ABSTRACT BOOK

ICGRC

Santika Hotel Malang

September 4 - 5, 2019

THE 10th INTERNATIONAL CONFERENCE ON GLOBAL RESOURCE CONSERVATION

"Biodiversity Conservation for Sustainable Bioeconomy"

ORGANIZED BY:

Biology Department
Faculty of Mathematics and Natural Sciences
Universitas Brawijaya

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FOREWORD

Welcome to the 10th International Conference on Global Resource Conservation (ICGRC 2019). The theme this year is Biodiversity Conservation for Sustainable Bioeconomy. The topic aligns bio-based economic activities that have strong innovation potential due to their use of a wide range of sciences, and enabling industrial technologies with biodiversity conservation so that a sustainable activity could be established.

In this event, around 130 authors will share their current experiments, knowledge, and experiences through five subtopics which are botany, zoology, conservation ecology, environmental science, and sustainable materials and resources. They are experts, lecturers, researchers, and students from various universities and research centers from Indonesia and abroad. Through this activity, it is expected to initiate collaborations, create innovation, and meet the demands for development of science and technology.

We would like to deliver a deep appreciation to the dedicated committee members, honorable speakers, and active participants, who have invested significant time to success this event. Additional thanks are given to Universitas Brawijaya and Indonesian Biology Consortium (KOBI) for their supports, and Center of Academic Proofreading Agency (CAPA) for sponsorship.

Finally, we welcome you to Malang, a city known for its cooler temperature, beautiful surrounding countryside, and attractive streets lined with historical buildings. We hope that you will take advantage of the many sights to see in the city, as well as the many natural and man-made wonders nearby, during your stay.

Malang, 04 September 2019

Irfan Mustafa
Chairperson of the 10th ICGRC
Universitas Brawijaya

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"Biodiversity Conservation for Sustainable Bioeconomy"
Santika Premiere Hotel, Malang, Indonesia

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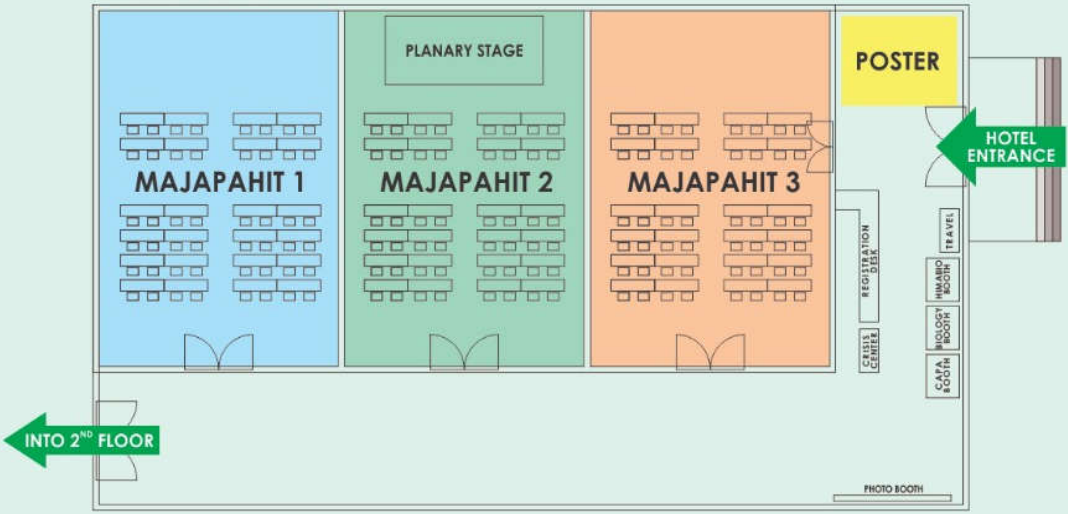
INTERNATIONAL CONFERENCE ON

GLOBAL RESOURCE CONSERVATION

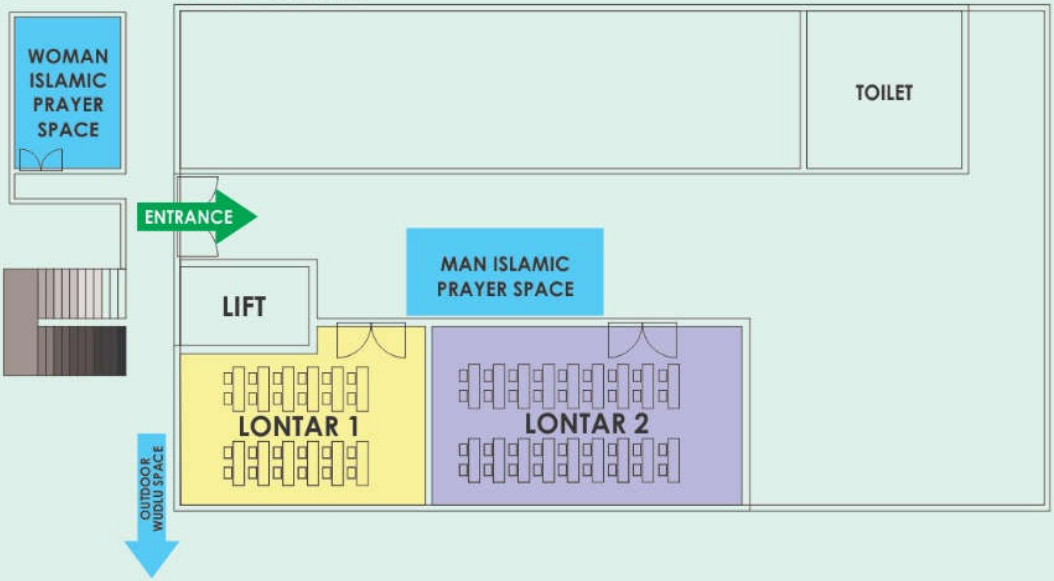
ICGRC

September 4-5, 2019

1ST FLOOR



2ND FLOOR



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Wednesday, 4 September 2019

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14.55 – 15.05	**Discussion**	
15.05 – 15.35	Coffee Break	

15.35 – 15.45	**SMR/O-001. Siti Oriza Salsijanti *et al.*** Using Environmental Learning Models to Increase The Students' Productive Skills	**Moderator: Raden Darmawan**
15.45 – 15.55	**SMR/O-008. Agung Budiantoro *et al.*** The Sustainable Ecotourism Potential Development With Special Reference to Oliveridley (*Lepidochelys olivacea*) Along Bantul Beaches, Indonesia	
15.55 – 16.05	**SMR/O-026. Ratna Purwaningsih *et al.***. Assessment of Sustainability Status of Tourism Destination using Rap-tourism	
16.05 – 16.15	**Discussion**	
16.15 – 16.25	**SMR/O-009. Devi Dwi Siskawardani and Warkoyo.** Sweet Bread Chemical Properties Optimization Based on Baking Temperature and Duration	**Moderator: Agung Budiantoro**
16.25 – 16.35	**SMR/O-022. Raden Darmawan et al.** Effect of Carbon Cloth Types and Addition of Sterile Molasses – Stillage on Electricity Production Using Microbial Fuel Cell	
16.35 – 16.45	**Discussion**	

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10.00 – 10.10	**SMR/O-010. Siti Khotimah *et al.*** Density of soil biofertilizer bacteria on fibric peat in oil palm plantation area Kubu Raya District, West Kalimantan	**Moderator: Chomsin S Widodo**
10.10 – 10.20	**SMR/O-011. Syukria Ikhsan Zam *et al.*** Nitrogen Sources Selection in Fermentation of Anti-phytopathogenic Compounds by *Bacillus subtilis* AAF2	

10.20 – 10.30	**SMR/O-012. Nur Muflihah *et al.*** Analysis of the factors that impact product performance on responses market (Case study of home industry vegetable floss 'Bonsay' Jombang)	
10.30 – 10.40	**SMR/O-013. Talitha Widiatningrum *et al.*** Identification of Bioactive Substances in Fresh and Dried Leaves Extract of *Saccharum officinarum* by using Gas Chromatography-Mass Spectrometry	
10.40 – 10.50	**Discussion**	
10.50 – 11.00	**SMR/O-014. Chomsin S Widodo *et al.*** Effects of Heating on the dielectric properties of egg yolk and egg white of chicken (*Gallus domesticus*)	**Moderator: Talitha Widiatningrum**
11.00 – 11.10	**SMR/O-015. Ardyah Ramadhina Irsanti Putri *et al.*** Analysis of Boer Spermatozoa Quality in Different Incubation Periods and Medium for *In Vitro* Preparation	
11.10 – 11.20	**SMR/O-016. Debrina Puspita Andriani.** Parameters Optimization of Bio Composite Manufacturing Using Experimental Design	
11.20 – 11.30	**SMR/O-017. Fathul Aziz *et al.*** The Utilization of *Syzygium polyanthum* Walp. Leaf and *Arcangelisia flava* Merr. Stem Extracts to Inhibit Coconut Sap Water Fermentation	
11.30 – 11.40	**Discussion**	
11.45 – 12.45	Lunch Break	
12.45 – 12.55	**SMR/O-018. Dewi Mustikaningtyas *et al.*** Soybean Extract Supplementation on *Saccharomyces cerevisiae* Culture Media in Producing Glutathione	**Moderator: Umi Marwati**

12.55 – 13.05	**SMR/O-019. Dina Wahyu Indriani *et al.*** Physicochemical Analysis of Taro (*Colocasia esculenta*) Flour on Water Contain and Milling Velocity using Pin Disc Mill	
13.05 – 13.15	**SMR/O-020. Wirdatun Nafisah *et al.*** Combination of *Moringa oleifera* Extract and Albumin can Reduce Inflammatory Cytokine TNFα and IFNγ and Lipid Retention in Steatohepatitis Mice Model	
13.15 – 13.25	**Discussion**	
13.25 – 13.35	**SMR/O-021. Umi Marwati *et al.*** The Effects of Different Initial Substrate Concentration on Antioxidant Capacity of Leaf Infuse of *Moringa oleifera* during Lactic Acid Fermentation	**Moderator: Dewi Mustikaningtyas**
13.35 – 13.45	**SMR/O-023. Saptini Mukti Rahajeng.** Formulation and Characteristic Evaluation of Corn Harvest Waste Based Paper	
13.45 – 13.55	**SMR/O-024. Sundari *et al.*** Prospects For The Development and Analysis of Kenari Shell Biobriquette Product Business As an Alternative Fuel Based on Green Energy in North Maluku	
13.55 – 14.05	**Discussion**	
14.05 – 14.15	**SMR/O-025. Sulistya Rini Pratiwi *et al.*.** Economic Valuation of Critical Land	**Moderator: Saptini Mukti Rahajeng**
14.15 – 14.25	**SMR/O-027. Sri Nabawiyati Nurul Makiyah *et al.*** Allergenic Activity of Steroid Saponins in *Dioscorea alata* L. Tubers In Silico	
14.25 – 14.35	**SMR/O-028. Nur Fitriana *et al.*** Potential Compounds *of Curcuma xanthorrhiza* and *Curcuma zedoaria* as	

	Mortalin Inhibitor to Control Cancer Cell Growth Through Computational Study	
14.35 – 14.45	**Discussion**	

KEYNOTE SPEAKERS

Divine Sustainable Bio-economy

Muhaimin Iqbal

Founder of Indonesia Startup Center, Indonesia

ABSTRACT

The age of petro-based economy which has been going on more than two centuries seems to end soon. The main fuel of the petro-based economy era that relies on fossils is threatened that it can no longer be sustainable; if it is still available in the bowels of the earth, the excessive extraction will disrupt the balance of nature.

Humans are tiny creatures that live in huge universes; they are very short in the age of nature that has been billions of years, but these only tiny and short-lived creatures that can damage the balance of the universe. So, Allah the Creator says to humans, "So that you do not transgress (disturb) about that balance" (QS Ar-Rahman: 8). However, He Almighty also at the same time represents His tiny and short-aged creatures to be able to establish or maintain balance in that world. He said, "And establish that balance justly and do not reduce that balance" (Surah Ar-Rahman: 9). So, to this trusted representative or caliph, He (Allah) gave all His complete instructions to be able to answer all the problems of human life in the universe and at the same time give a complete answer to all the questions that may arise in the past, present and the future until the end of the universe (note HIS word in Surah 16:89 and 12: 111).

All the needs needed by humans to survive and develop offspring, whether in the form of water, food, shelter, clothing, energy, etc. that modern humans call economic goods have also been provided with instructions on how to procure, maintain, and distribute them so that they are always available in sufficient quantities for all HIS creatures on earth. The provided resources by HIS are guaranteed to be sufficient both for humans themselves and for other creatures, such as all kinds of animals, and plants that must also be fulfilled by their respective rights to survive and maintain their offspring. More than that, humans are also given provision by Him to be able to present a fertile earth or live from a dead earth (Qur'an 36:33), to grow all kinds of beautiful plants from the arid earth (Qur'an 22: 5), even

humans are also inspired on how to bring many fruits from plants and trees that they plant or around (Qur'an 16: 10-11).

Humans are inspired by Him to bring fresh water from a spring that emanates from the earth that was originally dead (Qur'an 36:34), inspired by Him to present renewable energy from plants that grow today (Qur'an 36:80; 56: 71-73) so that humans do not have to rely on energy derived from plants and animals that have become fossils whose process takes millions of years. This is the essence of sustainable bio-economy, which is when humans can bring everything they need to fulfill their lives continuously without having to rely on natural resources whose existence continues to shrink. However, this is only and only if the man follows HIS guidance in all matters of his life, humans must rely on the *haq* knowledge that comes from HIM and do not boast of his knowledge which is only *dzon* (presumed) which temporarily appears correct but not long after it will be proven wrong.

Biodiversity conservation towards successful inclusion : An Indian perspective

Premavathi Vijayan

Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India

ABSTRACT

The concept of 'living in harmony with nature' has been encrypted in Indian culture since time immemorial. India is one of the 17 mega biodiversity-rich countries accounting for 7 to 8 per cent of the recorded species, supporting 16% of global human population with only 2.4% of the global land area. Tribal population still depend on natural resources for their livelihood, as in Odisha, where tribals harvest 357 types of foods from the. India's growing population, rapid economic growth and industrialization have increased the pressure on biodiversity and ecosystem services. Indian government has rightly adopted several conservative measures to overcome this global threat on biodiversity depletion. For sustainable management and conservation of biodiversity in the context of changing scenario of climate conditions, keeping in mind the diverse geographic structure in India, a coordinated strategy across various levels of governance hierarchy as well as across strategic components such as capacity building, knowledge dissemination, adaptation of technology and partnerships with institutions, needs to be pursued. With these objectives, several programs have been implemented by the Indian government. Programs under the National Food Security Act in India cover more than 800 million people in the country. The National Mission on Sustainable Agriculture is implementing climate change adaptation strategies for sustaining agricultural productivity in collaboration with other stakeholders. Digitization of agricultural marketing is another area where considerable progress has been made. The electronic National Agricultural Marketing platform presently is linked with 250 Mandis (agricultural markets) across the country. A revamped crop insurance programme, the Pradhan Mantri Fasal Bima Yojana, has also been launched for the welfare of farmers. The National Bureau of Plant Genetic Resources, established in 1976 by Indian Council of Agricultural Research to record and preserve indigenous fauna

has been further enriched by importing over 9,00,000 samples from more than 70 countries. The Exploration Division of NBPGR develops advance perspective plans for germplasm collection in collaboration with other cooperating institutes/centres across the globe. More than 80,000 accessions of indigenous cultivars of food crops and their wild relatives have already been collected through over 300 crop-specific and region-specific explorations. The vision of Indian government is in line with the UN's strategic development goal for a world in which every country enjoys a sustained, inclusive and sustainable economic growth, a world where consumption and production patterns and use of all natural resources are sustainable.

Ecosystem Services and Sustainability on Islands, Republic of Korea

Jae-Eun KIM

Institution for Marine and Island Cultures, Mokpo National University, South Korea

ABSTRACT

Many countries are accelerating their efforts to solve the problem of island residents' survival in relation to climate change and take possession of marine resources around islands. In the meantime, many islands have also seen their economic value increase considerably due to tourist industry. People are trying to utilize island resources in many ways, and island landscape management plans are developed to ensure sustainable development.

There are about 3,400 islands in Korea, and 60% of them are located along the southwestern coast in the Jeonnam region. The Islands Development Promotion Act is enacted in Korea since 1986. This law initiated the start of a project run by seven government ministries including the Ministry of Public Administration and Security, the Ministry of Maritime Affairs and Fisheries and the Ministry of Construction and Transportation. The purpose of this project is to improve island residents' income and their welfare by establishing production base, cultural facilities and welfare facilities. The project started in 1988 on a ten-year cycle and first resulted in the publication of the Second Islands Integrated Development Plan in 2007. The second and current cycle started in 2008 and works towards the Third Islands Integrated Development Plan. The purpose of this plan is to create "Attractive Island" and develop islands by considering their characteristics. In addition, it aims to solve the isolation of islands by expanding bridge construction business with government involvement to ensure stable progress.

The tidal flats in Korea consist of about 6,990 local tidal flats that measure a total area of 2,489 km^2 (Ministry of Land, Transport and Maritime Affairs 2008). Tidal flat area now occupies 2.5% of Korean territory, which is 60.8 km^2 less than in 2003, five years before. Jeonnam region in the southwestern part of Korea has the largest tidal flat area in the country, measuring 1,036.9 km^2 (41.7%). Within the Jeonnam region, Shinan-gun possesses 36% of the country's tidal flat area. Given the aforementioned

pressure on tidal flat areas, the meaning of the tidal flats in Jeonnam region and especially Shinan-gun is becoming increasingly important and warrants efforts to make clear the full value of tidal flats to policy and decision makers. This presentation will explain the land use types related to the tidal flats in Shinan-gun and discuss the proper utilization of these tidal flats in terms of ecosystem services.

The concept of ecosystem services discusses what and how much benefits the ecological function gives to human directly or indirectly through many complicated ecological processes. From 2001 to 2005 the United Nations performed "The Millennium Assessment" (MA), an international research project in which researchers around the world participated. About 1,300 scientists from various fields participated in this international research program. The purpose of the MA project was to study the importance of ecosystem change considering policy decision makers and general scientific information, and to improve the quality of human life according to this change.

The tidal flats along the southwestern coast of Korea have high productivity and species diversity, and also a very high conservation value. The use of tidal flats in Shinan-gun is very important, not only to the Jeonnam region but also to the whole country. In general, according to Article 28 of the Public Waters Reclamation License in Paragraph 2 of the Public Waters Management and Reclamation Act, a project on less than 100,000 km^2 area only needs to get permission the cities and regions it affects. For this reason, small-scale reclamation projects are still taking place. In addition, the Public Waters Management and Reclamation Act gives preference to project operators on land acquisition and lease, so actually it cannot prevent reclamation effectively (Chun 2001).

It is difficult to measure the aesthetic value of tidal flats that have cultural value. This is because every region differs in characteristics and culture. In Korea, there is a lack of studies quantifying the aesthetic value of tidal flats. According to Cherem & Traweek (1977)'s study, the most beautiful landscape to Americans is wetland with inland waters. A wetland landscape mixed with wide tidal flats where birds and people are in harmony could have the best value in aesthetic terms.

Through various studies, the value of the tidal flat ecosystem has begun to

be more highly regarded than in the past. But, the full value of tidal flats is often still not recognized as certain aspects tend to be overlooked. The tidal flats in Shinan-gun have various values due to their function regarding fish production, fish habitat and natural disaster prevention, and this is combined with great island landscape. Its cultural value is also very important, and therefore the eco-cultural values of tidal flats should be recognized as ecosystem services, and its economic value should be quantified and assessed so that the people and policy makers can easily understand the full value. But the economic value of tidal flats has in so many ways to do with human life ecologically and socioculturally, that it is hard to be all-inclusive, let alone express all aspects in monetary figures. Nonetheless, the tidal flats are public properties that we must share, and we can easily realize that preserving these areas as they are can generate much more economic and cultural values than transforming it into other types of land use.

Grasses : An Important Underutilized Natural Resource for Sustainable Bioeconomy

Chandrakant Salunkhe*

Krishna Mahavidyalaya, Rethare (Bk.) - 415 108, M.S., India.
*Corresponding author : chandrakantsalunkhe62@gmail.com

ABSTRACT

The grass family Poaceae is a major economically and ecologically important group of monocotyledonous plants. It is the single most important family of flowering plants for survival of mankind. The grasses form a natural homogenous group of plants with remarkable diversity playing a significant role in the lives of human beings and animals. Grasses play important role in man's economic activity and in the composition of natural plant communities. Grasslands occupy about 25% of earth's vegetation cover. They are rather uniformly distributed on all continents and in all climatic zones. The grass family is not the largest family in terms of species and genera of flowering plants in the world but beyond doubt, it stands first in its economic and ecological importance. Watson and Dallwitz (1992) and Clayton and Renvoize (1986) made significant contributions to the taxonomy of the family and recognized about 700 genera and 10,000 species for the world. Soreng et al. (2015) recognized 764 genera in 12 subfamilies, six supertribes, 51 tribes, and 79 subtribes encompassing 12 074 species b) whereas Kellogg (2015) recognized 698 genera, and 13 isolated species, without formal generic names, in the same 12 subfamilies, no supertribes, 30 tribes, and 53 subtribes encompassing ca. 11 000 species. The grasses are one of the most successful terrestrial life forms on the earth due to their adaptability to changeable environments, ability to coexist with grazing animals and with man; and endless variations with distinct life forms. Most of the grasses can tolerate long period of drought. They may be annuals and perennials and range from herbs of few centimetres to arborescent bamboos measuring a height of 25 meters or more. Grasses and bamboos are of great economic potential. Grasses include grains, the single most important group, and major supplier of calories for human nutrition and also for nutrition of animals. All our staple crops – rice, wheat, oats, rye, barley, maize, sorghum, millet and sugarcane are grasses. Of the top ten crops we use to sustain ourselves, the first ten are all grasses. Grasses

constitute major ground cover and make significant contributions to biomass production. They play crucial role in the maintenance of world's ecosystem and biodiversity. According to an estimate about 70% of the farmlands of the world are cultivated with crop grasses. Studies on grasslands and wild grasses, especially of fodder value have become very important for development of dairy industry, productions of meat and restoration of degraded ecosystems. The grasses have good potential in sustainable development of the country as well as conservation of both plant and animal diversity. The wide genetic diversity within and between grass species opens up unexplored possibilities for green bioeconomy. Grasslands do well also in circulating economy as they are species mixtures composing both forage grasses and legumes. Therefore, there is a need for detailed studies on grasses of different phytogeographical regions for their utilization for human welfare for Sustainable bioeconomy.

Exploring Philippine Caves as Potential Sources of Bioactive Compounds

Marian P. De Leon[1*]

[1]Museum of Natural History, University of the Philippines Los Baños
*Corresponding Author: mpdeleon1@up.edu.ph; mapdeleon11@gmail.com

ABSTRACT

The Philippines is an archipelagic country composed of more than 7,000 islands abound with more than 2,000 caves of karstic and limestone origin. These caves, or natural void, cavity or interconnected passages beneath the surface of the earth are popular among locals and foreign visitors for its unique rock formations and geological features, abundant mineral and guano deposits and diverse biological species. Considered an extreme environment, caves are also a promising natural sources of microorganisms producing secondary metabolites or bioactive compounds. This paper will describe the microbiome of Philippine caves using conventional and high throughput sequencing and prove that Philippine limestone caves are good sources of potentially new, biologically active microorganisms with potential socio-economic and medical, agricultural and industrial importance.

Keywords: Philippine cave, bioactive compounds, secondary metabolites

The concept of Biodiversity on Indonesian Traditional medicine of JAMU

Widodo

Biology Department, Brawijaya University, Indonesia

ABSTRACT

JAMU is Indonesia traditional medicine that made by blend several herbals or animal products for human healing and rejuvenating. The term of Jamu was used for the first time at 15th century AD in the almanac of java which describes 1734 formula of medicine. The formula is continuously used by Indonesian people until now, and over 50% of Indonesia population consumes Jamu as alternative medicine. Ten percent of household consume the herbal medicines by self-made and the other bought from home industry, thus causing a lack of standardization that may provide inconsistency of the functionality. Therefore, Food and Drug Agency of Indonesia release guidance for a standard of traditional medicine to control the quality of Jamu, in 2012. Currently, the herbal medicine industry in the country is growing which reach over than 1,166 corporates. To strengthen the utilization and quality of traditional medicine, the government issued the regulation of the application of jamu as standardized herbal medicine and allowed a medical doctor to prescribe it for the patient. This condition leads a new era of jamu in Indonesia, from traditional to be used in the clinic. However, the less scientific evident of Jamu is one of restricted to utilize jamu in the clinic used, and this condition is a challenge for the scientist to resolve it. Thus, we reviewed one of the Jamu formulas for health promoting and diseases therapy, by employing the bioinformatic system. The study suggested that the Jamu provided formula to utilize nature for promoting human health that warrants further research to provide the scientific evidence. The scientification of Jamu will revive the functionality of herbal medicine which lead to conserving the resources. It will implicate for conserving for at least 200 species that has been used as Jamu material, and also may reachout until 96.000 species of plants that knowns have health promoting activity.

Keywords: Jamu, Herbal medicine, Indonesia, bioinformatic

INVITED SPEAKERS

Ethanol Extract of *Marsilea crenata*Leafs and Its Effects on Sperm Quality and Histology of The Testes of *Rattus norvegicus*

Sri Rahayu*, Hani Khairina, Wiam, Aris Soewondo, Agung Permana Warih Marhendra

Biology Department, Mathematics and Natural Sciences Faculty, Brawijaya University, Malang
*Corresponding author : srahayu@ub.ac.id

ABSTRACT

The increasing prevalence of infertility cases is becoming a major public health problem. *Marsilea crenata* (MC) plays an important role as a fertility agen due to its antioxidant.The aims of the present study was to identify the effect of ethanol extract of MC leaves on sperm quality and histology of the testis. White Rat (*Rattus norvegicus*) used in this research was in healthy condition, 4 monthsof age with 200-300 gof weight. The ratswere divided into four groups : K (Control), not givenMC ethanol extract.P1, P2 and P3 were the groups that given MC ethanol extract, with doses of 43.2 mg /200g body weight, 86.4 mg /200 g body weight and 129.6 mg / 200g body weight, respectively. The extract given for 30 days. The data were analyzed by One Way ANOVA using SPSS 20.0 for Windows program and continued by Tukey test. Oral administration of MC extract showed an increased sperm count, sperm motility, and sperm normal morphology.Histological examination of the testis showed that MCethanol extract with doses of 43.2 mg / 200gbody weight and 86.4 mg / 200 gbody weightcan increase the seminiferous tubule diameter, the germ layer thickness, the number of germ layer, and spermatogenic cells.

