Feed Enriched Phytase Enzyme

Istiyanto Samidjan and Diana Rachmawati

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012011

The Diversity of Vibrios Associated with Vibriosis in Pacific White Shrimp (*Litopenaeus vannamei*) from Extensive Shrimp Pond in Kendal District, Indonesia

Sarjito, Alfabetian Harjuno Condro Haditomo, Desrina, Ali Djunaedi and Slamet Budi Prayitno

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012012

Factors Affecting Husband Participation in Antenatal Care Attendance and Delivery

R Rumaseuw, S M Berliana, N Nursalam, F Efendi, R Pradanie, P D Rachmawati and G E Aurizki

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OPEN ACCESS

012013

Nitrate and Phosphate Contents on Sediments Related to The Density Levels of Mangrove *Rhizophora* Sp. in Mangrove Park Waters of Pekalongan, Central Java

E Supriyantini, A Santoso and N Soenardjo

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012014

Analysis of the Survival of Children Under Five in Indonesia and Associated Factors

Annisa Nur Islami Warrohmah, Sarni Maniar Berliana, Nursalam Nursalam, Ferry Efendi, Joni Haryanto, Eka Misbahatul M Has, Elida Ulfiana and Sylvia Dwi Wahyuni

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012015

Formulation of Emergency Food in Biscuit-Form Made From Proso Millet Flour (*Panicum miliaceum*) and Snakehead Fish (*Channa striata*) –Tempeh Flour Koya

R B K Anandito, S R Kurniawan, E Nurhartadi and Siswanti

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012016

The Relation of Environmental Quality and Fishery Sector in Indonesia

Shanty Oktavilia, Reikha Habibah Yusfi, Firmansyah and FX Sugiyanto

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-
- OPEN ACCESS** 012017
Oceanographic Factors in Fishing Ground Location of Anchovy at Teluk Cenderawasih National Park, West Papua : Are These Factors Have an Effect of Whale Sharks Appearance Frequencies?
Evi Nurul Ihsan, Siti Yasmina Enita, Kunarso and Anindya Wirasatriya
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012018
Probiotic Candidates from Fish Pond Water in Central Java Indonesia
Alfabetian Harjuno Condro Haditomo, Desrina, Sarjito and S. Budi Prayitno
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012019
Flavor Enhancer From Catfish (*Clarias batrachus*) Bekasam Powder and Angiotensin-I-Converting Enzyme (ACE) Inhibitory Activity in Various Dishes
Yanesti N Lestari, Retno Murwani and Tri W Agustini
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012020
The Use of Different Diets for Feeding Rate and Growth of Shortfin Eel (*Anguilla bicolor bicolor*)
N Taufiq-Spj, S Sunaryo, A Wirasatria, I Pratikto, D H Ismunarti and M I Syaputra
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012021
Impact of Monsoon to Aquatic Productivity and Fish Landing at Pesawaran Regency Waters
Kunarso, Muhammad Zainuri, Raden Ario, Bayu Munandar and Harmon Prayogi
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012022
Business Profile of Boat Lift Net and Stationary Lift Net Fishing Gear in Morodemak Waters Central Java
Trisnani D Hapsari, Bogi B Jayanto, Aristi D P Fitri and I Triarso
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012023
Impact of Fishery Policy on Fishery Manufacture Output, Economy and Welfare in Indonesia
Firmansyah, Shanty Oktavilia, F.X. Sugiyanto and Ibnu N Hamzah
[+](#) [Open abstract](#) [View article](#) [PDF](#)

-
- OPEN ACCESS** 012024
Cytotoxicity and Phytochemical Profiling of *Sargassum Sp.* Extract As Anti-Mdr Bacteria
Wilis A. Setyati, Rini Pramesti, Muhamad Zainuddin, Maya Puspita and Person P Renta
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012025
Mapping of HABs Contaminated In Green Shells (*Perna viridis*) in Semarang Bay
Churun A'in, Suryanti Suryanti and Haeruddin Haeruddin
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012026
Nutritional Composition Changes During *Tempeh Gembus* Processing
Ruth Nazaretha Sandessy Damanik, Dwi Yanti Winda Pratiwi, Nurmasari Widyastuti, Ninik Rustanti, Gemala Anjani and Diana Nur Afifah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012027
Characterizations of milkfish (*Chanos chanos*) meatballs as effect of nanoencapsulation liquid smoke addition
Fronthea Swastawati, Ambaryanto, Bambang Cahyono, Ima Wijayanti and Diana Chilmawati
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012028
Clinical Outcome And Arginine Serum of Acute Ischemic Stroke Patients Supplemented by Snakehead Fish Extract
Dwi Pudjonarko, Retnaningsih and Zainal Abidin
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012029
Implementation of Water Safety Plans (WSPs): A Case Study in the Coastal Area in Semarang City, Indonesia
Budiyono, P Ginandjar, L D Saraswati, D R Pangestuti, Martini and S P Jati
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012030
Effect of Different Coating Materials on The Characteristics Of Chlorophyll Microcapsules from *Caulerpa racemosa*
R A Kurniasih, E N Dewi and L Purnamayati
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012031

