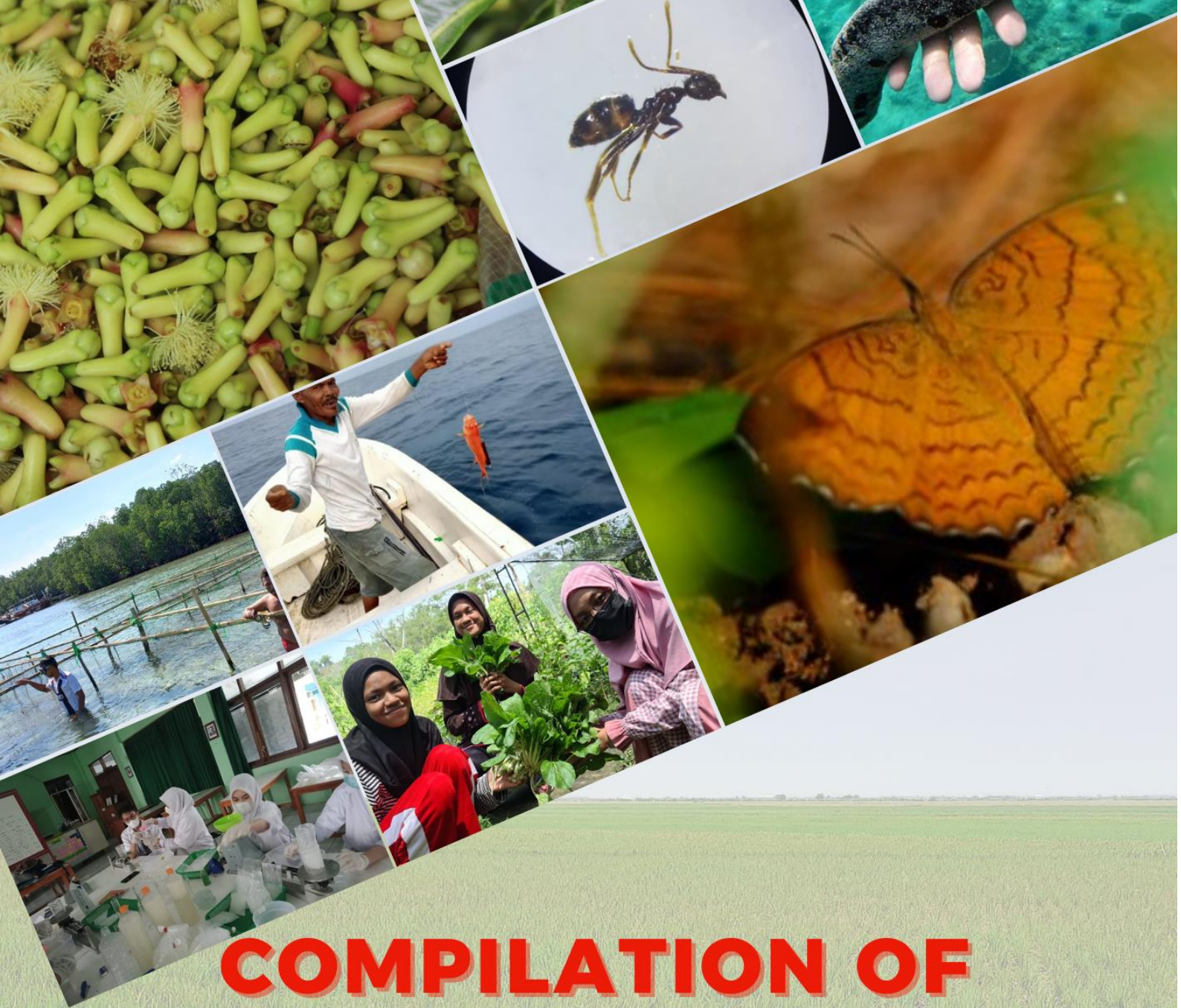




COMPILATION OF PUBLISHED RESEARCH ABSTRACTS FOR THE PERIOD OF 2017 - 2021

Compiler :

Dr. Zulhamsyah Imran . Dr. Perdinan . Ir. Sri Widayanti, M.Si.
Risa Rosita, S.Si., M.Si. . Trijanti A. Widinni A., M.Si
Shella Marlinda, M.Si . Aan Darwati, S.Ak.



SEAMEO BIOTROP
Southeast Asian Regional Centre for Tropical Biology

COMPILATION OF PUBLISHED RESEARCH ABSTRACT FOR THE PERIOD OF 2017 - 2021

Compiler :

1. Dr. Zulhamsyah Imran
2. Ir. Sri Widayanti, M.Si.
3. Risa Rosita, S.Si., M.Si.
4. Trijanti A. Widinni A., M.Si
5. Aan Darwati, S.Ak.

**MINISTRY OF EDUCATION, CULTURE, RESEARCH AND
TECHNOLOGY OF THE REPUBLIC OF INDONESIA
SECRETARIAT GENERAL
SEAMEO SEAMOLEC
SOUTHEAST ASIAN REGIONAL CENTRE FOR TROPICAL
BIOLOGY (SEAMEO BIOTROP)
2021**

Preface

SEAMEO BIOTROP, the Southeast Asian Regional Centre for Tropical Biology, is a SEAMEO regional center under the coordination of the Ministry of Education, Culture, Research and Technology of the Republic of Indonesia. SEAMEO BIOTROP has a role in developing quality basic and applied scientific researches that are beneficial to multi-stakeholders and communities in Indonesia and Southeast Asia.

In the context of sustainable development in Southeast Asia, SEAMEO BIOTROP focuses on its mandates to conduct and develop research and education in the tropical biology field and to disseminate knowledge and information on tropical biology issues. SEAMEO BIOTROP is a leading centre in enriching and promoting the real values of tropical biology in Southeast Asia and therefore, SEAMEO BIOTROP is a center of excellence focusing on professionalism and innovation in advancing and developing education and science in tropical biology. Researches in SEAMEO BIOTROP focus on improving health and education, reducing inequality, thrusting economic growth, tackling climate change and conserving natural resources such as in the fields of agriculture, fisheries, forestry and renewable energy sectors.

Every year SEAMEO BIOTROP opens a Call for Research Proposals to invite multi-stakeholders to submit research proposals in various aspects of the tropical biology field, based on the program thrusts of SEAMEO BIOTROP. The research results benefit multi-stakeholders, including communities, private sectors, exporters, importers, farmers, teachers, students, lecturers, academics, government institutions, policymakers, and the general public in Indonesia and in regional scopes. Among the sources of research funding at SEAMEO BIOTROP is DIPA funds.

This compilation of abstracts provides brief information on each research conducted by SEAMEO BIOTROP funded by DIPA funds for the period of 2017 – 2021. Our sincere gratitude goes to all research proponents of SEAMEO BIOTROP DIPA Funds for the Fiscal Year 2017 – 2021 for the research outputs. I do hope that this document benefits all stakeholders in Indonesia and Southeast Asia for the advancement of science, especially in the tropical biology field.

Bogor, December 2021

Director
SEAMEO BIOTROP



Contents

Preface

RESEARCH ABSTRACT OF DIPA SEAMEO BIOTROP 2017	1
Integrating Styrax-Coffee Agroforestry System and Apiculture as Alternative Source of Livelihood for Communities in Lake Toba Catchment Area, North Sumatra (Aswandi, Cut Rizlani Kholibrina and Apri Heri Iswanto)	2
Environmental Site Engineering and Integrated Bio-Cycles Management for Rehabilitation of Degraded Tin Mining Land in Tropical Ecosystem (Cahyono Agus, Dewi Wulandari, Pita AB Cahyanti, Idi Bantara, Benny P Hutahaeen, Tri Lestari)	3
Analisis Sifat Fisika-Kimia dan Penggunaan Metode Volumetri Dalam Penentuan Asam Sinamat pada Kemenyan (<i>Styrax</i> spp.) Tapanuli Utara (Agung Abadi Kiswandono, Apri Heri Iswanto, Arida Susilowati, Agnes Farida Lumbantobing)	4
Characters of Mitochondrial DNA D-LOOP Hypervariable III Fragments of Indonesian Rhinoceros Hornbill (<i>Buceros rhinoceros</i>) (Aves: Bucerotidae) (Jarulis, Choirul Muslim, Dedy Duryadi Solihin, Ani Mardiasuti, and Lilik Budi Prasetyo)	5
Diet Management and Nutritional Fulfillment of Kalimantan Orangutan (<i>Pongo pygmaeus</i>) in Indonesian Safari Garden and Ragunan Zoo Garden (Nurzaidah Putri Dalimunthe, Hady Sukadi Alikodra, Entang Iskandar, Sri Suci Utami)	6
Fingerprinting Sengon (<i>Falcatria moluccana</i>) Accessions Resistant to Bektor Pest and Gall Rust Disease Using Microsatellite Markers (Ulfah J. Siregar, Dewi Rahmawati, Apriliya Damayanti)	7
Utilization of Selected Microorganisms in Enhancing the Growth of Selected Plant In Ex Gold Mining Soil (H Widiastuti, D Wulandari and, J Zarate)	8
Assessment of The Quality of Arabica Coffee Beans from Three Processing Methods and Two Types of Packaging Materials (Okky Setyawati Dharmaputra, Santi Ambarwati, Ina Retnowati and Nijma Nurfadila)	9
The Effectiveness of Clove Oil and its Fractions, As well As Clove Oil-based Fumigant Tablet Formulations, against <i>Tribolium castaneum</i> Herbst. (Trijanti Anugrahiyaharti Widinni Asnan, Sri Widayanti, Idham Sakti Harahap, Herni Widhisatuti)	10

RESEARCH ABSTRACT OF DIPA SEAMEO BIOTROP 2018

Development of Ecosystem Health Index in Rural Areas of Java Island: Preliminary Results (A S Yuwono, Y Wardiatno, R Widyastuti , D Wulandari, and M Natali)	12
Toksisitas Tiga Jenis Minyak Atsiri dan Fraksinasinya Terhadap <i>Tribolium castaneum</i> Herbst. (Coleoptera: Tenebrionidae) (Trijanti A. Widinni A., Idham Sakti Harahap, Sri Widayanti, Herni Widhiastuti)	13
Remote Sensing of Seagrass and Seabed Using Acoustic Technology in Bintan Seawater, Indonesia (Henry Munandar Manik and Dony Apdillah)	14
Fungal Infection in Stored Arabica Coffee (<i>Coffea arabica</i>) Beans At 20 Various Stages of The Delivery Chain in South Sulawesi Province (Okky Setyawati Dharmaputra, Santi Ambarwati, Ina Retnowati and Nijma Nurfadila)	15
Species Diversity and Composition of Marine Wood Borer Communities in Mangrove Forest of Sarawak, Malaysia (Khairul Adha A. Rahim, Farah Diba, Chen Cheng Ann)	16
Bioconversion Performance and Development of Black Soldier Fly (<i>Hermetia illucens</i> L.) on Treated Cocoa Pod Husk (Ciptadi Achmad Yusup, Haryo Tejo Prakoso, Siswanto & Deden Dewantara Eris)	17
Growth, Photosynthesis and Proline Accumulation of Metal-Accumulator Weeds (Hamim, Rani Apriani, Deden Saprudin, Yohana C Sulistyaningsih, Razali Ismail and Jafariah Jaafar)	18
Diversity of Stingless Bees Based on Principal Component Analysis in Halmahera Island, Indonesia (Hearty Salatnaya, Asnath Maria Fuah, Cece Sumantri, Widiatmaka and Sih Kahoho)	19
Morphological and Phytochemical Characterization of Susceptible and Resistant Sengon (<i>Falcataria moluccana</i>) Tree to Gall Rust Disease (Dewi Rahmawati, Nurul Khumaida, Ulfah J. Siregar)	20
Status of Phosphine Resistance of <i>Tribolium castaneum</i> in Indonesia (Sri Widayanti, Idham S. Harahap, Trijanti A. Widinni Asnan, Herni Widhiastuti)	21

RESEARCH ABSTRACT OF DIPA SEAMEO BIOTROP 2019

Integrating DNA Barcoding and Traditional Taxonomy for the Identification of Dipterocarps in Remnant Lowland Forests of Sumatra (Carina Carneiro de Melo Moura, Fabian Brambach, Kevin Jair Hernandez Bado, Konstantin V. Krutovsky, Holger Kreft, Sri Sudarmiyati Tjitrosoedirdjo, Iskandar Z. Siregar and Oliver Gailing)	23
Trypsin Inhibitor Activities as Defense Mechanism of Sengon (<i>Falcataria moluccana</i>) Against Pest Attacks (U J Siregar, I M Situmorang, F A Pasaribu, A Lestari, Y Istikorini, and N F Haneda)	24
The Dataset of De Novo Transcriptome Assembly of <i>Falcataria Moluccana</i> Cambium from Gall-Rust (<i>Uromycladium falcatarium</i>) Infected and	

Non-Infected Tree (Hasyiyati Shabrina, Ulfah J.Siregar, Deden D.Matra, Iskandar Z.Siregar)	25
Partisipasi Masyarakat dalam Pengelolaan Mangrove (Community Participation in Mangrove Management) (Desrian Alfandi, Rommy Qurniati, Indra Gumay Febryano)	26
Selection and Potential Test of Dark Septate Endophytes Fungus as Biological Agent of White Root Rot Disease (<i>Rigidoporus microporus</i>) on the Rubber Plant (Cici Indriani Dalimunthe, Bonny P W Soekarno, Abdul Munif, dan Surono)	27
Biomass Carbon Stocks in he Mangrove Rehabilitated Area of Sinjai District, South Sulawesi, Indonesia (Abdul Malik, Abd. Rasyid Jalil, Ahsin Arifuddin, Ainun Syahmuddin)	28
The First Complete Mitochondrial Genome Sequence of The Endangered Mountain Anoa (<i>Bubalus quarlesi</i>) and Phylogenetic Analysis (Dwi Sendi Priyono, Dedy Duryadi Solihin, Achmad Farajallah, Bambang Purwantara)	29
The Real Time Participatory Mapping for Disaster and Emergency Preparedness Model: a Case Study of Teachers Involvement in Center Sulawesi-Indonesia (Zulhamsyah Imran, Slamet Widodo Sugiarto, Harry Imantho, Benny Purwonegoro)	30
Potential Use of <i>Claroideoglomus etunicatum</i> to Enrich Signal Grass (<i>Brachiaria decumbens</i> Stapf.) for Silvopasture Preparation (Risa Rosita, Rahayu Widyastuti, Irdika Mansur, and Sarah Asih Faulina)	31
Antagonistic Effect of Yeast, Acetic Acid Bacteria, and Mangosteen Rind Extract on Aflatoxigenic <i>Aspergillus flavus</i> in Unfermented Cocoa Beans (Nijma Nurfadila, Sutrisno, Usman Ahmad, Samsudin)	32