Key words: epididymis, sperm quality, testis *Marsilea crenata*

Effects of functional foods on thermotolerance of the nematode *Caenorhabditis elegans*

Tetsuya Okuyama[*1], Yukinobu Ikeya[2], Mikio Nishizawa[1]

[1]*Department of Biomedical Sciences, College of Life Sciences, Ritsumeikan University, Kusatsu, Shiga, Japan*
[2]*Center for Supporting Pharmaceutical Education, Daiichi University of Pharmacy, Minami-ku, Fukuoka, Japan*
[*]Corresponding email: t-okuyam@fc.ritsumeikan.ac.jp

ABSTRACT

[**Introduction**] Standardized extract of cultured *Lentinula edodes* mycelia (ECLM, AHCC®), and standardized extract of *Asparagus officinalis* stem (EAS, ETAS®50), are functional foods that have enhanced benefits above their basic nutrition. ECLM improves the prognosis of post-operative carcinoma patients, whereas EAS shows anti-inflammatory effects. Here we investigated the effects of these functional foods on thermotolerance of *Caenorhabditis elegans*, a model animal that is widely used to assess stress resistance.
[**Methods**] *C. elegans* animals were grown on a medium in the absence or presence of each functional food at the permissive temperature (20°C). Thermotolerance assays were performed at 35°C, the restrictive temperature of the animals. The mRNA levels were measured by quantitative reverse transcription-polymerase chain reaction.
[**Results**] At the restrictive temperature, ECLM and EAS extended the survival time of the animals. Both functional foods enhanced induction of expression of the genes encoding heat shock proteins after a shift to the restrictive temperature (35°C). Furthermore, EAS enhanced heat induction of oxidative stress-related gene expression.
[**Conclusion**] The beneficial effects of the functional foods, ECLM and EAS, on thermotolerance are partly involved in the activation of the anti-stress genes.

Keywords: functional food, thermotolerance, *C. elegans*

Diversity of bioactive secondary metabolites produced by medicinal plants Ciplukan (Physalis angulata L.)

Retno Mastuti[1*], Mufidatur Rosyidah[2]

[1]*Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[2]*Biology Education Department, Faculty of Teacher Training and Education, Kadiri Islamic University, Kediri, Indonesia*
[*]Corresponding email: mastuti7@ub.ac.id

ABSTRACT

Plants are a main source of various types of secondary compounds. Plant secondary compounds play a greater role in interacting with the environment than contributing to the growth and development. Therefore, different environmental conditions besides influencing growth can also affect the profile and concentration of secondary compounds. Ciplukan (Physalis angulata L.) has been known as medicinal plants. The medicinal properties are derived from bioactive secondary compounds especially withanolide and physalin. This study aims to identify the diversity of secondary metabolites found in in vitro callus and plants tissue of ciplukan. Withanolide and physalin profiles of callus tissues, cotyledonary shoot-derived plantlet and germinated seeds-derived plant, were evaluated by LC-MS analysis. The LC-MS analysis of methanol extract showed the diversity in the amount and type of withanolide and physalins. This study confirmed that in undifferentiated callus cultures and in vitro induced plantlet of P. angulata the biosynthesis activity was not altered and the accumulation sites of withanolides were not missing. However in vitro regenerated plant produced withanolides and physalins in higher number. Therefore, modification of plant cell culture system to improve withanolide and physalin production of P. angulata is a good future prospect.

Keywords: Ciplukan, diversity, physalin, withanolide

WATER QUALITY EVALUATION OF SOME BEACH WITH VARIATIONS OF HUMAN ACTIVITIES AND LAND USE IN SPERMONDE ISLANDS OF MAKASSAR SOUTH SULAWESI

Catur Retnaningdyah[*1], Rispah Hamzah[2], Arina Mana Sikana[2]

[1] *Biology Department, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya*
[2] *Student of Biology Magister Study Program, Biology Department, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya*
[*]Corresponding email: caturretnaningdyah@gmail.com

ABSTRACT

Spermonde Islands, Makassar South Sulawesi consists of hundreds of small islands with varied land uses and human activities. This will have an impact on decreasing the quality of coastal waters. The purpose of this study was to analyze the relationship between land use and human activities with water quality on the coast around the island. The study was carried out on five islands in the Makassar Spermonde Islands of South Sulawesi (Barrangcaddi, Badi, Baranglompo, Bonebatang and Kodingarengkeke Island). Water quality was measured included pH, DO, salinity, turbidity, BOD, nitrate, TP, H2S, oil and fat, and Pb. Observation of the water quality of each island was carried out in 1-3 stations depending on the size of the island. Repetition of water quality measurements for each station 3 times. Observation of land use and human activities in the study area using the environmental services indices (Hemeroby and Naturalness). The results showed pH (7.99-8.39), turbidity (0.6-1.3 NTU), total phosphate (<0.010 mg/L), H2S (<0.01 mg/L), oil and fat (<0.1 mg/L), and Pb (<0.005 mg/L) still met quality standards of sea water based on Decree of the State Minister for Environment No. 51/2004 for marine biota. DO Levels of Baranglompo and Badi islands (6.1-7.7 mg / L) have met seawater quality standards for marine biota which require DO levels to be more than 5 mg/L. DO levels of water on the other coast of the island 4.6-4.9 mg / L. Water salinity in all water have range 29-30‰. BOD levels (25.4-29.8 mg / L) and nitrate (0.03-0.17 mg / L) have exceeded sea water quality standards for marine biota (20 mg / L for BOD and 0.008 mg / L for nitrates). Baranglompo Island with the highest land use and human activities (Hemeroby 5 and Naturalness 3) has had an impact on water quality degradation reflected in the high turbidity and BOD levels. Bonebatang and Badi islands which have the lowest human activity and land use (Index of

Hemeroby 3 and Naturalness 5) have better water quality with low to moderate BOD and turbidity. In order to improve water quality on the coast, human activities on five islands need to be controlled.

The effectiveness of banana tuber and goat rumen as bio-activator of liquid biopesticide fertilizers

Amin Setyo Leksono[1*], Irfan Mustafa[1], Aminudin Afandhi[2], Anisa Zairina[3], Yuris Setyadin[1]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang
[2] Faculty of Agriculture, Brawijaya University, Malang
[3] Faculty of Forestry, Malang Institute of Agriculture, Malang
[*]Corresponding email: amin28@ub.ac.id

ABSTRACT

The purpose of this study was to examine the use of bio-activator from the banana tuber and goat rumen to make liquid biopesticide fertilizers. The liquid biopesticide fertilizer (LBF) was formulated from ginger, turmeric, curcuma, papaya, and pineapple. The ingredients are blended prior to the test. Treatment 1 (P1) was set with the mixture of LBF added with bio-activator from the banana tuber and goat rumen, P2 mixture added bio-activator, while the control (K) only added with aquades. All treatments were mixed a concentration of bio-activator of 50 ppm. The results showed that temperatures fluctuate from days 1 to 9, while the pH increased from days 1 to 4, then began to stabilize from day 5. On the 13th day, the levels of C, N, P, K in the P1 treatment were higher than P2 and K.

Integration of Traditional Knowledge with Modern Science for Conservation of Medicinal Plants in India

Kalaiselvi Senthil

Assistant Professor, Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, Tamil Nadu, India

ABSTRACT

Plants are an integral part of human civilization and evolution. Apart from plants being the sole source of easily available and accessible energy on earth, they contribute to the well being of a society. Along with human evolution, plants have also been selected and domesticated, in the process where several plant species got extinct or their importance became unknown. Several drug formulation of the modern medicine is inspired from traditional knowledge about plants the knowledge which was transferred by word of mouth across generations in a highly conserved sector of medicinal practitioners. With the availability of immediate relief from disease conditions on using modern medicines, the traditional medicinal practices, which gave a holistic long term remedy/cure for the disease condition, became less important for the civilized society. Hence, the information regarding several medicinal plants has become inaccessible which has also lead to the extinction of several plants species. Several steps have been adapted by the Indian Government to conserve medicinal plants across Indian subcontinent which is also one among the 12 mega biodiversity hotspots around the globe. Along with the government, individual scientists are contributing their part in way of adding scientific evidence to the traditional knowledge, so that, information will be kept live. In this digital era, digital conservation of medicinal plants in the form of images, the chemical constituents, their functions, growth characteristics and genomic data, etc., has to be maintained which is going to be one of the best conservation strategies that can be adapted. The indiscriminate harvesting of medicinal plants from wild for medicines have almost led to the extinction of several species. An alternate is to grow the plants *in vitro*, to provide the source material for medicines. This will also provide a safe and constant supply of raw material without any variation in its chemical constituents throughout the year. One of the important medicinal plants of

Ayurveda, the Indian Traditional medicine system, is *Withania somnifera,* which is used in more than 300 formulations. The in vitro tissue culture system as a potential way of producing raw material for medicine preparation and its advantages will be discussed. In essence, utilization is conservation, the more we utilize resources, knowledge and materials will be conserved.

Evaluation of Yeast Diversity in Dadih and Dangke Using PCR-RFLP of internal transcribed spacer REGION

Yoga Dwi Jatmiko[1, a)], Gordon S. Howarth[2, 3, b)], Mary D. Barton[4, c)]

[1)]Department of Biology, Faculty of Mathematics and Natural Sciences, UniversitasBrawijaya, Malang, East Java, Indonesia 65145.
[2)]School of Animal and Veterinary Sciences, The University of Adelaide, Roseworthy Campus, Roseworthy, South Australia, Australia 5371
[3)]Centre for Paediatric and Adolescent Gastroenterology, Women's and Children's Hospital, Adelaide, South Australia, Australia 5006
[4)]School of Pharmacy and Medical Sciences, The University of South Australia, City East Campus, Adelaide, South Australia, Australia 5000.
[a)]Corresponding author: jatmiko_yd@ub.ac.id;
[b)]gordon.howarth@adelaide.edu.au; [c)]mary.barton@unisa.edu.au

ABSTRACT

Abstract. The dominant indigenous microbes, such as lactic acid bacteria group, mainly determine the quality of naturally fermented milk products. Yeasts have also contributed to the fermentation development, especially in determining the organoleptic or physicochemical characteristics of the products. This study was aimed to evaluate the diversity of yeasts in the naturally fermented milk products from Indonesia, which were dadih and dangke by using PCR-RFLP of ITS region. Two dadih samples used with one samples were collected in three consecutive days. Dangke samples consisted of three made from buffalo milk (sample A-C), and sample D was from cow's milk. The isolated yeasts were further characterized genotypically using RFLP analysis of ITS region. The representative isolates of each cluster as a result of restriction pattern obtained with *Hinf*I and *Hae*IIIenzymes were further identified. A total of 37 yeast isolates (17 isolates from dadih and 22 isolates from dangke) were grouped into three clusters based on the band pattern of RFLP analysis. Based on DNA sequencing analysis, the three species were identified as *Saccharomyces cerevisiae*(group I), *Candida metapsilosis*(group II)and *Kluyveromycesmarxianus*(group III). *Saccharomyces cerevisiae*and *Kluyveromycesmarxianus* were found in both dadih and dangke samples. Unfortunately, yeasts were not detected in dangke samples A and C. *Candida metapsilosis*was found frequently in dadih, while *Saccharomyces cerevisiae* was the dominant species in dangke.Further investigations are needed to shed light on microbial dynamics, since the changes in the

abundance and type of microbiota during the fermentation process play a pivotal role in the quality of the final products.

Keywords: naturally fermented milk, dadih, dangke, PCR-RFLP, ITS region

SYMPOSIUMS

Botany (BOT)

BOT/O-001

Sporophyte Formation of Cibotium barometz at Various Concentrations of KNO3

Yupi Isnaini [1*], Siti Nurmela[2], Maryanti Setyaningsih[2] and Titien Ng Praptosuwiryo[1]

[1] Research Center for Plant Conservation and Botanic Gardens
[2] University of Muhammadiyah Prof. Dr. Hamka, Jl. Tanah Merdeka Kp Rambutan Pasar Rebo Jakarta Timur
[*]Corresponding email: yupinurfauzi@gmail.com

ABSTRACT

Golden chiken fern (Cibotium barometz) is one species of tree nail which is included as an export commodity as an ingredient in medicine. The trade of C. barometz is regulated and limited to CITES quota. To anticipate this species of extinction, cultivation efforts are needed. Propagation through spore culture has been carried out in the Bogor Botanical Gardens since 2013 but to obtain seedling in large quantities is still constrained by the minimum number of sporophytes (planlets) produced. This study aims to obtain the right concentration of KNO3 as one of the contributors to nitrogen to induce the formation of healthy sporophytes. Six genotypes of C. barometz (Cb, Cb1, Cb2, Cb3, Cb4 and Cb5) were subcultured to basic media 1/12 MS with the addition of KNO3 according to MS concentration (1900 mg/l), 633 mg/l, 316 mg/l and 158 mg/l. The results showed the average number of sporophytes formed in all treatment media showed no significant difference, but sporophytes with greener and healthier performance were seen in the media with the highest addition of KNO3. The percentage of the total protalus formed the most sporophytes in C.barometz Cb1 (69%), but the average number of sporophytes was highest produced by C.barometz Cb4.

BOT/O-003

Modelling Casuarina junghuhniana dispersal in Tengger Sea of Sands of Bromo Tengger Semeru National Park using Cellular Automata

Brian Rahardi[1], Serafinah Indriyani[1], Luchman Hakim[1], Agus Suryanto[2]

[1]*Dept. of Biology, Brawijaya University, Malang*
[2]*Dept. of Mathematics, Brawijaya University, Malang*
*Corresponding email: brian_rhardi@ub.ac.id

ABSTRACT

The growing of population of a pioneer species may show a unique behaviour. *Casuarina junghuhniana* is reported as a pioneer species, this is because of its tolerance to adverse environment and transform it to become inhabitable for other organism. A comprehensive method involving field observation, the use of mathematical model and computation to understand plants behaviour still needs to be developed. This paper is attempting to show a method to model for showing unique dispersal behaviour of the species. A relatively straightforward use of Fisher's reaction diffusion equation, cellular automata based modelling and programming can show behavior easier to understand on a grid space. Some assumption must be used to represent the species dispersal. As it is known that *C. junghuhniana* can reproduce both vegetatively and generatively, both are assumed to have different dispersal behaviour. Vegetative reproduction using shoots emerging from roots has pattern to spread close to each other. While generative reproduction by seeds which is lightweight has possibility spread with the help of wind to further distance. The total model area of 1km^2 was divided into cells which represents 10x10 m^2 area. Cellular automate applies the same rule to each cell and the result was observed from cells interaction. A simple program was developed using Python with Jupyter Notebook computing environment. The number of iteration was limited until observed change reached one of area boundaries. The simulation running time was greatly reduced with the assistance of Graphical Processing Unit (GPU) parallel processing. For speeding up calculation using GPU the simulation used NUMBA as interface between python and CUDA. The simulation showed behaviour of the trees spread

downward following the slope. Modelling dispersal with wind influence showed more sporadic pattern at further distance from originating parents cluster. The wind direction can be simulated with additional data from wind rose available from internet. The simulation has not yet been optimized to easily accept input of the wind rose. The wind information still needs to be written into the program. keywords: pioneer species, fisher's equation, python

Ethnobotany of Jonggol Plants (Erechtites valerianifolia Wolf.) By Communities in Traditional Markets in Malang City and Detection of Its Chemical Compounds

Prita Paramitha Fatmawati [1], Jati Batoro [2]

Biology Department, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang
[*]Corresponding email: pritafatmawati18@gmail.com

ABSTRACT

The increasing number of population causes increasing food needs too. The market is one place where food needs are available. One of the plants that has economic value and can be used is jonggol (Erechtites valerianifolia Wolf.). The objective of this study is to determine the morphology, forms of use and chemical compounds found in the jonggol plant. This research was conducted on October 2017 until March 2018. The methods used in this study were preliminary surveys, market area selection, morphological observations, interviews, chemical compound detection, and data analysis. The selection of market areas was carried out in 5 sub-districts of Malang City, with each sub-district selected by one market, they are Sawojajar Market, Sukun Market, Malang Big Market, Blimbing Market, and Dinoyo Market. The results of the study show that jonggol is a herbaceous plant. Jonggol has a taproot type with a hairy and grooved stem surface. The jonggol leaves are obovate, pointed ends, tapered base with a leaf surface with adaxial and abaxial hair. The flowers are cup-shaped compound flowers and they are located at the end of the stem. The petals are modified into pappus. The crown is reddish yellow, the pistil head is brownish red, and the stamens are purple. The fruit type is achene which is brown. Jonggol has a UVs value of 3.0 meaning that it is an important species or priority species, this is due to Jonggol plants often used as vegetables but there is no other form of utilization. Chemical compounds found in jonggol plants are alkaloids, flavonoids, and steroids. Keywords: Jonggol, Malang City, traditional market, utilization

BOT/O-005

The Effect of Explants And Growth Regulators On Callus Induction of Geranium (Pelargonium graveolens L'Her) In Vitro

Moch. Faizul Huda[1], Serafinah Indriyani[2], and Wahyu Widoretno[2*]

[1] *Student of Biology Department, Faculty of Mathematics and Natural Sciences, University of Brawijaya, Malang, Indonesia*
[2] *Department of Biology, Faculty of Mathematics and Natural Sciences, University of Brawijaya, Malang, Indonesia*
[*]Corresponding email: mochfaizulhuda99@gmail.com

ABSTRACT

The purpose of this study was to determine the effect of explants and growth regulators (GR) on geranium callus formation (Pelargonium graveolens L'Her). Callus induction was carried out by culturing leaf and petiole explants on MS + 0,5 mg/l 2,4-D + 0,1 and 0,3 mg/l Benzyladenine (BA) or Kinetin. Each culture was carried out in 5 replications, cultures were incubated in rooms 25 C and 600 lux. The parameters days for callus induction and percentage of callus formation were observed. Geranium callus formation was influenced by types of explants and growth regulators. Petiole explants was able to induce callus better than leaf explants. Days for callus induction at second week and percentage of callus formation of petiole explants were 72 and 55.2% compared to leaf explants were only 56 and 39.2%. BA combined with 2,4-D was able to induce callus better than Kinetin. The best callus formation was produced from petiole explants cultured on MS + 0.5 mg/l 2,4-D + 0.3 mg/l BA by 68%. Keywords: Pelargonium graveolens L'Her, Callus, Leaves, Petiole, BA, Kinetin.

Characterization dan Genetic Variability of Rambutan (Nephelium lappaceum L) Based on Morphological Characteristics in Pekanbaru, Riau

Isnaini*[1], Aslim Rasyad[1] and Ari Wibowo Ginting[1]

[1]*Department of Agrotechnology, Faculty of Agriculture, Universitas Riau, Pekanbaru, Indonesia*
*Corresponding email: isnaini@lecturer.unri.ac.id

ABSTRACT

The rambutan (Nephelium lappaceum L.) explorations had been conducted in Pekanbaru, Riau Province in 2017. The objectives of this study were to characterize the morphological characters, to determine genotype variability and relative relationship of rambutan in Pekanbaru. Morphological characters were observed from 28 accessions of more than 10 year-old rambutan trees grown in Pekanbaru Riau, Indonesia. Data collected were then scored as outlined in IPGRI procedure and analyzed by statistical method using NTSYS-pc 2.02. This study indicated that morphological variablity of rambutan in Pekanbaru is considerably narrow due to farmers grown almost similar clone as recommended by government official and following their neighbourhood. The simalirity coefficient from 48 characters ranged from 0.43 to 0.82. Cluster analyzed showed that the 28 accessions could be classified into six groups..

BOT/O-007

Character Selection by Path and Principal Component Analysis for Enhanced Seed Size and Yield in Local Castor Bean (Ricinus communis L.)

Puji Shandila[1], Darmawan Saptadi[2], Noer Rahmi Ardiarini[2], Kuswanto[2], Chindy Ulima Zanetta[3], Budi Waluyo[2*]

[1]*Master Program of Agronomy, Faculty of Agriculture, Brawijaya University, Malang, Indonesia*
[2]*Department of Agronomy, Faculty of Agriculture, Brawijaya University, Malang, Indonesia*
[3]*School of Life Sciences and Technology, Institut Teknologi Bandung, Bandung, Indonesia*
[*]Corresponding email: budiwaluyo@ub.ac.id

ABSTRACT

Castor bean (Richinus communis L.) is commercial plant that widely use in industry and manufacturing. The research were conducted to study character selection in castor bean to improve yield and determine accessions that has high value of principal component analysis (PCA). Twenty-two local castor accessions with two replications were studied at Malang in 2017. Path analysis was done on 21 characters. The result showed seed diameter had a high positive direct effect on seed volume. Character that had a high direct effect on seed weight per plant is weight of inflorescence per plant. Seed diameter had a high positive direct effect on 100-seed weight. In order to identify the patterns of morphological variation, PCA was conducted. In this study, 3 components contributed 86.42% of the total variation. PC1 strongly correlated with capsule length, capsule diameter, seed length, seed width, seed thickness, seed diameter, inflorescence length and seed volume. PC2 varied as a measure of the days to flowering, days to harvesting, plant height, length of main stem, node number in main stem, cluster number. PC3 showed varied as inflorescence weight per plant, seed number per plant, inflorescence number per plant, capsule number per plant, seed weight per plant. The similarity coefficient between accessions is 85.8%-99.8%. Genetic distance of 0.002 obtained 3 clusters. The accessions that had high value in first principal component were ASB 60, SUKO 0216, SUKO 0316, TBN 0216 and LMG 0316.

Morphological and Cytological Response of Bambara Groundnut (*Vigna subterranea* (L.) Verdcourt) by Colchicine Polyploidization

Darmawan Saptadi[*1], Sri Rejeki Utami[2], Andy Soegianto[1], Budi Waluyo[1]

[1]*Dept. of Agronomy, Faculty of Agriculture, Universitas Brawijaya, Malang, Indonesia*
[2]*Postgraduate Program, Faculty of Agriculture, Universitas Brawijaya, Malang, Indonesia*
[*]Corresponding email: darmawansaptadi@gmail.com

ABSTRACT

Bambara groundnut (2n = 2x = 22) are native species from Africa and have developed in several regions in Indonesia. This commodity has the potential to be developed for economic purposes as well as for food diversification. The development constraints are on the limitations of existing genetic diversity. One effort to increase genetic diversity is by polyploidization using colchicine. This study was conducted to determine the morphological and cytological response of Bambara groundnut to the treatment of several doses of colchicine. Four days-old germinated seed roots of Bambara groundnut were soaked in colchicine solution with a concentration of 0, 400, 800 and 1,200 ppm. Observation of the chromosome number was carried out on the sample sprouts root preparations. Plants are grown on the land for observation of morphological variables. A 50% lethal dose (LD50) occurs at 1,200 ppm. All treatments can cause changes in the number of chromosomes to their normal number. Not all changes in chromosome number occur with perfect polyploidy. Colchicine treatment causes the plant to shorten and flower earlier. Keywords: Bambara groundnut, colchicine, chromosome, mutation

BOT/O-009

Beeswax Formulation and Wrapping Effects on Physical Characteristics of Red Garifta Mango Variety

Syarif Husen[*1], Muhidin[1], Sri Winarsih[2], Devi Dwi Siskawardani[2] and Anggoro Wicaksono[1]

[1] *Agronomic Department, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia*
[2] *Food Science and Technology Department, Faculty of Agriculture and Animal Science, University of Muhammadiyah Malang, Malang, Indonesia*
[*]Corresponding email: syarifhusen.hasan@gmail.com

ABSTRACT

Red garifta mango is a variety that has an attractive appearance with sweet and fresh taste. It is one of the superior Indonesian fruits which having export potency. But it's only can grow in several areas, so require great packaging to increase market competitiveness and distribution. Waxing is a potential method to alleviate chilling injury related to the major changes of the cell membrane, which lead to metabolism rate reduction and textural quality improvement. This study aimed to determine the effect of beeswax coating concentration on the fruit peel and wrapping to the red garifta mango quality. Nested design with 3 replications applied, the first factor was beeswax concentration (0%, 2%, 4%, and 6%), while the second was wrapping (without and cardboard wrapped). The result revealed that waxing affected hardness and color (redness and yellowness). The hardness without waxing and wrapped rapidly decreased during storage. Furthermore, there was an interaction between waxing and wrapping on fruit sensory texture and weight loss. Fruit weight loss is mainly associated with respiration and moisture evaporation through the skin which affected by packaging. The 6% beeswax concentration is the best treatment throughout the storage period with minimum loss of weight, extended color, and hardness.