Effect of Melanin Free Ink Extracted From Squid (*Loligo* sp.) on Proximate and Sensory Characteristics of Soft-Bone Milkfish (*Chanos chanos*) During Storage

Tri Winarni Agustini, Hadiyanto, Ima Wijayanti, Ulfah Amalia and Soottawat Benjakul

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012032

Nutrition Quality and Microbiology of Goat Milk Kefir Fortified with Vitamin B₁₂ and Vitamin D₃ during Storage

EP Dianti, G Anjani, DN Afifah, N Rustanti and B Panunggal

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012033

Total Lactic Acid Bacteria (LAB), Antioxidant Activity, and Acceptance of Synbiotic Yoghurt with Binahong Leaf Extract (*Anredera cordifolia* (Ten.) Steenis)

R P Lestari, C Nissa, D N Afifah, G Anjani and N Rustanti

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012034

The Effectiveness of Heterotrophic Bacteria Isolated from Dumai Marine Waters of Riau, Used as Antibacterial against Pathogens in Fish Culture

F Feliatra, Nursyirwani, A Tanjung, DS Adithiya, M Susanna and I Lukystyawati

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012035

Preliminary Study On Gonad Maturity Stages of the Sea Cucumber *Paracaudina australis* from Kenjeran Water, Surabaya, Indonesia

Widianingsih Widianingsih, Muhammad Zaenuri, Sutrisno Anggoro, Hermin Pancasakti Kusumaningrum and Retno Hartati

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012036

EXPLORING THE POSITION OF OLD SEMARANG SEA PORT: Based on Javanese City Pattern

R. Siti Rukayah, Endang Sri Susilo, Muhammad Abdullah and Siddhi Saputro

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012037

Total lactic acid bacteria, antioxidant activity, and acceptance of synbiotic yoghurt with red ginger extract (*Zingiberofficinale var. rubrum*)

B A Larasati, B Panunggal, D N Afifah, G Anjani and N Rustanti

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

-
- OPEN ACCESS** 012038
Edco-tourism; A Coastal Management Program to Improve Social Economics
Arsi Rakhmanissazly, Anggun Intan Permatasari and Ely Chandra Peranginangin
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012039
Exploration of Sea Cucumbers *Stichopus hermanii* from Karimunjawa Islands as Production of Marine Biological Resources
Delianis Pringgenies, Siti Rudiyaniti and Ervia Yudiati
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012040
Microbiological Characteristic and Nutrition Quality of Goat Milk Kefir Based on Vitamin D₃ Fortification Time
F Fauziyyah, B Panunggal, D N Afifah, N Rustanti and G Anjani
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012041
Effect of Protein-Based Edible Coating from Red Snapper (*Lutjanus* sp.) Surimi on Cooked Shrimp
I Rostini, B Ibrahim and W Trilaksani
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012042
The Environmentally Sound Aquaculture Strategies Based on Bioaccumulation of Heavy Metal of Lead (Pb) on Seaweed of *Gracilaria verrucosa* on Aquaculture Areas of Muarareja Village, Tegal City
Nurjanah, Ambariyanto, Supriharyono and Bambang Yulianto
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012043
Determination Hypoiodous Acid (HIO) By Peroxidase System Using Peroxidase Enzyme
A N Al-Baarri, A M Legowo, Widayat, S B M Abduh, M Hadipernata, Wisnubroto, D K Ardianti, M N Susanto, M Yusuf and E K Demasta
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012044
Antimicrobial activity of *tempeh gembus* hydrolyzate
A Noviana, F F Dieny, N Rustanti, G Anjani and D N Afifah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012045