RESEARCH ABSTRACT OF DIPA SEAMEO BIOTROP 2020

A Novel Formulation of Ecosystem Health Index in Urban Areas of Java Island, Indonesia (Arief Sabdo Yuwono, Dewi Wulandari, Rahayu Widyastuti, Muhammad Riva Algar, Ridla Arifriana)	34
Estimation of Heritability in Three Months Old Sengon (<i>Falcataria moluccana</i>) Seedlings at a Progeny Testing in Kediri, East Jawa, Indonesia (UJ Siregar, A Nugroho, H Shabrina, Y Istikorini, R Rahmawati, Y Amin and NF Haneda)	35
Short Communication – The First Inventory of The Nest Placement of Horseshoe Crab (<i>Tachypleus gigas</i>) in Indonesia (N K Aini, Y Wardiatno, A Mashar, H Effendi and H Madduppa)	36
Plasma Metabolites of Kampung Chicken (<i>Gallus gallus domesticus</i>) in Peatland Free-Range System with Differences of Vegetation (D Fitra, N Ulupi, I I Arief, R Mutia, L Abdullah and E Erwan)	37
Spatial-Planning-Based Ecosystem Adaptation (SPBEA): A Concept and Modeling of Prone Shoreline Retreat Areas (Dewayany Sutrisno, Mulyanto	

Darmawan, Ati Rahadiati, Muhammad Helmi, Armaiki Yusmur, Mazlan Hashim, Peter Tian-Yuan Shih, Rongjun Qin and Li Zhang)	38
Channeling Agriculture Innovation Transfer from Universities and Research Centre to Vocational High Schools: Lesson Learned from Indonesia (Irdika Mansur, Supriyanto, Harry Imantho, Slamet Widodo, Joner Situmorang)	39
Spatial Dynamic Modeling for Increasing the Competitiveness of Small Medium Enterprises: Case Study of Bogor City, West Java, Indonesia (Hartrisari Hanggoro Hardjomidjojo, Harry Imantho, Anissa Damayanti)	40
The Development of an e-Traceability System for Cattle Delivery Chains (Kudang Boro Seminar, Edit Lesa Aditya, Harry Imantho, Diki Gita Purnama, Ahmad Yani, Lucia Cyrilla)	41
Polymeric Encapsulation of Mint Oil: Effect of Oil Load on The Physical Properties (Sri Yuliani, Kendri Wahyuningsih, Sri Widayanti and Trijanti A.W. Asnan)	42

RESEARCH ABSTRACT OF DIPA SEAMEO BIOTROP 2021

Isolation and Amplification of Mangrove Plants Using DNA Barcode in Percut Sei Tuan, North Sumatra, Indonesia (R Syahbana, M Basyuni and L A M Siregar)	44
Stichopodidae (Holothuroidea: Echinodermata) from Nyamuk Island, Karimunjawa National Park, Central of Java, Indonesia (R Hartati, A Ambariyanto, W Widianingsih, R T Mahendrajaya, M Mustagfirin and P Prihatinningsih)	45
Sea Ranching of <i>Holothuria atra</i> : Stocking Density and Time (Retno Hartati, Ambariyanto Ambariyanto, Muhammad Zainuri, Widianingsih Widianingsih)	46
DNA Extraction and Pattern of Crab and Macrobentos from North Sumatran Mangrove Forest, Indonesia (A M Harahap, M Basyuni and I E Susetya)	47
De Novo Transcriptome Assembly Data for Sengon (<i>Falcataria moluccana</i>) Trees Displaying Resistance and Susceptibility to Boktor Stem Borers (<i>Xystrocera festiva</i> Pascoe) (Ulfah J. Siregar, Aditya Nugroho, Hasyiyati Shabrina, Fitri Indriani, Apriliya Damayanti and Deden D. Matra)	48



RESEARCH ABSTRACT

OF DIPA SEAMEO BIOTROP 2017



Integrating Styrax-Coffee Agroforestry System and Apiculture as Alternative Source of Livelihood for Communities in Lake Toba Catchment Area, North Sumatra

Aswandi¹, Cut Rizlani Kholibrina¹, Apri Heri Iswanto²

¹Ministry of Environment and Forestry Research and Development Institute of Aek Nauli.
Jl. Raya Parapat Km 10,5. Parapat Sumatera Utara

²Faculty of Forestry, Universitas Sumatera Utara. Jl. Tridharma Ujung No.1 Kampus USU
Medan, 20155

Abstract

The environmental degradation in the Lake Toba Water Catchment is multidimensional, so the recovery effort requires a holistic and integrative approach. Based on its multifunction, agroforestry system has potential for ecological regulation as well as community economic development through bee cultivation. This study aims to illustrate the potential of apiculture practices in agroforestry system in Lake Toba. The research was conducted on coffee-styrax-agroforestry system integrated with Apis and Trigona beekeeping in Aek Nauli, Simalungun, Humbang Hasundutan and Pakpak Bharat, North Sumatra. Results showed that plant diversity in agroforestry system provides feed sources in form of nectar and resin for Apis and Trigona bees. Each Trigona colony produces 30-70 g propolis every two weeks which typical flavor of Styrax incense. Whereas from Apis bee cultivation obtained an average 0.3 liters of honey each stup at two weekly harvest. From this integrated practice, farmers earn income Rp1,2 to 2,4 million per month, the welfare improvement considering bee maintenance is relatively easy and minimal time allocation. The laying of bee colonies around coffee gardens also increase fruit production by flowering intensify. Beekeeping in the agroforestry system opens opportunities for alternative livelihood development, optimization land productivity, as well as increased public nutritional security.

Keywords: agroforestry, apiculture, coffee, styrax, lake toba

Source:

In Proceedings of the International Conference on Natural Resources and Technology (ICONART 2019), pages 252-260. doi: 10.5220/0008552602520260

Environmental Site Engineering and Integrated Bio-Cycles Management for Rehabilitation of Degraded Tin Mining Land in Tropical Ecosystem

Cahyono Agus^{*1}, Dewi Wulandari^{*2}, Pita AB Cahyanti³, Idi Bantara⁴, Benny P Hutahae⁵,
Tri Lestari⁶

¹Faculty of Forestry Universitas Gadjah Mada Yogyakarta Indonesia

²Department of Environmental Engineering, Faculty of Civil Engineering and Planning,
Universitas Islam Indonesia, Yogyakarta, Indonesia.

³Department of Architecture, Faculty of Engineering, Universitas Gadjah Mada
Yogyakarta Indonesia

⁴BPDASHL Baturusa Cerucuk, Bangka Belitung Islands Province, Indonesia

⁵PT Timah Tbk, Bangka Indonesia

⁶Universitas Bangka Belitung, Bangka, Indonesia

*Corresponding author: cahyonoagus@gadjahmada.edu, dewi.wulandari@uii.ac.id

Abstract

Indonesia is known as the emerald of equator that has high values of natural resources although it also has a huge disaster risk. It is because Indonesia is located in the strategic areas, namely: (i) the equator, (ii) ring of fire, and (iii) earth plates of Eurasian, Pacific & Indo Australia. Mining activities of natural resources in tropical region exposes carbon and heavy metals and thus are the main cause of severe local, regional, and global environmental damage. The change of national economic development from extraction to empowerment of natural resource will facilitate shifting paradigm from red & green economic to blue economic concept that more smart, global, focus, and futuristic. Site engineering on critically degraded land through land preparation, soil amendment & biofertilizer could facilitate a better rehabilitation of mining land and have added value on environment, economy, sociocultural and health aspect. Synergism to genetic engineering using fast-growing species (indigenous and exotic) will improve success rate of land rehabilitation. An integrated bio-cycle management for managing land resources (i.e., soil, water, mineral, air, and microclimate) and biological resources (i.e., fauna, flora, and human) is an important strategy for sustainable productivity in protective tropical ecosystems.

Source:

International Conference on Resources and Environment Sciences, IOP Conf. Series: Earth and Environmental Science 398 (2019). doi: 10.1088/1755-1315/398/1/012013

Analisis Sifat Fisika-Kimia dan Penggunaan Metode Volumetri Dalam Penentuan Asam Sinamat pada Kemenyan (*Styrax* spp.) Tapanuli Utara

Agung Abadi Kiswandono^{*1}, Apri Heri Iswanto², Arida Susilowati², Agnes Farida Lumbantobing²

¹Jurusan Kimia Fakultas MIPA, Universitas Lampung, Bandar Lampung

²Departemen Kehutanan, Fakultas Kehutanan, Universitas Sumatera Utara

³Departemen Budidaya Hutan, Fakultas Kehutanan, Universitas Sumatera Utara

*Korespondensi penulis: agungkiswandono@fmipa.unila.ac.id

Abstract

Tapanuli Utara merupakan sentra produksi getah kemenyan di Indonesia. Getah kemenyan di perdagangan yang terdiri dari kemenyan Toba (*Styrax paralleloneurum* PERK), kemenyan Durame (*Styrax benzoine* Dryland), dan kemenyan Bulu (*Styrax benzoine* var *hiliferum*) biasanya belum diketahui dengan pasti kadar asam sinamat dan jenis metabolit sekundernya. Tujuan penelitian ini dimaksudkan untuk mengetahui kandungan metabolit sekunder dan sifat fisikakimia dari getah kemenyan jenis Toba dan jenis Durame yang ada di pasaran, sehingga diharapkan nantinya pengelompokan kualitas getah kemenyan dapat dipertimbangkan secara kuantitatif berdasarkan sifat fisika-kimianya. Sifat fisikakimia getah kemenyan yang diuji adalah warna, kadar air, kadar kotoran, kadar abu, titik lunak, dan kadar asam sinamat. Pada pengujian skrining fitokimia diketahui bahwa getah kemenyan jenis Toba dan Durame positif mengandung alkaloid, saponin, tanin dan triterpenoid. Hasil penelitian juga menunjukkan bahwa kadar air, titik lunak, dan kadar asam sinamat masuk dalam kualifikasi SNI 7940:2013 sedangkan pada pengujian warna kadar kotoran, dan kadar abu tidak masuk dalam kualifikasi SNI 7940 : 2013

Keywords: Fitokimia, kemenyan Durame-Toba, Tapanuli Utara

Source:

<http://repository.lppm.unila.ac.id/4479/1/BUKU%20ABSTRAK%20SEMNAS%2023%20OKT%202017.pdf>

Characters of Mitochondrial DNA D-LOOP Hypervariable III Fragments of Indonesian Rhinoceros Hornbill (*Buceros rhinoceros*) (Aves: Bucerotidae)

Jarulis^{*1}, Choirul Muslim¹, Dedy Duryadi Solihin², Ani Mardiasuti³, and Lilik Budi Prasetyo³

¹Department of Biology, Faculty of Mathematics and Science, University of Bengkulu

²Department of Biology, Faculty of Mathematics and Science, IPB University

³Department of Conservation of Forest Resources and Ecotourism, Faculty of Forestry, IPB University

*Corresponding author: jarulis@unib.ac.id

Received: 24 September 2020; Accepted: 12 December 2020

Abstract

The rhinoceros hornbill (*Buceros rhinoceros*) genetic characteristics consist of nucleotide polymorphisms, haplotypes, genetic distances, and relationships which are important for their conservation effort in Indonesia. We sequenced mitochondrial DNA D-loop hypervariable III fragments from five rhinoceros hornbill individuals at Safari Park Indonesia I and Ragunan Zoo, which were isolated using Dneasy® Blood and Tissue Kit Spin-Column Protocol, Qiagen. D-loop fragment replication was done by PCR technique using DLBuce_F (5'-TGGCCTTTCTCCAAGGTCTA-3') and DLBuce_R (5'-TGAAGG AGT TCATGGGCTTAG-3') primer. Thirty SNP sites were found in 788 bp D-loop sequences of five rhinoceros hornbill individuals and each individual had a different haplotype. The average genetic distance between individuals was 3.09% and all individuals were categorized into two groups (Group I: EC6TS, EC1RG, EC2TS and Group II: EC9TS, EC10TS) with a genetic distance of 3.99%. This result indicated that the two groups were distinct subspecies. The genetic distance between Indonesian and Thai *Rhinoceros hornbills* was 10.76%. Five Indonesian *Rhinoceros hornbill* individuals at Safari Park Indonesia I and Ragunan Zoo probably came from different populations, ancestors, and two different islands. This study can be of use for management consideration in captive breeding effort at both zoos. The D-loop sequence obtained is a useful character to distinguish three *Rhinoceros hornbill* subspecies in Indonesia.