BOT/O-010

LC-MS Analysis of Carbohydrate Components in Porang Tubers (Amorphophallus muelleri Blume) from the Second and Third Growth Period

Dwi Gusmalawati[*1,2], Estri Laras Arumingtyas[2], Rodiyati Azrianingsih[2], Retno Mastuti[2]

[1]*Biology Dept, Faculty of Mathematics and Natural Sciences, Tanjungpura University, West Kalimantan, Indonesia*
[2]*Biology Dept, Faculty of Mathematics and Natural Sciences, Brawijaya University, East Java, Indonesia*
[*]Corresponding email: dwi_gusmalawati@yahoo.com

ABSTRACT

The presence of carbohydrates, especially glucomannan, causes porang tuber to be important in some industries including food, cosmetics, medicines, and other industries. Porang has four growing periods (GP) in its life cycle. The GP1 until GP3 is the vegetative phase and GP4 is the generative phase. The tubers used as industrial materials generally were from GP2 and GP3 plants. The study aimed to analyze carbohydrate components in porang tubers from GP2 and GP3 with Liquid Chromatography Mass Spectrometry (LC-MS). The tubers produced from plants at GP2 and GP3 were extracted by maceration method using methanol solvent (pa) for 1 hour. Liquid extracts obtained was further identified for the levels of carbohydrate components using LC-MS technique. The carbohydrate components identified with LC-MS were selected for quantifications. LC-MS analysis showed that both GP2 and GP3 tubers contained 67 types of chemical compounds. In GP2 there were 8 carbohydrate components (xylose, arabinose, rhamnose, glucose, galactose, mannose, mannan, and glucomannan), while in GP3 there were 9 carbohydrate components. In addition to trehalose, 8 other carbohydrate components are the same as those identified in GP2. The highest carbohydrate components in GP2 and GP3 were mannose (55371.64µg/g) and glucomannan (99436.85µg/g), respectively. GP2 glucomannan levels (58845.54µg/g) were lower than those of GP3. Therefore, GP3 are better than GP2 to be used as industrial materials. Keywords: carbohydrates, growing period, LC-MS, porang, tubers

BOT/O-011

The effect of cutting the bulbil-porang (Amorphophallus muelleri) on its germination ability

Nunung Harijati*

Biology Department, Faculty Science, Brawijaya University, Malang, Indonesia
*Corresponding email: harijati@ub.ac.id

ABSTRACT

Bulbil is one tool for multiplication of porang (Amorphophallus muelleri). While bulbil is an aerial tuber specifically found on porang. The purpose of this study was to determine the effect of bulbil cutting on the number of tubercles, the proportion of black and white tubercles, the potential for shoot production, the height of shoots produced from both cutting (half and quarter bulbils) which appeared in the abaxial or adaxial parts, and the direction of shoot growth. This study was designed using a completely randomized design, each unit of observation was repeated 4. The obtained data were analyzed using Anova, Tukey or independence t-test. The results showed the number of shoots from the whole bulbil, cut bulbil (two or four) differed significantly. The highest number of shoots was obtained from bulbil cut 4 i.e. 9. Those highest number of shoots was supported by the highest total tubercle. However, the potential for shoots to emerge (number of shoots / number of white tubers x 100%) from both whole and cut bulbils were almost the same, the length of the shoots did not differ significantly between them as well. The ratio between white and black tubercle seems to affect the number of shoots, the high ratio produces more shoots. The tubercle ratio from intact bulbil, half bulbil and quarter bulbil tends to move from low to high but not significantly different. The length of shoots that appear from the adaxial and abaxial parts is not different as well. All shoots from both the whole bulbil and cut bulbil grew upwards, none of which grows horizontally or towards the earth Keyword: tubercle, bulbil, shoot, upward, abaxial, adaxial

BOT/O-012

Study on the Profile of Capsanthin-Capsurobin Synthase (Ccs) Gene responsible for Carotenoid Synthesis in Chili Pepper (*Capsicum frutescens* L.) Mutants G1M6 M2 Generation

Estri Laras Arumingtyas[*1], Ayu Zahrotul Fuadati [2], Edia Fitri Dwinianti [2]

[1]*Department of Biology, Faculty of Mathematics and Natural Sciences, University of Brawijaya, Jl. Veteran, Malang, Indonesia*
[2]*Graduates of the Department of Biology, Faculty of Mathematics and Natural Sciences, University of Brawijaya, Jl. Veteran, Malang, Indonesia*
[*]Corresponding email: larasbio@gmail.com

ABSTRACT

The Capsanthin-capsorubin synthase (Ccs) is one of the enzymes that play a role in carotenoid pigment bio-synthesis. Mutations in the Ccs gene cause the formation of yellow or orange fruit colour instead of red. This study aims to analyze the genetic profile of the Ccs gene and its effect on the carotenoid content of the chili pepper mutant G1M6 generation M2. The profile of the Ccs gene was analyzed using Polymerase Chain Reaction (PCR) continued with sequencing methods.The carotenoid content was measured from chili fruit harvested at 35 and 65 days after planting. Comparison of the partial sequence of Ccs gene of the mutants and the Capsicum annuum var. Landrace, showed a substitution of adenine into guanine in the 124 bp nucleotide base sequence and the cytosine nucleotide substitution to thymine in the 556 bp nucleotide base sequence. However there was no difference between the Ccs gene sequence of the chili pepper G1M6/13, G1M6/7, G1M6/8 compared to the control plant (G1K1). The consistency showed by these sequence did not reflect the carotenoid content. Carotenoid content in the three mutant plants varied compared to control plants. The G1M6/8 mutant had higher carotenoid content, while the G1M6/13 mutant had a lower carotenoid content compared to the control plant. Since there was no differences on the partial sequence of the Ccs gene observed, the deviation of carotenoid content between mutant and control plants maybe governed by other part of the gene. Keywords: Capsanthin-Capsurobin Synthase, carotenoid, mutant, chili pepper

BOT/O-013

Isolation of constituents that inhibit nitric oxide production from *the Angelica dahurica* root

Ryo Okada[1],[2], Hazuki Abe[1], Tetsuya Okuyama[1], Yukinobu Ikeya[3], and Mikio Nishizawa[1*]

[1] Department of Biomedical Sciences, College of Life Sciences, Ritsumeikan University, Kusatsu, Shiga, Japan
[2]Graduate School of Life Sciences, Ritsumeikan University, Kusatsu, Shiga, Japan
[3] Center for Supporting Pharmaceutical Education, Daiich University of Pharmacy, Fukuoka, Japan
[*]Corresponding email: nishizaw@sk.ritsumei.ac.jp

ABSTRACT

Background: The root of *Angelica dahurica* Benth. et Hook. f. ex Franch. et Sav. (RAD) has been traditionally used for inflammatory skin diseases. RAD contains furanocoumarins, such as imperatorin and byakangelicin. To elucidate which constituents are responsible for its anti-inflammatory effect, we evaluated potency of crude fractions from RAD extract by monitoring production of an inflammatory mediator, nitric oxide (NO), in hepatocytes. **Methods**: RAD collected in South Korea were extracted by methanol. The resultant extract was fractionated into ethyl acetate (EtOAc)-soluble, n-butanol-soluble, and water-soluble fractions. Primary cultured rat hepatocytes were treated with interleukin-1β and each fraction for 8 h. NO production in the medium was measured by Griess method. Lactate dehydrogenase activity in the medium was measured to monitor cytotoxicity. The expression of inducible nitric oxide synthase (iNOS) in the hepatocytes was detected by western blotting with hepatocyte extracts. **Results and discussion**: EtOAc-soluble fraction significantly suppressed NO production without showing cytotoxicity. Furthermore, EtOAc-soluble fraction decreased iNOS expression. However, imperatorin, which was present in EtOAc-soluble fraction, did not affect NO production. These data imply that hydrophobic compounds other than imperatorin in EtOAc-soluble fraction may contribute to the anti-inflammatory effects of the root of A. dahurica.**Keywords**: Angelica, nitric oxide, inflammation, hepatocytes

BOT/O-014

The effect of the rhizome of *Cyperus rotundus* on nitric oxide production in rat hepatocytes

Suzuka Makabe[1] [2], Kirara Kawajiri[1], Tetsuya Okuyama[1], Yukinobu Ikeya[3], and Mikio Nishizawa[*1]

[1]*Department of Biomedical Sciences, College of Life Sciences, Ritsumeikan University, Kusatsu, Shiga, Japan*
[2]*Graduate School of Life Sciences, Ritsumeikan University, Kusatsu, Shiga, Japan*
[3]*Center for Supporting Pharmaceutical Education, Daiich University of Pharmacy, Fukuoka, Japan*
[*]Corresponding email: nishizaw@sk.ritsumei.ac.jp

ABSTRACT

Background: The rhizome of *Cyperus rotundus* L. (RCR) has been traditionally used as a crude drug to treat menstrual pain and neurosis. RCR contains sesquiterpenes, *e.g.*, α-cyperone and cyperene. However, it is unclear which constituents are responsible for its anti-inflammatory effect. Here, we investigated the effect of RCR and its constituents on the production of nitric oxide (NO), a proinflammatory mediator in hepatocytes. **Methods**: RCR (Hainan, China) was extracted by methanol. The resultant extract was fractionated into ethyl acetate (EtOAc)-soluble, *n*-butanol-soluble, and water-soluble fractions. Primary cultured rat hepatocytes were treated with interleukin-1β and each fraction or a constituent. After 8-h incubation, NO production in the medium was measured by Griess method. Activity of lactate dehydrogenase released to the medium was measured as an indicator of cytotoxicity. The expression of inducible nitric oxide synthase (iNOS) protein in the hepatocytes was analyzed by western blotting. **Results and discussion**: All the fractions significantly suppressed NO production and iNOS expression without showing cytotoxicity. Among them, EtOAc-soluble fraction showed the highest NO-suppressing potency. Furthermore, α-cyperone suppressed NO production. These results suggest that hydrophobic constituents in EtOAc-soluble fraction, such as α-cyperone, may contribute to the anti-inflammatory effect of the rhizome of *C. rotundus*. **Keywords**: *Cyperus rotundus*, nitric oxide, inflammation, hepatocytes

BOT/O-016

Habitat Characteristic of Taxus sumatrana (Miquel) de Laub In The Kerinci Seblat National Park

Titi Kalima1, Adi Susilo1*

(1) Forestry Research and Development Center, Bogor, Indonesia
*Corresponding email: adisusilo@hotmail.com

ABSTRACT

Abstract Sumatran yew (Taxus sumatrana) tree contain taxane diterpenoid, an effective anti-cancer drug. Taxus population in the world is declining due to over exploitation. Study on habitat characteristic of T. sumatrana was conducted in Kerinci Seblat National Park. Twenty four Plots of 20 x 20 m were laid purposively in the habitat of T. Sumatrana to determine the structure and composition of the vegetation. At each plot data on the physical component such as land slope, air temperature and humidity were also measured. Soil samples were taken around T. sumatrana trees at 4 different depths i.e. 0-10 cm, 10-20 cm, 20-40 cm and 40-60cm and brought to a soil laboratory for physical and chemical properties analysis. The result showed that T. sumatrana at tree and pole stage was easily found, however at sapling stage was rare and the seedling stage was not present at the plots. T. sumatrana commonly grow to clump at a steep slope, high humidity, and cold temperature. The soil at the habitat of T. sumatrana is porous and fertile. Keywords: Taxus sumatrana, Habitat, Kerinci Seblat National Park.

BOT/O-017

Species Composition in the Habitat of Dipterocarpus gracilis Ulolanang Nature Reserve

Denny1, Adi Susilo1*

Forest Research and Development Center, Bogor, Indonesia
*Corresponding email: adisusilo@hotmail.com

ABSTRACT

This study aims to determine flora diversity of Dipterocarpus gracillis habitat in the Ulolanang Nature Reserve. The information obtained is expected to be a reference for the restoration of dipterocarps, especially D. gracillis. In 1998, the species was declared as Critically Endangered with criteria A1cd + 2cd ver 2.3. Eighty-seven sample plot of 20 x 20 m laid down to conduct vegetation inventory. The plots were randomly distributed in D. gracillis native habitat. The study showed that at the tree level the dominating species was D. gracillis, Pometia pinnata, and Donax canniformis. While at the pole level were D. gracillis, Vitex sp. and Piper betle. At the sapling level, the composition of vegetation was dominated by Gelonium glomerulatum, Alchornea rugosa, and Plectronia horrida. Whereas the seedling and understorey levels were dominated by D. gracilis, Horsfieldia glabra, and Aglaia odoratissima. Keywords: Dipterocarpus gracilis, Endanger, Ulolanang Nature Reserve

BOT/O-018

Lime (Citrus aurantifolia) Peel Effect on Peroxide Value of Cooking Oil

Sri Rahayu[1*], Supriyatin[2], Tiya Resti Fauziah[1]

[1]*Biology Department, Faculty of Mathematics and Sciences, Universitas Negeri Jakarta.*
[2]*Biology Department, Faculty of Mathematics and Sciences , Universitas Negeri Jakarta*
[*]Corresponding email: srirahayu@unj.ac.id

ABSTRACT

Lime (Citrus aurantifolia) Peel Effect on Peroxide Value of Cooking Oil Sri Rahayu[1]*, Supriyatin[2], Tiya Resti Fauziah[1] [1]Biology Department, Faculty of Mathematics and Sciences, Universitas Negeri Jakarta. [2]Biology Department, Faculty of Mathematics and Sciences , Universitas Negeri Jakarta a) Corresponding author: srirahayu@unj.ac.id Cooking oil is a staple in everyday life. One of that is often used is bulk cooking oil. The quality of cooking oil can be known from taste, colour, and aroma. In terms of aroma, rancidity caused by the presence of peroxide. Peroxide is a sign of oil breakdown or damage due to oxidation, which causes a rancid odour. Lime peel is used as an antioxidant because it contains vitamin C, flavonoids, and carotenoids. Damage to cooking oil can't be prevented but slowed by way of giving antioxidants from lime peel. This study aims to determine the effect of lime peel extract on the peroxide number in cooking oil. The method used in this study was an experiment using a complete randomized design with two factorials. The first factor is the type of solvent (aquadest, ethanol, and chloroform). The second factor is the extract concentration (70, 80, and 90) ?g / ml. Peroxide number measurement data were analyzed using ANOVA ($p < 0.05$) and continued with the Duncan test. The results obtained by aquadest extract combined with oil at a concentration of 90 ?g / ml had the lowest peroxide number of 0.56 Mek O2 / Kg and chloroform extract of 0.72 Mek O2 / Kg while the highest value was found in the control of 1.04 Mek O2 / Kg. It can be concluded that lime peel extract significantly gave effects peroxide number of cooking oil. Both concentration and extract solvent determine the peroxide number.
Keywords: cooking oil, lime, peroxide, concentration, solvent

BOT/O-019

Leveraging Local Wisdom on Plants to Unlock the Green Economy Potential of Flores

Shinta[1*], Kaho LMR[2], Lindawati[1], Rosaria[1,3], Rustiami H[4] Sukara E[1,5]

[1]Surya University, Tangerang 15143, Indonesia
[2] Faculty of Agriculture, Nusa Cendana University, Kupang 85001, Indonesia
[3]Department of Zoology, University of Oxford, Oxford OX1 3SZ, United Kingdom
[4]Botany Division, Research Center for Biology, Indonesia Institute of Sciences, Cibinong 16911, Indonesia
[5]Indonesian Academy of Sciences, Perpustakaan Nasional RI, Jalan Medan Merdeka Selatan, DKI Jakarta 10110, Indonesia
[*]Corresponding email: rahel.shinta@surya.ac.id

ABSTRACT

Flores is an island in Wallacea with a rich diversity of more than 150 plant species, some of which are endemic, such as Begonia kelimutuensis and Rhododendron renschianum. Plants have a critical role in ecological functions, such as carbon storage, water and air purification, and mitigation of climate change. They also provide an opportunity to develop a green economy for increasing the livelihoods of local people. Green economy consists of the efficient use of natural resources, low-carbon economic activities, and social inclusion. This paper aims to formulate a green economy strategy for Flores by evaluating the natural capital assets, which include plants and its associated local wisdom, as a reccommendation for government authorities, local community, and other stakeholders. There are at least 6 published ethnobotanical research of Flores, particularly in Ruteng Mountains, Manggarai Barat, and Ngada. These studies uncover the rich local wisdom in utilizing plants, mainly for consumption, medication, and building material. We envisage strategic approach to leverage this potential, which involves ecotourism, carbon trading, and value-added processing of aromatic oils or functional foods. Together, this analysis is targeted for paving the way to unlock Flores socio-economically important plants to improve the life quality of rural communities and beyond. Keywords: Endemic Plants, Local Wisdom, Green Economy, Carbon Trading, Value-added

BOT/O-020

Comparison of Organosulfur Bioactive Compounds in Bulb, Callus and Cells Suspension of Single Garlic (Allium sativum. L)

Frida Kunti Setiowati[1], Wahyu Widoretno[2], Betty Lukiati[3], Sasangka Prasetyawan[4]

[1]Student of Doctoral Program, Dept. of Biology, Brawijaya University, Malang
[2]Dept. of Biology, Brawijaya University, Malang
[1],[3]Dept. of Biology, State University of Malang, Malang
[4]Dept. of Chemistry, Brawijaya University, Malang
[*]Corresponding email: frida.fmipa@um.ac.id

ABSTRACT

Single garlic (Allium sativum. L) is one of herbs widely used for healing various kinds of health problems such as diabetes, hypertension, cholesterol, atheroskeloris, and cancer. Benefits of single garlic as a medicinal plant was caused by organosulfur bioactive compounds which are widely used in the field of health including alliin, allicin, allyl sulphide, ajoene and dithiin. This study aimed to identify and compare organosulfur bioactive compounds in bulb, callus and cells suspension. Callus induction was carried out by culturing the buds explants on MS basal medium with 2.4 D and kinetin. The cells suspension were conducted by culturing callus in liquid medium with 2.4 D and kinetin. HPLC technique was used to analyse organosulfur bioactive compound in samples. The HPLC chromatograms confirmed the same presence of 30 organosulfur bioactive compounds. Among the 30 detected alliin, allicin, allyl trisulphide, E1 propenyl allyl disulfide, 2 propenyl 1 propenyl disulfide, 2 vinyl 4H 1,3 dithiin, 3 vinyl 4H 1,2 dithiin and ajoene were found as the major compounds in samples. The ratio of bioactive compounds in the bulb, callus and cells suspension is 3: 1: 1. Although the callus and cell suspension produce lower yields but callus culture and cell suspension have been applied for the alternative to production of organosulfur bioactive compounds by carrying out strategies to improve the compounds so that it can be used to support the use of herbal medicines. Keywords : single garlic, organosulfur compounds, bulb, callus, cells suspension

BOT/O-021

Effect of Growth Regulators on Cell Growth and Flavonoid Production in Cell Culture of Elaecarpus grandiflorus

Noor Aini Habibah[1], Nugrahaningsih WH[2], Y. Ulung Anggraito[1], Fajar Mustafa[1], Khoirul Mukhtar[1], Nur Wijawati[1], Yosa Rostriana[1]

[1]Plant Tissue Culture Laboratory, Faculty of Science and Mathematic, Universitas Negeri Semarang, Indonesia
[2]Biochemistry Laboratory, Faculty of Science and Mathematics, Universitas Negeri Semarang, Indonesia
*Corresponding email: nooraini@mail.unnes.ac.id

ABSTRACT

Elaecarpus grandiflorus has the potential to be developed as a source of bioactive compounds. This study aims to obtain the most optimal medium for cell culture induction and flavonoid production in Elaeocarpus grandiflorus culture. Picloram (3.5, 5 and 7.5 ppm) and 2,4-D (1.5, 2.5 and 3.5 ppm) were used for induction of cell suspension culture. Cell suspension culture induction was observed through growth parameters (fresh and dry weight of cells) and cell suspension formation. In addition, it was observed the production of flavonoids. Induction of cell culture is done by growing callus on Woody Plant Medium (WPM) with a variety of growth regulators. The culture was maintained in a shaker at a speed of 120 rpm for 30 days. At harvest, cells were filtered, weighed and dried. Spectrophotometer was used to determine the total flavonoid content. Quercetin was used as a standard compound. The best cell culture induction was obtained in cells maintained in WPM medium with the addition of 2,4-D 2.5 ppm. All cells in various treatment media can produce flavonoids with varying concentrations. WPM medium with the addition of 2.4 D and Picloram can be used for the production of flavonoids from Elaecarpus grandiflorus cells. Keywords : Elaecarpus grandiflorus, cell culture, 2,4D, picloram, flavonoid production

BOT/O-022

Standardization of Some Indonesian Medicinal Plants Used in "Scientific Jamu"

Kartini Kartini[*1], Nikmatul Ikhrom Eka Jayani[1], Nina Dewi Octaviyanti[1], Alfian Hendra Krisnawan[1], Christina Avanti[2]

[1] *Dept. of Pharmaceutical Biology, Faculty of Pharmacy, University of Surabaya, Surabaya*
[2] *Dept. of Pharmaceutic, Faculty of Pharmacy, University of Surabaya, Surabaya*
[*]Corresponding email: kartini@staff.ubaya.ac.id

ABSTRACT

Jamu is Indonesian indigenous herbal medicine that has been used empirically to prevent and treat various diseases. To provide evidence on its safety and efficacy, Indonesian government has developed Jamu into Standardized Herbal Medicine and Phytopharmaca. Another strategy is development of Jamu into Scientific Jamu. This herbal medicine has assurance on safety and efficacy through health service-based research. Its raw material is various crude drugs. The problem of this type of raw material is that, depending on the environmental conditions, the quality can vary significantly. This study aimed to standardize crude drug of six medicinal plants included in the composition of Scientific Jamu. They are Orthosiphonis Folium, Sonchi Folium, Centella Asiatica Herba, Phyllanti Herba, Curcuma Domesticae Rhizoma, and Curcumae Rhizoma which were collected from three different origins in Indonesia, i.e.: Batu, Bogor, and Tawangmangu Districts. Standardization was conducted by determination of specific parameters (macroscopic, microscopic, TLC profile) and non specific parameters (loss on drying, total ash, acid-insoluble ash, water and ethanol extractable matter). Results were then compared to Indonesian Herbal Pharmacopoeia to conclude wether the crude drugs have a good quality. Crude drugs from Bogor and Tawangmangu meet the specific and non specific parameters as required. The crude drugs from Batu fulfill all specific parameters, however they fail to comply non specific parameters as required by Indonesian Herbal Pharmacopoeia. All the results represent important information origin of the plant material and the crude drugs should be checked for their specific and non specific parameters before used to ensure their quality. Keywords:

standardization, scientific jamu, specific parameters, non specific parameters, herbal pharmacopoeia

BOT/O-023

Characterization of Peanut Stripe Virus from West Nusa Tenggara

Nur Indah Julisaniah [1],[2], Suharjono Suharjono[1], Retno Mastuti[1], Estri Laras Arumingtyas[1]

[1]*Biology Department, University of Brawijaya, Malang*
[2]*Biology Department, University of Mataram, Mataram*
[*]Corresponding email: julisaniah@gmail.com

ABSTRACT

Abstract. Peanut Stripe Virus (PStV) infection on peanut plants causes a reduction in the yield of peanuts. This study was aimed to characterized PStV that infects peanut (Arachis hypogaea) plants in the West Nusa Tenggara province. Peanut plants that showed symptoms of stripes on leaves were collected from West Nusa Tenggara province peanut fields. Stripes symptoms on leaves indicate that the plant is infected with PStV. PStV mechanical inoculation to the healthy Chenopodium amaranticolor plant with sap from PStV infected peanut leaf showed local lesions symptoms on the leaf. Molecular characterization was carried out using RT-PCR with specific primers produced fragments of 1071 nt, consisting of NIb, coat protein (CP) gene, and 3'UTR. Nucleotide sequences based on coat protein gene showed 97-99 % similarity with PStV data reference in Genbank. Keywords: Peanut Stripe Virus, symptom, coat protein gene, West Nusa Tenggara

BOT/O-024

POTENTIAL OF ETNOZOOLOGY IN TRADITIONAL TREATMENT OF ETHNIC BADA IN LORE LINDU BIOSPHERE RESERVES CENTRAL SULAWESI

Eny Yuniati [1], Serafinah Indriyani [2], Jati Batoro [2], Yohanes Purwanto [c]

[1] *Department of Biology, Faculty of Mathematics and Natural Sciences, Tadulako University, Palu, Central Sulawesi, Indonesia*

[2] *Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, East Java, Indonesia*

[3] *dLaboratory of Ethnobotany, Division of Biology, Indonesian Institute of Sciences, Bogor, Jawa Barat, Indonesia*

[*]Corresponding email: enybiountad16@yahoo.com

ABSTRACT

The relationship between human and animal has existed since a long time ago. Animals as resources play a role in human life. Bada ethnic communities that occupy Bada valley area in the Lore Lindu biosphere reserve are indigenous people called to Bada / Tampo Bada that have a local wisdom, and act as a strategy for a life activity. This study aims to inventory and find out the perceptions of Bada's ethnic conception of the use of animals in traditional medicine. This exploratory research uses semi-structured interview techniques and free interviews (indepth interviews). Information obtained based on key informants. Based on the results of the study there are 13 species consisting of 5 classes and 8 families of animals which are commonly used as traditional medicine, and there are 9 types of diseases that can be treated. The use of body parts used includes the whole body, meat, liver, bile and fat. Keywords: Ethnozoology, Ethnic bada, Traditional Medicine, Lore Lindu Biosphere Reverse

BOT/O-025

MOLECULAR DOCKING STUDIES OF ALKALOID FROM SANREGO (Lunasia amara Blanco) AS ANTIDIABETES THROUGH ALPHA AMYLASE INHIBITOR

Adriani[*1,2], Noorhamdani[3], Sri Winarsih[3], Tri Ardyati[4]

[1]Doctoral Program of Medical Science, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia
[2]STKIP Pembangunan Indonesia, Makassar, Indonesia
[3]Departement of Microbiology Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia
[4]Departemen of Biology, Faculty of Mathematics and Science Universitas Brawijaya, Malang, Indonesia
[*]Corresponding email: adrimarsya@gmail.com

ABSTRACT

One of the plant active compounds that acts as an antidiabetic is an alkaloid. Sanrego plants (lunasia amara) contain alkaloids and have been used by the people of south Sulawesi for a long time as antidiabetic. Alkaloid in the form of lunacrine, lunacridine and skimmianine in Sanrego plant is thought to act as an antidiabetic, but until now no information about this. The aim of this study was to predict the ability of lunacrine, lunacridine and skimmianine as antidiabetic through alpha amylase inhibitors. Molecular docking begins with downloading ligands (lunacridine, skimmianine) and receptors (alpha amylase) from Pubchem online services and Protein Data Base (PDB) in sequence. Enzyme preparation using pymol, followed by docking, visualization and enzyme interactions using pyrx, pymol and ligplot software. Based on the molecular results of docking, it is known that lunacrine, lunacridine and skimmianine have potential as alpha amylase enzyme inhibitors. The inhibition values were respectively -7.9, -7.2 and -6.7, these values were still below of the acarbose control value of - 9.7. Alkaloid (lunacrine, lunamarine and skimmianine) from the sanrego plant has the potential to be antidiabetic through alpha amylase enzyme inhibitors. Keywords: lunacridine, skimmianine, lunacrine, alpha amylase inhibitor, Lunasia amara

BOT/O-026

Improvement of Herbal Research with Bioinformatics in Pharmacy Student Faculty of Pharmacy University of Surabaya

Marisca Evalina Gondokesumo [(1)*], Yulanda Antonius [(2)], Oeke Yunita [(1)]

[(1)] Faculty of Pharmacy, University of Surabaya, Surabaya, Indonesia
[(2)] Faculty of Biotechnology, University of Surabaya, Surabaya, Indonesia
*Corresponding email: mariscaevalina@gmail.com

ABSTRACT

Improvement of Herbal Research with Bioinformatics in Pharmacy Student Faculty of Pharmacy University of Surabaya Marisca Evalina Gondokesumo1, Yulanda Antonius2, Oeke Yunita1 1Faculty of Pharmacy, University of Surabaya, Surabaya, Indonesia 2Faculty of Biotechnology, University of Surabaya, Surabaya, Indonesia ABSTRACT Bioinformatics is a combination of biological study and information engineering. It can be widely applied to various studies, especially in the medicinal study to explore the herbal medicine towards drug delivery. By knowing the benefits of various herbs, especially Indonesian endemic plants or plants with lack of function, bioinformatics acts as a mediator to increase the awareness of plant conservation.The pharmaceutical studies are closely related to the process of exploration of natural compounds for drugs development. However, the bioinformatics topic at the Faculty of Pharmacy University of Surabaya still needs to be improved due to the limited number of the lecture. Moreover, this topic is highly needed for pharmacist.Therefore, applicable learning and fun approachthrough the three golden stages of the workshop was conducted. It consisted of introduction, practice course, and deepening research application. In brief, 95 pharmacist students were addressed as a subject in this research. They were handed by questionnaire I (before workshop) and questionnaire II (after workshop) to measure the success rate of learning. Result showed that 72% student never know about bioinformatics but they have strong courage to learn which proved by high interest ratein bioinformatics (78%) and herbal exploration (72%), respectively. Most of student was actively engaged in every step of workshop by asking questions and directly practice for using the tools that specially directed for herbal exploration. In the end of workshop, the

interest rate of student to bioinformatics was reached 96%. It was in line with the understanding rate of the tools usage in advance research. Therefore, it concluded thatthe workshop withthis three golden steps was successfully boosting not only the interest and skill of student in bioinformatics but also the awareness of herbal conservation. Keywords: Conservation, herbal medicine, post-questionnaire, pre-questionnaire, workshop

BOT/O-027

Comparative Study of Leaf Stomata Profiles among Different Genomic Groups of Banana (Musa L.)