The Abundance Of Makrozoobenthos On Different Break Water In Semarang And Demak Coastal Area

A Kristiningsih, D N Sugianto, Munasik, R Pribadi and J Suprijanto

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

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012046

Wastewater Treatment from Batik Industries Using TiO₂ Nanoparticles

Fahmi Arifan, FS Nugraheni, Hafiz Rama Devara and Niken Elsa Lianandya

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012047

The Application of Microencapsulated Phycocyanin as a Blue Natural Colorant to the Quality of Jelly Candy

E N Dewi, R A Kurniasih and L Purnamayati

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012048

Mapping of trophic states based on nutrients concentration and phytoplankton abundance in Jatibarang Reservoir

Siti Rudyanti, Sutrisno Anggoro and Arif Rahman

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012049

Characterization of Lactic Acid Bacteria (LAB) isolated from Indonesian shrimp paste (terasi)

U Amalia, Sumardianto and T W Agustini

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012050

Effect of Time Length Fermentation to *Katsuobushi* Oxidation Rate As Fish Flavor Based

U Amalia, L Rianingsih and I Wijayanti

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012051

Community Participation Of Coastal Area On Management Of National Park, Karimunjawa Island

Bambang A Wibowo, Aryo B Aditomo and Kuku E Prihantoko

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012052

Study of AUTO-LION (Automatic Lighting *Rumpon*) on Fisheries of Stationary Lift Net in Semarang, Central Java

S Chairunnisa, N Setiawan, Irkham, K Ekawati, A Anwar and A DP Fitri

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012053

Biodiversity of Cryptofauna (Decapods) and Their Correlation with Dead Coral *Pocillopora* sp. Volume at Bunaken Island, North Sulawesi

Muhammad Danie Al Malik, Nenik Kholilah, Eka Maya Kurniasih, Andrianus Sembiring, Ni Putu Dian Pertiwi, Ambariyanto Ambariyanto, Munasik Munasik and Christopher Meyer

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012054

Identification of Antipathogenic Bacterial Coral Symbionts Against *Porites Ulcerative White Spots* Disease

Nor Sa'adah, Agus Sabdono and dan Diah Permata Wijayanti

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012055

Community Structure of Decapod Inhabit Dead Coral *Pocillopora* sp. in Pemuteran, Bali

N P D Pertiwi, M D A Malik, N Kholilah, E M Kurniasih, A Sembiring, A W Anggoro, Ambariyanto and C Meyer

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012056

Amino Acid Profile and Volatile Flavour Compounds of Raw and Steamed Patin Catfish (*Pangasius hypophthalmus*) and Narrow-barred Spanish Mackerel (*Scomberomorus commerson*)

Rusky I Pratama, I Rostini and E Rochima

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012057

Anti-Pathogenic Activity of Coral Bacteria Againsts White Plaque Disease of Coral *Dipsastraea* from Tengah Island, Karimunjawa

Sakti Imam Muchlissin, Agus Sabdono and Diah Permata W

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012058

Seagrass Parameter Affect the Fish Assemblages in Karimunjawa Archipelago

Endang Sri Susilo, Denny Nugroho Sugianto, Munasik, Nirwani and Chrisna Adhi Suryono

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012059

Early weaning food for infants (0-6 months old) in madurese people based on transcultural nursing theory

Eka Mishbahatul M. Has, M. Syaltut, Tiya Kusumaningrum and Ferry Efendi

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012060

Genetic Diversity and Geographical Gene Flow Patterns of Spawning Broadcast Coral *Lobophyllia corymbosa* in The Sulawesi Waters as A Coral Triangle Area

Widyastuti Umar, Jamaluddin Jompa and Asmi Citra Malina A.R. Tassakka

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012061

Vertical Distribution of Temperature in Transitional Season II and West Monsoon in Western Pacific

Hikari A H Pranoto, Kunarso and Endro Soeyanto

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012062

The Quality of Edible Film Made from Nile Tilapia (*Oreochromis niloticus*) Skin Gelatin with Addition of Different Type Seaweed Hydrocolloid

H Deanti, J M Hulu, A. Setyaji, R N Eliyanti, K Aliya and E N Dewi

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012063

Effect of ENSO on the variability of SST and Chlorophyll-a in Java Sea

Anindya Wirasatriya, Indra B Prasetyawan, Chandra D Triyono, Muslim and Lilik Maslukah