Keywords: bucerotidae, control region, phylogenetic, *Rhinoceros hornbill* conservation, zoo

Source:

Treubia, 47(2): 99–110, December 2020. doi: 10.14203/treubia.v47i2.3971

Diet Management and Nutritional Fulfillment of Kalimantan Orangutan (*Pongo pygmaeus*) in Indonesian Safari Garden and Ragunan Zoo Garden

Nurzaidah Putri Dalimunthe^{*1}, Hady Sukadi Alikodra², Entang Iskandar², Sri Suci Utami Atmoko³

¹Mahasiswa Program Doktor Primatologi Institut Pertanian Bogor

²Program Primatologi Institut Pertanian Bogor

³Departmen Biologi Universitas Nasional

^{*}Corresponding author: putridlt@gmail.com

Received: Februari 2020; Accepted: April 2020

Abstract

Diet is one of the most important factors for growth, reproduction, and survivability of animals against disease. It is very important to conduct an animal welfare assessment in an effort to improve and optimize care management of orangutan in the zoo. Assessment of optimization of orangutan diet management carried out by analyzing several parameters, including the type and amount of food, nutrient content of food, time, and place for feeding and fulfillment of animal nutrition. The orangutan diet management research methods carried out in this study include direct observation, interviews, and literature study. The nutrient content of the food was analyzed by proximate analysis while the nutritional fulfillment of orangutans was analyzed by Nutrisurvey software. The results showed that feeding in Taman Safari Indonesia (TSI) carried out once a day in the morning at the sleeping cage, while in Taman Margasatwa Ragunan (TMR) was twice a day in the morning and evening at the sleeping cage. Both zoos provided higher amounts of fruit than the vegetable, primate biscuits, and tubers. The amount of diet nutrition given to orangutans in TMR and TSI was higher than the daily nutritional needs of orangutans. In an effort to create the orangutan welfare in the zoo, it is necessary to optimize the application of diet management in aspects of time, place, and frequency of feeding and consideration of the nutritional need of each individual.

Keywords: kalimantan orangutan, diet management, zoo, animal welfare

Source:

[https://e-](https://e-journal.biologi.lipi.go.id/index.php/jurnal_biologi_indonesia/article/viewFile/3883/3188)

[journal.biologi.lipi.go.id/index.php/jurnal_biologi_indonesia/article/viewFile/3883/3188](https://e-journal.biologi.lipi.go.id/index.php/jurnal_biologi_indonesia/article/viewFile/3883/3188)

Fingerprinting Sengon (*Falcataria moluccana*) Accessions Resistant to Borkor Pest and Gall Rust Disease Using Microsatellite Markers

Ulfah J. Siregar^{*1,2}, Dewi Rahmawati², Apriliya Damayanti¹

¹Department of Silviculture, Faculty of Forestry, Institut Pertanian Bogor. Jl. Ulin, Kampus IPB Dramaga, Bogor 16680, West Java, Indonesia.

²Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP). Jl. Raya Tajur Km 6, Bogor 16134, West Java, Indonesia

* Corresponding author: ujsiregar@gmail.com

Received: 25 July 2019; Accepted: 27 August 2019

Abstract

Fingerprinting sengon (*Falcataria moluccana*) accessions resistant to borkor pest and gall rust disease using microsatellite markers. Biodiversitas 20: 2698-2706. Sengon (*Falcataria moluccana* Miq.) is a multipurpose fast-growing tree species and widely planted as community forest in Indonesia. According to Indonesian Light Wood Association (ILWA) *F. moluccana* wood products coming from forest industries in Jawa worth US\$ 244.46 million export to China alone. The wood dust also has high potential as source for biomass-based energy in the form of wood-pellet. Monoculture plantation however often suffers from stem borer pest, known as borkor (*Xystrocera festiva*) and a gall rust disease, caused by fungi *Uromycladium falcatarium*. This research was aimed to characterize accessions of resistant and susceptible sengon individuals to both gall rust disease as well as stem borer pest using microsatellite markers. Totally 50 accessions of resistant and of resistant to stem borer pest were collected from Sumedang, West Jawa Province, while 88 accessions of resistant and of resistant to gall rust disease were sampled from Kediri, East Jawa Province and Sukabumi, Indonesia. Eight microsatellite markers could amplify most of the accessions used in this study and produce polymorphic fragments. High genetic diversity was detected in all of *F. moluccana* populations, with *He* ranged from 0.431 to 0.650. AMOVA showed that most genetic variations come from within populations. A dendrogram based on Nei's genetic distance (1972) clustered some resistant accessions to either stem borer pest or gall rust disease separately from susceptible ones.

Keywords: gall rust disease, microsatellite, resistant, sengon, stem borer, susceptible

Source:

BIODIVERSITAS. Volume 20, Number 9, September 2019 E-ISSN: 2085-4722 Pages: 2698-2706. doi: 10.13057/biodiv/d200935

Utilization of Selected Microorganisms in Enhancing the Growth of Selected Plant In Ex Gold Mining Soil

H Widiastuti^{*1}, D Wulandari² and, J Zarate³

¹Indonesian Research Institute for Biotechnology and Bioindustry, Jl Taman Kencana No 1
Bogor, Indonesia

²Department of Environmental Engineering, Faculty of Civil and Planning Engineering,
Universitas Islam Indonesia Yogyakarta, Indonesia

³National Institute of Molecular Biology and Biotechnology (BIOTECH), University of the
Philippines Los Banos, College, Laguna 4030 Philippines

*Corresponding author: happywidiastuti@yahoo.com

Abstract

Gold mining is an essential economic booster in enhancing the foreign exchange of a country. However, the gold mining activities resulting in contaminated soil. Phytoremediation, using plants for environmental remediation, has been intensively investigated in last decade. Phytoremediation has fewer side effects than conventional physical and chemical methods. This remediation technique embraces an array of low-cost plant-based technologies that could be potentially advantageous for remediation of the former gold mining site. This research aimed to assess the potency of selected microorganisms to support the growth of the plant in the soil of the former gold mining area. The application of selected microorganisms of P solubilizer, N fixing, growth-promoting bacteria, and arbuscular mycorrhizal fungi showed the best result on yield. This study showed that sengon (*Falcataria*) yields the better one compared to that of sorghum both in a medium consisting of ex gold mining soil and compost and medium with the composition of the soil, compost, and zeolite. It can thus be concluded that sengon inoculated with selected microbe is a potential method for remediating ex gold mining area.

Keywords : sorghum, sengon, microorganism, ex gold mining

Source:

IOP Conf. Series: Earth and Environmental Science 583 (2020) 012007, doi:10.1088/1755-1315/583/1/012007

Assessment of The Quality of Arabica Coffee Beans from Three Processing Methods and Two Types of Packaging Materials

Okky Setyawati Dharmaputra*¹, Santi Ambarwati¹, Ina Retnowati¹ and
Nijma Nurfadila¹

¹Laboratory of Phytopathology, SEAMEO BIOTROP, Bogor 16134, Indonesia

Received: 14 January 2020; Accepted: 27 April 2020

Abstract

In Southeast Asia, Indonesia is the second highest producing country of coffee beans after Vietnam. Consequently, Indonesia competes with other countries in producing good quality coffee beans. However, not many people have sufficient skills in tackling problems related to the postharvest handling of coffee beans. The objective of this study was to assess the quality of Arabica coffee (*Coffea arabica*) beans in terms of moisture content, fungal infection (especially ochratoxin A or OTA producing fungi), OTA contamination, and the taste of the coffee during storage. The three processing methods used were dry, wet, and semi-wet methods. The beans were packed using two types of packaging materials, i.e., Kantong Semar high gas barrier and polypropylene bags (4 kg/bag). They were then stored under warehouse conditions for 4 months of storage. The moisture content of coffee beans processed using the three methods and packed using polypropylene bags was higher than that of coffee beans packed using Kantong Semar high gas barrier; however, it was still lower than the safe moisture content for coffee determined by the Indonesian National Standard (12.5%). *Aspergillus niger* was found in coffee processed using the three methods and packed using a Kantong Semar high gas barrier. Its population was relatively low ($< 0.1 \times 10^6$ cfu/g wet basis). *Aspergillus ochraceus* was found in coffee processed using dry and wet methods at the beginning of storage. Its population was also relatively low ($< 0.3 \times 10^6$ cfu/g w.b. OTA content was not detected in all coffee samples, because it was lower than the detection limit of the instrument used (< 1.85 ppb). At the beginning of the storage, all coffee samples were dominated by yeast with the population of 1.9×10^2 - 1.2×10^3 cfu/g w.b. The taste of coffee in various treatments during 4 months of storage was still above the total standard score for specialty grade ≥ 80 . The highest total score (84) was found in coffee beans processed using a dry method and packed in Kantong Semar high gas barrier. The three processing methods and the two types of packaging materials can be used to maintain the quality of coffee beans for 4 months of storage.

Keywords: arabica coffee beans, processing methods, quality, types of packaging materials

Source:
BIOTROPIA. doi: 10.11598/btb.2021.28.3.1325

The Effectiveness of Clove Oil and its Fractions, As well As Clove Oil-based Fumigant Tablet Formulations, against *Tribolium castaneum* Herbst.

Trijanti Anugrahiyaharti Widinni Asnan^{*1}, Sri Widayanti¹, Idham Sakti Harahap^{1,2}, Herni Widhisatuti¹

¹Entomology Laboratory, SEAMEO BIOTROP, Jl. Raya Tajur, Km 6, Bogor, 16134

²Depat. Of Plant Protection, Faculty of Agriculture, IPB University, Jl. Kamper, Kampus IPB Dramaga, Bogor, 16680

*Corresponding author: trijanti@biotrop.org

Received: June 2020; Accepted: August 2021

Abstract

Indonesia has seen increased and widespread reports of resistance among stored-product insect pests to phosphine. The use of *Syzigium aromaticum* (clove oil) as an alternative fumigant may be a useful strategy to control infestation by phosphine-resistant varieties of stored-product insects. This study aimed to examine the effectiveness of whole (unfractionated) clove oil as well as its component fractions as a fumigant and repellent against the red flour beetle (*Tribolium castaneum*), and to develop a simple fumigant formulation for this purpose. Our experimental protocol used completely randomized design (CRD) in testing the effectiveness of clove oil and its fractions. The experimental design used for a bioassay to then test selected fumigants in tablet form, was factorial CRD. Fumigation test results gave LD₅₀ and LD₉₅ values of 0.234 and 1.142 mL/L respectively, for crude clove oil used in a fumigation chamber against *T. castaneum*. An *n*-hexane fraction of clove oil tested under the same conditions was more lethal, causing 95% mortality of *T. castaneum* at the dose of 0.801 mL/L during fumigation. Finally, tablets containing a set proportion of clove oil and naphthalene (1:1) reached LD₉₁ against *T. castaneum* after 7 days' fumigation.

Keywords: fractionation, mortality, naphthalene, stored product insect

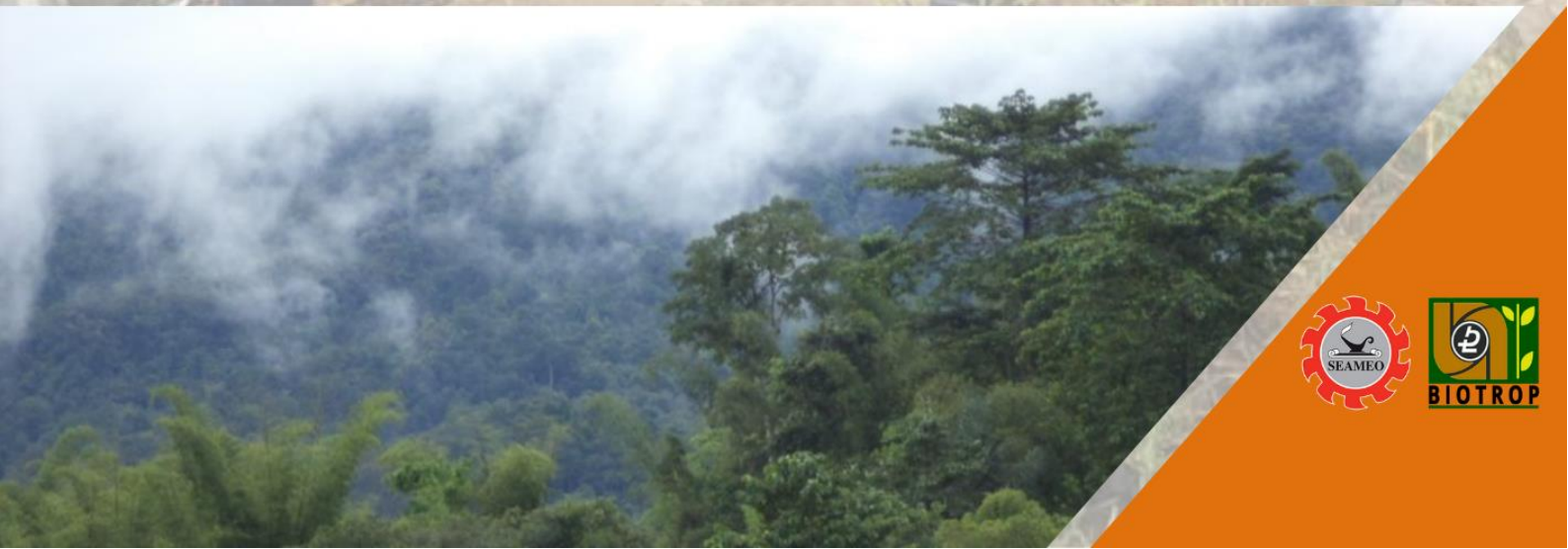
Source:

Asnan, T. A. W., Widayanti, S. ., Harahap, I. S. ., & Widhisatuti, H. . (2021). The effectiveness of clove oil, its fractions, and clove oil-based fumigant tablet formulations, against *Tribolium castaneum* (Herbst). *Jurnal Entomologi Indonesia*, 18(3), 191. <https://doi.org/10.5994/jei.18.3.19>



RESEARCH ABSTRACT

OF DIPA SEAMEO BIOTROP 2018



Development of Ecosystem Health Index in Rural Areas of Java Island: Preliminary Results

A S Yuwono^{*1}, Y Wardiatno², R Widyastuti³, D Wulandari⁴, M Natali¹

¹Department of Civil and Environmental Engineering, IPB University, Bogor, Indonesia 16680 ²Department of Aquatic Resources Management, IPB University, Bogor, Indonesia 16680

³Department of Soil Science and Land Resources, IPB University, Bogor, Indonesia 16680

⁴Department of Environmental Engineering, Indonesian Islamic University (UII), Yogyakarta, Indonesia 55584

*Corresponding author: arief.sabdo.yuwono66@gmail.com

Abstract

The assessment of ecosystem health in Indonesia is currently being conducted poorly since no national guidance standard. This study aimed to formulate a quantitative system to justify the rural ecosystem quality with six indicators, i.e. air pollution index (API), water pollution index (WPI), forest coverage index (FCI), biodiversity index, public health and environmental health. This research is a type of basic and applied research at the same time, where applied research lies in the implementation part of the ecosystem health index. Environmental conditions at rural areas of Java Island (Regencies of Pandeglang, Bandung, Temanggung, Magetan and Bangkalan) was evaluated. Secondary data collection from local environmental management and health authorities was conducted in March-May 2019. The data is expressed into indices with a value of each components ranging from 0 to 100. The ecosystem quality of Bandung Regency, Temanggung Regency, Bangkalan Regency, Magetan Regency quantitatively showing numbers of 67.03, 80.68, 81.76 and 78.66. The four values exceeded the national standard (IKLH, Indeks Kesehatan Lingkungan Hidup) in 2017, i.e. 66.46. It indicates that the ecosystem quality of these four regencies is generally professionally managed. Meanwhile, Pandeglang Regency shows the number of 65.22, which is below the national standard of IKLH.