Itsar Auliya[1], Lia Hapsari[*2], Rodiyati Azrianingsih[1]

[1]Biology Department, Mathematics and Natural Sciences Faculty, Brawijaya University, Malang
[2]Purwodadi Botanic Garden – Research Center for Plant Conservation and Botanic Gardens, Indonesian Institute of Sciences, Pasuruan
[*]Corresponding email: hapsari.lia@gmail.com

ABSTRACT

Indonesia possessed high diversity of bananas both wild species and cultivars which need to be clearly classified. Stomata are pressumable to be a potential taxonomic differentiating character. This study was aimed to describe the leaf stomata characteristics of banana from different genomic groups, to analyze its clustering pattern, and to confirm the potential character of leaf stomata as a taxonomic marker. Plant materials used in this study were twelve banana leaf; representing 6 genomic groups (AAw, AAcv, AAA, AAB, ABB, ABB and BBw). Stomata observation was carried out by replica method on both adaxial and abaxial parts of the leaf near to petiole. Results showed that stomata density on abaxial was higher than adaxial. Stomata size on triploid bananas were larger than diploid bananas. Ratio length to width on triploid bananas were also higher and have a more of an oval shape compared to diploid bananas (rounded). Stomata density in bananas with B genomes were higher on abaxial but lower on adaxial. Bananas with more than one A genomes have larger stomata openings. Each level of ploidy and genomic groups of banana examined tend to have different characteristics of leaf stomata. Thus, it can be used as a complementary character to classify among different genomic groups of banana. Keywords: banana, characteristic, genome, leaf, stomata

BOT/O-028

Diversity and Population Structure Pea (Pisum sativum L.) Landrace Based on Morphological Data for Indigenous Biodiversity Conservation and Breeding in Indonesia

Budi Waluyo[*1], Sri Lestari Purnamaningsih[1], Siti Nurul Hikmah[1], Mayang Ayudya Handini[1], Darmawan Saptadi[1], Chindy Ulima Zanetta[2]

[1]*Department of Agronomy, Faculty of Agriculture, Universitas Brawijaya, Malang, 65145, Indonesia*
[2]*School of Life Sciences and Technology, Institut Teknologi Bandung, Bandung, 40132, Indonesia*
[*]Corresponding email: budiwaluyo@ub.ac.id

ABSTRACT

Pea (Pisum sativum) was cultivated in several regions of Indonesia. It uses local cultivation systems and cultivation was carried out in highlands. Pea landrace was collected from North Sumatra, West Java, and East Java. The research objective was to measure diversity and population structure pea accessions based on morphological data that could be used as the basis of indigenous biodiversity conservation and application of plant breeding methods in Indonesia. The study was conducted in February - May 2019 at Seed Bank of Agro Techno Park, Universitas Brawijaya. The accessions was planted in a single row. Every accession was evaluated for morphological traits. Data analysis was done by multivariate statistical approach to measure variability and genetic distance. There is high variability in character of Indonesian pea. Grouping and distribution of local germplasm are obtained from different regions. It shows existence of landrace divergences due to local adaptation in certain geographical areas. Some of them also spread to other regions due to the movement of seeds by humans. This indication means that conservation is needed to empower local genetic resources. Divergences between regions and between individual accession makes it possible to make genetic recombination to bring out new superior characteristics of peas.

Zoology (ZLG)

ZLG/O-001

Comparison between Indonesian Local Ettawah Goats derived from Natural Service and Artificial Insemination based on Repeated T-Nucleotide

dawamah Mudawamah[1*], M. Zainul Fadli[2], Gatot Ciptadi[3], and Usman Ali[1]

[1]*Faculty of Animal Husbandry, University of Islam Malang, Indonesia*
[2]*Faculty of Medical, University of Islam Malang, Indonesia*
[3]*Faculty of Animal Husbandry, Brawijaya University Malang Indonesia*
[*]Corresponding email: mudawamah@gmail.com

ABSTRACT

Indonesian Local Ettawah Goat (ILEG) is a Local Indonesian goat which was grading up for decades between Ettawah bucks and Local Kacang does. The ILEG population based on the mating system is divided into two groups: natural mating goats (NSG) and artificial insemination goats (AIG). This study aimed to compare the number of Repeated T-nucleotides sequenced from NSG and AIG. The method of this research was an experiment using RAPD with primary OPA-19 followed by sequencing. The variable observed was the number of repeated T-nucleotide, replicating five times each group was analyzed by unpaired t-test using SPSS PASW Statistic 18 software. The results showed that repeated T-nucleotide, namely TT (T2) to T14 was found in NSG and TT (T2) until T12 was found in AIG. From the unpaired t-test, it showed that NSG was significantly different ($P < 0.05$) compared to AIG based only on repeated-T3 (TTT) Nucleotide. Whereas repeated-T2, T4-T12 were not significantly different ($P > 0.05$) between NSG and AIG. It was concluded that repeated-T3 (TTT) from AIG was significantly higher by 90.91% compared to NSG. Repeated-T3 (TTT) has a chance as a candidate of a microsatellite marker in ILEG. Keywords: Goat, sequence, RAPD, OPA-19, Thymine

ZLG/O-002

OPTIMIZATION OF MAKING BREAST CANCER MODEL RATS USING 7,12-dimethylbenz (a) anthracene (DMBA) INDUCTION

Zauhani Kusnul H

Pamenang Institute of Health Science (STIKES PAMENANG)
*Corresponding email: zauhani.kusnul@gmail.com

ABSTRACT

Animal models have an important role in health research, ideal animal models must have similarities with the original disease in humans. This research is a preliminary study to optimize the procedure for making breast cancer rat with 7,12-dimethylbenz (a) anthracene (DMBA) induction. total of 10 Sprague-Dawley rats virgin, aged 45–50 days, received 2 x 10 mg of DMBA subcutaneous injection, at one-week intervals. Further, a week later each rat was also given a gastric sonde of 5 mg DMBA. Four rats without DMBA served as negative control. To ensure breast cancer at week 8th five rats DMBA-induced and two negative controls were randomly selected and euthanized. Their breast tissue was then dissected for histological analysis by hematoxylin-eosin staining. We found that breast ductal cell morphological changes were apparent in DMBA-treated rats but had not been diagnosed as having breast cancer. Next 3 weeks later from each breast tissue one slice is made in the medial section cutting the papillae part of the breast. The results of histopathological examination with hematoxylin-eosin staining of rat breast tissue at week 11th after DMBA induction appeared to have undergone a very real change. The shape and boundary between the ducts from one another are not obvious, this occurs because ductal epithelial cells proliferate rapidly to meet the ductal lumen and surrounding area. This process produces mass formation of cells that form tumor tissue. From this study we found that 100% of mice with 2 x 10 mg DMBA of 7.12-dimethylbenz (a) anthracene (DMBA) subcutaneous injection, at one-week intervals and booster by gastric sonde of 5 mg DMBA had breast cancer in week 11th. Keyword: Breast cancer model, DMBA

ZLG/O-003

DIGITAL BOOK DEVELOPMENT IN LOCOMOTOR SYSTEM MATERIAL

Yulilina Retno Dewahrani[1], Mahrawi Suprapto[2], Daniar Setyorini[1]

[1]*Dept. of Biology Education, Universitas Negeri Jakarta*
[2]*Dept. of Biology Education, Universitas Sultan Ageng Tirtayasa Banten*
*Corresponding email: yulilinaretno@yahoo.co.id

ABSTRACT

Indonesia is ranked 9th largest paper producing country in the world. It's paper production, which is increasing year by year, can be an opportunity to develop Indonesia's economy to be superior. But the increase in paper production is a threat to forest sustainability because the paper's raw material is wood. Along with the development of technology in the world of Education, technology-based learning media emerged, such as digital books. This product is a breakthrough in the world of education to be able to make an innovation that will have an impact on increasing students' interest in learning Biology material while minimizing the use of paper in textbooks at school. Biology is a subject field which has several complicated materials and is often considered difficult for students. Data obtained through questionnaires reveal the fact that the locomotor system is one of the heavy materials due to its complexity. That is why development in creating a digital book is strongly needed to strengthen and maintain students' understanding. The purpose of this study was to find out whether a newly developed digital book can help the students in understanding materials in Biology subject, especially on the locomotor system. The method used in this study was research and development method. The subjects were Biology teachers and XI grade students of Science in senior high school. Questionnaires were used to analyze students' need to understand on locomotor system material. The module had passed the feasibility test by materials, media, and language expert before was given to the research subjects. The result showed that this product was exciting, has a brief explanation, and the instructions were easy to follow, and were helpful for them in studying the material both at school and at home. Furthermore, it can strengthen and maintain students' understanding and increasing cognition analysis.

ZLG/O-004

Survival Rate and Quality of Zoea Phronima Suppa (Phronima sp) with the Cryptobiosis Application

Muhammad Hattah Fattah[1,*)], Siti Rahbiah Busaeri[2)], dan Alan Munandar[1)]

[1)] *Department of Aquaculture, Fisheries and Marine Science Faculty*
[2)] *Department of Agribusiness, Agriculture Faculty*
Universitas Muslim Indonesia (UMI) Makassar
[*]Corresponding email: muhhattah.fattah@umi.ac.id

ABSTRACT

Phronima suppa (Phronima sp) application on hatchery and cultivation has succeeded in increasing the survival, growth, and production of black tiger shrimp (Penaeus monodon). Phronima has great potential in improving the performance of the national and global shrimp industry while also substituting the use of Artemia salina. Phronima suppa lives endemic in Tasiwalie Village and Wiringtasi Village in Pinrang District, South Sulawesi Province. Phronima suppa distribution to various regions and countries is constrained by storage systems using water media. Phronima dorman's biomass production is an effective solution to the constraints of storage and transportation. The application of cryptobiosis produces low temperature stress to produce dormant Phronima. This study aims to determine the effective temperature and activation period to produce dormant Phronima biomass. The study was conducted in May to August 2017 at the Phronima suppa Installation of Universitas Muslim Indonesia in Tasiwalie Village. The treatments in this study were three and each with three replications. The treatment of cryptobiosis in the first phase of the study consisted of temperature levels of 8 oC, 4 oC, and 0 oC. The activation period of dormant Phronima biomass with the application of cryptobiosis at a temperature of 8 oC in the second phase of the study was 3 hours, 8 hours, 13 hours and 24 hours activation period. The highest biomass survival (60%) was generated in the 24 hour activation period. Keywords : Phronima Suppa; Cryptobiosis; Black Tiger Shrimp

ZLG/O-005

Structural Coloration Observation that Produced Iridescent Blue Color on Javan Peacock (*Pavo muticus muticus*) Tail Feather using SEM and Polarization Microscopy

Naqiyah A. Mulachelah[*1], Sutiman B. Sumitro[2], Dionysius J.D.H. Santjojo[3]

[1]*Undergraduate Student, Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[2] *Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[3] *Department of Physics, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: nanamch97@gmail.com

ABSTRACT

Javan peafowl is one of Indonesian endangered species. Peafowl acknowledged for its particular pattern tail feather and its striking appearance. The melanin pigment indicates that, instead of colorful, this bird color should be around black, brown or dull red. Moreover, the color is iridescent, it changes when discerned from different angles. Among the colors, blue is remarkable because there is almost no pigment that could produce a blue color in nature. The purpose of this research is to explain how the iridescent blue color on Javan peacock could be produced. SEM was used to observe the sample's nanostructure. Polarization microscopy was used to support the hypothesis. The sample also poured with solutions to prove the non-pigment coloration. The result shows that the iridescent blue originated by the changing of the light character after it interacts with the feather's nanostructure. The order of melanosome, air hole, and keratin created difference refractive index so physical phenomenon would occur to produce one certain color, bluish. The phenomenon called multilayer thin-film interference. Polarization observation has also supported this concept. Pouring with solutions with higher refractive index causes the sample color to change to higher wavelength color. Keywords: green peafowl, SEM, structural coloration, polarization

ZLG/O-006

The effect of Moringa oleifera Lam leaf extract fermented by lactobacillus plantarum on the expression of B220 + cells and CD11b + cells in mice infected with Salmonella typhi

MM Riyaniarti Estri Wuryandari [*1,2], Nashi Widodo [1], Edi Widjajanto [1], Muhaimin Rifa'i [1]

[1] *Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[2]Department of Biology, FSTA, Institut Ilmu Kesehatan Kediri, Indonesia
[*]Corresponding email: rifa123@ub.ac.id

ABSTRACT

ABSTRACT Defense against pathogens is essential for survival and it is controlled by the innate and adaptive immunity. Phagocytosis is a complex mechanism which involved the activation of macrophages and its cytokines, stimulated T cells, then activation of B cells. M. oleifera plants are thought to have immunostimulatory properties due to its complex nutrients and phenolic acids and flavonoids contents as phytochemicals. Lactobacillus plantarum is able to produce lactic acid as the final product to reform carbohydrates, hydrogen peroxide, and bacteriocin as antimicrobial substances, which lead to inhibit pathogenic bacteria. This researched aims to evaluate the CD11b+ and B220+ population after S. typhimurium infection with/without administration of M.oleifera leaves extract. S. typhimurium was labeled with CFSE to determine phagocytosis activity. This experiment used was a complete randomized factorial pattern design. Mice were divided into two groups, namely the without treatment group and treatment group mice (fermented red M. oliefera leaves extract dose 84 mg/kg BW) and infected by S. typhimurium. Data analysis was confirmed with the one-way ANOVA test followed by Tukey test ($p<0.05$). The results showed that fermented red M. oleifera leaves extract increase the number of CD11b+and B220+ at the time of 2 hours and 4 hours. Key words: B cells, Macrophage, M. oleifera, S.typhimurium, Lactobacillus plantarum

ZLG/O-007

Apoptotic and Necrotic Lymphocytes after Treatment of Stem Bark Extract of Plumeria rubra L Invitro

Nur Kuswanti[12], Sri Widyarti[1], Widodo Widodo[1], Muhaimin Rifa'i[*1]

[1] *Biology Department, Faculty of Mathematics and Science, University of Brawijaya, Malang, Indonesia*
[2] *Biology Department, Faculty of Mathematics and Sciences, Universitas Negeri Surabaya, Surabaya, Indonesia*
[*]Corresponding email: immunobiology.ub@gmail.com

ABSTRACT

Based on its LC50, stembark extract of Plumeria rubra L was not toxic to lymphocytes. The goals of this experiment were to determine the effect of stem bark extract of P. rubra L doses on apoptotic and necrotic lymphocyte percentages. The cells were isolated using density gradient configuration method to PBMCs. Then, they were cultured in well plates and treated with cisplatin and the stem bark ethanolic extract of P. rubra L in 0, 20, 130, 240, 350, 460, and 570 µg/mL. After 24 hours incubation, the lymphocytes in each sample were stained using annexin V and propidium iodide reagents and ran in a flow cytometer. The data gained were analyzed statistically using Kolmogorov Smirnov, one way ANOVA, and LSD tests. The results showed that there were significant apoptotic cell percentage differences ($p<0.05$) among treatments ($p<0.05$), with the lowest of $2.22 \pm 0.25\%$ and the highest of $14.36 \pm 1.06\%$. However, the necrosis' was no different, with the lowest of $0.52 \pm 0.18\%$ and the highest of $1.85 \pm 0.58\%$. In conclusion, the extract affect the percentage of apoptotic lymphocytes, on the contrary, did not influence the necrotic cells'.

ZLG/O-008

First Record of Two Known Species of Mylonchulus Cobb, 1916 (Nematoda: Mylonchulidae) from South Kalimantan

Abdul Gafur

Department of Biology, Faculty of Mathematics and Natural Sciences, Lambung Mangkurat University, Banjarbaru, Indonesia
*Corresponding email: agafur@ulm.ac.id

ABSTRACT

Soil nematode community structure has been demonstrated to determine and reflect soil conditions. Information on nematode fauna of a region not only contribute to biogeography, but also signal possible nematode challenges to land use and possible use of nematode as biocontrol and as soil bioindicator. The present study is a part of the South Kalimantan Nematode Biodiversity Project, an initiative to inventory of nematode species in the province. Three known species belonging to the genera Mylonchulus Cobb, 1916 and Paramylonchulus Jairajpuri & Khan, 1982 are described: Mylonchulus brachyuris (Butschli, 1873) Cobb, 1917; Mylonchulus ananasi Yeates, 1992; and Paramylonchulus mulveyi (Jairajpuri, 1970) Jairajpuri & Khan, 1982. These are the first record of existence of the three species in South Kalimantan. Morphological characters of the specimens from South Kalimantan generally fit the original and further descriptions of the species. Some deviations are considered intraspecific variations, and redescriptions of the corresponding species are proposed. Keywords: biodiversity, identification, mononchida, nematode collection, predatory nematodes

ZLG/O-009

GOAT OOCYTES QUALITY AFTER VITRIFICATION USING DIFFERENCE OF GLYCEROL CONCENTRATION AND EXPOSURE TIME

Sri Wahjuningsih, Gatot Ciptadi, Muhammad Nur Ihsan, Ardyah Ramadhina Irsanti Putri,Hely Nurul Karima

Faculty of Animal Science, University of Brawijaya,Malang,Indonesia
*Corresponding email: yuning@ub.ac.id

ABSTRACT

The aim of the study was to analyze the effect of glycerol intracellular cryoprotectant concentration and the length of exposure to the morphology of oocytes after cryopreservation using the vitrification method. The research material was Mt-II goat oocytes which had been carried out in IVM media in 24 hours. The study design used a completely randomized design of factorial patterns of 6 x 3, the first factor was glycerol concentration 0,15, 20, 25,30, and 35% and the second factor was the exposure time of 1,3,5 minutes. Data analysis uses analysis of variance. The results showed glycerol concentration and exposure time had an effect (P <0.05) on oocyte morphology. The percentage of normal oocyte morphology resulted from vitrification using 25% glycerol concentration and 3 minutes exposure time.

ZLG/O-010

Developmental Response of Spodoptera litura Larvae due to Exposure of Leaf Extracts of Two Papaya Cultivars

Sofia Ery Rahayu*(1), Amin Setyo Leksono(2), Zulfaidah Penata Gama(2), and Hagus Tarno(3)

(1) Dept. of Biology, Faculty of Matemathics and Natural Sciences, Universitas Negeri Malang, Malang, Indonesia
(2) Dept. of Biology, Faculty of Matemathics and Natural Sciences, Brawijaya University, Malang, Indonesia
(3) Dept. of Plant Pests and Diseases, Faculty of Agriculture, Brawijaya University, Malang, Indonesia
*Corresponding email: sofia.ery.fmipa@um.ac.id

ABSTRACT

Thailand and Ungu Papaya cultivar is cultivated in East Java. The purpose of the study was to determine the developmental response of Spodoptera litura larvae due to exposure of papaya leaf extract of Thailand and Ungu cultivar. Papaya leaves were taken from the upland and lowland. The leaf were extracted using maceration method with methanol as solvent. S. litura larvae treated during instar phase 2. Feed leaves sprayed with 2 kind of papaya leaf extract. The indicator of the development of S. litura larvae is the success of pupae into imago. The results showed that papaya leaf extract caused larval mortality and variations in pupae conditions (normal pupae, failed pupae, or damaged pupae). Unlike the control treatment, some of the larvae were unsuccessfully developed into pupae. The sexing of normal pupa were found to be 1: 1 ratio in the treatment of papaya leaf extract from the upland. Around 10% of pupae of each kind papaya leaf extract treatment failed to hatch into imago. Inhibition of the development of S. litura larvae into imago is suspected due to active compounds contained in the extract. This results support the potential of papaya leaves extract as bioinsecticides against S. litura larvae. Keywords: developmental respon, Spodoptera litura larvae, leaf papaya extract, Thailand and Ungu cultivar papaya

The Recovery Rate Of Simmental Sperm Frozen Of Post Thawing By Using Tris Dilution With Different Egg Yolks

Yendraliza [*(1)], Yose Hendriyanto[(1)], Dewi Ananda Mucra[(1)], Zumarni [(1)], Muhammad Rodiallah [(1)]

[1]*Departemen Animal Science, Faculty of Agriculture and Animal Science, State Islamic University Sultan Syarif Kasim Riau, Pekanbaru, Indonesia*
[*]Corresponding email: yendraliza@uin-suska.ac.id

ABSTRACT

The yolk content of each poultry varies so that the quality of sperm diluents from various egg yolks will also vary. The purpose of this study was to determine the effect of the use of broiler, duck, and quail egg yolks in Tris dilution to the quality of Simmental semen. Semen used in this study used semen Simental Cattle from the Regional Technical Implementation Unit of the Artificial Insemination Center of Tuah Sakato, Payakumbuh. The research used a completely randomized design (CRD) of three treatments with ten replications. The results of the research showed that the use of different egg yolk diluent gave a significant effect in motility values, life percentage, intact plasma membrane, recovery rate and abnormalities sperm Simmental. Conclusion, the use of duck egg yolk in Tris dilution was able to maintain the quality of Simmental frozen semen with motility values (43.00%), abnormalities (13.33%), percentage of life (45.17%), intact plasma membranes (54.67 %), and Recovery rate (57.33%). Keywords: abnormality, intact plasma membrane, motility, viability.

ZLG/O-012

Reproductive Characters and Performance of Swamp Buffalo in Dry and Wet Condition Area in Small Holder Farmer in Lumajang Regency, East Java.

Gatot Ciptadi[1], Ayu Mahesa Sabila[2], Yoga Dwi Agung[2], Mudawamah[3], Ardyah Irsanti Putri[1], Helly Nurul Karima[4], and Agus Budiarto[*] [1]

[1]Departemen of Animal Production, Faculty of Animal Sciences, UB
[2]Student of Animal Sciences Faculty, UB
[3]Faculty of Animal Husbandry, Unisma, Islamic University of Malang
[4]Laboratorium of Life Sciences, UB
[*]Corresponding email: budiartoagus57@gmail.com

ABSTRACT

The purpose of this field research was to study the reproductive character and performance of swamp buffalo in dry and wetland area at the traditional system rearing of smallholder farmers in Lumajang, East Java. Both of the area namely Jatiroto and Tempursari villages was considered to be selected not only different microclimate condition but also of the important implementation of artificial insemination was started in this location. The method used in this research is a survey and a case study. Variable observed were Service per conception (S/C), Days open (DO) Interval of Calving (CI) and Reproductive Efficiency (ER) and data were analyzed descriptively. Animal observed were 53 heads of buffalo. The result of the reproductive character showed that: (1). the S/C in two different area is 2.26 + 0.59 and 2.51 + 0.69., (2) DO is 115.16 + 16.76 days and 122.37 + 19.54 days, meanwhile the CI of buffalo are 481.87 + 30.01 days and 505.85 + 18.44 days. However, base on the performance of ER which 1.52 + 0.45 and 1.84 + 0.72 % were considered lower than normal. In general, the performance of swamp buffalo in both locations is categorized low. Implementation of Artificial insemination (AI) faced in the problems of poor recording. It was concluded that the different condition of both areas was not influenced by the character and reproductive performance of swamp buffalo. Keywords: Reproduction, Buffalo, East Java, Artificial Insemination, Performance.