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012065

Molecular Identification and Genetic Diversity of *Acropora hyacinthus* from Boo and Deer Island, Raja Ampat, West Papua

DP Wijayanti, E Indrayanti, H Nuryadi, RA Dewi and A Sabdonno

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012066

Seasonal and Non-Seasonal Generalized Pareto Distribution to Estimate Extreme Significant Wave Height in The Banda Sea

Nursamsiah, Denny Nugroho Sugianto, Jusup Suprijanto, Munasik and Bambang Yulianto

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012067

Stolephorus sp Behavior in Different LED (Light Emitting Diode) Color and Light Intensities

D P Fitri Aristi, I A Ramadanita, T D Hapsari and A Susanto

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Johan Danu Prasetya, Ambariyanto, Supriharyono and Frida Purwanti
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Agus Trianto, Agus Sabdono, Baskoro Rochaddi, Desy Wulan Triningsih and Dewi Seswita Zilda
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Preliminary Study Contamination of Organochlorine Pesticide (Heptachlor) and Heavy Metal (Arsenic) in Shallow Groundwater Aquifer of Semarang Coastal Areas
Baskoro Rochaddi, Chrisna Adhi Suryono, Warsito Atmodjo and Alfi Satriadi
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The Preliminary Study of Organochlorine Pesticide Residues on Sediments of Bivalvia Fishing Ground at Eastern Part of Coastal Semarang

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Abstract. This paper presents the occurrence level of organochlorine contamination in marine sediments of Semarang coastal areas as a fishing ground of Bivalvia. Five compounds (Heptachlor, Aldrin, Endosulfan, Endrin and pp-DDT) of contaminant have been determined in the sediments surface of Semarang coastal waters. The samples were then analyzed by using gas chromatography and followed by using the method of Standard Method Examination. The result showed that the average concentration of organochlorine pesticides Heptachlor, Aldrin, Endosulfan, Endrin and pp-DDT were 25.5, below detected, 7.1, 37.2, 28.6 μ g/L, respectively. The high concentration of pesticide showed on Endrin (65.84 ppb), pp-DDT (29.53 μ g/L), and heptachlor (25.45 μ g/L). The low concentrations were detected on aldrin (below detected) and endosulfan (0.92 μ g/L). The concentration of organochlorine pesticides in these areas might contribute on four rivers which deposited the sediment in these coastal waters

1. Introduction

Persistent organochlorine compounds including organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs) were widely used in industry and agriculture. There are two kinds for OCPs, one is made of benzene including hexachlorocyclohexane (HCH) and dichlorodiphenyltrichloroethane (DDT), and another one is cyclodiene including heptachlor, aldrin, dieldrin, and endrin. PCBs were produced as dielectric and hydraulic fluids on an industrial scale since 1929, with particularly large volumes made in the 1950s–1970s [1]. Persistent organochlorine compounds are thought as an important component of xenobiotic chemicals. Their residues were causing the hazard to the environment and had the potential to elicit endocrine disruption in biota [2];[3]. Although organochlorine pesticides (OCPs) such as DDT, HCH, and Aldrin were banned in developed countries over 25 years ago, their continued use has been reported in several Asian countries [4]. The use of such pesticides in tropical countries is often justified for the eradication of disease vectors such as the malaria-carrying mosquito. OCPs are still used in large quantities especially in developing countries for the control of agricultural pests [5]. The bans of PCBs and OCPs were imposed in many countries after their toxicity, and environmental persistence was realized [6]. Due to high toxicity, long environmental half-lives and long scale transportation ability, they are of significant concern and have been studied extensively in the last decades [7]. Organochlorine compounds were detected in many environmental media such as water [8]; [3], sediment [3]; [7], air [9], biota [10] and in bivalve [11]. Organochlorine pesticides are one of the important components of chemical pollutants present in the marine environment. They are toxic to all living organisms [11]. Organochlorine pesticide enters into the marine environment through different sources, more particularly from estuaries [12]. Estuarine and marine sediments are the ultimate global sinks for most of the pollutants. Contamination of soil and sediments of coastal areas with persistent organochlorine compounds may be related to point sources, e.g., industrial discharges and domestic sewage, but more frequently, as in the case of pesticide pollution, it can also be attributed to precipitation, agricultural runoff, etc. [3]. Therefore, the study on



organochlorine pesticides in sediment which is the bivalve habitat in Semarang coastal areas is very important to be conducted to discover how far the contamination level of those materials in the sediment. Because in the sediment, the bivalve gets the food by filtering the sediment.