Source:

ISCEE 2020, IOP Publishing, IOP Conf. Series: Earth and Environmental Science 622 (2021) 012020, doi:10.1088/1755-1315/622/1/012020

Toksisitas Tiga Jenis Minyak Atsiri dan Fraksinasinya Terhadap *Tribolium castaneum* Herbst. (Coleoptera: Tenebrionidae)

Trijanti A. Widinni A.*¹), Idham Sakti Harahap¹, Sri Widayanti¹, Herni Widhiastuti¹

¹Laboratorium Entomologi, SEAMEO BIOTROP Jl. Raya Tajur, Km 6, Bogor, 16134

*Korespondensi penulis: trijantiwiwi@gmail.com

Abstrak

Pengendalian serangga hama yang umum dilakukan selama di penyimpanan adalah melalui fumigasi dengan menggunakan fosfin. Laporan dari beberapa negara menunjukkan bahwa beberapa jenis hama gudang telah resisten terhadap fosfin. Minyak atsiri merupakan salah satu alternatif fumigan yang dapat digunakan untuk mengendalikan serangga hama gudang dan perlu untuk dikembangkan. Penelitian ini bertujuan untuk menilai toksisitas fumigan minyak atsiri mint, kayu manis, dan kapulaga serta masing-masing fraksinya terhadap *T. castaneum*. Penelitian ini dilakukan dengan menguji keefektifan minyak atsiri mint, kayu manis, dan kapulaga serta masing-masing fraksinya sebagai fumigan terhadap *T. castaneum*. Keefektifan masing-masing minyak atsiri diuji toksisitasnya dengan menggunakan cawan petri sebagai ruang fumigasi. Pengujian toksisitas fumigan dilakukan melalui dua tahap: uji pendahuluan dan uji lanjut. Nilai LD₉₅ minyak atsiri mint, kayu manis, dan kapulaga berturut-turut sebesar 0.194, 0.07, dan 0.227 mL/L ruang fumigasi. Fraksi minyak atsiri yang efektif terhadap *T. castaneum* dengan nilai LD₉₅ yang lebih rendah dari minyak kasar terdiri dari fraksi n-heksana minyak mint (2.2 kali lebih toksik dibandingkan minyak kasar), fraksi n-heksana minyak kapulaga (1.06 kali lebih toksik dibandingkan minyak kasar), dan fraksi etil asetat minyak kayu manis (1.054 kali lebih toksik dibandingkan minyak kasar). Hal ini menunjukkan bahwa fraksinasi pada minyak atsiri mint, kayumanis, dan kapulaga dapat meningkatkan toksisitas masing-masing minyak atsiri terhadap *T. castaneum*.

Kata kunci: kapulaga, kayu manis, minyak atsiri, mint, serangga hama gudang

Source:

Prosiding Seminar Nasional PEI Cabang Palembang 2018, Palembang 12-13 Juli 2018. "Serangga untuk Pertanian Berkelanjutan dan Kesehatan Lebih Baik" Editor: Siti Herlinda et. al. ISBN: 978-979-587-788-2 425

Remote Sensing of Seagrass and Seabed Using Acoustic Technology in Bintan Seawater, Indonesia

Henry Munandar Manik*¹, Dony Apdillah²

¹Department of Marine Science and Technology, Faculty of Fisheries and Marine Sciences, IPB University (Bogor Agricultural University), 16680 Bogor, Indonesia

²Department of Marine Science, Faculty of Marine Science and Fisheries, Raja Ali Haji Maritime University, 29115 Tanjung Pinang, Indonesia

Abstract

Seagrass were flowering plants that grow entirely under the sea. Seagrass were a significant element in coastal habitats such as Bintan waters because it acts as a protective beach. Seagrasses have the capacity to stabilize the bottom waters of sediments and were able to generate sediments that can fertilize the waters. Seagrass can be a reference in coastal area to improve the stability of the coastal environment. Seagrass beds are useful for a protected area for tiny organisms, a spawning location for aquatic biota, and a location for juvenile and larval enlargement. Distribution of seagrass abundance are essential to understand because they can define coastal regions whether they are harmed or not. Seagrass surveillance techniques were still using divers with restricted coverage of the study region. For this reason, an acoustic method was used through this research to detect seagrass and the habitats that it occupied. It can be concluded that the acoustic method can measure sound intensity or acoustic backscatter from seagrass and their habitat. The height of the seagrass can be evaluated depending on the acoustic reflection value of the seagrass. There were 3 seagrass groups based on percent closure in the research place, which were tiny to none of the seagrass groups, unusual seagrass groups, and many seagrass groups. Seagrass was mostly found in good sedimentary habitats. The increase in the quantity of manually calculated seagrass biomass was accompanied by a rise in the value of acoustic backscattering intensity. The overall accuracy of the seagrass species using the acoustic technique is 87%.

Keywords: backscatter, biomass, hydroacoustics, seagrass

Source:

Pertanika Journal of Science & Technology . Apr2020, Vol. 28 Issue 2, p421-439. 19p.

Fungal Infection in Stored Arabica Coffee (*Coffea arabica*) Beans At 20 Various Stages of The Delivery Chain in South Sulawesi Province

Okky Setyawati Dharmaputra^{*1,2}, Santi Ambarwati¹, Ina Retnowati¹, Nijma Nurfadila¹

¹SEAMEO BIOTROP, Bogor 16134, Indonesia

²Department of Biology, Faculty of Mathematics and Natural Sciences, Institut Pertanian Bogor, 25 Bogor 16680, Indonesia

*Corresponding author: okky@biotrop.org

Running title: Fungal infection in stored arabica coffee beans

Abstract

Indonesia is the world's fourth-largest coffee producer after Brazil, Vietnam, and Columbia, in which one of its well-known coffee originates from the Toraja region, South Sulawesi. As such, Indonesia has to compete with these countries in producing good quality coffee beans. Consequently, this research aimed (a) to obtain information on the postharvest handling methods of Arabica coffee (*C. arabica*) beans in Tana Toraja, North Toraja Regencies, and Makassar Municipality, Indonesia, and (b) to investigate the occurrence of fungi (including ochratoxin A producing fungi) in stored Arabica coffee beans collected from various stages of the delivery chain. The data collection process included surveys, interviews, and sample collections conducted in May and July 2016 at each level of the delivery chain. The moisture content (MC) and the physical quality of the beans were also measured to determine its quality. Sixty-four (64) coffee bean samples were collected, consisting of 27 samples from the farmers, 15 samples from the collectors, 13 samples from the traders, and 9 samples from the exporters. The results showed that the moisture contents of coffee beans collected from the farmers and bean collectors (42.5%) were significantly higher than the maximum tolerable limit determined by the Indonesian National Standard (SNI) (13%), while the MC of the beans from the traders and exporters (9.7-10.9%) was significantly lower. Based on the total defective values, coffee beans from the farmers had more diverse grades (1-6) than those at other levels. *Penicillium citrinum* was the dominant fungus found in those beans collected from the farmers, collectors, and traders, while *Aspergillus niger* was the dominant fungus found in those beans from the exporters. At trader level, 46% of the samples were infected by *Aspergillus ochraceus* and *A. niger*, which are known as ochratoxin A (OTA) producing fungi. At exporter level, 44% of the samples were infected by *A. ochraceus*, while 78% of the samples were infected by *A. niger*. Thus, the postharvest handling methods conducted especially by farmers and collectors of Arabica coffee beans should be improved to reduce the moisture content and to increase the grade quality of the coffee beans.

Keywords: arabica coffee beans, *Aspergillus niger*, *A. ochraceus*, ochratoxin, quality

Source:

BIOTROPIA Vol. 26 No. 2, 2019: 127-135. DOI: 10.11598/btb.2019.26.2.900

Species Diversity and Composition of Marine Wood Borer Communities in Mangrove Forest of Sarawak, Malaysia

Khairul Adha A. Rahim^{*1}, Farah Diba², Chen Cheng Ann³

¹Department of Aquatic Science, Faculty of Resource Science & Technology, Universiti Malaysia Sarawak, Kota Samarahan-94300, Sarawak, Malaysia

²Faculty of Forestry, Universitas Tanjungpura. Jl. Prof. Hadari Nawawi, Pontianak 78124, West Kalimantan, Indonesia

³Borneo Marine Research Institute, Universiti Malaysia Sabah. Jalan UMS, 8400 Kota Kinabalu, Sabah, Malaysia

*Corresponding author: akhairul@frst.unimas.my

Abstract

Marine wood borer known as teredinids, commonly found in the mangrove ecosystem. However, the species composition and distribution of marine wood borer species in the coastal area of Borneo and the factors controlling their species composition and distribution are poorly known. Thus, the main objectives of this study were to examine the ecology, distribution and species composition of marine wood borer communities in mangrove ecosystem. The studies were carried out at Lundu and Sematan mangrove forest in Blunnei Bay, Sarawak, East Malaysia. A total of 829 individuals from 26 species belonging to 14 families, including non-boring organisms was identified. Only 12 species of marine wood borer were collected. These included 11 species and two families of marine wood borer from family Terenididae and one species from Pholadidae. *Teredo* sp. represented 48.4% of the total marine wood borer sampled. Certain environmental factors have significantly influenced the species composition and distribution of marine wood borer. The documentation of the species composition, ecology, and distribution of marine wood borer communities is important for sustainable development, conservation and management of mangrove forest.

Keywords: mangrove, marine wood borer, *Teredo*

Source:

ABS MASY BIODIV INDON, Pontianak, 14-15 Oktober 2017, hal. 187-225.

Bioconversion Performance and Development of Black Soldier Fly (*Hermetia illucens* L.) on Treated Cocoa Pod Husk

Ciptadi Achmad YUSUP¹, Haryo Tejo PRAKOSO¹, SISWANTO¹, Deden Dewantara ERIS¹

¹Indonesian Research Institute for Biotechnology and Bioindustry, Jalan Taman Kencana No. 1. Bogor 16128, Indonesia

Received: 22 February 2020; Accepted: 06 April 2020

Abstract

Indonesia is the third largest cocoa producer in the world, thus the number of cocoa pod husk (CPH) resulted from this activity is abundant. To handle this waste, farmer usually uses it directly as a feed source to small ruminants but this practice is less effective due to its low protein content and it also contains a substantial amount of lignin. Black Soldier Fly (BSF) (*Hermetia illucens* L.) (Diptera: Stratiomyidae) larvae are known as bioconversion agents that can be fed upon various organic substrates and they are also high protein source. The aim of this research was to evaluate the possibility of BSF grown on CPH based on their relative growth rate (RGR), efficiency of conversion of ingested food (ECI), waste reduction index (WRI), and development time. Body size of the imago from each treatment was also measured. Larvae were fed with fresh CPH (F), fresh blended CPH (B), composted CPH (C), mix of fresh CPH with food waste (F+FW) and mix of composted CPH with food waste (C+FW). Food waste served as a control. The results of this study show that the most ideal treatment that possible to be applied in cocoa plantation was C+FW treatment which gave average prepupal fresh weight of 11.20 g/100 larvae with 18 days of development time. This treatment had the highest value of WRI and RGR among all treatments. Composted CPH that mixed with food waste treatment also had a shorter development time of BSF larvae.

Keywords: ECI, RGR, development time, WRI, alternative protein feed

Source:

Menara Perkebunan 2020, 88(1), 9-15, p-ISSN: 0125-9318/ e-ISSN: 1858-3768, doi: <http://dx.doi.org/10.22302/iribb.jur.mp.v88i1.365>

Growth, Photosynthesis and Proline Accumulation of Metal-Accumulator Weeds

Hamim¹, Rani Apriani¹, Deden Saprudin², Yohana C Sulistyaningsih¹, Razali Ismail³, Jafariah Jaafar³

¹Department of Biology, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University

²Department of Chemistry, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University

³Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia 81310, Johor, Malaysia

Abstract

Heavy metals especially lead and mercury contaminant have been spread widely because of their intensive utilization in industry or extraction in mining area which threaten our environment. The experiment aimed to examine the growth and some physiological parameters of five metal-accumulator weed species in response to mercury (Hg) and lead (Pb) treatment. Five weed species (*Branchiaria mutica*, *Cyperus kyllingia*, *Ipomea aquatica*, *Mikania micrantha*, and *Paspalum conjugatum*) were grown in water culture using half strength Hoagland's solution and subjected to Hg(NO₃)₂ and Pb(NO₃)₂ at 0, 0.25 and 0.5 mM for 3 weeks. The growth, photosynthesis, lipid peroxidation and proline content were observed during the treatments. The result showed that both Hg and Pb decreased growth significantly, but the decrease was far higher in Hg than in Pb treatments. Hg treatment reduced photosynthetic rate dramatically under different photosynthetic photon flux density suggesting that heavy metal Hg until 0.5 mM caused the damage of photosynthetic apparatus almost all species except in *I. aquatica*. Hg and Pb treatment caused dramatic increase in leaf MDA content, which was associated with the decrease of chlorophyll content significantly. Almost all the species were tolerant to Pb treatment up to 0.5 mM except *M. micrantha*, while only *C. kyllingia* and *I. aquatica* were tolerant to Hg treatment up to 0.5 mM. Only Hg treatment and not Pb that induced higher proline content in the leaves of threated plants without clear pattern of the increment among the species suggesting that proline may have a role as alarm stress rather than tolerant indicator.