Development of Archipelago Entomology Module Based on Research of Genetic Diversity of Ornithoptera spp. In Khairun University

[1]Ade Haerullah, [2]Abdu Mas'ud , [2]Said Hasan, [2]Sundari[*],

[1,2]Departement Biology Education, Faculty of Teacher Training and Education, Khairun University, Street Pertamina Kampus II Unkhair Gambesi City of South Ternate, North Maluku 97728 Indonesia.
[*]Corresponding email: sundari@unkhair.ac.id

ABSTRACT

Research and development aims to produce module based research on material Entomology of archipelago. The method used in the research and development followed development model Borg and Gall (1983), which consists of seven stages. The research object using fresh graduated students who are taking Entomology of lesson. Measurement of the effectiveness of the module used gain score, The results of the validation of media expert is 81.17%, while the results of the validation of module contains experts is 90%. The test results readability is 90.84%. The test results showed the effectiveness of module is 0.78, it means included medium criteria. Keywords: module, research, Entomology of Archipelago

Life Cycle of Ornithoptera croesus Endemic Buttons of Bacan Islands on Plants of Mussaenda and Assoca

[1]Abdu Mas'ud, [2]Ade Haerullah, [2]Said Hasan, [2]Sundari[*],

[1,2]Departement Biology Education, Faculty of Teacher Training and Education, Khairun University, Street Pertamina Kampus II Unkhair Gambesi City of South Ternate, North Maluku 97728 Indonesia.
[*]Corresponding email: abdumasud@unkhair.ac.id

ABSTRACT

This research has been done from July to October 2010. The research goal was to know the life cycle of Ornithoptera croesus endemic butterflies on Mussaenda and Asoka as a host plant, by using exploration method, starting from egg until imago. The eggs were collected from Mussaenda and asoka plantation, in Bacan island, and kept into the Laboratory of Biology at Faculty of Teacher Training and Educatuion Khairun University for further observation. The result shown that there were two species that put their eggs on Mussaenda and Asoka 's leaf as a host plant, they were Ornithoptera croesus. Life cycle of Ornithoptera croesus was 28-32 days; 3 days for stage of egg, 14-16 days for larvae stage, 1 day for prepupae, and 9-11 days fot pupae stage. Key word: life cycle, butterfly, hostplant, Ornithoptera croesus

ZLG/O-015

Reproduction Index of Kacang goats at different parities in closed population in Buduran Village, Sidoarjo, East Java, Indonesia

Suyadi*[1], M Nasich [2]

[1] *Dept of Animal Reproduction*
[2] *Dept of Animal Production*
*Corresponding email: suyadi@ub.ac.id

ABSTRACT

Kacang goat is believed as the main genetic source of all goat breeds that exist at present day in Indonesia. Crossing Kacang goats with exotic breeds results different breed at present known such as Peranakan Etawah (Eatawah Crossbred), Bligon goats and Senduro goats. Concervation and development of Kacang goat is important to serve genetic resources of local goats for good development of goats in the future. This study was to evaluate the reproduction index of Kacang goats at different parities in closed population of Sidoarjo Regenecy, East Java Province. A total of 146 mature female Kacang goats were randomly selected from around 2000 total population. Due to limited records, data were collected by interview and discussion with farmers. Most of dam delivered single kid (67.80%), and the others twin birth (30.13%) and triplet (2.05%). Litter size tended to increase from parity 1 to 6, and slight declined at parity 7, with average of 1.34 ± 0.51. Pre-weaning mortality decreased by increasing ages ranging from 11.36% to 31.25%. Kidding interval and days open were not affected by parity with average of 7.41 ± 0.99 and 2.41 ± 0.99. Reproduction index of dams increased from parity 2 to 7, although not significant difference was observed with average of 1.69. Kacang goats were well adapted at Sidoarjo Regency with good reproductive performances, and the Reproduction Index of dam were increasing by the age or parity of dam.
Keywords: Kacang goats, reproductive performances, reproductive index.

Genetic Characteristics of Whale Shark Rhincodon typus based on fragment mitochondrial COI gene sequences

Abdul Hamid A. Toha[*1,6], Muhammad Dailami[2], Saiful Anwar[3], Juswono B. Setiawan[4], Yusup Jentewo[5], Ida Lapadi[1], and Ambariyanto[6]

[1]*Fisheries Department, Faculty of Fisheries and Marine Science, University of Papua, Manokwari, Indonesia*
[2]*Aquaculture Department, Faculty of Fisheries and Marine Science, University of Brawijaya, Malang, Indonesia*
[3]*Central of Cenderawasih Bay National Park, Malang, Indonesia*
[4]*World Wildlife Fund-Indonesia, Manokwari*
[5]*Marine Science Department, Faculty of Fisheries and Marine Science, University of Papua, Manokwari, Indonesia*
[6]*Marine Science Department, Faculty of Fisheries and Marine Science, University of Diponegoro, Semarang, Indonesia*
[*]Corresponding email: h.toha@unipa.ac.id

ABSTRACT

The whale shark is the world's largest fish, but little is known about its genetic characteristics. The aim of the study was to sequence and to characterize of the R. typus COI gene fragment from Cenderawasih Bay, in order to accurately compare with the COI from the global. We looked for COI sequences from Genbank. Skin samples were also collected by biopsy for live animals in Cenderawasih Bay. Using sequencing, we determined genetic characteristics from 28 individuals. The determined COI is a 669 bp, comprising of A = 26.47%, T/U = 30.49%, C = 28.34%, and G = 14.71%. We identified 41 cutting sites of all the sequences ranged in size from 5-7 bp long. We also identified 1 COI single nucleotide polymorphisms and 2 haplotypes. There was single site substitution change from T to C for both haplotypes. Overall, the haplotype diversity (Hd), and nucleotide diversity (Pi) were relatively low (Hd= 0.137, Pi =0.0002). We found 17 COI sequences from several countries in the GenBank. They have different number and arrangement of the sequences with Cenderawasih Bay. The availability of sequence of whale shark will contribute to aid further studies of phylogeography and conservation genetics in this species.

Conservation Ecology (ECO)

ECO/O-001

Internal Bioeroders in Skeleton Massive Coral Porites lutea of South Java Sea

Oktiyas Muzaky Luthfi[1, a)], Rosdianto[2] and RM. Agung M. Rizqon Sontodipoero[1,b)]

[1]Department of Marine Sciences, Faculty of Fisheries and Marine Sciences, University of Brawijaya, Veteran Street, Malang, Indonesia 65145
[2]Marine Science, East Kutai Agricultural College School (STIPER), Jl. Soekarno Hatta, Tlk. Lingga, Sangatta, Kabupaten Kutai Timur, Kalimantan Timur 75683, Indonesia
[*]Corresponding email: omuzakyl@ub.ac.id

ABSTRACT

Coral Porites lutea had well distributed in the periphery of South Java Sea area. These corals become an important natural barrier to reduce wave force and strong current from the Indian Ocean protected shoreline from abrasion and many non-sessile organisms from dangerous of strong water movement. The accretion process of P. lutea growth some time disturbed by the presence of boreholes of bioeroders, that weakness of coral structure by removing their calcium carbonate. In this research, we choose the different environments that used as utilization area (Sendang Biru) and non-utilization area (Kondang Merak). Eight colonies of P. lutea with 40 cm in diameter was carried out from these areas, slabbed and photographed using X-ray. The result showed that coral from P. lutea was invaded by bivalve, worms, barnacles, bacteria. In term of ecology, the bioerosion process is balancing system of accretion and destruction. Bioerosion from internal bioeroders can remove up to 9 kg calcium carbonate during a year from coral and convert it into the sediment.

ECO/O-002

BIODIVERSITY CONSERVATION OF EPIPHYTE ORCHIDS IN THE NATURAL HABITAT FOR SUSTAINABLE BIOECONOMY

Lita Soetopo[1*], Tutik Sri Rejeki[2] and Noorfakhriyah Ashanti N[3]

[1] *Laboratory of Plant Breeding,Department of Agronomy, Faculty of Agriculture. Brawijaya University, Malang*
[2] *Laboratory of Plant Breeding,Department of Agronomy, Faculty of Agriculture. Brawijaya University, Malang*
[3] *Laboratory of Plant Breeding,Department of Agronomy, Faculty of Agriculture. Brawijaya University, Malang*
[*]Corresponding email: lita.fp@ub.ac.id

ABSTRACT

ABSTRACT Epiphyte orcids grow abundantly in tropical rainforests. To save the existence of epiphyte orchids, it is necessary to keep them from the threat of extinction. Some efforts that could be done is by conducted periodically exploration and conservation activities. Objective of this research was to gather information on the biodiversity of epiphyte orchids at Tahura R Soeryo and supported by exploration data in 2006. Exploration of epiphyte orchid at Jogging Track and Coban Watu Ondo, Tahura R. Soeryo, East Java was conducted in May-June 2019. The research method was descriptive-exploration with random sampling method. Exploration results at Tahura R Soeryo South Mt Arjuno Lalijiwo in 2006 found epyphyte orchids 14 genus, 33 pecies, 343 populations; highest IVI Dendrobium nudum 32.01; lowest IVI Liparis caespitosa, Schoenorchis juncifolia and Thrixspermum aff subulantuntum 1.05. At East Mt Anjasmoro found 18 genus, 34 species, 1175 populations; highest IVI Trichostosia annulata 48.21; lowest IVI Ceratostylis andjasmoroensis 0.73. In 2019 at Jogging Track site found epifit orchids 14 genus, 53 species, 5545 populations. Highest IVI Appendicula elegans 35.55; lowest IVI Agrostophyllum sp, Bulbophyllum sp and Dendrobium tenellum 0.24 with Shannon-Wiener Index 2.73. At Coban Watu Ondo site 14 genus, 37 species, 2352 populations. Highest IVI Eria vericulosa 20.33; lowest IVI Oberonia similis, Bulbophyllum sp, Pholidota carnea, and Appendicula sp 0,40. with Shannon-Wiener Index 2.86. It concluded that biodiversity of epyphyte orchids at Tahura R. Soeryo East Java Indonesia is moderately

diverse. Its conservation also maintained well. Some epyphyte orchids have bioeconomy potential as raw material for perfume. Keywords :biodiversity, conservation, bioeconomy, epiphyte orchids.

ECO/O-004

Diversity and Distribution of Sea Slugs (Gastropoda: Heterobranchia) in Sempu Strait, Indonesia

Anthon Andrimida[*1], Rudi Hermawan[2]

[1]*Deptartment of Marine Affairs and Fisheries of East Java, Surabaya, Indonesia*
[2]*Bhakti Alam Sendang Biru, Malang, Indonesia*
[*]Corresponding email: anthonandrimida@gmail.com

ABSTRACT

The heterobranch sea slugs are one of the most under-studied marine lifeforms found around the Sempu Strait Area. Currently, the records of their occurrences around this area are only known from the underwater macro photography enthusiast's collection and have not been published on a scientific article. We conducted underwater surveys spanning from October 2017 to June 2019 at eleven dive sites of Sempu Strait and yielded 46 different species of heterobranch sea slugs, including 35 species of Nudibranchia, 6 Aplysiida (Anaspidea), 2 Cephalaspidea, and 2 Sacoglossa. The analysis of the sea slugs occurrence on Sempu Strait reveals that the areas around the Western Sempu Strait, including Rumah Apung, Kondang Buntung, Tiga Warna, and Stumbut have the most diverse sea slugs species, even though the majority of the species have a low sighting frequency. The analysis also revealed that roughly a third of the sea slugs encountered on the Sempu Strait areas are found on the coral rubble substrate. This study revealed that Sempu Strait has a significant sea slug species diversity, which hopefully the records provided here could help to encourage macro-photography recreational dive activities to further develop the ecotourism sector around this area. Keywords: Distribution, Diversity, Heterobranch, Sea Slug, Sempu Strait

ECO/O-005

Effect of Rhizobium Inoculum and Liquid Organic Fertilizer on Growth and Yield of Peanut (Arachis Hypogaea L.) CV. Takar-2

Alfandi[1*], Siti Wahyuni[2] and Wida Wardatun Nisa[3]

[1,2,3]*Agrotechnology, Agriculture, Swadaya Gunung Jati Univ., Cirebon, Indonesia*
[*]Corresponding email: alfandi2008@gmail.com

ABSTRACT

ABSTRACT The purpose of this research was to know the interaction effect of Rhizobium inoculants and liquid organic fertilizer on growth and yield of Peanut (Arachis hypogaea L.) cv. Takar-2. The experimental design used Randomized Complete Block Design by Factorial pattern, with two factors and repeated three times. First factor is rhizobium inoculants with three levels (5, 10, 15 g kg -1 seed) per plots. Second factor is liquid organic fertilizer with three levels (0, 3, 6 ml/l water). The result showed that there was a significant interaction between Rhizobium inoculants and liquid organic fertilizer to number of filling pods per crop, weight of fresh pods per plot, and weight of dry pods per plot. Rhizobium inoculants gave rates significantly effect on plant height at 38 Days After Planted (DAP), number of leaves per crop, number of branches per crop at 33 and 38 DAP, root volume, number of root nodules and effective root nodules, number of ginofor, weight of fresh and dry pods per plot, and weight of 100 grains of dry beans. The concentration liquid organic fertilizer afect on number of ginofor number, weight of fresh and dry pods per plot, weight of 100 grains of dry beans. Keywords: Peanut, Liquid Organic Fertilizer, Rhizobium

ECO/O-006

Species composition of spiny lobsters caught at the South Sea of Pacitan of East Java, Indonesia

Arief Setyanto[1, 2*], W. Setyowati[1], Soemarno[2], DGR Wiadnya[1], C. Prayogo[2]

[1]*Faculty of Fisheries and Marine Science, Universitas Brawijaya, Malang-Indonesia*
[2]*School of Postgraduate, Faculty of Agriculture, Universitas Brawijaya, Malang-Indonesia*
[*]Corresponding email: a.setyanto@ub.ac.id

ABSTRACT

Indonesia is the largest archipelagic state with mixture oceanography and bio-geography diversity. Information of the distribution of marine organisms is necessary for their management. The national fisheries management authority of the Republic of Indonesian has set East Java Province in 2 management areas, namely WPPNRI 712 in the North (Java Sea) and WPPNRI 573 in the South (Indian Ocean). Pacitan regency lies at the South Sea of East Java and known as one regency with the highest lobster production in the region. One of the priority fishery groups in the management is a lobster fishery. Lobster is known as a fishery commodity with a very high economic, social and ecological value. This study aims to identify species composition of lobster caught in Pacitan's waters. The study will be fundamental information for connectivity study of the lobster in the region. Data was based on lobster catch from local fisher. Data collection was carried out in Tamperan, Pacitan regency of East Java. Data analysis was performed using ANOVA test. There are six species lobster found. Dominant lobster species are Panulirus homarus (Pasir), followed by P. penicillatus (Batu), P. versicolor (Bambu), P. longipes (Batik), P. ornatus (Mutiara), and the least dominant is P. polyphagus (Pakistan).

ECO/O-007

The Implication of Communities Against Coastal Water Pollution

Hasrianti[*1], Azis Nur Bambang[2], Maryono[3]

[1] *Doctorate Program of Environmental Science, School of Postgraduate Studies, Diponegoro University, Semarang, Indonesia*
[2] *Faculty of Fishery and Ocean, Diponegoro University, Semarang, Indonesia*
[3] *Department of Urban and Regional Planning, Diponegoro University, Semarang, Indonesia*
[*]Corresponding email: hasriantychemyst@gmail.com

ABSTRACT

The amount of population pressure in coastal areas is one of the factors causing damage to the aquatic environment. Damage to the coastal environment is dominated by oil pollution, mangrove damage, coastal abrasion and waste. This phenomenon indicates that communities activity is a major cause of damage to the coastal environment. This research aims to study the implication of communities in terms of knowledge, attitudes and behavior of coastal communities against coastal water pollution. The method used of survey, documentation, and interview to the coastal communities of Palopo City with a questionnaire guide. Questionnaire data analysis was carried out descriptively. The results of questionnaire data analysis indicate the implication of coastal communities in pollution. The low percentage of knowledge of coastal communities about management rules and the importance of maintaining the environment influences the attitudes and behavior of people who tend to waste waste disposal into the aquatic environment. Keywords: Coastal communities, pollution, coastal water

ECO/O-008

DIVERSITY AND CONSERVATION STATUS OF FISH IN THE WATER OF ROLAK SONGO DAM, MOJOKERTO DISTRICT EAST JAVA INDONESIA

Nuril Ahmad[1], Bagyo Yanuwiadi[2], Catur Retnaningdyah[2], Luchman Hakim[2]

[1] Students of the Biology Doctoral Study Program, Faculty of Mathematics and Natural Sciences Universitas Brawijaya and lecturers of Majapahit Islamic University

[2] Biology Department, Faculty of Mathematics and Natural Sciences Universitas Brawijaya, Malang

*Corresponding email: nuril21ahmad@gmail.com

ABSTRACT

ABSTRACT The purpose of this study was to analyze and describe the diversity and conservation status of fish in dam Rolak Songo which are located in Mojokerto District. Sampling of fish using gill nets was carried out during the dry and rainy seasons. Research result showed that in the dry season there were three species of fish, namely two endemic species of Brantas river (Channa sriata and Barbonymous gonivatus), and one exotic species (Oreochompis mossambica). While in the rainy season, we found four species of fish i.e Barbonymous gonivatus, Muysticus micronantus, Puntius bromoides (Brantas River endemic fish species), and Oreochompis mossambica (exotic fish species). Fish diversity in the water of Rolak Songo dam was low. Conservation status of these endemic fish (C. sriata, B.gonivatus, M. micronantus, and P.bromoides) is vulnerable (VU), while status of O. mossambica is least concern.

ECO/O-009

Refugia Effect toward Arthropods in a Organic Paddy Field in Malang, East Java

Zainal Abidin[1,2], Amin Setyo Leksono[2], Bagyo Yanuwiadi[2], Mangku Purnomo[3]

[1]*Department of Agrotechnology, Faculty of Sains and Tecnology, Islamic Raden Rahmat Univesity, Malang, Indonesia*
[2]*Departement of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang*
[3]*Departement of Social dan Economic, Faculty Agriculture, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: zainal.abidin@uniramalang.ac.id

ABSTRACT

Abstract This study aims to determine the abundance, community structure, diversity of Arthropods visitors of Refugia in the organic paddy fields in Malang regency from February to June 2019. Measurement of abiotic factors consist of air temperature, relative humidity and light intensity were conducted in each observation. The method used is the visual encounter surveys against Arthropods. Data retrieval was performed three times a day on the phase of vegetative and generative plant refugia for 15 minutes. The result showed 15.050 individu consisting of 11 orders and 42 families were observed. The abundance of common predator families such as Aleyrodidae, Formicidae, Libellulidae, and Tetragnatidae were higer in organic paddy. The diversity of Arthopod visitors in the organic paddy plots (4.20±0.09) was also higher than that in refugia (2.05±0.08). This study showed that of the abundance of herbivorus Arthropods obtained in the plot with refugia plants was lower than that of organic paddy field without refugia plant. In conclusion this study found that the population of Arthropods highest in organic paddy crops without refugia and is highest population of natural enemies in organic paddy without using crop edge.
Key words: Refugia Effect, Arthropods, Organic Paddy

ECO/O-011

Holothuroiidea as a Constituent of Benthic Communities in the Seagrass Ecosystems at Bira Island of the Kepulauan Seribu

Ratna Komala[*1], Mieke Miarsyah[2], Ratna Dewi Wulaningsih[3]

[1,2,3]*Department of Biology , Faculty of Mathematic and Natural Science, Jakarta State University, Jakarta, Indonesia*
[*]Corresponding email: ratna_komala08@yahoo.co.id

ABSTRACT

Seagrass ecosystems are one of the suitable habitats for the Holothuroiidea group which has an important role both ecologically and economically. One of the distribution areas of Holothuroiidea in Indonesia is Bira Island, located in the Kepulauan Seribu. The purpose of this study were to determine the composition, abundance and diversity of holothuridea as a constituent of benthic communities, and to know the quality of water in seagrass ecosystems. The research method used descriptive method with data retrieval technique by purposive sampling with line transect method. The data were analyzed descriptively based on the calculation of the abundance, and the diversity, while the relationship of environmental parameters that influenced the diversity of holothuroiidea was carried out by Principal component analysis (PCA) The results showed three species of Holothuriidae were identified, with the highest to lowest abundance and composition respectively, namely Holothuria atra, Holothuria leucopilota, and Holothuria fuscocinerea. Species diversity is classified as low criteria, while environmental parameters that affect species diversity are dissolved oxygen, turbidity, orthophosphate and Biologycal Oxygen Demand.

ECO/O-012

Microalgae as a Bioindicator of Water Quality in the Tidung Island of The Kepulauan Seribu

Ratna Komala[*1], Mieke Miarsyah[1], Eka Putri Azrai[1], M. Isnin Noer[1]

[1]*Department of Biology , Faculty of Mathematic and Natural Science, Jakarta State University, Jakarta, Indonesia*
[*]Corresponding email: ratna_komala08@yahoo.co.id

ABSTRACT

Plankton is a group of microorganisms that live floating in the water and swimming ability is very weak, based on its main group plankton consists of phytoplankton and zooplankton. Phytoplankton are known as microalgae. The abundance of microalgae in the waters can provide benefits for aquatic organisms , but also can be detrimental if the abundant is a type of toxic phytoplankton because it can cause Red Tide which can kill organisms. The aims of this research were to determine microalgae and the potential for red tide and to analyze the influences of some environmental factors to its variety. A survey method was used in this research and continued by identification of microlagae in the laboratory. Data analysis included the abundance, the diversity by and dominance index of microalgae, and principal component analysis (PCA). The result identified as much as 23 species of diatoms and 20 species of dinoflagellates. The highest abundance and composition of the Diatoms group is represented by Sceletonema sp while the Dinoflagellates group is represented by Noctiluca milliaris. The diversity criteria og microalgae is a midlle, and there is no species dominate.

Liquid Smoke Potential Based on Coconut Shell (Cocos nucifera) For Controling of Rice Bug (Leptocorisa oratorius Fabricius) (Hemiptera : Alydidae)

Rizky Mulyo Adi P[*1], Zulfaidah Penata Gama [2], Dewi Melani [3]

[1,2] Biology Departement, Mathematics and Natural Science Faculty, Brawijaya University, Malang, Indonesia
[3] Laboratory Installation and Plant Protection, Balai Besar Pelatihan Pertanian, Malang, Indonesia
[*]Corresponding email: rizkymulyo26@gmail.com

ABSTRACT

Liquid Smoke Potential Based on Coconut Shell (Cocos nucifera) For Controling of Rice Bug (Leptocorisa oratorius Fabricius) (Hemiptera : Alydidae) Rizky Mulyo Adi Purnama1*, Zulfaidah Penata Gama2, and Dewi Melani3 1,2 Biology Departement, Mathematics and Natural Science Faculty, Brawijaya University, Malang, Indonesia 3 Laboratory Installation and Plant Protection, Balai Besar Pelatihan Pertanian, Malang, Indonesia *Corresponding author : rizkymulyo26@gmail.com Abstract Rice bug (Leptocorisa oracorius F) is one of the most dangerous pests for paddy commodities (Oryza sativa) in the world. The use of liquid smoke is one way that can be used for controling rice bug. One material that has the potential to be used as liquid smoke is coconut shell. This research aims to analyze the mortality and to analyze antifeedant activity of rice bugs after dipped with coconut shell liquid smoke. The effectiveness of liquid smoke test was carried out by dipping method of paddy as much 5 g which was previously soaked with coconut shell liquid smoke until 20 second with a concentration of 0%; 0.50%; 0.75%; 1%; 1.25% and 1,50%. Observations were made at 24, 48, 72, 96, 120, 144 and 168 hours. Data analysis was performed by one way ANOVA test, using SPSS 20 and followed by a 0.05 Tukey test to determine the significance of the rice bug pest mortality. Results of the mortality value from low concentration to high concentration respectively were 40%, 46.67%, 60%, 70%, 80% for 7 days. The percentage of antifeedant from low concentration to high concentration respectively were 10.14%, 15.15%, 31.03%, 46.15% and 68.88% during 7 days. 1,5% was the concentrate of liquid smoke that has the highest

mortality (80%) and antifeedant value (68,88%). Keywords: Coconut shell, effectiveness, liquid smoke, rice bug.

ECO/O-015

Evaluation of Ecosystem Quality, Comfort and Ecosystem Services of Eco-friendly Residential in Lowokaru District of Malang

Dian Rizkiaditama*, Dian Siswanto, and Endang Arisoesilaningsih

Biology Department, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang
*Corresponding email: rizki.aditama08@gmail.com

ABSTRACT

This research aimed to evaluate the quality residential ecosystem in the Lowokwaru District of Malang. The research was conducted in five different densities residences (namely BCT, BHPH, GJM, PJ) and a traditional residence (TW) as a reference, using a purposive sampling method. In each sampling sites, we observed the quality of vegetation of Green Open Space (RTH), microclimate, geography, comfortable index, and ecosystem services. Data were analyzed by PCA and Cluster by using the software PAST 3.0. The results showed RTH coverage in all locations met the government standard of the Malang City and showed similar performance in comfort, although each residence varied RTH distribution. House density affected the RTH coverage dominating by non-native trees with the C and D stratification. Furthermore, RTH vegetation in BP effectively reduced dust deposition or noise and attracted wild bird visitors such as Pycononotus aurigaster. Besides BP, PJ and GJM became potential eco-friendly residences by planting more native tree species.

ECO/O-016

Native and non-native frogs responded differently to modernization in the irrigation system at Japanese paddy fields

Qothrun izza[*1], Go Fujita[1], and Tadashi Miyashita[1]

[1]*Department of Ecosystem Studies, Graduate School of Agriculture and Life Sciences, The University of Tokyo, Tokyo, Japan*
[*]Corresponding email: qothrunizza@es.a.u-tokyo.ac.jp

ABSTRACT

Rice farming modernizations, especially changes in the irrigation system, have been accused as one of the reasons of frog population decline in Japan. Here, we examined responses of native frog (Pelophylax porosus porosus) and non-native frog (Fejervarya kawamurai) population to the modern irrigation system in Japanese paddy field. I tested the following two hypotheses: 1) native frogs population will be lower in the modernized paddy field, and 2) non-native frog population will not be affected by modernization. After two periods of field studies (2017 and 2018), we found that changes of shallow soil ditches to consolidated deep ones act as a death trap for (\Pelophylax porosus porosus\) population. Also, the lack of wet surfaces in a modernized paddy field at midsummer drainage period negatively affecting the tadpoles. On the other hand, the population of (Fejervarya kawamurai) remained stable because they possibly performed developmental plasticity, which helps them overcome the harsh habitat in modernized paddy fields. Keywords: Paddy field, Pelophylax porosus porosus, Fejervarya kawamurai

ECO/O-017

Understanding the Characteristic of Roosting Sites of Green Peafowl (Pavo muticus Linnaeus, 1766) in Baluran National Park

Prof. Dr. Ir Suhadi, M.Si[*1], Drs. Agus Dharmawan M.Si[1], Etis Prasila Utami[1]

[1]*Department of biology, Faculty of Mathematics and Natural Science, State University of Malang, street Semarang 5, Malang, indonesia*
[*]Corresponding email: suhadi@um.ac.id

ABSTRACT

Abstract. National park is a means of establishing natural resource conservation efforts, as well as the protection of ecological elements and the buffer system of life developed as a research activity and nature tourism.Characterized with the savanna, Baluran National Park hold the suitable habitat for many species including green peafowl whose global population is decreasing. This research aims to characterize the types and map the distribution of trees that become the roosting sites of green peafowl and initiated by a habitat survey which is continued by mapping the trees with the signs of green peafowl occupation such as droppings or molted feathers and characterizing the roosting sites by measuring as well as identifying the trees. The results showed that the green peafowls form association with Cervus timorensis according to the traces found on the indicated roosting sites and that there are as many as 33 trees of different species namely Acacia leucophloea, Azadirachta indica, Tamarindus indica, and Ziziphus mauritiana that are preferred by green peafowl to be their roosting sites. The diameter of the trees is in average is 2 m, with the height of 14 m, the average number of strata 4, as well as the canopy area of 221,81 m2. Keywords: Roosting site, green peafowl, habitat characteristics, Baluran National Park.