2. Materials And Methods

2.1. Samples collection

Sampling points were located on coastal waters areas at the east part of Semarang. Figure 1 shows the sampling sites, the samples of sediments were collected in polyethylene plastic bags bottles from different stations (4 stations). The samples were collected in 3 kg plastic bags. Then, plastic bags were labeled properly and sealed tightly. All the samples were brought to the laboratory for the organochlorine pesticide to be analyzed. The parameters analyzed were psycho-hydrochemical properties of marine waters and organochlorine contents of sediments. The salinity, total dissolved solids, pH, dissolved oxygen, and temperature were measured at the time of samples collection using water quality checker (Horiba Co. Ltd., Japan)

2.2. Sample analysis

The analytical procedure applied was the method of Standard Method [13]. The analytical procedure of Organochlorine Pesticide (OCPs) in sediment samples was modified according to the method described previously [14]; [15]. 15 g of freeze-dried and homogenized sediment sample was placed into a Soxhlet apparatus and extracted with 250 ml of hexane-dichloromethane in n-hexane and capillary columns. One-liter samples were extracted with a solvent mixture and then concentrated in a Kuderna-Danish apparatus. The extracts were cleaned up with Florisil column. The final pesticide extract was obtained in 5 mL of hexane. The samples were then analyzed by using gas chromatography Model Hitachi 163 FPD (Flame Photometer Detector), and nitrogen High Pure (HP) was used as the carrier gas. A 2 in a glass column (3 mm ID) packed with 3% Silicon OV1 on 80-100 mesh Supelcon was used. Gas flow at 30 mL min', column temperature at 160-230°C, detector temperature at 290°C and the injector temperature at 290°C were maintained.

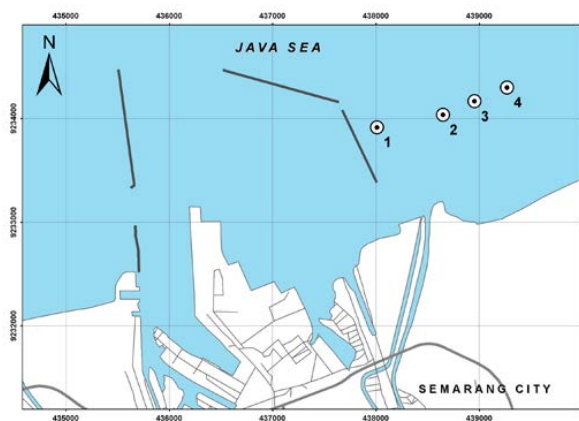


Figure 1. The sampling areas at the eastern part of Semarang Coastal waters

3. Results And Discussion

The eastern part of Semarang coastal waters is a fishing ground area for several biotas such as fish, shrimp, crab, and bivalve. The high activities of fishermen in this area are because in this area the waters is very fertile, some rivers are flowing through this area such as East Banjir Kanal River, Banger, Babon and Sri Mulyo which all of them are flowing the nutrient and pollutant whether in solid, suspension and solution [16]. The high production of fisheries in that area is supported by a good quality of water so it can support the life of sea organisms [16]. It is also proved by the research result on recent water quality that can be seen in table 1. From the table, it can be seen that the water

quality can support the life of sea organisms to live and grow. The range of salinity between (31 – 33 ppt), total dissolved solid between (30.5 – 31.5 mg/L), pH between (7.3 – 7.5), dissolved oxygen (5.6 – 6.4 mg/L) and temperature (29.5 – 29.9 °C).

Table 1. Physico-chemical properties of water samples of marine waters in the sampling areas (Eastern part of Semarang coastal waters)

Water Quality	ST 1	ST 2	ST 3	ST 4
Salinity (ppt)	33	33	31.5	31
Total Dissolved Solid (mg/ L)	31.5	30.5	31.5	31
pH	7.3	7.3	7.5	7.3
DO (mg/L)	5.9	5.9	6.4	5.62
Temperature (°C)	29.8	29.5	29.8	29.9

The inclusion of nutrient in the waters is also followed by the inclusion of pollutant such as heavy metal, pesticide, bacteria, etc. Several previous researches conducted in the Semarang waters showed that Organochlorine Pesticides such as Heptachlor, Aldrin, Endosulfan, Endrin, and pp-DDT were found in the coastal waters in the West part of Semarang [17]. The research of organochlorine pesticides accumulation in the sea sediment had also been conducted in many countries like India [3], China [15], Singapore [7], Korea [18]. From all of those countries, organochlorine pesticides were found in sediment.