Keywords: heavy metals, metal toxicity, phytoremediation, stress physiology, weeds

Source:

BIOTROPIA, Vol. 27 No. 3 (2020): BIOTROPIA Vol. 27 No. 3 December 2020, DOI: <https://doi.org/10.11598/btb.0.0.0.1200>

Diversity of Stingless Bees Based on Principal Component Analysis in Halmahera Island, Indonesia

Hearty Salatnaya^{1, 4}, Asnath Maria Fuah¹, Cece Sumantri¹, Widiatmaka², Sih Kahoho³

¹Department of Animal Production and Technology, Faculty of Animal Science, IPB University, Bogor 16680, Indonesia

²Department of Soil Science and Land Resources, Faculty of Agriculture, IPB University, Bogor 16680, Indonesia

³Research Center for Biology, Indonesian Institute of Sciences, Cibinong 16911, Indonesia

⁴Agrotechnology Study Program, Banau Tertiary Institute of Agricultural Enterprise, West Halmahera 97752, Indonesia

Abstract

Tetragonula is one of stingless bees genus widely spread in Indo-Pacific with various species, including Indonesia. This genus is also found in West Halmahera, but it does not have a unique character as the marker, so it is difficult to identify. The best way to identify is by measuring the body part from each individual. This research was conducted to analyze morphometry to know the diversity of stingless bee in West Halmahera. Three hundred thirty-two (332) stingless bees from 51 colonies of three different species were used, namely *Tetragonula clypearis*, 40 colonies (252 bees), *T. sapiens*, 10 colonies (72 bees), and *T. biroi*, one colony (eight bees). Morphometry of stingless bees were analyzed based on principal component analysis (PCA), visualized into scree plot, score plot, loading plot and biplot. The results showed that only two principal components (PCs) on eigenvalue have a score more than one with the total proportions are 85.8%. All the species were not correlated because they appeared in different quadrants. Morphometry variables have a positive correlation with *T. sapiens*, but negative correlation with *T. clypearis*, while *T. biroi* has a weak correlation with the variables of *T. sapiens*. *T. sapiens* can only be found in the highlands, *T. clypearis* is mostly found in medium elevations but can also be found in highlands, while *T. biroi* can only be found in lowlands.

Keywords: morphometry, *Tetragonula*, elevation, Halmahera island.

Source:

Journal of Agricultural Science and Technology A 9 (2019) 262-268, doi: 10.17265/2161-6256/2019.04.006

Morphological and Phytochemical Characterization of Susceptible and Resistant Sengon (*Falcataria moluccana*) Tree to Gall Rust Disease

Dewi Rahmawati¹, Nurul Khumaida², Ulfah J. Siregar^{*1,3}

¹Department of Research, Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP). Jl. Raya Tajur Km 6, Bogor 16134, West Java, Indonesia.

²Department of Agronomy, Faculty of Agriculture, Institut Pertanian Bogor. Jl. Raya Dramaga, Bogor 16680, West Java, Indonesia

³Department of Silviculture, Faculty of Forestry, Institut Pertanian Bogor. Jl. Raya Dramaga, Bogor 16680, West Java, Indonesia

*Corresponding author: email: siregaruj@gmail.com

Received: 5 January 2019; Accepted: 28 February 2019

Abstract

Gall rust disease has severely attacked sengon tree (*Falcataria moluccana* Miq. Barneby & J.W. Grimes)) and it rapidly spread in tree plantations, causing decrease in wood productivity. Although sengon is widely cultivated in several areas in Indonesia, there are limited studies on secondary metabolite composition of its wood. This research aimed to study differences on morphology, wood anatomy and secondary metabolites content of resistant and susceptible sengon tree trunk to gall rust disease. Both resistant and susceptible tree samples to gall rust were selected from the same plantation plots to minimize environmental effects. Structure of wood samples was observed using Scanning Electron Microscope (SEM) JSM-5310LV. Seven types of secondary metabolites, i.e., alkaloids, flavonoids, saponins, phenolic hydroquinones, tannins, triterpenoids, and steroids were qualitatively analyzed from powdered wood samples. Based on field observations, the gall rust fungi changed the color, texture, pores of the tree surface and decreased wood density. In microscopic observations, sengon trunk, which is resistant to gall rust disease, showed organized and regularly structured wood anatomy and did not show hyphae of the infecting fungi inside the wood. The fungi damaged susceptible sengon trunk as indicated by the dispersed and irregular structure of wood tissue, while the presence of fungal hyphae among wood cells was detected. Phytochemical analyses indicated that trunk of sengon containing flavonoids, saponins, phenolic hydroquinones, tannins, triterpenoids, and steroids, except alkaloids. Sengon trunk, which is resistant to gall rust disease, had stronger reactions of flavonoids, saponins, triterpenoids, and steroids compared to that susceptible one.

Keywords: *Falcataria moluccana*, galls rust disease, phytochemical, resistant, scanning electron microscope

Source:

BIODIVERSITAS. Vol. 20 No. 3 (2019) <https://smujo.id/biodiv/article/view/3126/2831>

Status of Phosphine Resistance of *Tribolium castaneum* in Indonesia

Sri Widayanti*¹, Idham S. Harahap^{1,2}, Trijanti A. Widinni Asnan¹, Herni Widhiastuti¹

¹Entomologi Laboratory, SEAMEO BIOTROP, Jl. Raya Tajur, Km 6, Bogor, 16134

²Plant Protection Dept., Faculty of Agriculture, Bogor Agriculture University, Jl. Kamper, Kampus IPB Darmaga, Bogor

*Corresponding author's email: s_widayanti@biotrop.org

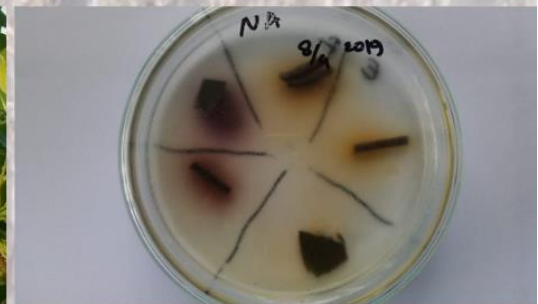
Abstract

Storage period is the most vulnerable stage in postharvest system of all agricultural products. Fumigation using phosphine has long been an option in managing stored-product insect pests during storage period. The long-term use of phosphine can lead to the development of resistant strains of stored-product insects. This study aimed to determine the distribution and resistance status of *Tribolium castaneum* in Indonesia. Samples of *T. castaneum* were obtained from various food and feed warehouses in 33 cities from 13 provinces in Indonesia which routinely conduct fumigation. The study was conducted using the FAO method for resistance test of stored product insect pests. It was found resistance cases had been spread out in various cities in Indonesia, and almost all *T. castaneum* samples collected had shown their resistance against phosphine. As many as 24 samples of *T. castaneum* collected from 24 cities in different 11 provinces (75% from total samples) had shown their resistance to phosphine with resistance factors (RF) ranging from 1.2 – 350.7 times. Besides, there were eight cities from 6 provinces that had not experienced resistance to phosphine. The province with the lowest RF value was East Kalimantan, 0.6.

Keywords: distribution, phosphine, resistance, *Tribolium castaneum*

Source:

CAF2020 paper No. P-3-7-33. Widayanti S, Harahap IS, Asnan TAW, Widhiastuti H (2021) Status of phosphine resistance of *Tribolium castaneum* in Indonesia. Pp. 102 - 107. In: Jayas DS, Jian F (eds) Proceedings of the 11th International Conference on Controlled Atmosphere and Fumigation in Stored Products (CAF2020), CAF Permanent Committee Secretariat, Winnipeg, Canada.



RESEARCH ABSTRACT

OF DIPA SEAMEO BIOTROP 2019



Integrating DNA Barcoding and Traditional Taxonomy for the Identification of Dipterocarps in Remnant Lowland Forests of Sumatra

Moura CCM¹, Brambach F², Bado KJH¹, Krutovsky KV^{1,3,4,5,6}, Kreft H², Tjitrosoedirdjo SS⁷, Siregar IZ⁸, Gailing O^{*1,3}

¹ Department of Forest Genetics and Forest Tree Breeding, University of Göttingen, Büsgenweg 2, 37077 Göttingen, Germany

² Biodiversity, Macroecology and Biogeography, University of Göttingen, Büsgenweg 1, 37077 Göttingen, Germany

³ Center for Integrated Breeding Research, University of Göttingen, Albrecht-Thaer-Weg 3, 37075 Göttingen, Germany

⁴ Laboratory of Population Genetics, N. I. Vavilov Institute of General Genetics, Russian Academy of Sciences, 3 Gubkin Str., Moscow 119333, Russian

⁵ Laboratory of Forest Genomics, Genome Research and Education Center, Institute of Fundamental Biology and Biotechnology, Siberian Federal University, 50a/2 Akademgorodok, Krasnoyarsk 660036, Russia

⁶ Department of Ecosystem Science and Management, Texas A&M University, College Station, TX 77843-2138, USA

⁷ Southeast Asian Regional Center for Tropical Biology (SEAMEO BIOTROP), Jalan Raya Tajur Km. 6, Bogor 16144, Indonesia

⁸ Department of Silviculture, Faculty of Forestry, Bogor Agricultural University, Dramaga Campus, Bogor 16680

*Corresponding author: ogailin@gwdg.de; Tel.: +49-551-3933536

Received: 23 August 2019; Accepted: 17 October 2019; Published: 30 October 2019

Abstract

DNA barcoding has been used as a universal tool for phylogenetic inferences and diversity assessments, especially in poorly studied species and regions. The aim of this study was to contrast morphological taxonomy and DNA barcoding, using the three frequently used markers *matK*, *rbcL*, and *trnL-F*, to assess the efficiency of DNA barcoding in the identification of dipterocarps in Sumatra, Indonesia. The chloroplast gene *matK* was the most polymorphic among these three markers with an average interspecific genetic distance of 0.020. The results of the molecular data were mostly in agreement with the morphological identification for the clades of *Anthoshorea*, *Hopea*, *Richetia*, *Parashorea*, and *Anisoptera*, nonetheless these markers were inefficient to resolve the relationships within the *Rubroshorea* group. The maximum likelihood and Bayesian inference phylogenies identified *Shorea* as a paraphyletic genus, *Anthoshorea* appeared as sister to *Hopea*, and *Richetia* was sister to *Parashorea*. A better discriminatory power among dipterocarp species provided by *matK* and observed in our study suggests that this marker has a higher evolutionary rate than the other two markers tested. However, a combination of several different barcoding markers is essential for reliable identification of the species at a lower taxonomic level.

Keywords: *matK*, *rbcL*, *trnL-F*, Dipterocarpoideae, tropical tree diversity, genetic distance, reference DNA library

Source:

Plants 2019, 8, 461; doi:10.3390/plants8110461

Trypsin Inhibitor Activities as Defense Mechanism of Sengon (*Falcataria moluccana*) Against Pest Attacks

U J Siregar^{*1}, I M Situmorang¹, F A Pasaribu¹, A Lestari¹, Y Istikorini¹, N F Haneda¹

Department of Silviculture, Faculty of Forestry, IPB University, Bogor, 16680, Indonesia

*Corresponding author: ulfahjs@apps.ipb.ac.id

Abstract

Sengon (*Falcataria moluccana*) plantation always suffers from a serious attack of stem borer, which is called Boktor (*Xystrocera festiva* Pascoe). This research aimed to investigate the presence of anti-pest substances, i.e. trypsin inhibitor on each part of a sengon tree, which might serve as a defense mechanism against the pest. Healthy and severely attacked sengon trees from Cianjur, Solomon, and Kediri provenances were sampled for their leaves, barks, and woods. Trypsin inhibitor activity from each sample was assayed using synthetic enzyme and substrate in a spectrophotometer. Data were analyzed under Complete Randomized Design, using SPSS 11.5. Different provenances, tree condition, and part of tree gave significant effects on trypsin inhibitor activity. Healthy trees had a higher Trypsin Inhibitor Activity (TIA) value compared to the pest-infected tree. The sengon tree tissue that had the highest TIA is the bark from healthy trees of Solomon provenance, with a value of 730.0403 TIU/mg. Obviously the bark is the first defense against the stem borer pest.

Source:

IOP Conf. Series: Materials Science and Engineering 935 (2020) 012034. doi:10.1088/1757-899X/935/1/012034

The Dataset of De Novo Transcriptome Assembly of *Falcataria Moluccana* Cambium from Gall-Rust (*Uromycladium falcatarium*) Infected and Non-Infected Tree

Hasyati Shabrina¹, Ulfah J.Siregar², Deden D.Matra³, Iskandar Z.Siregar²

¹Tropical Silviculture Program, Graduate School, IPB University (Bogor Agricultural University), Indonesia

²Department of Silviculture, Faculty of Forestry, IPB University (Bogor Agricultural University), Indonesia

³Department of Agronomy and Horticulture, Faculty of Agriculture, IPB University (Bogor Agricultural University), Indonesia

Received: 01 July 2019; Accepted: 30 August 2019

Abstract

Sengon (*Falcataria moluccana*), formerly known as *Albizia falcataria* or *Paraserianthes falcataria*, is an essential tree species for the development of community-based timber plantation, especially in Indonesia. The plantations nowadays are facing a significant disease threat, namely infection of gall-rust fungi (*Uromycladium falcatarium*). However, a clear understanding of the molecular mechanisms of the tree response against the disease is still unknown. We carried out transcriptome assembly using BGISEQ-500 technology to provide assembled de novo transcriptome dataset generated from gall-rust infected and non-infected trees. The construction of assembled transcriptome was conducted using Trinity v.2.3.2. The raw reads are available in the DDBJ platform with accession number, DRA007983.