ECO/O-018

Metagenomic analysis of diversity and composition of soil bacteria under intercropping system Hevea brasiliensis and Canna indica, L

Yunus Effendi*, Arief Pambudi, Yorianta. S. Hidayat, Risa Swandari

Biology Dept, Al Azhar Indonesia University
*Corresponding email: effendiy@uai.ac.id

ABSTRACT

Composition of soil microbiomes plays a number important ecologically roles and vital ecosystem processes in nature of soil. Indeed, interaction between plant root, microbes, and soil significantly contribute build biologically, physically and chemically of soil properties. In this study, Next Generation Sequencing of 16SrRNA gene using Illumina was used for analyzing composition, richness and biodiversity of soil bacteria in intercropping areas- planted with and without Canna indica. Total 2 soil samples for each soil condition were analysed. Each soil samples were collected from a mixing of soils from 3 different sites. Data showed more than 5500 bacterial OTU were found in the samples. Relative abundance of individual OTU between soil with and without C. indica showed statistically not difference. From 30 phyla has been identified in both soil conditions, only 5 phyla (BH180.139, Cyanobacteria, Proteobacteria, TM6, and WS3) showed a statistically different ($p < 0.05$) in their abundance. A total 270 and 355 Familia and Genus respectively were identified. There is no statistically difference in richness, abundance and diversity of species between both soil conditions. However, soil with C. indica showed lower species abundance in comparison with soil without C. indica (ACE index 112 and 125,6 respectively). In contrast, soil with C. indica has more taxa richness in comparison with soil without C. indica (Fisher index 278 and 230,4, respectively). Keyword: 16srRNA, metagenomic analysis, rhizospheral microbes, Canna indica L.

ECO/O-019

Interspecific variation in herbivory level and leaf nutrients of mangroves Rhizophora

Indah Trisnawati[*1], Mukhammad Muryono[2], Iska Desmawati[3]

[1,2,3] *Dept. of Biology, Faculty of Science, Institut Teknologi Sepuluh Nopember, Surabaya*

[*]Corresponding email: indahtris@yahoo.com

ABSTRACT

Trees and saplings of two mangrove species, Rhizophora stylosa Griff. and Rhizophora mucronata Lam. were observed in herbivory level (leaf damage area) and leaf nutrients (total nitrogen, phosphorus, potassium, water content, and deterrent tannin). We observed mangrove habitat located around Institut Teknologi Sepuluh November (ITS) Campus in Surabaya, East Java dominated by Rhizophora vegetation. Herbivorous insects showed an individual abundance of 15.15% of the total insects found in mangroves around the studied areas. Saplings tended to be significantly higher in relative leaf damage and preferred by the herbivores than trees. One way ANOVA showed a non-significant difference in leaf area damage between two species (F=0.63, p-0.43; F=2.29; p-0.13). The Concentration of leaf nutrients was significantly different between two species than habitus. Total nitrogen and water content in R. mucronata were significantly higher than in R. stylosa (F=5.10, p-0.03; F=142.13, p-<0.0001), whereas phosphorous and potassium (K) was significantly higher in R. stylosa than in R. mucronata (F=15.25, p-0.0002; F=75.916; p-<0.0001). Descriptively, R. stylosa leaves tended to be higher in deterrent tannins than R. mucronata, especially in sapling habitus. Leaf age, represented by plant habitus, is less to be related to high leaf palatability and insect herbivore nutrition than mangrove species. Keywords: Herbivory level, leaf nutrients, Rhizophora species

ECO/O-020

PESANTREN-BASED DISASTER MITIGATION STRATEGY : CASE STUDY PONDOK PESANTREN DARUNNAJAH CIPINING BOGOR

Asma Irma Setianingsih[1], Rihlah Nur Aulia[*2], Kurniawati[3], Sari Narulita[4]

[1] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[2] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[3] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[4] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[*]Corresponding email: rihlah-nuraulia@unj.ac.id

ABSTRACT

This study aims to analyze the pesantren-based Drought disaster mitigation strategy. Research Methods This research is a type of descriptive research, using a qualitative approach to describing drought disaster mitigation in Islamic boarding schools. What is meant by mitigation is following the theory of mitigation, which divides mitigation into two forms, namely: 1. Structural mitigation; in the form of infrastructure development as a driver for minimizing the impact and use of a technological approach The symptoms observed, were: compilation of a database of potential landslide hazards and the creation of an early warning system. 2. Non-structural mitigation, in the form of spatial management and training, to increase community capacity. The research concludes: Mitigation of drought in the Darunnajah Cipining Islamic Boarding School in Bogor is carried out structurally and non-structurally. Structural mitigation is carried out by compiling a database of potential hazard areas and installing an Early Warning System (EWS). Non-structural mitigation is carried out by providing information, outreach and training and disaster simulations. Efforts that have been made to improve the effectiveness of disaster mitigation are through the establishment of Resilient Disaster Response Students and Disaster Resilient Alumni. Keywords: Strategy, Disaster Mitigation, Islamic Boarding School

Environmental Science (ENV)

ENV/O-001

Factors for Empowering UMKM in Maintaining Sustainable Bioeconomy

Saparuddin Mukhtar[*1], K. Y.S. Putri[2], and Samadi[3]

[1] *Management Department, Economic Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[2] *Communication Department, Social Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[3] *Geography Department, Social Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[*]Corresponding email: dr.herkin@gmail.com

ABSTRACT

Economic empowerment of the Indonesian people has been carried out through UMKM. The formulation of research problems is the factors of empowering UMKM in maintaining sustainable bioeconomics? The purpose of this study is to analyze the factors of empowering any UMKM in maintaining sustainable bioeconomy. The method used is quantitative by distributing questionnaires to 93 respondents in several major cities in Indonesia. Reflective descriptive research is all positive in empowering UMKM in the community. The most influential factor in community economic empowerment is making the community more independent. The smallest value dimension is the occurrence of structural changes in the economy. Suggestion for research is that all aspects of society should help empower UMKM communities so that society do not depend on the system implemented by the government. Keywords: economic empowerment, integrated marketing communication technology, and sustainable bioeconomic

Water conservation in Islamic studies

Miftahul Jannah [1] and Sari Narulita[*] [2]

[1] *Department of Islamic Education, Faculty of Islamic Education, STAI Nur El-Ghazy, West Java, Indonesia*
[2] *Department of Islamic Education, Faculty of Social Science, Universitas Negeri Jakarta, Indonesia*
[*]Corresponding email: Sari-Narulita@unj.ac.id

ABSTRACT

Islam, as a religion puts the study of water as an essential study; considering that water is a prerequisite for the validity of the worship for a Muslim. Water is the primary medium used to cleanse dirt physically and symbolically. This study reviews the views of Islam on water and its conservation and its relevance in the present and future. This research is a literature study through classical literature, namely Fiqh books that review water with all its aspects; also equipped with the implementation of water conservation in worship activities in the present. The research findings show that the concept of water in Islam is a comprehensive concept when implemented optimally

ENV/O-003

Utilization of Coconut Milk and Cane Sugar to Grow Indigenous Entomopathogenic Bacillus thuringiensis for Controlling Aedes aegypti Larvae

Bambang Fajar Suryadi[1], Ezia Eki Safira [1], Ernin Hidayati [1], Faturrahman [1], Sarkono [1]

[1]*Department Biology, Faculty of Mathematics and Natural Sciences*
University of Mataram, Mataram – West Nusa Tenggara
[*]Corresponding email: bambangfajar@unram.ac.id

ABSTRACT

Research objectives. To evaluate growth and toxicity of Mataram indigenous Bacillus thuringiensis isolate when grown in coconut milk and cane sugar as natural culture medium. As the use of natural culture medium will lower production cost of B. thuringiensis-based bio-larvicide. Materials and Methods. Mataram indigenous B. thuringiensis isolate (namely Bt-TP2B) was grown in liquid medium consisted of coconut milk and cane sugar in various ratios (1:1; 1:3; 1:5 and 1:7) for 7x24 hours. Bt-TP2B cultured in liquid medium NYSM in similar incubation time was treated as control medium. Cell, endospore and parasporal crystal concentration from all ratios and control medium were measured every 24 hours for 7x24 hours. Toxicity evaluation was also made from all cultures against 3rd instar A. aegypti larvae in 3x24-hour observation. Result. B. thuringiensis grown in all ratio natural medium showed similar trend in cell, endosporal and parasporal crystal concentration. For the first 24-hour, cell concentration from all ratios raised slightly and declined from 72 hours onward. From 48 hours onward, endospore and parasporal crystal concentration began to raise significantly. Those raises were maintained after the end of fermentation. The highest culture toxicity against 3rd instar A. aegypti larvae was found on the highest sugar concentration. Larval death percentage showed above 50% on third day observation. Conclusion. The higher cane sugar concentration used in natural medium used, the higher toxicity could obtain from local isolate of B. thuringiensis against 3rd instar A. aegypti larvae.

ENV/O-004

Effects of Media Literacy on the Message of the Conservation of the Earth to the knowledge of the Indonesian people

K. Y.S. Putri[*1], Adamu Abbas Adamu[2]. And Saparuddin Mukhtar[3]

[1]*Communication Department, Social Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[2]*Department of Marketing, Faculty of Business,Curtin University Malaysia , Kuala Lumpur, Malaysia*
[3]*Management Department, Economic Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[*]Corresponding email: kinkinsubarsa@unj.ac.id

ABSTRACT

New media gives color to human life. The formulation of the problem of this research is how is the use of media literacy in the message of the diversity of conservation of the earth? The main objective of this research is to analyze the influence of the use of new media literacy in the message of the conservation of the earth to the knowledge of new media users. Media literacy is a human ability in the skills of using new media in terms of insight, processing messages, analyzing messages and evaluating messages. The research method used was quantitative. Reflective descriptive research is positive in both variable indicators. The influence of these two variables is positive and has a strong influence on user knowledge. Suggestions for research are that all messages in new media should directly use sentences and images that are understood by the user. Keywords: Biodiversity conservation, media literacy, and new media

ENV/O-005

Relationship Content Media in New Media about the News Hoax about Conservation Diversity towards the Attitudes of Indonesian Women

K. Y.S. Putri[*1], Maulina Larasati Putri[2], and Vera Wijayanti Sutjipto[3]

[1]*Communication Department, Social Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[2]*Communication Department, Social Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[3]*Communication Department, Social Faculty, Universitas Negeri Jakarta, Jakarta, Indonesia*
[*]Corresponding email: kinkinsubarsa@unj.ac.id

ABSTRACT

The message in the new media greatly influences human life. The message of the diversity of conservation in many new media. The formulation of the research problem is whether there is a relationship between the content of the message in the new media regarding conservation diversity towards women's knowledge in Indonesia? The aim of the study was to analyze the relationship between the content of messages in new media regarding hoax news about the diversity of conservation towards the knowledge of Indonesian women. The research method used was quantitative research with 131 respondents in large cities in Indonesia. The result of the research description is that all research indicators are positive. The reflection of the research relationship is that there is a high relationship to the knowledge of Indonesian women. Indonesian women know the message in new media. But in reflecting on their lives there are several indicators that can be helped by the surrounding community in the knowledge of conservation diversity. Keywords: biodiversity conservation, media content, and new media literacy

ENV/O-006

BIOLOGY AND POPULATION DYNAMICS ANALYSIS OF FRINGESCALE SARDINE (Sardinella fimbriata) IN BALI STRAIT WATERS, INDONESIA

Gatut Bintoro, Daduk Setyohadi, Tri Djoko Lelono, and Fitri Maharani

Fisheries and Marine Science Faculty, Universitas Brawijaya, Malang Indonesia
*Corresponding email: gbintoro@ub.ac.id

ABSTRACT

Fringescale sardine (Sardinella fimbriata) is small pelagic fish that has an increasing production every year. This can trigger the occurrence of overfishing, so it is necessary to study the biology and dynamic population of fish. This research was conducted in December 2016 - May 2017. The purpose of this research was to determine the biological aspects and population dynamic of fringescale sardine (S. fimbriata) in Bali Strait. Samples were obtained from surface gillnet fishing gear landed in Muncar fishing port, with 1471 of fish. Results showed that sex ratio was about balanced with the proportion of 55% male and 45% female. Length and weight relationship was negative allometric patterns. Length of first mature (Lm) male and female was 11.95 cm and 10.79 cm respectively. Based on dynamics population analysis it was found that length at first capture (Lc) was 10.44 cm. While K, L? and t0 were 0.54/ year, 19.6 cm and -0.149 year respectively. In addition there was only one peak recruitment occured in 7th month of recruitment pattern. Another analysis indicated that a value of natural mortality (M) was 1.38 with sea surface temperature (SST) of 29.45oC. According to length frequency data total mortality (Z) was 6.41 so that fishing mortality (F) was calculated to be 5.03. Hence value of exploitation rate (E) was 0.79. It can be concluded that the fisheries resources status is categorized as over fishing.

ENV/O-007

Spatial Patterns of Ecological Value of Sumba Island analyzed with Local Ecological Footprinting Tool for Supporting Sustainable Green Economy Growth

Rosaria[*1,2], Kaho LMR[3], Endang Sukara[4,5]

[1]*Biology Department, Faculty of Life Sciences, Surya University, Tangerang 15143, Indonesia*
[2]*Department of Zoology, University of Oxford, Oxford OX1 3SZ, United Kingdom*
[3]*Faculty of Agriculture, Nusa Cendana University, Kupang 85001, Indonesia*
[4]*Indonesian Academy of Sciences, Perpustakaan Nasional RI, DKI Jakarta 10110, Indonesia*
[5]*Study Center for Environmental Ethics, Universitas Nasional, DKI Jakarta 12520, Indonesia*
[*]Corresponding email: rosaria@surya.ac.id

ABSTRACT

Local Ecological Footprinting Tool (LEFT) is a web-based interface that evaluates ecological value across a landscape to determine ecologically important regions that carry a high ecological risk if damaged through the conversion of natural habitat such as for urban growth, agriculture, industrial activities. It has been used by companies, NGOs, and public sectors as pre-planning tool to minimize and mitigate environmental impact. The parameters are landcover class, beta-diversity, vulnerability, habitat fragmentation, wetland connectivity, number of migratory species and vegetation resilience. This research aims to analyze ecological features and ecosystem services of Sumba island with LEFT as a reccommendation for stakeholders to manage the area sustainably. A coordinate of analysis with a maximum spatial extent 4 decimal degrees squared is submitted to LEFT which process a series of high-quality datasets, such as GBIF and IUCN, using standarized alogarithms. The resolution of the data is 1 arcsec at approximately 30m. There are at least 353 plant and 357 bird species in Sumba. Its land cover is comprised of mostly grassland and forest with deciduous forest ecoregion type. LEFT identified 12 vulnerable species such as Cacatua sulphurea (bird CR), Acerodon mackloti (mammal VU), and 79 migratory species, mainly birds. The eastern side of Sumba has a relatively higher beta-diversity value. A relatively large area is intact and

has a good resillience. Keywords: Sumba, Local Ecological Footprinting Tool, Biodiversity, Ecology, Ecosystem Service

ENV/O-008

Hematology and Micronuclei Analysis of Tilapia (Oreochromis niloticus) from Selorejo Reservoir, Ngantang, Malang, Indonesia

Diana Arfiati, Karina Farkha Dina

Fisheries and Marine Faculty, Brawijaya University, Malang
*Corresponding email: d-arfiati@ub.ac.id

ABSTRACT

The Hematology of Nile tilapia had studied in Selorejo Reservoir as an eutrophic reservoir. Hematology of tilapia can be used to detect physiological changes in fish due to environmental changes. This research was conducted from February to March 2019 by using a survey method to determine the hematological structure and micronuclei of tilapia from Selorejo Reservoir. Sampling was carried out 4 times in a week at three different stations. Researcher took 105 fish by using hand line and gill net. The measurement of water quality (temperature, pH, dissolved oxygen and total organic matter) and data analysis, researcher employed the statistical T test of Minitab application. The results of hematology analysis of tilapia indicated that the number of erythrocytes ranged from 1,489,967 - 1,656,658 cells / mm3; leukocytes ranged from 91,305 - 104,648 cells / mm3; hemoglobin ranged from 9-10 g%; hematocrit ranged from 24.3 - 28.2% and the amount micronuclei ranged from 8.2 to 9.6 cells / 1000. It can be stated that the Hematology of tilapia is still within the normal range. Furthermore, the calculation of the hematology T test of tilapia caught with fishing rods and gill net is not significantly different. In addition, the results of water quality parameter's measurements indicate fine condition for the growth of tilapia; the temperatures range from 27.8-280C; pH value is 7-8, dissolved oxygen is 7.5 - 8.38 mg / L and Total Organic Matter is 4.78 - 18.33 mg / L. It can be inferred that the hematology and micronuclei of tilapia from Selorejo Reservoir are still within the normal range even though the water reservoir has eutrophic status. Thus, the community and the government are encouraged to monitor the condition of Selorejo Reservoir to maintain fish healthy. Keywords: Selorejo Reservoir, Tilapia, hematology, micronuclei

ENV/O-009

THE COMMUNITY STRUCTURE OF MICROALGAE AND EXPLORING ITS POTENTIALLY TO BIOFUEL PRODUCING IN RANU GRATI, EAST JAVA INDONESIA

Sitoresmi Prabaningtyas[1], Tri Ardyati[2], Suharjono[2], Catur Retnaningdyah[2]

[1]Students of the Biology Doctoral Study Program, Faculty of Mathematics and Natural Sciences Universitas Brawijaya and lecturers of Universitas Negeri Malang
[2]Biology Department, Faculty of Mathematics and Natural Sciences Universitas Brawijaya, Malang
[*]Corresponding email: sitoresmi.prabaningtyas.fmipa@um.ac.id

ABSTRACT

THE COMMUNITY STRUCTURE OF MICROALGAE AND EXPLORING ITS POTENTIALLY TO BIOFUEL PRODUCING IN RANU GRATI, EAST JAVA INDONESIA Sitoresmi Prabaningtyas1), Tri Ardyati2), Suharjono2), Catur Retnaningdyah2) 1) Students of the Biology Doctoral Study Program, Faculty of Mathematics and Natural Sciences Universitas Brawijaya and lecturers of Universitas Negeri Malang 2) Biology Department, Faculty of Mathematics and Natural Sciences Universitas Brawijaya, Malang ABSTRACT Microalgae are microscopic autotrophic organisms which act as one of the biofuel-producing organisms. Ranu Grati is one of the volcanic lakes located in Pasuruan, East Java. Human activities around the waters are responsible for eutrophication of the water quality. The aim of this study was (1) described the profile of water quality and microalgae community structure, and (2) investigated microalgae potential as a producer of biofuels based on lipid content. Explorative research was carried out by taking a sample of water at a depth of 50 cm at 5 stations. Water quality parameters measured were DO, pH, BOD, TP, and TKN. Microalgae samples were taken by filtering 3 L of water using Plankton Nets. Plankton samples were identified and calculated using Haemocytometer. Furthermore, microalga abundance, Important Value Index (IVI), diversity index, richness taxa, Evenness, and Richness index were determined. Species with the two highest IVI was determined the lipid levels use literature. The results showed that the waters of Ranu Grati had been contaminated with high organic matter (BOD levels 8.30-8.72 mg/L) with trophic status classified as mesotrophic to hypertrophic

(TP 0.05-0.08 mg/L and TKN 0.23-0.32 mg/L). DO levels was high and have a range value 7.47-9.87 mg / L, while range of pH value 8.73-9.07. There were found 10 species of microalgae with varied 7-10 species in each station. Pollution status of Ranu Grati based on Shannon Wiener diversity index categorized as moderately polluted with range values 1.95-2.34. Value of microalgae evenness 0.77-0.86 indicated high uniformity with equally even distribution of species. Chlorella sp. and Scenedesmus sp. have the highest IVI and have a potential to produce biofuel with lipid levels 28 - 32% (dry weight) and 12-14% (dry weight) respectively.

ENV/O-010

Biodiversity of Endophytic Fungi from Lowland Tomato Plants and It's Potential to Antracnose Disease in Chili Plants at Green House

Arika Purnawati[1*], Tri Mujoko[1], Noni Rahmadhini[1], Elly Syafriani[1]

[1]*Agrotechnology, Agriculture Faculty, UPN "Veteran" Jawa Timur, Surabaya 60294*

[*]Corresponding email: arika_p@upnjatim.ac.id

ABSTRACT

Endophytic fungi are endophytic groups that can be isolated from lowland tomato plants (Jombang and Kediri). Isolation was done from the stem and was cultured on Potato Dextrose Agar (PDA) media to get pure culture and identified based on book Illustrated Genera of Imperfect Fungi by H. L. Barnett, Barry B. Hunter (1998), Trichoderma and Gliocladium Vol. 1: Basic Biology, Taxonomy and Genetics by Kubicek and Harman (2002). Then, it was applied to plants using root immersion techniques to know their potential for anthracnose disease in chili plants and plants inoculated with pathogenic fungi Colletotrichum capsici using spray techniques on leaves. The identification results get Penicillium sp., Aspergillus sp., Fusarium sp., and the results of the application showed that all of them had potential to suppress anthracnose disease in chili plants at greenhouse. Keywords: endophytic fungi, Colletotrichum capsici, antracnose disease

ENV/O-011

Characterization of Rhizosphere Bacteria and Their Potency as Phytoremediation Promoting Agents of Cr (VI) Contaminated Soil

Nita Shilfiani Rohmah, Suharjono, Irfan Mustafa*

Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia
*Corresponding email: irfan@ub.ac.id

ABSTRACT

Rhizosphere bacteria have an adaptation mechanism in the chromium contaminated environment and produce compounds that promote the heavy metal resistance of plants. Bacteria were isolated from tannery waste contaminated rhizospheric soil of Ficus septica Burm.F. Screening was done based on the level of Cr (VI) tolerance. High tolerant isolates were tested for their potential in phosphate-solubilizing, Indole Acetic Acid (IAA) production, exopolysaccharide (EPS) production, and detected the presence of chromium reductase (ChR) genes. Based on the results of screening, there were four rhizosphere bacterial isolates (R7, R9, R10, and R12) which were tolerant to 800 mg/L of Cr (VI). All isolates were able to produce IAA, EPS, and dissolve phosphate in medium containing 150 mg/L Cr (VI). The highest production capacity of IAA (25.08 ?g/mL) and phosphate-solubilizing (150.98 ?g/mL) was shown by R9 isolate, while the highest EPS production was found in R12 isolate (0.02 mg/L). ChR gene was found in R10 and R12 isolates. Bacterial isolates obtained from this study were potential to be used as promoting agents for phytoremediation of Cr (VI) contaminated soil. Keywords: Rhizosphere bacteria, phytoremediation, heavy metal, chromium

ENV/O-012

Effect of crude oil exposure to fertilization and larva development of the Black scar Oyster Crasosstrea iredalei

Gunawan Abidin[1,2], Kullanist Tanormjit[3], Supatta Chueycham[4], Amin Setyo Leksono[1], Yenny Risjani[5], Sutin Kingtong[3,*]

[1]*Environmental Science Program, Post Graduate Brawijaya University, Malang, Indonesia*
[2] *Institute for Mariculture Research Aquaculture and Fisheries Extension, Gondol, Bali, Indonesia*
[3] *Departement of Biological Science, Faculty of Science, Burapha University, Bangsaen, Chonburi 20131, Thailand*
[4] *Environmental Science Program, Faculty of Science, Burapha University, Bangsaen, Chonburi 20131, Thailand*
[5] *Faculty of Fisheries and Marine Science Brawijaya University, Malang, Indonesia*
[*]Corresponding email: sutin11k@yahoo.com

ABSTRACT

Spill incidents of crude oil have been occasionally reported from time to time and potentially affect an organism in the marine ecosystem. This work was carried out to access health risk of crude oil to fertilization success and larva development of a sessile organism the Black scar oyster Crassostrea Iredalei by using water accommodated fraction (WAF) of crude oil. Male and female gametes were incubated in various concentrations of WAF (0, 6.25, 12.5, 25, 50, and 100 %) before fertilization so-called pre-fertilization. WAF effect at post-fertilization was also observed by incubation of oyster larva to WAF with the same concentration as above. The result showed that WAF has no effect on fertilization success in the oyster. All treated groups were able to undergo fertilization as in control. The effects of crude oil WAF on survival and development of larva were then observed at D-larva veliger stage (24 hours after fertilization). The results revealed that the severity of WAF effect was increasing with dosages of exposure. The abnormal larva developments were increasing in the high concentrations. The information obtaining from current work is important for health risk assessment of crude oil contamination incident in the marine ecosystem. This study will also contribute valuable knowledge needed for aquaculture to know the effect of the crude oil spill to the oyster farming area.