The recent research result by taking the sediment samples in the bivalve fishing ground areas in the east part of Semarang showed that the sediment in that area was found the concentrations of heptachlor, endosulfan, endrin, and pp-DDT exclude aldrin. The range of pesticides residues concentration from the highest to the lowest as followed endrin (8.55 – 65.84 μ g/L) detected in two samples, then pp-DDT (27.66 – 50 μ g/L) detected in two samples, heptachlor (25 μ g/L) only detected in one sample, Endosulfan (0.92 -13.18 μ g/L) detected in three samples while Aldrin on the four samples showed the number of below detection. The result can be seen in Table 2 and Figure 2.

Table 2. Range, frequency of occurrence and mean \pm standard deviation of organochlorine pesticide residue levels (μ g/L) from bivalvia fishing ground at eastern part of coastal Semarang

Sediment	Heptachlor	Aldrin	Endosulfan	Endrin	pp-DDT
ST 1	<i>bd</i>	<i>bd</i>	1.56	<i>bd</i>	<i>bd</i>
ST 2	25.45	<i>bd</i>	13.18	8.55	<i>bd</i>
ST 3	<i>bd</i>	<i>bd</i>	0.92	65.84	27.66
ST 4	<i>bd</i>	<i>bd</i>	<i>bd</i>	<i>bd</i>	29.53
% detection	25	0	75	50	50
Range	25	0	0.92 -13.18	8.55 - 65.84	27.66 - 50
Mean + SD	25.45	0	5.22 \pm 6.9	37.2 \pm 40.51	28.59 \pm 1.32

Bd = below detection

Evans until now in Indonesia there are no concentration criteria of organochlorine pesticide in the sea sediment for the feasibility of living organisms but OCPs is a persistent material and can be accumulated in the tissues of marine organisms. Moreover, the bivalve from cockles type is normally found in muddy areas near the river mouth [19]. They are sedentary filter feeder, taking in food particulates through their gills when their shells are open [20]. Besides, the sediment in the research location comes from several river currents which flowing through agricultural, residential and industrial areas estimated to still using OCPs. It is estimated later that the higher the OCPs concentration in sediment will also be followed by the increase of the material in bivalve tissue.

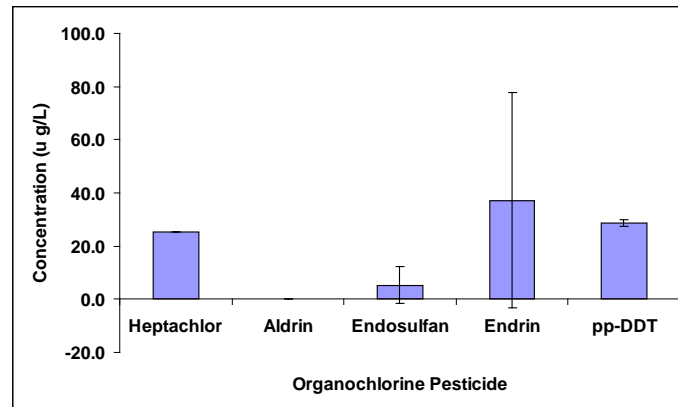


Figure 2. Mean \pm SD of occurrence of organochlorine pesticide residue levels (μ g/L) from bivalvia fishing ground at eastern part of coastal Semarang

4. Conclusion

Some kinds of organochlorine pesticide have been contaminating sediment in the Semarang coastal area which is a fishing ground of bivalve. The OCPs including Heptachlor, Endosulfan, Endrin, and pp-DDT. That was the high concentration of pesticide showed on Endrin (65,84 ppb), pp-DDT (29,53 μ g/L), and heptachlor (25,45 μ g/L). Futher more the low concentrations were detected on aldrin (bellow detected) and endosulfan (0,92 μ g/L).

5. Acknowledgment

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