Keywords: *de novo*, *Falcataria moluccana*, gall-rust (*Uromycladium falcatarium*) infected, next-generation sequencing (NGS), RNA, transcriptome

Source:

Data in brief, Volume 26, October 2019, 104489

Partisipasi Masyarakat dalam Pengelolaan Mangrove (Community Participation in Mangrove Management)

Desrian Alfandi, Rommy Qurniati, Indra Gumay Febryano

Abstract

Community participation has an important role in mangrove management because the community is the front guard in maintaining the sustainability of mangroves. This study aims to determine the level and type of participation of Kelompok Paguyuban Peduli Lingkungan (a mangrove group). The research was conducted in January-February 2018 in Sidodadi Village, Teluk Pandan Subdistrict, Pesawaran District, Lampung Province. Data obtained through in-depth and structured interviews were then analyzed qualitatively using Arstein and Hobley Theory. The results show that community participation is at the level of therapeutic participation and the type of passive participation. The involvement of various parties in the planning stage to implementation is needed to encourage increased community participation.

Keyword: community participation, level of participation, mangrove, type of participation

Source:
Jurnal Sylva Lestari 7.1 (2019): 30-41

Selection and Potential Test of Dark Septate Endophytes Fungus as Biological Agent of White Root Rot Disease (*Rigidoporus microporus*) on the Rubber Plant

Cici Indriani Dalimunthe^{*1,2}, Bonny P W Soekarno², Abdul Munif², Surono³

¹Balai Penelitian Sungei Putih, Pusat Penelitian Karet Galang, Deli Serdang, PO BOX 1415 Medan 20001 Sumatera Utara

²Departemen Proteksi Tanaman, Institut Pertanian Bogor (IPB University) Jalan Meranti Kampus IPB Dramaga Bogor 16680 Jawa Barat

³Balai Penelitian Tanah Jalan Tentara Pelajar Nomor 12 Cimanggu Bogor 16114 Jawa Barat

*Corresponding author: dalimunthe@yahoo.com

Received: 17 May 2019; Accepted: 13 June 2019

Abstract

Dark Septate Endophyte (DSE) fungus is a group of endophytic fungi that generally have dark melanin hyphae, form dark colonies on agar media, and are able to colonize plant roots without causing disease symptoms. No reports relating to the role of DSE fungi as biocontrol agents of white root rot disease, especially in Indonesia. This study aimed to obtain DSE fungal isolates from Indonesia by the selection of DSE fungal isolates that have the potency as biological agents of white root rot disease on the rubber plant. The initial stage of the study was the isolation of DSE fungi from roots and soil around rubber roots, pathogenicity test, dual culture test and metabolite test of volatile compounds. In this study, five DSE fungal isolates APDS 3.2, TBMDs 2.4b, TMDS 2.1, TMDS 3.2 and SBTBMDS 1 were able to inhibit the growth of *Rigidoporus microporus* causing white root rot disease on the rubber plant. This study proved that DSE fungal isolates can be isolated from rubber plant roots and have potential as a biological agent for *Rigidoporus microporus* causing white root rot disease on the rubber plant. Further studies will be carried out in the field testing and hoped the result of this study will provide preliminary information about the role of DSE fungus in rubber plants in overcoming biotic stress conditions caused by a pathogenic fungus

Keywords: biotic stress; DSE fungus volatile compound; dual culture; *Hevea brasiliensis*; *Rigidoporus microporus*

Source:

Jurnal Penelitian Karet, 2019, 37 (1) : 11 – 20, Indonesian J. Nat. Rubb. Res. 2019, 37 (1) : 11 – 20, doi : <https://doi.org/10.22302/ppk.jpk.v37i1.624>

Biomass Carbon Stocks in he Mangrove Rehabilitated Area of Sinjai District, South Sulawesi, Indonesia

Abdul Malik^{*1,2}, Abd. Rasyid Jalil³, Ahsin Arifuddin¹, Ainun Syahmuddin¹

¹Department of Geography, Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar, Jl. Malengkeri Raya, Kampus Parangtambung, Makassar 90224, Indonesia

²Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP), Jl. Raya Tajur Km. 6, Bogor, 16134, Indonesia

³Department of Marine Science, Faculty of Marine Science and Fisheries, Universitas Hasanuddin, Jl. Perintis Kemerdekaan Km.10, Makassar, 90245, Indonesia

*Corresponding author: abdulmalik@unm.ac.id

Received: 17 October 2019; Accepted: 10 May 2020

Abstract

Mangrove forest plays a crucial role in climate change mitigation by storing carbon in its above-belowground pools. However, this forest remains under considerable high exploitation from the expansion of settlement and aquaculture pond that likely results in much CO₂ release to the atmosphere. The objective of this research is to estimate biomass carbon stocks of mangrove rehabilitated areas in Sinjai District, South Sulawesi. We used a line transects method for mangrove vegetation survey and determined above-belowground biomass and carbon stock using published allometric equations and a conversion factor, respectively. The results showed that the mean values of carbon stocks in above-belowground biomass were 125.48±93.48 Mg C ha⁻¹ and 60.23±44.87 Mg C ha⁻¹. The aboveground biomass stored more carbon than the belowground pool. However, low planting distance in mangrove rehabilitation and conversion of mangrove area into settlements and aquaculture ponds in the last three decades have affected forest structure and biomass carbon magnitudes. Therefore, preservation of intact mangrove and restoration of disturbed forests with pay attention to planting distance should consider. Besides, halting the expansion of settlements and aquaculture ponds are worthwhile options to maintain and possibly increase biomass carbon stocks.

Keywords: mangrove, biomass carbon stocks, mangrove rehabilitation, planting distance

Source:

Geography, Environment, Sustainability Vol 13, No. 3 (2020)

The First Complete Mitochondrial Genome Sequence of The Endangered Mountain Anoa (*Bubalus quarlesi*) and Phylogenetic Analysis

Dwi Sendi Priyono^{1,2}, Dedy Duryadi Solihin¹, Achmad Farajallah¹, Bambang Purwantara³

¹Department of Biology, Faculty of Mathematics and Natural Sciences, IPB University, Bogor 16680, West Java, Indonesia

²Southeast Asian Regional Centre for Tropical Biology, SEAMEO BIOTROP, Bogor 16134, West Java, Indonesia

³Department of Veterinary Clinic Reproduction and Pathology, Faculty of Veterinary Medicine, IPB University, Bogor, 16680, West Java, Indonesia

Abstract

The mitochondrial genome is able to provide important information for evolutionary biology. Therefore, this research aims at characterizing that of *Bubalus quarlesi* mitochondrial genome. Furthermore, it was entirely 16,354 bp in length, consisting of 13 protein coding genes (PCGs), 22 tRNA, and two rRNA genes, one putative control region. All PCGs, however, used a typical ATN as start codon, while the stop codon were typically TAA, TGA, and TGA, with the exception of nad3 and nad6 genes using TCA. It was also observed that the lowest evolution rate of PCG was cox1, while the highest was atp8. Meanwhile, a phylogenetic analysis based on 13 PCGs was performed on 14 bovine species, using Bayesian and maximum likelihood, and its tree indicated that *B. quarlesi* belongs to the subtribe of Bubalina, closely related to *Bubalus depressicornis*. These, therefore, provide novel meaningful insights for the conservation genetics and population genetics of *B. quarlesi*.

Keywords: anoa, *Bubalus quarlesi*, complete mitochondrial genome Phylogenetic

The Real Time Participatory Mapping for Disaster and Emergency Preparedness Model: a Case Study of Teachers Involvement in Center Sulawesi-Indonesia

Zulhamsyah Imran¹, Slamet Widodo Sugiarto², Harry Imantho³, Benny Purwonegoro⁴

¹Deputy Director for Administration, SEAMEO BIOTROP & Lecturer in Aquatic Resources Management, IPB University

²Remote Sensing and Ecology Laboratory of SEAMEO BIOTROP Researcher

³Remote Sensing and Ecology Laboratory of SEAMEO BIOTROP Researcher

⁴A Student in Master Science of Information Technology for Natural Resources (MIT), Bogor Agricultural University

Abstract

The Real Time Participatory Mapping for Disaster and Emergency Preparedness System (RTPADEPS) has an significant play role for disaster management. It is an idea to adopt open web standards to share a map services based on Participatory Geographic Information Systems (P-GIS) and Spatial Notification for emergency condition such as disaster, accident, emergency condition, Etc. The objective of this paper is to develop collaborative web Geographic Information System (Web GIS) based on the realtime geotagging emergency occurrence. This model was generated due to a case study aftermath earthquake and tsunami in PaluCenter Sulawesi, Indonesia. This system was not only applied to noticed heartbreak condition, but also it could be used to estimate or analyze a certain area affected by disasters and damage building/facilities. Moreover, it obtained to show the real existing accessibility and the fastest route to impacted area. Finally, the system could connect the user and the authorized agency to inform or take immediate action for handling the emergency condition. Integrating the spatial information with web GIS and mobile platform, it can quickly and accurately collect and share the information as soon as possible implementation.

Keywords: disaster, emergency, GIS, RT-PADEPS, spatial

Source:

Journal of Southeast Asian Education (Vol. 1): 111-122.

Potential Use of *Claroideoglomus etunicatum* to Enrich Signal Grass (*Brachiaria decumbens* Stapf.) for Silvopasture Preparation

Risa Rosita^{1,2}, Rahayu Widyastuti¹, Irdika Mansur^{1,2} & Sarah Asih Faulina³

¹Bogor Agricultural University, Darmaga Campus of IPB, Bogor 16680, Indonesia

²SEAMEO BIOTROP, Jl. Raya Tajur Km 6. Bogor 16134, Indonesia

³Forest Products Research and Development Center, Jl. Gunung Batu No 5, Bogor 16610, Indonesia

Received: 03 February 2020; Accepted: 16 May 2020

Abstract

Silvopasture system improvement in managing post-mining land resources has been done by searching for a quality grass. One of the selected grass species is signal grass (*Brachiaria decumbens* Stapf.). This research aimed to prepare signal grass through the inoculation of AMF *Claroideoglomus etunicatum*, as an effort to enrich its growth before being applied to post-mining soil. Research stages included the AMF inoculation on signal grass through spore culture and then transferred the colonized grass to the pot using sterile zeolite as a growth medium. The treatment on the first stage was without and with AMF inoculation (dose of 20 spores) on signal grass which was repeated for 12 times. Incubation in a spore culture was 4 weeks while incubation in a pot containing sterile zeolite medium was 8 weeks. Research data were analyzed using the Shapiro-Wilk's normality test, Independent Sample T-test, and Pearson's correlation test. Observation results showed that the inoculation of *C. etunicatum* on signal grass was significantly impact on the increase of plant height, stem diameter, number of leaves, number of tillers, shoot and root fresh weight, and shoot dry weight ($p < 0.05$). Microscopic observation showed that there was AMF colonization on treated signal grass roots in the amount of 55 ± 0.06 % with number of spores was 252 ± 9.82 per 10 g zeolites, while AMF infection was not found in uninoculated signal grass. It is expected that by providing signal grass inoculated with AMF *C. etunicatum* would support its growth in post-mining land for Silvopasture system.

Keywords: AMF inoculation, number of spores, zeolite

Source:

Menara Perkebunan 2020, 88(1), 61-68, doi:<http://dx.doi.org/10.22302/iribb.jur.mp.v88i1.364>

Antagonistic Effect of Yeast, Acetic Acid Bacteria, and Mangosteen Rind Extract on Aflatoxigenic *Aspergillus flavus* in Unfermented Cocoa Beans

Nijma Nurfadila^{1,2}, Sutrisno², Usman Ahmad², Samsudin³

¹SEAMEO BIOTROP, Jalan Raya Tajur Km. 6, Bogor 16134, Indonesia

²Study Program of Postharvest Technology, Faculty of Agricultural Technology, Institut Pertanian Bogor, Bogor 16680, Indonesia

³Balai Penelitian Tanaman Industri dan Penyegar (BALITTRI), Parungkuda, Sukabumi, Indonesia

Received: 22 May 2020; Accepted: 6 January 2021

Abstract

Yeasts and bacteria are two of common biocontrol agents to control mycotoxigenic fungi. Meanwhile, the mangosteen rind extract contains xanthone and gartanin compounds for antioxidant, antiproliferation, antiinflammation, antimicrobial, and anticancer. The objectives of this research were to test the effects of yeasts, acetic acid bacteria (AAB), and mangosteen rind extract on the aflatoxigenic *Aspergillus flavus* growth and aflatoxin production in unfermented cocoa beans. Four yeast isolates, i.e., *Issatchenkia orientalis* (Io) BIO 211291, 286 and 288, and *Endomyces fibuliger* (Ef) BIO 132219; one bacteria isolate of *Acetobacter aceti* (Aa) FNCC0016; and mangosteen rind extract (MRE) were tested for their capabilities in inhibiting an aflatoxigenic *A. flavus* (Af) BIO 3361/747 growth using the well method (in vitro). Two types of yeast (Io BIO 211291 and 288) were combined with Aa and MRE in cocoa beans (in vivo). Aflatoxin production was analyzed using Thin Layer Chromathography (TLC). The results showed that interaction of Io BIO 211291 and 288, and Ef BIO 132219 on aflatoxigenic Af were interaction with inhibition zone ≥ 2 mm (type D), while the interaction type of Io BIO 211286 on Af were mutual intermingling growth, where both fungi grew into each other without any macroscopic sign of interaction (type A). The best treatment in agar media (in vitro) was Io BIO 211288 + Aa on Potato Dextrose Agar + 12 g/L MRE. The highest Io population was 5.88 log cfu/g on cocoa beans inoculated by Io BIO 211291 + MRE in 1 day after inoculation, while the highest *A. aceti* population was 4.74 log cfu/g on cocoa beans with Io BIO 211291 + BIO 211288 + Aa in 3 days after inoculation. Two best treatments were Io BIO 211288 + Aa + MRE and Io BIO 211291 + BIO 211288 + Aa + MRE, because there were no *A. flavus* population since 3 until 11 days after inoculation. Aflatoxin in all samples treatment was lower than limit detection B1 (< 2.20 ppb), B2 (< 3.50 ppb), (G1 < 0.54 ppb), dan (G2 < 1.00 ppb).