ENV/O-013

Effect of DDT on oyster and potential biomarkers of its exposure by using proteomic approach

Sutin Kingtong[*1], Supatta Chueycham[2], Daranee Chokchaichamnankit[3], Chantragan Srisomsap[3] and Jisnuson Svasti[3]

[1]*Dept. of Biology, Faculty of Science, Burapha University, Chonburi, Thailand*
[2]*Environmental Science Program, Faculty of Science, Burapha University, Chonburi, Thailand*
[3]*Laboratory of Biochemistry, Chulabhorn Research Institute, Bangkok, Thailand*
[*]Corresponding email: sutin@go.buu.ac.th

ABSTRACT

Dichlorodiphenyltrichloroethane (DDT), a persistent organochlorine pesticide, has been reported to have adverse effects in various organisms. Although toxicity of DDT has been widely reported, its effect to marine organism including oyster is limited and underlying molecular mechanisms remain unclear. This work aimed to study toxic effect of DDT on mortality and histopathology of oyster. In addition, proteomic approach was applied to investigate molecular response and screen for potential biomarkers of DDT exposure. Adult oysters, Saccostrea cucullata, were exposed to various concentrations of DDT (0-2,000 µg/L) for 96 hours. Results showed that DDT is toxic to oyster and produced histopathological alteration in oyster tissue in dose-dependent manner. Proteome results showed that DDT altered proteome profiles of exposed oysters. Potential biomarkers of DDT exposure were discussed. Results obtained from current work is important for the development of alternative method for DDT monitoring in coastal water in the future. Keywords: DDT, proteome, histopathology, oyster, biomarker

Morphology and Fruit Quality Characters of Pineapple (Ananas comosus L. Merr) cv. Quenn on Three Sites Planting: Freshwater Peat Swamp, Brackis Peat Swamp and Alluvial Soil

Rosmaina*, Abdi Al-Maktsur, Rita Elfianis, Oksana, and Zulfahmi.

Department of Agrotechnology, Universitas Islam Negeri Sultan Syarif Kasim Riau, Pekanbaru Indonesia.
*Corresponding email: rosmaina@uin-suska.ac.id

ABSTRACT

The growth and fruit quality of crop is strongly influenced by the environment in which it grows. The purpose of this study was to observe the growth and fruit quality of pineapple (Ananas comusus L. Merr) cv. Queen that cultivated in the three different locations. Pineapple cv. Queen was planted in three different locations, namely in freshwater peatlands, brackish water peatlands and Alluvial soils in Riau province. Morphology and fruit quality characters of pineapple were evaluated at each location. The result of this study displayed that pineapple cultivated in freshwater peatland having fruit weight (1540.64 g), fruit length (19.80 cm), sucker number (4.94 pieces), slip number (3.16 pieces), total dissolve content (14.19oBrix), total acidifid acid (0.51%), and water content (85.94%) higher than others site. Morphology and fruit quality characters of pineapple that cultivated in brackish water peatlands and alluvial soils were not significantly different. Our finding of this study that pineapple grows well on three soil types and is adaptive in peatland so that pineapple can be selected as an alternative crop to be developed in the peatland in the future.
Keywords: pineapple, alluvial, peatland, fruit quality.

ENV/O-015

Design of Waste Water Treatment Plant (WWTP) in Mini Incinerators

Aam Amaningsih Jumhur*, Eko Arief Syaefudin, Ragil Sukarno, Ari Pranoto

Mechanical Engineering Vocational Education Department, Engineering Faculty, Universitas Negeri Jakarta, Indonesia
*Corresponding email: aamamaningsihjumhur@unj.ac.id

ABSTRACT

Design of Waste Water Treatment Plant (WWTP) in Mini Incinerators Aam Amaningsih Jumhur, Eko Arief Syaefudin, Ragil Sukarno, Ari Pranoto Mechanical Engineering Vocational Education Department, Engineering Faculty, Universitas Negeri Jakarta, Indonesia Email : aamamaningsihjumhur@unj.ac.id Abstract Waste accumulation in the Final Waste Disposal Site (TPAS) needs to be reduced by trying to reduce the volume of waste sent to TPAS. Incineration is a solution to reduce the size of waste from the source, but in the process of combustion of waste, it has an adverse impact in the form of air pollution. The purpose of this study is to treat wastewater by using a filter on a mini incinerator. Mini incinerators are designed for residential environments to reduce the volume of house waste. The design method used is the design method VDI 2221. The results of the study are (1) Design of a wastewater treatment plant (WWTP) on a mini incinerator by selecting the 4th variation on the grounds that the test results show that the 4th variation is the most optimal, (2) The results of the combustion wastewater test results on the incinerator, there are 3 items still above. Keywords: mini incinerator, VDI 2221, WWTP, liquid waste, a filtration process

ENV/O-016

ENVIRONMENTAL MANAGEMENT MODEL IN COASTAL AREA (CASE STUDY OF EKOPESANTREN AL-KHAIRAT PALU SULAWESI TENGAH)

Rihlah Nur Aulia, MA[1*]; Faisal M.Jasin, ST, M.Si[2]; Dewi Anggraeni, MA[3]; Sari Narulita, M.Si[4]; Dr. Izzatul Mardhiah, MA[5]; Dr. Andy Hadiyanto, MA[6]

[1]*Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[2]*Staff Of Ministry Of Environtment and Forestry, Indonesia*
[3] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[4] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[5] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[6] *Lecturer and Researcher, Faculty Of Sosial Science, Universitas Negeri Jakarta, Jakarta, Indonesia*
[*]Corresponding email: rihlah-nuraulia@unj.ac.id

ABSTRACT

Abstract This study aims to determine the environmental management model in coastal area based ekopesantren Al-Khairat, Palu Sulawesi Tengah case study.Optimizing environmental preservation needs to involve all aspects, and religion becomes the basic line to create the character of future generations' attitude to protect nature. As for Islam, it has a clear concept of environmental conservation and is part of being part of a Muslim's faith. This research uses ecopesantren theory: The eco pesantren indicator are; First, Geographical Factors, Second, the policy of caring and environmentally friendly boarding schools. Third, policies are environment-based curriculum development. Fourt, the development of participatory based environmental activities. Fifth, management of supporting facilities for pesantren are environmentally friendly. The method of this study is a qualitative research method. Data sources used are primary data derived from observation and interviews. Secondary data comes from the study of literature, journals, books. This research concludes, first, that development policy for environmental management undertaken in Ekopesantren Al-

Khairat, which is at the Coastral Area, was to make an artificial environment and reforestation approach accomplished is to create an artificial environment reforestation decisions are made in the presence. Potential of forest resources owned by the ekopesantren al-khairat palu, in the Coastal region consists of mangrove vegetation. Secondly, the policy of pesantren is participative by making santri as relief teams (satgas) for overcoming environmental disaster around the pesantren. Keywords: Environmental management, Coastal area, Ekopesantren

ENV/O-017

Microplastic Detection in Local Duck from Intensive Farming in Central Java

R. Susanti[*1], Ari Yuniastuti [1], Fidia Fibriana [2]

[1] *1Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang*
[2] *2Department of Integrated Science, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang*
[*]Corresponding email: r.susanti@mail.unnes.ac.id

ABSTRACT

Microplastic is plastic particles sized from 330 microns (0.33 mm) up to 5 millimeters (mm) or as large as sesame seeds. It is an abundant environmental pollutant, found worldwide in various ecosystems, including in Central Java. This pollutant not only contaminating ecosystem but also many animals, such as fish, wild bird and may also domestic duck. Preliminary study found, intensive duck husbandry provides feed from fish material that exposed microplastic from Java Sea. Recent research expose that microplastics in Java Sea reaching 2,17 particles/ m2. This research aimed to observe microplastic content duck husbandry around Central Java to depict how far microplastic contaminating domestic duck. Samples was collected from five cities: Semarang and Pati to represent coastal area, Temanggung and Magelang for high land and Salatiga as a representing of low land. As much as five ducks was sacrificed and the digestion tract was collected and put into 1L baker glass. The samples than digested using 10 N of Kalium hydroxide (KOH) until sinking the organ. Then, sample-KOH was incubated at 60-80 °C for 24 h. The sample then filtered, remaining residues on the filter was placed into same baker glass and add more KOH until sinking, then repeat previous step until no organic materials left. All debris and filtrates were collected into vial tube and added with NaCl, then the solution was centrifuged to separate the microplastics density. The visual identification was conducted using light microscope. The identified plastics was characterized based on the size and shape characteistics. Based on the observation report, abundant microplastic was found in duck sample from Semarang City, and not found in Temanggung. The microplastic content likely comes from feed processing and raw materials. Mostly,

microplastic can be characterized into fragment and beads sized <0,5 mm.
Keywords : intensive farming, local duck, microplastic

ENV/O-018

Developing a low price integrated PM and Gas measurement system For Air Quality

Arinto Y. P. Wardoyo[*1], Hari A. Dharmawan[1], Muhammad Nurhuda[1], Eko T. P. Adi[1]

[1] *Laboratory of Air Quality and Astro Imaging, Department of Physics, Faculty of Mathematics and Natural Science, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: a.wardoyo@ub.ac.id

ABSTRACT

A low price PM measurement system has been designed to quanitify the concentration in the air. The device is built up by using a PM_{10} and $PM_{2.5}$ sensor. The sensor signals are processed and connected to a Arduino UNO microcontroller. A long-range wireless communication is attached in the system purposely for a distance observation. The system was validated using Kanomax dust monitor model 3522 and Hinaway PM_{10} Detector model CW-HAT200S. The system was tested in the distance to characterize the performance. The system works properly to measure the concentration of PM_{10} and $PM_{2.5}$. The proposed design presents the average concentration level of 30 seconds sampling measurement. The system is controlled by using humidity and temperature sensor to avoid any damage caused an environment condition. The system can be used for maximum relative humidity and temperature of 70% and 50 ℃ respectively. The device has an ability to measure particulate matter with maximum concentration of 750.0 $\mu g/m^3$ with the resolution of 0.3 $\mu g/m^3$. The instrument is accomplished to the addition NRF2401 to allow the data remotely observation. In conclusion, the proposed device work well to measure PM_{10} and $PM_{2.5}$ in the environment. It has been validated with the standard PM devices.

Application of Structural Equation Modeling to Control Anthracnose Disease Attacking Red Chili Grown in the East Java Production Center

Djuhari, Djuhari[1,2*], C. Retnaningdyah[2], B. Yanuwiadi[2], and E. Arisoesilaningsih[2]

[1]*Agrotechnology Study Program, Faculty of Agriculture, Universitas Islam Malang, Indonesia*
[2] *Doctoral Study Program in Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia*
[*]Corresponding email: djoe61@unisma.ac.id

ABSTRACT

Application of Structural Equation Modeling to Control Anthracnose Disease Attacking Red Chili Grown in the East Java Production Center Djuhari, Djuhari1,2 *, C. Retnaningdyah2, B. Yanuwiadi2, and E. Arisoesilaningsih2 1 Agrotechnology Study Program, Faculty of Agriculture, Universitas Islam Malang, Indonesia 2 Doctoral Study Program in Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia * Corresponding author: djoe61@unisma.ac.id ABSTRACT This study aimed to develop structural equational modeling using Partial Least Square for designing some alternative anthracnose control attacking red chili plants grown in some production centers in East Java, Indonesia. The survey was conducted in five red chili production centers. In each site, there were 20 farms studied using purposive sampling, while the farmers were interviewed as respondents. Latent variables included yields, disease attacks rate, climate, soil, geography, and cultivation techniques. Data were then analyzed using a structural equation modeling with the Smart PLS 3.0 for students. The results showed that the rate of anthracnose attack on red chili plants was directly influenced by climatic variable (annual rainfall and number of wet months) and soil variable (soil organic matter), but it was indirectly affected by the cultivation techniques. The latent variables such as geography (elevation), soil (soil organic matter), and anthracnose attacks directly influenced the red chili production. The findings revealed that cultivating red chili by applying the proper plant cultivation techniques (on the rain feed soil and reducing population density) of low elevation farm

and managing soil organic matter were potentially eco-friendly alternatives to improve yield and control anthracnose attacking red chili plants.
Keywords: Anthracnose disease, red Chili, Structural Equation Modeling

ENV/O-020

Impact Analysis of Physicochemical Soil on PGPR Density of Coffee Plantation Indonesia

Ervinda Yuliatin[*1], Tri Ardyati[1], and Suharjono Suharjono[1]

[1]*Dept. of Biology, Brawijaya University, Malang*
[*]Corresponding email: ervindayuliatin02@gmail.com

ABSTRACT

The objective of this research was to determine the physicochemical impact of coffee plantation soil on plant growth-promoting rhizobacteria (PGPR). The PGPR bacterias were isolated from Coffea arabica and Coffea canephora soil using serial dilution method. The number of IAA producing, phosphate solubilizing and nitrogen-fixing bacteria were determined by Tryptic Soy Agar, Pikovskaya and Nitrogen-free-Bromothymol Blue Agar, respectively. The density of IAA producing bacteria and nitrogen-fixing bacteria of Coffea arabica soil 1.48×105 cfu/g and 0.25×104 cfu/g, respectively were higher than Coffea canephora soil. The density of phosphate-solubilizing bacteria 1.78×105 cfu/g of Coffea canephora was higher than Coffea arabica soil. Environmental parameters of both coffee species were significantly influenced by latitude, light intensity and tree height ($p<0.05$). The C/N ratio was significantly higher of Coffea arabica soil 11,33 % than Coffea canephora soil 8,66 %. The highest correlation (correlation > 0,86) was between nitrogen-fixing bacteria and IAA-producing bacteria. This analysis can be performed that the density of PGPR may vary due to some soil properties, environment factors, and plant characteristics. Keywords: IAA, phosphate, nitrogen, PGPR, density, coffee

ENV/O-021

Diversity analysis of lichen in urban and rural area using species abundance model SAD (Species Abundance Distribution) : case study in Surakarta, Central Java

Efri Roziaty [1,2], Suntoro Suntoro [3], Sutarno* [4], Sugiyarto [4]

[1] *Environmental Science Doctorate Student Program, Universitas Sebelas Maret*
[2] *Biology Education, Universitas Muhammdiyah Surakarta*
[3] *Departement of Agriculture, Universitas Sebelas Maret*
[4] *Biology Departement Mathematics and Science Faculty, Universitas Sebelas Maret*
*Corresponding email: sutarno@staff.uns.ac.id

ABSTRACT

Lichen is an associate organism between mosses and fungi. The lichen thalus is composed of photobiont and mycobiont. Photobiont is a lichen partner that is autrotrophic, an organism capable of photosynthesis. The purpose of this study is to identify the diversity of lichen in two areas in Surakarta, urban area and rural area. The method was stratified with the purposive sampling technique applied in this reasearch. Twenty lichen sampling points were conducted. The study found as 34 species of lichen from 18 lichen taxa in urban areas while 16 taxa were found in rural one, but the number of individuals was more in the rural area was 1,085 individuals while in the urban area was 635 lichen individuals. The species most commonly found coming from the Family Parmeliaceae, and Genus Parmelia, species Lepraria incana was the most dominant in urban areas and Lepraria sp. the most dominant in the rural one. The Shannon Diversity Index showed that lichen in rural areas was higher than urban, which was 2,463 for rural and 2,419 for urban areas. It was concluded that the diversity and abundance still high, and also the distribution of lichen species in both regions was still normal. Keywords: lichen, SAD, abundance, Lepraria, Parmelia,

ENV/O-022

Screening of Keratinolytic Fungi for Biodegradation Agent of Chicken Feather Waste Keratin

Sutoyo[*1,2], Subandi[3], Tri Ardyati[1], Suharjono[1]

[1]*Department of Biology, Brawijaya University, Malang, Indonesia*
[2]*Department of Biology, University of Jember, Jember, Indonesia*
[3]*Department of Biochemistry, Malang State University, Malang, Indonesia*
[*]Corresponding email: sutoyo.fmipa@unej.ac.id

ABSTRACT

Chicken feathers waste is an abundant source of keratin protein. However, keratin contained in chicken feather waste is difficult to degrade so that its utilization becomes limited. Environmentally friendly degradation efforts require keratin proteases in addition to common proteases. Therefore, microorganisms that will effectively degrade keratin are needed to recycle the waste. This study aims to isolate and screen fungi that are capable of degrading chicken feather keratin. Isolate has the highest degradation activity index for hydrolyzing chicken feather flour and common protein substrate were selected as agents for chicken feather keratin biodegradation. The identification was carried out phenotypically and molecularly with phylogenetic analysis of the region gene sequences. The results of the study produced Talaromyces sayulitensis GF11 as a candidate for chicken feather keratin biodegradation agents, a new strain of keratinolytic fungi which was first published. Keywords: keratinolytic fungi, Talaromyces sayulitensis, biodegradation

ENV/O-023

The effectivity of Healthy Eating and Lifestyle (HEAL) program: a pilot project to initiate students' action in reducing air pollution

Rini Puspitaningrum[*1], Ivana Melda Anastasia[2], Shania Putri Apriani[2], M. Rafli Noer Haiqal[2], Zahra Muthmainnah[2]

[1]Biology Program, FMIPA, Universitas Negeri Jakarta, Jl. Rawamangun Muka, Jakarta Timur, Indonesia
[2]Community of Marine Conservation Acropora, FMIPA, Universitas Negeri Jakarta, Jl. Rawamangun Muka, Jakarta Timur, Indonsia
[*]Corresponding email: rini_puspitaningrum@unj.ac.id

ABSTRACT

Air pollution has more concern due to the high carbon footprints and pollutants produced by human activity. Air pollution can cause a high level of stress oxidation and harm cell components. The knowledge about air pollution leads students to take action in reducing air pollution. Healthy Eating and Lifestyle (HEAL) is a program which has a purpose to increase student' knowledge and attitude in several issues about lifestyle, specifically in reducing air pollution. This study was aimed to know the effect of the HEAL program to increase students' knowledge and attitude in reducing air pollution. The program was implemented in August 2019 with 35 students from SMA Negeri 31 Jakarta which is consist of interactive course and discussion activity. The pre-post questionnaires were used to collect data consist of students' knowledge and attitude in reducing air pollution. Data were analyzed with paired t-test. The results showed HEAL program affects students knowledge and not affect the student's attitude about air pollution.

Sustainable Materials and Resources (SMR)

Using Environmental Learning Models to Increase The Students' Productive Skills

Siti Oriza Salsijanti [*1], Suyadi [*2], Esti Junining [*3], Wike [*4]

[1]*Doctoral Program of Environmental Studies, University of Brawijaya, Malang, Indonesia*
[2]*Department of Animal Husbandry, Faculty of Animal Husbandry, University of Brawijaya, Malang, Indonesia*
[3]*Department of Language and Literatures, Faculty of Culture Studies, University of Brawijaya, Malang, Indonesia*
[4]*Master Program of Women Studies, University of Brawijaya, Malang, Indonesia*
[*]Corresponding email: oriza.siti@gmail.com

ABSTRACT

Based on the experience of writer as a teacher in SMAN 1 Gambiran, Banyuwangi, Indonesia showed that students of the school are lack of awareness of environment. They also find that writing is difficult. Moreover, most of the writer's students can hardly use English for communicative objectives. To overcome the problems, some learning models used to teach environmental education to construct their knowledge through engaging self-inquiry, problem solving, and critical thinking in the real environmental problems that their found in their villages. This study investigated whether integrating environmental education into the Problem Based Learning and Project Based Learning methods in learning English effectively increases students' productive skills. This study used quasi-experimental design non-randomized control group pretest-posttest. The subjects of this study were taken from the population of the XI grade students of SMAN 1 Gambiran, Banyuwangi, Indonesia in the 2018/2019 academic year. The result of Mann-Whitney U-Test showed that the Post-test data testing of the Experimental Class group got a total ranking number 5905 and the Post-test data in the Control Class group got a total ranking number 3140. So that, the Mann-Whitney U-Test value was 929 with a p-value 0,000. Due to the p-value < ? (0,000 < 0,050), the statistical hypothesis stated to reject H0. Therefore, the one that applies was H1, means that there is a significant difference between the Experimental Class data group and the Control Class data group in the Post test. It can be showed that students who are taught by using PBL and PjBL through

scaffold and campaign achieve significantly higher scores in writing and speaking than those taught by using conventional method Keywords: environmental learning models, effectiveness, productive skills

SMR/O-002

Optimization Operation Condition of Microwave Aided Extraction of Phenol and Flavonoid from Coleous amboinicus Leaves

Ni'matul Izza*, Shinta Rosalia Dewi

Bioprocess Engineering Study Program, Department of Agricultural Engineering, Faculty of Agricultural Technology, Brawijaya University, Malang, Indonesia
*Corresponding email: izza_nimatul@ub.ac.id

ABSTRACT

Torbangun leaf (Coleous amboinicus L) is one of herbs from Indonesia which has been believed to be able to boost breast milk production. Besides, it contains potential phytochemical compounds for human health; phenol and flavonoid. In this study, extraction of phenol and flavonoid was aided by using microwave. The optimal operation condition was determined using Box-Behnken experiment design and Response Surface Methodology (RSM) which was processed in Design Expert 9.0.3 (DE 9.03). The optimum operation condition is 30 ml/g of solvent ratio; 300 Watt of power microwave; and 4.6 minutes of extraction time. Applying the resulted model by DE 9.0.3, under those conditions the extract expected to reach 10.134 ml of volume, 9.165 mg/ml of phenol, and 3.617 of flavonoid.

Identification Indigenous Yeast from Palm Juice Cocos nucifera L for Bioethanol Production

Trianik Widyaningrum [1,2*], Suharjono Suharjono[3], Tri Ardyati[3], Aulanni'am Aulanni'am[4]

[1]*Department of Biology Education, Faculty of Teacher Training and Education, Ahmad Dahlan University, Yogyakarta, Indonesia*
[2]*Doctoral program Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia*
[3]*Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia*
[4]*Faculty of Veterinary Medicine, Universitas Brawijaya, Malang, Indonesia*
**Corresponding author trianik.widyaningrum@pbio.uad.ac.id*
*Corresponding email: trianik.widyaningrum@pbio.uad.ac.id

ABSTRACT

The main energy source commonly used by the community comes from fossil energy, especially petroleum. The energy crisis shows that Indonesia's fossil energy reserves are limited. Based on this fact, it is important to develop alternative energy that is environmentally friendly and sustainable, for example bioethanol. The purpose of this research is to screening and identify indegenous yeast from palm juice Cocos nucifera L which is potential for bioethanol production. Isolation of yeast from palm juice Cocos nucifera L is done using YMEA medium. Purification is done to get one pure isolate used coconut water media. Screening is done by observing several parameters: the level of bioethanol production (using an alcohol meter), the content of reducing sugar with the DNS method, and the number of cells with optical density (600nm). Identification is done using 18 S RNA. Based on the results of screening, four yeast isolates were produced, namely K3D, K21A, K1C1, K2C, and K1A. Based on these results the superior isolates producing bioethanol are K1A (16 %). The results of the identification showed that the isolate was similar to Pichia manshurica strain IFO 1072 with 99. 99% similarity value. Keywords: indegenous, Cocos nucifera L, bioethanol

SMR/O-004

Sustainability Analysis of Dairy-Horticulture Integrated Farming System (A Case In Suntenjaya Village, West Bandung District, West Java, Indonesia)

Mia Rosmiati[1], Ramadhani Eka Putra[1], Endang Hernawan[1], Tien Lastini[1], Pujo[1], Fakhira Rifanti Maulana[*1]

[1]*School of Life Sciences and Technology, Institut Teknologi Bandung, Bandung, Indonesia*
[*]Corresponding email: maulana.fakhira@gmail.com

ABSTRACT

The Integrated farming system offers better opportunities to be implemented in smallholder agriculture because it ensures productivity and profitability for sustainable livelihoods. Several local farmers in Suntenjaya Village have been adopted this approach including the integration of dairy cattle and horticulture. However, the evaluation of these practices has not been clearly identified. This study aimed to evaluate the ecological, economic, social, institutional, and technological aspects of sustainability of existing dairy-horticulture farming systems at the farm level. Data were collected through depth interview with 24 farmers who practiced the integrated farming system of dairy cattle and horticulture, observation and literature review. This research used Multidimensional Scaling called RAP-DHFS (Rapid Appraisal for Dairy-Horticulture Farming System), leverage analysis and Monte Carlo to analyze the data. It showed that Suntenjaya Village identified as being less sustainable. The important attributes were waste management, the use of chemical pesticides and fertilizer, middlemen's role, and farmer group existence. It was brought to the conclusion that farmers need to consider the sustainability issues in running their agricultural production systems in order to make their business more profitable and environmentally friendly for a long term basis. Keywords: Sustainability, Integrated Farming system, Dairy Cattle-Horticulture Farming System

SMR/O-005

Religious Tourism and Utilization of Ablution Water Recycling (Case Study of Istiqlal Mosque)

Sari Narulita*, Rihlah Nur Aulia, Arip Suprasetio, Umi Khumairoh, and Azry Arvah Hidayat

Department of Islamic Studies, Faculty of Social Sciences, State University of Jakarta, Indonesia
*Corresponding email: Sari-Narulita@unj.ac.id

ABSTRACT

Istiqlal Mosque is one of the most visited religious destinations in DKI Jakarta. A large number of visits has led to an increase in the need for clean water, especially those used for ablution, which is one of the requirements for the validity of prayer. To anticipate this, the Istiqlal Mosque has implemented ablution water recycling management, regardless of the pros and cons. This study aims to describe and analyze the benefits of ablution water recycling management and its relation to religious tourism. This study uses a descriptive qualitative approach that is arranged systematically, factually, and accurately by collecting data through observation, interviews, documentation, and literature. From the use of ablution water recycling, several benefits can be generated, such as environmental, social, and economic benefits. It can even be used as an object of education for visitors in managing mosque-based religious tourism environmentally friendly. The results of this study also show that overall, the use of recycled ablution water can reduce the need for clean water by 35% for the care of the Istiqlal Mosque

SMR/O-006

ESTIMATION AND CORRELATION OF SURIAN LEAVES (Toona sinensis) WEIGHT WITH THE TREE DIMENSIONS IN PRIVATE FOREST

Tien Lastini[1], Endang Hernawan[1], Mia Rosmiati[1], Ramadhani E Putra[1], and Triah Bulkiah[1]

[1] *School of Life Sciences and Tecnology, ITB*
[*]Corresponding email: tien@sith.itb.ac.id

ABSTRACT

Leaves of surian tree (Toona sinensis) based on the research, can be used for medications, such as diabetes, cancer, and others. At the present the people is being switched from chemical drugs to herbal medicines.Therefore, surian leaves is one source of herbal medicine to be developed in the future. However, information of biomass leaves in each tree relating to ages and tree dimensions is unknown. This study aims to determine the weight of surian leaves on each tree and the relationship of leaf weight with several tree dimensions. The study was conducted on private forests in Sumedang District. The sample of 110 trees were taken purposively. Tree dimensions were measured, namely: Diameter Breast Height (DBH), total height, branch free height, crown height, crown diameter, age, and leaf weight of each tree. The results of the correlation analysis showed that there was a significant relationship between four dimensions of the tree, namely DBH, total height, crown height, and crown diameter with surian leaf weight. The highest correlation with the weight of surian leaves is DBH, amounting to 0.75. Estimated weight of leaves in DBH 10-19 cm is 8-11 kg. Whereas for DBH above equal to 20 cm is 18-23 kg. Keywords: Surian tree leaves, tree dimensions, leaf weight, correlation, Diameter Breast Height.