Keywords: aflatoxin, antagonistic, *Aspergillus flavus*, mangosteen rind, yeasts



RESEARCH ABSTRACT

OF DIPA SEAMEO BIOTROP 2020



A Novel Formulation of Ecosystem Health Index in Urban Areas of Java Island, Indonesia

Arief Sabdo Yuwono^{1,2}, Dewi Wulandari³, Rahayu Widyastuti⁴, Muhammad Riva Algar¹,
Ridla Arifriana⁵

¹Dept. of Civil and Environmental Engineering, IPB University, Indonesia

²Southeast Asian Regional Centre for Tropical Biology (SEAMEO BIOTROP), Bogor,
Indonesia

³Dept. of Environmental Engineering, Indonesia Islamic University (UII), Yogyakarta,
Indonesia.

⁴Dept. of Land Resources Management, IPB University, Indonesia.

⁵Dept. of Bioresources Technology and Veterinary, Vocational College, Gadjah Mada
University, Yogyakarta, Indonesia.

Abstract

Quantitative assessment of ecosystem health in Indonesia is determined by water quality, air quality and forest cover condition. However, it is unable to describe the ecosystem quality completely. Therefore, we propose three additional parameters to complement the current ecosystem health index to be a novel ecosystem health index in Indonesia. This research aimed to formulate quantitative approaches of urban ecosystem health assessment as a basis of calculation and formulation of national ecosystem health assessment and to calculate urban ecosystem health in selected municipalities in Java Island Indonesia, namely Gunung Kidul, Sleman, Batu, Blitar, Mojokerto, Tangerang, and Tegal. The chosen locations were based on geographical location distribution and the comprehensiveness of the required data. This research was carried out during March-May 2020 by direct measurement and completed by secondary data. Six parameters determined a novel formulation of ecosystem health index completely including air quality index (AQI), water quality index (WQI), forest cover index (FCI), biodiversity index (BDI), public health index (PHI) and environmental health index (EHI). Based on data assessment, ecosystem health index of Gunung Kidul was 66.75, Sleman was 68.64, Batu was 77.64, Blitar was 67.22, Mojokerto was 66.35, Tangerang was 54.39, and Tegal was 57.46.

Keywords: ecosystem, ecosystem health index, Java Island, urban area.

Source:

International Journal of Engineering Research and Technology. ISSN 0974-3154, Volume 13, Number 11 (2020), pp. 3377-3385. doi: 10.37624/IJERT/13.11.2020.3377-3385

Estimation of Heritability in Three Months Old Sengon (*Falcataria moluccana*) Seedlings at a Progeny Testing in Kediri, East Jawa, Indonesia

UJ Siregar^{*1}, A Nugroho², H Shabrina², Y Istikorini¹, R Rahmawati³, Y Amin³ and NF Haneda¹

¹Department of Silviculture, Faculty of Forestry and Environment, IPB University, Bogor, Indonesia

²Tropical Silviculture Program, Graduate School of IPB University, Bogor, 16680, Indonesia ³Research and Development Center, Perum Perhutani, Cepu 58302, Indonesia

*Corresponding author: ulfahjs@apps.ipb.ac.id

Abstract

Heritability values were estimated for three months old seedlings height and diameter of Sengon (*Falcataria moluccana*) grown in a progeny testing in Kediri, East Jawa, Indonesia. Totally 10.000 seedlings from 100 families were planted, consisting of 50 families from resistant mother trees to boktor pest (*Xystrocera festiva*) and gall rust disease (*Uromycladium falcatariae*) and other 50 families from susceptible ones. The progeny testing applied split-plot block design with four blocks, 100 families as sub-plot and resistance to pest and disease as main-plot, while observing nine seedlings as replications. Parameters observed were seedlings height and diameter. ANOVA showed that all treatments had significant and highly significant effects on all parameters. Interactions between block and families also interaction between block and resistance were highly significant. However, the heritability values of height and diameter were both low. These low heritability values at seedling stage were expected as Sengon woods are usually harvested at the age of 5 years. However, the highly significant effects of families on both growth parameters indicated that genetics have high contribution to the seedlings performances in the field.

Source:

IOP Conf. Series: Earth and Environmental Science 800 (2021) 012043, doi:10.1088/1755-1315/800/1/012043

Short Communication – The First Inventory of The Nest Placement of Horseshoe Crab (*Tachypleus gigas*) in Indonesia

N K Aini*¹, Y Wardiatno^{2,3}, A Mashar², H Effendi^{2,3} and H Madduppa⁴

¹Study Program of Aquatic Resources Management, Department of Aquatic Resources Management, Faculty of Fisheries and Marine Sciences, Graduate School of IPB University, Indonesia

²Department of Aquatic Resources Management, Faculty of Fisheries and Marine Sciences, IPB University, Indonesia

³Environmental Research Center, IPB University, Indonesia ⁴ Department of Marine Science and Technology, Faculty of Fisheries and Marine Sciences, IPB University, Indonesia

*Corresponding author: naila_khurilaini@apps.ipb.ac.id

Abstract

Previous studies have reported that extant horseshoe crabs, including Atlantic and Asian horseshoe crab, spawned in intertidal zone during high tide season. Limited information about spawning nest of the horseshoe crab especially *Tachypleus gigas* in Indonesia has not been known yet. Moreover, according to the IUCN, the conservation status of *T. gigas* is still data deficient. During the fieldwork, we found the location that indicated as the spawning ground or nest placement of *T. gigas*. This is the first time when the spawning area of horseshoe crab is found in Subang, Indonesia. There were three clutches of eggs and the total number was 375-534 eggs in varying depth (5-20 cm) below the sand. The second observation in the same location on January 16, 2020, found a pair of *T. gigas* laying their eggs and the number was 244 eggs in varying depth (5-15 cm). The characteristics of nest placement of *T. gigas* that found in Subang was located on the small island in the middle of the sea. The island is an uninhabited island that has mangrove area and sandy substrate. Thus, based on what was found Burung island indicated as the spawning ground of coastal horseshoe crab (*T. gigas*).

Keywords: eggs, horseshoe crab, spawning site

Source:

IOP Conf. Series: Earth and Environmental Science 744 (2021) 012001, doi:10.1088/1755-1315/744/1/012001

Plasma Metabolites of Kampung Chicken (*Gallus gallus domesticus*) in Peatland Free-Range System with Differences of Vegetation

D Fitra^{1,4}, N Ulupi², I I Arief², R Mutia³, L Abdullah³ and E Erwan⁴

¹Graduate School of Animal Production and Technology, IPB University, Bogor

²Department of Animal Production and Technology, Faculty of Animal Science, IPB University, Bogor

³Department of Nutrition and Feed Technology, Faculty of Animal Science, IPB University, Bogor

⁴Department of Animal Science, Faculty of Agriculture and Animal Science, State Islamic University of Sultan Syarif Kasim Riau, Pekanbaru

*Corresponding author: deni.fitra@uin-suska.ac.id

Abstract

Vegetation in free range rearing systems can be obtained from grass or legumes. The aims of this study was to investigate the effect of different vegetation on free range systems in peatlands on plasma metabolites of kampung chickens, including concentration of cholesterol (CHO), triglycerides (TG), and glucose (GLU). This experimental study used two hundred and ten kampung chickens with a completely randomized design of 4 treatments with 5 replications. Each paddock was placed in a portable housing. Twelve kampung chickens aged 5-12 weeks were reared in different types of vegetation with a density of 6.67 m² /head. The treatment without vegetation was reared in the postal housing. At the end of the study, blood was collected from the jugularis vein to observe plasma metabolites. The results showed that the maintenance system and differences in vegetation types had a significant effect ($P < 0.05$) on CHO, TG and GLU. The highest TG was in the *Axonopus compressus* treatment, GLU was in the *Indigofera zollingeriana* treatment. while the lowest CHO was in the control or without vegetation. The conclusion of this study was the paddock planted with *Indigofera zollingeriana* can reduce CHO levels of kampung chickens in addition to control treatment.

Source:

The 3rd International Conference of Animal Science and Technology. IOP Conf. Series: Earth and Environmental Science 788 (2021) 012186, doi:10.1088/1755-1315/788/1/012186

Spatial-Planning-Based Ecosystem Adaptation (SPBEA): A Concept and Modeling of Prone Shoreline Retreat Areas

Dewayany Sutrisno^{*1}, Mulyanto Darmawan¹, Ati Rahadiati¹, Muhammad Helmi², Armaiki Yusmur³, Mazlan Hashim⁴, Peter Tian-Yuan Shih⁵, Rongjun Qin^{6,7,8} and Li Zhang⁹

¹Center for Research, Promotion and Cooperation, Geospatial Information Agency (BIG), Cibinong 16911, Indonesia

²Oceanography Department, Faculty of Fisheries and Marine Sciences, Diponegoro University, Semarang 50275, Indonesia

³Regional Research Centre for Tropical Biology, SEAMEO BIOTROP, Bogor 16134, Indonesia

⁴Geoscience and Digital Earth Centre, Faculty of Built Environment & Surveying, Universiti Teknologi Malaysia, Johor Bahru 81310, Malaysia

⁵Department of Civil engineering, National Yang Ming Chiao Tung University, Hsin-Chu 30010, Taiwan

⁶Department of Civil, Environmental and Geodetic Engineering, The Ohio State University, Columbus, OH 43210, USA

⁷Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH 43210, USA

⁸Translational Data Analytics Institute, The Ohio State University, Columbus, OH 43210, USA

⁹Aerospace Information Research Institute, Chinese Academy of Sciences, Haidian District, Beijing 100094, China

* Correspondence: dewayany@big.go.id

Abstract

Ecosystem-based adaptation to climate change impacts, such as shoreline retreat, has been promoted at the international, national, and even local levels. However, among scientists, opinions about how to implement it in spatial-planning practices are varied. Science-based environmental factors, human wellbeing, and sustainable development can be strengthened by developing spatialplanning-based ecosystem adaptations (SPBEAs). Therefore, this article aims to assess how the SPBEA model can be developed within an area prone to shoreline retreat. A coastal area of the Sayung subdistrict in Central Java, Indonesia, was selected as a study area because it has experienced a massive shoreline retreat. A multicriteria analysis (MCA) method was employed for developing the model by using the geographic information system (GIS) technique of analysis, divided into three steps: the fishpond zone determination, which involved the analytical hierarchy process (AHP) method in the process of model development; the fishpond site determination; SPBEA fishpond site development. The results show that the SPBEA model is the best practice solution for combatting shoreline retreat because of tidal waves and/or sea-level rise. The spatial site management should empower the coastal protection zone and the sustainable fishpond zone by implementing a silvofishery approach.

Keywords: spatial planning; ecosystem adaptation; fishpond culture

Source:

ISPRS Int. J. Geo-Inf. 2021, 10, 176. <https://doi.org/10.3390/ijgi10030176>

Channeling Agriculture Innovation Transfer from Universities and Research Centre to Vocational High Schools: Lesson Learned from Indonesia

Irdika Mansur, Supriyanto, Harry Imantho, Slamet Widodo, Joner Situmorang
SEAMEO BIOTROP, Jl. Raya Tajur Km 6 Bogor, West Java Indonesia

Abstract

SEAMEO BIOTROP has been assigned by the Ministry of Education and Culture of the Republic of Indonesia to revitalize secondary vocational high school in agriculture for the last three years. There were three main programmes, i.e. fruit tree gardening, food security, and establishment of teaching factory. The activities include: training, field implementation, and supervision. There were 46 schools have been selected for the implementation of fruit tree gardening, and 80 schools have been involved in the food security and teaching factory programmes. This has been a successful programme, where the capacity of the head masters, teachers, and students have been improved. SEAMEO BIOTROP has not only transferred innovation developed by the Centre, but also involved universities (IPB University) and agriculture research centre (Orange and Sub-tropical Fruit Research Centre under the Ministry of Agriculture) in implementing the programme. Most of the partner schools have implemented the technology introduced by SEAMEO BIOTROP and partners institution in their schools and the surrounding farms. SEAMEO BIOTROP scientists have developed an application to monitor the progress of the schools and also to sustain long distance consultation. The programmes have shown that secondary vocational high schools in agriculture have potential to be developed as transfer technology hub in agriculture for their surrounding communities/farmers. Skill development in industry 4.0 in the area of agriculture could also be introduced to selected schools in the future.

Keywords: BIOTROP, fruit, garden, industry 4.0, school, SEAMEO, vocational

Spatial Dynamic Modeling for Increasing the Competitiveness of Small Medium Enterprises: Case Study of Bogor City, West Java, Indonesia

Hartrisari Hanggoro Hardjomidjojo (IPB University, Indonesia), Harry Imantho (SEAMEO BIOTROP, Indonesia) and Anissa Damayanti (IPB University, Indonesia)

Abstract

The Role of Small and Medium Enterprises (SMEs) in supporting Indonesian economic activity are significant. SMEs face many obstacles in their business development. Empowerment of SMEs in Bogor by local governments carried out in conjunction with the Department of Cooperatives and SMEs. This study establishes the spatial model design of SMEs in Bogor area to improve the competitiveness of products in Bogor city. The analysis shows that SMEs in Bogor city is still in the phase of development, market penetration, and also product development. The model shows the average performance index of SMEs in Bogor is only 62.29, 19 among 41 have index values about 50. From the competitiveness analysis, authors could see that among 41 SMEs can be categorized in 4 quadrants. Strategic program could be developed based on the position in the quadrant. It can be concluded that in general SMEs in Bogor city have not been ready for internationally competition. Government should develop specific strategy for each SMEs based on the quadrant position defined by the model.

Source:

Economics, Business, and Islamic Finance in ASEAN Economics Community (pp. 16-30). IGI Global. DOI:10.4018/978-1-7998-2257-8.ch002

The Development of an e-Traceability System for Cattle Delivery Chains

Kudang Boro Seminar¹, Edit Lesa Aditya², Harry Imantho³, Diki Gita Purnama⁴, Ahmad Yani⁵, Lucia Cyrilla⁶

¹Faculty of Agricultural Engineering & Technology, IPB University, Indonesia

^{2,5,6}Faculty of Animal Science, IPB University, Indonesia

³Graduate Student of Agricultural Engineering & Technology Faculty, IPB University, Indonesia

³Remote Sensing & Ecology Laboratory, SEAMEO BIOTROP, Indonesia

⁴Faculty of Science & Engineering, Paramadina University, Jakarta, Indonesia

Abstract

Transparency of livestock supply chain management is still a significant problem in Indonesia due to the unavailability of data and information accessible by the stakeholders of cattle supply chains. It is difficult to obtain information for queries, monitoring, and control purposes at any node along cattle supply chains, and thus introducing some risks of insecurity and uncertainty of cattle conditions along the supply chains. Nowadays, consumers are getting smarter and more curious about selecting healthy and high-quality beef. This requires the provision of an easily and securely accessible traceability and transparency system. This research aims to develop an e-traceability system for cattle supply chains. The proposed e-traceability system was developed based on a web-platform that provides wide access and easy links to all actors within a cattle supply chain and stakeholders. All actors in the cattle supply chain need to be registered and the data related to cattle need to be recorded in the traceability system database for prudent analytics and decision-making. The potential applicability of the developed e-traceability system is examined and demonstrated to highlight the benefits of the system in improving transparency and traceability cattle deliveries from land to table for better managerial tasks.

Keywords: cattle delivery chains, decision making systems, e-traceability systems, RFID, supply chain

Source:

International Journal of Supply Chain Management, Vol. 9, No. 5, October 2020

Polymeric Encapsulation of Mint Oil: Effect of Oil Load on The Physical Properties

Sri Yuliani^{*1,2}, Kendri Wahyuningsih¹, Sri Widayanti², Trijanti A.W. Asnan²

¹Indonesian Center for Agricultural Postharvest Research and Development

² SEAMEO BIOTROP

*Corresponding author: s.yuliani@gmail.com

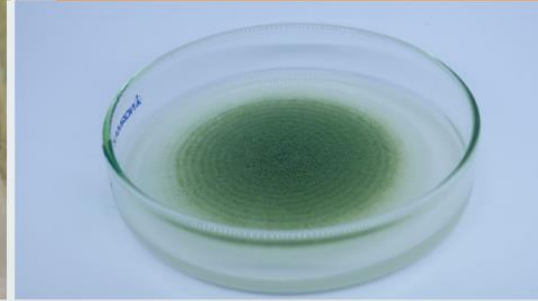
Abstract

Mint oil has many applications including foods, perfumes and fragrances, pharmaceuticals, cosmetics and pest control. This essential oil is easily damaged because of its high sensitivity to environmental conditions such as heat, oxygen, light and reactions with other compounds. Encapsulation provides protection of the oil against these undesirable conditions. This study was aimed at evaluating the characteristics of mint oil encapsulated in a polymeric system as influenced by mint oil load. Mint oil was encapsulated in polyethylene glycol at four different percentages (5.0, 7.5, 10 and 12.5%) using a melt dispersion technique. The encapsulates were characterized for their morphology, size attributes and thermal properties. Particulate sizes ranged from 281.4 – 569.5 nm and tended to increase with the increase in oil load. Microstructure of the particles examined under scanning electron microscope showed irregular flakes with sizes around 10 µm. These particles contained oil droplets in the sizes of about 200 – 500 nm as confirmed by observation with a transmission electron microscope. The presence of oil lowered the melting point of the polymeric encapsulant from 65.66°C to 59.00°C – 63.18°C, and the crystallization point from 42.66°C to 34.49°C – 39.88°C describing the properties of the encapsulates under thermal conditions. This study provides useful information in developing essential oil encapsulation for use in wider applications.

Keywords: encapsulation, mint oil, oil load, melt dispersion

Source:

International Conference on Agricultural Postharvest Handling and Processing; Bandung – West Java-Indonesia, August 24-26th, 2021. Prosiding will be published on December 2021.



RESEARCH ABSTRACT

OF DIPA SEAMEO BIOTROP 2021



Isolation and Amplification of Mangrove Plants Using DNA Barcode in Percut Sei Tuan, North Sumatra, Indonesia

R Syahbana¹, M Basyuni*², LAM Siregar³

¹Graduate School of Agrotechnology, Faculty of Agriculture, University of North Sumatra, Jl. Dr. A Sofyan No. 3 Medan, North Sumatra 20155, Indonesia

²Department of Forestry, Faculty of Forestry, University of North Sumatra, Jl. Tri Dharma Ujung No. 1 Medan, North Sumatra 20155, Indonesia

³Faculty of Agriculture, University of North Sumatra, Jl. Dr. A Sofyan No. 3 Medan, North Sumatra 20155, Indonesia

*Corresponding author: m.basyuni@usu.ac.id

Abstract

Mangroves are a collection of several species of trees or shrubs that distribute around the coastline and can survive in high salinity environments. Around 60% of mangrove forests in North Sumatra are reported to have been damaged, the main factors of this damage being the mangrove forests conversion into ponds and the expansion of oil palm plantations. Identification of mangrove species is very important in protecting and applying the biodiversity of mangrove forests. Identification of living things has evolved from morphological characterization to molecular identification. This study aims to explain the DNA isolation and PCR methods to identify mangrove species in North Sumatra. The results suggested that the *rbcL* primer used can detect mangrove species that were visualized in the form of DNA bands. The length of DNA fragments of mangrove species *Acrosticum aureum* ranged 632.0-619.6 bp, species *Rhizophora apiculata* 619.6-585.8 bp, species *Nypa fruticans* 600- 592.9 bp, species *Avicennia alba* 549.1- 533.5 bp, species *Hibiscus tiliaceus* was not detected, and mangrove species *Acanthus ilicifolius* 480.3 bp.

Source:

IOP Conf. Series: Earth and Environmental Science 912 (2021) 012028, doi:10.1088/1755-1315/912/1/012028

Stichopodidae (Holothuroidea: Echinodermata) from Nyamuk Island, Karimunjawa National Park, Central of Java, Indonesia

R Hartati^{1*}, A Ambariyanto¹, W Widianingsih¹, R T Mahendrajaya¹, M Mustagfirin², P Prihatinningsih³

¹Department of Marine Science, Faculty of Fisheries and Marine Science, Diponegoro University, Jl. Prof. Soedharto, SH. Kampus Tembalang. Semarang. Indonesia

²PT. Kilang Pertamina International Refinery Unit VII Kasim, Sorong, Papua Barat

³Karimunjawa National Park Office

*Corresponding author email: retnohartati.undip@yahoo.com

Abstract

Sea cucumbers have been the subject of increased worldwide interest for scientific knowledge, sustainable use and conservation purposes. One family found in Karimunjawa National Park Area, Jepara was Stichopudidae. The present work was aimed to identify the species of Stichopudidae caught from the waters around Nyamuk Island, Karimunjawa National Park prior to sea ranching for their conservation. The samples were taken during 2018-2019 directly from fisher, processor, traders and wholesaler. By fisher, collections relied on free diving (in depth of 5-10 meters); diving with compressor (in depth of 10-25 meters) and all sea cucumbers were capture by hand. In the processors, the species were samples taken before being processed. They usually were gutted/un-gutted, boiled, smoked or brined. The identification was done through their morphological characters. There were eleven species found belonged to two genera (Stichopus and Thelenota), i.e. *Stichopus horrens*, *S. pseudohorrens*, *S. naso*, *S. vastus*, *S. chloronatus*, *S. herrmanni*, *S. monotuberculatus*, *S. ocellatus*, *S. quadrifasciatus*, *Thelenota anax* and *T. ananas*. All Stichopodid sea cucumber called as gamet or gamat by all stake holders of sea cucumber fisheries. With the increasing demand and good price of these species, the conservation effort, especially through sea ranching was urged to be done.

Source:

IOP Conf. Series: Earth and Environmental Science 919 (2021) 012024, doi:10.1088/1755-1315/919/1/012024

Sea Ranching of *Holothuria atra*: Stocking Density and Time

Retno Hartati¹, Ambariyanto Ambariyanto¹, Muhammad Zainuri¹, Widianingsih Widianingsih¹

¹Department of Marine Science, Faculty of Fisheries and Marine Science, Diponegoro University

Abstract

Strong market demand and uncontrolled exploitation and/or the inadequate management of fisheries have caused many stocks of sea cucumbers to be overexploited. One suggested effort to overcome this problem is sea ranching. Stocking density is the most important consideration in sea cucumber rearing; therefore, this present work is aimed at elucidating the best stocking density for sea ranching of *Holothuria atra*. *H. atra* was taken from the Panjang Island, Jepara waters and reared in bottom cages in Teluk Awur waters, Jepara with a density of 30, 20, or 10 individuals per cage measuring 2 m × 2 m × 1.8 m (with bottom area of 4 m²). Stocking times of *H. atra* were at the initial time of cage installation, the second and the third months after installation. Bottom sediment characteristics (i.e., chlorophyll a, b, phaeophytin, and total carotene) of the sea cucumber habitat and water quality in the cages were measured monthly during the study. The results showed that growth of *H. atra* fluctuated; low stocking density yielded a higher weight gain than high stocking density did. The highest weight gain was present in the density of 10 individuals/cage in the second stocking month. The highest survival rate of *H. atra* was seen in the condition of 30 individuals/cage (93%) at the third stocking month, which means that these sea cucumbers were only reared for three months. The highest mortality occurred at a density of 20 individuals/cage with the survival rate being low (45%) at the first stocking time or in the fifth month of rearing. There was fission evidence among *H. atra* reared in the cages, resulting in smaller organisms. Among the water quality parameters, the concentration of chlorophyll a, b, phaeophytin, and carotene in the sediment fluctuated according to the time of sea cucumber rearing caused by their feeding and bioturbation. The study results suggested to stock *H. atra* at low density during the second stocking month to get higher growth.

Keywords: chlorophyll, fission, growth, sediment, survival

Source:

Vol. 28 No. 2 (2021): BIOTROPIA Vol.28 No.2, Agustus 2021, DOI: <https://doi.org/10.11598/btb.0.0.0.1180>

DNA Extraction and Pattern of Crab and Macrobentos from North Sumatran Mangrove Forest, Indonesia

A M Harahap¹, M Basyuni^{*2,3} and I E Susetya^{3,4}

¹Undergraduate school of Forestry, Faculty of Forestry, Universitas Sumatera Utara, Jl. Tri Dharma Ujung No. 1 Medan 20155, North Sumatera, Indonesia

²Department of Forestry, Faculty of Forestry, Universitas Sumatera Utara, Jl. Tri Dharma Ujung No. 1 Medan, North Sumatera 20155, Indonesia

³Center of Excellence for Mangrove, Universitas Sumatera Utara, Jl. Tri Dharma Ujung No. 1 Medan, North Sumatera 20155, Indonesia

⁴Department of Aquatic Resource Management, Faculty of Agriculture, Universitas Sumatera Utara, Jl. Dr. A Sofyan No. 3 Medan Medan, North Sumatera 20155, Indonesia

*Corresponding author: m.basyuni@usu.ac.id

Abstract

Mangrove forest ecosystem is one of the most productive and unique ecosystems that serves to protect coastal areas from various disturbances, as well as provide habitat for various animal species. The large number of crab species and macrobentos in mangrove ecosystems results in frequent errors in the naming of species that have similarities in morphological features. This problem can be solved through a comprehensive approach by combining morphological analysis with genetic analysis. This study aims to report a DNA extraction and PCR amplification prior was used for the identification of crab and macrozoobentos from mangrove forest, North Sumatra. Primer 16S has a conserved area so it is appropriately used in Polymerase Chain Reaction (PCR) and sequencing analysis to determine taxonomy, phylogeny and diversity between species. Visualization of PCR amplification results with primer 16S from crab samples and macrobentos resulting a low DNA band with a size of 206 bp and a high of 678bp.

Source:

IOP Conf. Series: Earth and Environmental Science 912 (2021) 012046, doi:10.1088/1755-1315/912/1/012046

De Novo Transcriptome Assembly Data for Sengon (*Falcataria moluccana*) Trees Displaying Resistance and Susceptibility to Boktor Stem Borers (*Xystrocera festiva* Pascoe)

Ulfah J. Siregar^{*1,2}, Aditya Nugroho³, Hasyiyati Shabrina³, Fitri Indriani³, Apriliya Damayanti¹ and Deden D. Matra⁴

Abstract

Objectives: Sengon (*Falcataria moluccana*) is a popular tree species in community plantation forests in Java, Indonesia due to its fast-growing and multipurpose characteristics. However, without effective control measures sengon plantations are vulnerable to boktor stem borer (*Xystrocera festiva*) infestation. Previous research found some boktor-resistant trees amid mostly susceptible individuals. Resistant trees have higher levels of enzyme inhibitory activity than susceptible ones. However, efforts to differentiate between the two accessions using microsatellite markers failed to provide satisfactory answers. This dataset was created to study differences in gene expressions between resistant and susceptible accessions, and to identify candidate genes involved in boktor resistance in sengon.

Data description: RNA was extracted from fresh wood samples collected from two individual trees: one heavily infested with boktor larvae, and the other showing no signs of infestation. The sample trees grow in close proximity to each other within the same plantation. The RNA was sequenced using the BGISEQ-500 platform and produced 78.5 million raw reads. De novo transcriptome were assembled using Trinity and produced 96,164 contigs after filtering and clustering. This transcriptome data is important for understanding pest resistance mechanisms in sengon trees, serving as basis for an improvement program for resistance to boktor pest.

Keywords: *Falcataria moluccana*, resistance, transcriptome, *Xystrocera festiva*

Source:

Siregar *et al.* BMC Res Notes (2021) 14:261 <https://doi.org/10.1186/s13104-021-05675-9>





Southeast Asian Regional Centre For Tropical Biology

RESEARCH HUB INNOVATION DEPARTMENT