SMR/O-007

VALUE OF THE BENEFITS HYDROLOGICAL GUNUNG GEULIS PROTECTED FOREST AS AN ECONOMIC PRODUCT OF ECOSYSTEM SERVICES

Yooce Yustiana*, Hikmat Ramdhan, Pujo Hutomo, Sofiatin and Agustania.

School of Life Sciences and Tehcnology - Institut Teknologi Bandung Indonesia
*Corresponding email: yooce@sith.itb.ac.id

ABSTRACT

VALUE OF THE BENEFITS HYDROLOGICAL GUNUNG GEULIS PROTECTED FOREST AS AN ECONOMIC PRODUCT OF ECOSYSTEM SERVICES Yooce Yustiana1 ; Hikmat Ramdhan2 ; Pujo Hutomo3 ; Sofiatin4 ; Agustania5. 1,2.3,4,5 School of Life Sciences and Technology - Institut Technologi Bandung West Java - Indonesia Author Correspondent: yooce@sith.itb.ac.id ABSTRACT The natural system of forest ecosystems and the interaction of physical and biological components in it makes forests act as the most important water catchment areas in the hydrological cycle. However, until now, the value of its hydrological benefits has not been properly assessed and tends to be under pricing. This study aims to map water potential, calculate the value of functions and the value of hydrological benefits of the Gunung Geulis Protected Forest area. Mapping water potential using Drone, measuring the value of water with Water Pricing and the Willingness to Pay. The results showed that almost 54% (181.65 ha) of the Forest area was a catchment area with an average water flow of 0.00011014945 m3 / sec. The water demand function at the household and industry level in sequence is as follows: Yrt = 1,678 + 0,277X1 - 0,05X2 + 0,058 X3 + 0,080X4 - 0,05X5 - 0,078 X6 Yid = 21338,087 + 0.002 X1 - 0.000000192 X2 + 9658,825 X3 - 34968,722 X4 Only the procurement cost variable has a significant effect on the amount of water demand, with water values of Rp 3,609.56 / m3 and Rp 247.15 / m3, and the willingness to pay values of Rp 221.67 and Rp 6,537,928,837,650 , 00. Key Word : Ecosystem Services, Willingness to Pay

SMR/O-008

The Sustainable Ecotourism Potential Development With Special Reference to Oliveridley (Lepidochelys olivacea) Along Bantul Beaches, Indonesia

Agung Budiantoro[1], Catur Retnaningdyah[2], Luchman Hakim[2] and Amin Setyo Leksono[2]

[1]Dept. of Biology, Ahmad Dahlan University, Yogyakarta.
PhD Student of dept. Biology, Brawijaya University, Malang
[2]Dept. Biology, Brawijaya University, Malang
[*]Corresponding email: agung.budiantoro@bio.uad.ac.id

ABSTRACT

All seven species of sea turtle are endangered species; Oliveridley Lepidochelys olivacea is listed as a red list of threatened species by the IUCN. From 2012 until 2018 only L. Olivacea that can be found landing at Bantul Beaches. Bantul has four beaches for sea turtle conservations; Pandansimo, Goa Cemara, Samas, and Pelangi. The purpose of this study to explore information on the perception of general tourists about the potential development of turtle conservation based ecotourism in Bantul. A questionnaire by random sampling used to collect data to respondents (200 visitors). The data processed using quantitative descriptive. SWOT analysis methods used to evaluate the possibility of sea turtle based sustainable ecotourism development. The results show that almost of tourist perception about the condition of the beach in Bantul that is positive, the responses of the beach operators were good. Visitors approve of turtle conservation based ecotourism development; agree with the policy to donate for the efforts of turtle conservation; have the perception that the turtle has its attractiveness for beach tourism; agree that giving an explanation of the importance of turtle conservation before the release of hatchlings open to the tourists' insight about the importance of turtle conservation. The presence of donations by tourists in conservation efforts can be used as a source of funding for turtle conservation. From SWOT analysis, the sea turtle conservation in Bantul is potential to be developed into sustainable ecotourism. Keywords: ecotourism, conservation, sea turtle.

SMR/O-009

Sweet Bread Chemical Properties Optimization Based on Baking Temperature and Duration

Devi Dwi Siskawardani* and Warkoyo

Department of Food Science and Technology University of Muhammadiyah Malang, Indonesia
*Corresponding email: devi@umm.ac.id

ABSTRACT

Bread is main food in several countries. Sweet bread is one popular type that has a sweet taste that stands out and textured padded with or without stuffing. Baking is the most important process in bread production. The temperature and time required in the oven varies according to the type of bread, big dough, and baking pan in the oven used. This research aimed to identify the optimum level of baking temperature and duration to the chemical properties of sweet bread. Randomized Complete Block Design (RCBD) Factorial was applied for this research. The first factor was baking temperature consisted 4 level (T1= 180oC, T2= 190oC, T3= 200oC, T4= 210oC), and the second factor was baking duration which also composed 4 level (A1= 10 minutes, A2= 15 minutes, A3= 20 minutes, A4= 25 minutes) all treatment was replied 3 times. The results showed that there wasn't interaction between baking temperature and duration to water content, fat, protein, and carbohydrate, but it was interaction to the ash content. The baking temperature and duration separately has significantly effect to the all parameter. The best result according to the SNI 01-3840-1995 was S4W4 (185o C : 14 minutes) with water content (23,572%), fat (10,906), protein (1.105%), carbohydrate (62,940 %), and ash content (1,736 %). Keywords: Temperature, Duration, Baking, Chemical Properties

SMR/O-010

Density of soil biofertilizer bacteria on fibric peat in oil palm plantation area Kubu Raya District, West Kalimantan

Siti Khotimah[1,2] , Suharjono[3], Tri Ardiyati[3], Yulia Nurani[4]

1,2 Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia,
2Permanent address: Faculty of Mathematics and Natural Sciences, Tanjungpura University
Pontianak, Indonesia
3Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia
4Department of Agriculture Technology, Faculty of Agriculture Technology, Brawijaya University, Malang, Indonesia
*Corresponding email: khotimah_untan@yahoo.co.id

ABSTRACT

Characteristics of fibric peat are high fiber content and low pH 2-3. The presence of soil bacteria affects the fertility of fibric peat. This study aims to analyze density of soil bacteria in the fibric peat layer in the area of oil palm plantations. Bacteria as biofertilizer candidate was isolated by pour plate method on Carboxymethylcellulose (CMC), Pikovskaya, Nitrogen Fixing bacteria (Nfb), and Tryptic Soy Agar (TSA) media. Fibric peat at oil palm plantation contain 8.4 x105 cfu/g cellulolytic bacteria, 2.86x104 MPN/g nitrogen fixing bacteria, 3,48x105 cfu/g phosphate solubilizing bacteria, and 6.5 x105 IAA producing bacteria. Those functional bacteria can be develop as biofertilizer agent to improve fertility of peat soil.
Keywords: Density soil bacteria, fibric peat, biofertilizer agent

Nitrogen Sources Selection in Fermentation of Anti-phytopathogenic Compounds by Bacillus subtilis AAF2

Syukria Ikhsan Zam[*1], Oksana[1], Anthoni Agustien[2], Syamsuardi[2], Akmal Djamaan[3] and Irfan Mustafa[4]

[1] Department of Agrotechnology, Faculty of Agriculture and Animal Science, Universitas Islam Negeri Sultan Syarif Kasim Riau, Pekanbaru, Indonesia
[2] Department of Biology, Faculty of Mathematic and Natural Science, Andalas University, Padang, Indonesia
[3] Faculty of Pharmacy, Andalas University, Padang, Indonesia
[4] Department of Biology, Faculty of Mathematic and Natural Science, Brawijaya University, Malang, Indonesia
[*]Corresponding email: syukria.ikhsan.zam@uin-suska.ac.id

ABSTRACT

The filtrate from Bacillus subtilis AAF2 fermentation was reported to have high anti-phytopathogenic activity in the corn steep liquor modified medium with glucose as its carbon source. Besides media and carbon sources, the nitrogen source also affects these activities. This study aims to obtain the best nitrogen source in the fermentation of anti-phytopathogenic compounds by B. subtilis AAF2. The nitrogen sources used were yeast extract (15 g L^{-1}), peptone (15 g L^{-1}), NH_4NO_3 (1.71 g L^{-1}), and $(NH_4)_2SO_4$ (2.83 g L^{-1}), with phytopathogen test were Fusarium oxysporum and Sclerotium rolfsii. The parameters measured were pH fluctuations, the number of B. subtilis AAF2 cells, and the efficacy of phytopathogen (measured every 24 hours for 3 x 24 hours). The results showed pH ranged from 5.7 to 7.1; the number of cells ranges from $2.1x10^6$ - $1.00x10^{15}$ CFU ml^{-1}; the efficacy against F. oxysporum ranged from 7.10 - 71.40% and against S. rolfsii ranged from 17.70 - 71.80%. The best nitrogen source in the fermentation of anti-phytopathogenic compounds by B. subtilis AAF2 is peptone.

Analysis of the factors that impact product performance on responses market (Case study of home industry vegetable floss 'Bonsay' Jombang)

Nur Muflihah[*1], Retno Eka Pramitasari[2], Rahma Ramadhani[3]

[1] *Dept. of Industrial Engineering, Hasyim Asy'ari University, Jombang*
[2] *Dept. of Mechanical Engineering, Hasyim Asy'ari University, Jombang*
[3] *Dept. of Civil Engineering, Hasyim Asy'ari University, Jombang*
[*]Corresponding email: nmufie@gmail.com

ABSTRACT

The Impact of the industrial revolution 4.0 causes two basic problems, including the existence of Small and Medium Enterprises (SMEs) in which still not maximally developed in Indonesia and the potential of natural resources that have not been optimized yet. Recently, we revealed that the commodities most often founded in rural areas are the banana blossom's and moringa oleifera. Therefore, the innovation of proceed food product is needed. One of them is to procees banana blossom's and moringa oleifera becoming Abon vegetable (Bonsay). Furthermore, this study aims to analyze the factors that impact product performance on market responses. This research method used descriptive analysis and linear regression. Linier regression analysis included validity, reliability, and determination. Notably, The results of this study from 63 respondents indicate Cronbach's alpha values obtained 0.917 (reliable) and valid (item scores > 0.3173). Whereas, the coefficient of determination R2 is 0.7 (performance affects 70% of market response). However, the survey results show that 45% respondents were very satisfied and 44% of the total respondents were satisfied while 11 % respondents were satisfied enough. Keywords—Industrial revolution 4.0, Small and Medium Enterprises (SMEs), home industry, linier regression

SMR/O-013

Identification of Bioactive Substances in Fresh and Dried Leaves Extract of Saccharum officinarum by using Gas Chromatography-Mass Spectrometry

Talitha Widiatningrum[1*], Krispinus Kedati Pukan[1], Andin Vita Amalia[2] and Uswatun Chasanah[1]

[1] *Biology Department, Faculty of Mathematic and Natural Science, Universitas Negeri Semarang, Semarang, Indonesia*
[2] *Natural Science Department, Faculty of Mathematic and Natural Science, Universitas Negeri Semarang, Semarang, Indonesia*
[*]Corresponding email: talitha_widiatningrum@mail.unnes.ac.id

ABSTRACT

Cane (Saccharum officinarum) baggase extract showed bacteriostatic activity due to the occurence of some metabolites. There is a chance that analogous substances can also be found in the leaves as the most waste in sugar manufacture. In order to gain a wider usage of cane, analysis of the leaves' materials should be held. Phytopharmacies and their derived products were often prepared from fresh and dried plant extracts. Thus, the current experiment aimed to identify the bioactive properties found in the extract of Saccharum officinarum fresh and dried grinded leaves by using GC-MS. The screening analysis used GC-MS which is suitable for phytochemical detection. The goal of the research was confirmation of the compounds presence in the cane leaves together with the advantages. It was started by separately grinding fresh and dried leaves of cane. Both were macerated in H2O at room temperature for 3x16 h. The concentrated extract was dissolved in ethanol and employed for GC-MS. The results showed some single peaks of some compounds as follows. There are metil palmitic, palmitic acid and ?-linolenat acid in the fresh leaves solution. While metil palmitic and palmitic acid were found in the dried one. These compounds were mostly examined as antibacteria. Keywords: cane, leaves, Saccharum officinarum, metabolite, GC-MS

Effects of Heating on the dielectric properties of egg yolk and egg white of chicken (Gallus Domesticus)

Chomsin S Widodo [1], Ahmad Hidayat [1], Tasingatun Ukhro[1]

[1] *Dept. of Physics, Brawijaya University, Malang*
*Corresponding email: chomsin@ub.ac.id

ABSTRACT

868/5000 Eggs are livestock products that make the greatest contribution to achieving adequate community nutrition, especially protein. The egg will experience changes when heated. A fundamental change occurs in proteins, namely protein denaturation. The dielectric properties of eggs assessed by measuring capacitance by parallel plate capacitor method. The capacitor plate is 20 x 10 mm2 with a distance between 5 mm plates. Parallel plate capacitors are connected in series with the capacitance probe and inductance on the LCR meter GW-Instek 816 series and are measured in the frequency range 100-2000 Hz at intervals of 25 Hz. Samples of race chicken eggs are heated with water for 10 minutes, 15 minutes, 20 minutes and 30 minutes. The results showed that the capacitance and dielectric constant of egg yolk and egg white of chicken (Gallus Domesticus) changes due to heating. This change indicates the presence of protein denaturation.

SMR/O-015

Analysis of Boer Spermatozoa Quality in Different Incubation Periods and Medium for In Vitro Preparation

Ardyah Ramadhina Irsanti Putri[1], Gatot Ciptadi[1], Sri Wahyuningsih[1], Wahyu Gondo Wibowo[1]

[1]*Faculty of Animal Science, Brawijaya University, Malang*
[*]Corresponding email: ciptadi@ub.ac.id

ABSTRACT

One of the developments in biotechnology is In Vitro Fertilization (IVF) that requires a preparation process, one of prepared sample is spermatozoa. Preparation of spermatozoa is a stage of purification and separation as well as to eliminate bacteria and clear the unwanted residues. In preparation usually use a special medium to maintain the quality, as energy sources, and others. This research aims to determine the effect of incubation time on the quality of spermatozoa of Boer goats in two different types of medium, Tissue Culture Medium (TCM) -199 and Phosphate Buffer Saline (PBS). This research used frozen semen obtained from Balai Benih Inseminasi Buatan (BBIB) Singosari then analyzed the quality of post-thawing for further treatment. Post-thawing semen then prepared and tested in two types of media, there are TCM-199 and PBS. In each media, Semen was incubated at 38°C CO2 5% for 30 (P1), 45 (P2), and 60 (P3) minutes. The results of the study then observed sperm quality, like; motility, viability, abnormality, and concentration, in addition to quality, the effect of incubation time was analyzed using Randomized Block Design (RBD) and continued with further testing of the Least Significance Different (LSD). The results showed the average sperm motility for TCM-199 medium P1, P2, and P3 respectively; 28 ± 10.95, 34 ± 8.94, and 26 ± 5.48, while for PBS P1, P2, and P3 medium respectively; 58 ± 4.47, 56 ± 8.94, and 46 ± 8.94. The conclusion of this study is that PBS medium is better for maintaining sperm quality while incubation, especially in the 30th minute compared to TCM-199 medium. Keywords: Boer Goat, Spermatozoa, TCM-199, PBS, Quality

Parameters Optimization of Bio Composite Manufacturing Using Experimental Design

Debrina Puspita Andriani*

Department of Industrial Engineering, Universitas Brawijaya, Indonesia
*Corresponding email: debrina@ub.ac.id

ABSTRACT

Indonesia is one of the banana producing countries that reaches millions of tons every year. With a huge number of banana production, the waste from banana trees, especially banana midribs, is also huge. Banana midribs or pseudo-stem is known to have robust tensile strength and can be made miscellaneous products, such as composite materials. Composites are currently used in industry many times, especially in the construction industry as partitioning and ceiling material. The purpose of this study was to discover the optimal parameters in the manufacture of bio composite materials in an effort to utilize the pseudo-stem and environmental sustainability. This study began with conducting experiments, testing the tensile strength of composite materials, and calculating the experimental results. The method applied was the factorial experimental design to figure out the best parameters in the manufacture of composite materials. The results showed that from the 3 factors used, the direction of fibre had the substantial contribution, followed by the length of pressing time, and the type of adhesive. Meanwhile, the combination of factors and levels that produce the optimum parameters for tensile strength were by using the type of adhesive on level 1, the direction of fibre on level 1, and the length of pressing time on level 2 which are Polyvinyl acetate (PVAc), parallel, and 1 hour, respectively. Keywords: ANOVA, banana pseudo-stem, bio composite, experimental design, tensile strength.

The Utilization of Syzygium polyanthum Walp. Leaf and Arcangelisia flava Merr. Stem Extracts to Inhibit Coconut Sap Water Fermentation

Fathul Aziz[1*], Ayu Biakhlaqir Rossa[1], Setyaki Kevin Pratama[1], Dian Siswanto[1]

[1]*Biology Department, Faculty of Mathematics and Natural Sciences, Brawijaya University*

[*]Corresponding email: fathul1600@gmail.com

ABSTRACT

Sap water is a raw material for brown sugar and can be obtained from the coconut trees. Besides, the coconut sap water is easily fermented by microbes thus fail sugar hardening. This research aims to determine the easiest and most efficient method to extract Syzygium polyanthum leaves and Arcangelisia flava stems, and to determine the optimum concentration of S. polyanthum leaf and A. flava stem extracts to inhibit fermentation of the coconut sap water. The extraction had been conducted by boiling and maceration of leaves and stems. Furthermore, the plant extracts obtained from the boiling method were freeze-dried and centrifuged. The plant extracts obtained from maceration were concentrated by rotary evaporator. All of the plant extracts obtained from several methods were used for inhibition zone method against microorganism of coconut sap water. Only the plant extract from boiling method was continually tested by qualitative fermentation inhibition method, pH analysis, made for brown sugar, and finally, the bacteria in sugar was tested by total plate count analysis. The result showed that all of S. polyanthum leaf extracts involved of supernatant, pellet, and maceration extract instead of inhibiting, triggered the bacteria as wide as 10 mm, 15 mm, and 20 mm, respectively. Also, the result showed that A. flava stem extracts involved of supernatant, pellet, and maceration extract instead of inhibiting, triggered the bacteria as wide as 30 mm, 40 mm, and 30 mm, respectively. Extracts obtained from the freeze-drying method did not show any inhibition zone to coconut sap microorganisms. The qualitative method for fermentation inhibition showed that the addition of S. polyanthum leaf and A. flava stem extracts as much as 25% concentration had successfully inhibited coconut sap water fermentation and stabilized the sap water acidity for 8 hours. The results

indicated that the plant extracts indirectly inhibited coconut sap water fermentation. Sugar was successfully made with the addition of the aqueous extracts at 5% and 10% concentrations. The total plate count analysis showed that the sugar made with additional plant extracts had less than 30 x 101 CFU/ml of bacteria. Keywords: plant extracts, coconut sap water, bacteria, microorganisms, fermentation

Soybean Extract Supplementation on Saccharomyces cerevisiae Culture Media in Producing Glutathione

Dewi Mustikaningtyas[1,3], Sri Widyarti[2], Muhaimin Rifa'i[2], and Nashi Widodo[2*]

[1]*Biology Doctoral Program, Brawijaya University, Malang*
[2]*Department of Biology, Brawijaya University, Malang*
[3]*Department of Biology, Universitas Negeri Semarang, Semarang*
[*]Corresponding email: widodo@ub.ac.id

ABSTRACT

The Soybean extract has potential value as enrichment media for Saccharomyces cerevisiae to glutathione (GSH) production. This study aimed to evaluate the effect of soybean extract supplementation on GSH production by S. cerevisiae. Soybeans that used in this study were local varieties of Grobogan Central Java. It is as amino acid resources especially cysteine in S. cerevisiae culture media. Four concentration of soybean extract are 10, 20, 30 and 40 mg/mL, were added at the first stationary phase. As a treatment control in this study was S. cerevisiae culture without soybean extract supplementation. Measurement of GSH yield done after 44 h incubation using the Ellman method by ELISA reader. The highest GSH yield achieved 683.5 mg/L from 40 mg/mL soybean extract supplementation. As a result, the strategy of precursor amino acids supplementation is a key aspect in increasing GSH production. Keywords: Cysteine, culture media modification, Grobogan Soybean local variety.

Physicochemical Analysis of Taro (Colocasia esculenta) Flour on Water Contain and Milling Velocity using Pin Disc Mill

Dina Wahyu Indriani[1*], Yusron Sugiarto[1], and La Choviya Hawa[1]

[1] *Department of Agricultural Engineering, Faculty of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia*
[*]Corresponding email: dinawahyu@ub.ac.id

ABSTRACT

Colocasia esculenta (Taro tuber) has a high fiber content when compared to sweet potato tuber which is about 0.6-0.8 g / 100g, and protein is around 2-6g / 100g (Koswara, 2010) which can be utilized by the human body as a good source of protein and fiber for human body. However, with the fiber and protein values found in the taro tubers, it can be damaged due to high water content, microbial attack and other damage when harvesting and storing so that other alternatives are processed into taro flour. In this study flour production using disc mill was carried out with the aim of increasing the uniformity of the size of taro flour produced and able to optimize processed products. This research uses descriptive method with two factorials, namely the content of taro chip water (10, 15, and 20%) and disc mill type grinding speed (1000, 2000, and 3000 rpm). The results showed that taro chips with a moisture content of 10, 15 and 20% were obtained in a time span of 100, 85 and 75 minutes. With the physicochemical characteristic value of 20% taro flour treatment, protein levels were 4.19%, fat content was 0.46%, ash content was 4.01% and carbohydrate content was 82.35%. This shows that the effect of chip water content affects the chemical characteristics to make taro flour. Keywords: drying, milling velocity, physicochemical characteristic taro flour

Combination of Moringa oleifera Extract and Albumin can Reduce Inflammatory Cytokine TNF? and IFN? and Lipid Retention in Steatohepatitis Mice Model

Wirdatun Nafisah[1], Mas Adam Lukman C[1], Leli Nur zaidaha[1], Aris Soewondo[1], Muhaimin Rifa'i[1*]

[1] *Dept. of Biology, Brawijaya University*
[*]Corresponding email: wirdatunnafisah@student.ub.ac.id

ABSTRACT

Combination of Moringa oleifera Extract and Albumin can Reduce Inflammatory Cytokine TNF? and IFN? and Lipid Retention in Steatohepatitis Mice Model Wirdatun Nafisah, Mas Adam Lukman Chaubah, Leli Nur zaidah, Aris Soewondo, Muhaimin Rifa'i* Biology Department, Faculty of Sciences, Brawijaya University, Indonesia *Corresponding email: wirdatunnafisah@student.ub.ac.id Abstract Steatohepatitis is condition where there is accumulation of lipids in the liver. This condition can caused by alcohol consumtion and chemical subtances of industries. M.oleifera is a miracle plant that is capable as hepatoprotective and albumin encourages the process of homeostasis in the body. The aim of this study is to determine the effect of M. oleifera and albumin on pro-inflammatory cytokine TNF? and IFN? and lipid retention on steatohepatitis mice model. The research was conducted using 5 different groups. Normal control was completely untreated. Steatohepatitis control was induced with CCL4 and alcohol without M. oleifera and albumin administration. Three different doses of M.oleifera is used in this study with dose 1000mg/kg and albumin was 5300 mg/kg. The first dose is combination of M. oleifera 75% and albumin 25%, next dose is 50% M. oleifera and 50% albumin, and the last dose is 25% M. oleifera and 75% albumin . After 2 weeks treatment with M. oleifera and albumin (except normal and steatohepatitis group), mice were sacrificed and the liver and spleen were isolated. The liver tissues were fixed and embeded in parafin to analyse the histology by hematoxylin and eosin staining. The spleen used to isolate CD4 T cells and analyse pro-inflammatory cytokine TNF? and IFN? by flow cytometry analysis. The results showed the reduction of pro-inflammatory cytokine TNF? and IFN?. Its reduction was linked to the reduction of lipid retention and it shows a promising effect of combination

M. oleifera and albumin to treat steatohepatitis. Keywords: Albumin, M. oleifera, pro-inflammatory cytokine, steatohepatitis.

SMR/O-021

THE EFFECTS OF DIFFERENT INITIAL SUBSTRATE CONCENTRATION ON ANTIOXIDANT CAPACITY OF LEAF INFUSE OF Moringa oleifera DURING LACTIC ACID FERMENTATION

Umi Marwati[*1], Wibowo Mangunwardoyo[2], Abinawanto[2], Vidyanti Permata Dewi[1], Kanisa Firanisa Putri[2]

[1]*Faculty of Pharmacy, Pancasila University, Jakarta, Indonesia*
[2]*Biology Department, MIPA Faculty, University of Indonesia, Indonesia*
[*]Corresponding email: wibowo.mangun@yahoo.co.id

ABSTRACT

This study evaluated the use of traditional Indonesian herb Moringa oleifera, Lam. This plant is a tradisional food, generally used for the treatment of hypertension, diabetes, cardiovascular disorder, etc. In this study, leaf of Moringa oleifera, Lam were used as substrate for lactic fermentation in different concentration. Fermentation has been known to be the oldest and cost effective method with the ability to improve food nutritional qualities. Information on the antioxidant capacity of lactic fermented herb as a food or beverage is still lacking. Hence, the objective of this study is to determine the changes in the antioxidant properties of Moringa oleifera herbal infuses after being subjected to lactic fermentation. The fermentation product were analyzed for their total phenolic, antioxidant activity via DPPH , total acid content during 24 hours fermentation. All lactic fermented herbal infuses in different concentration exhibited diferrent phenolic contents, and antioxidant activity compared to the freshly-prepared herbal infuses with majority showing signifcant changes ($p < 0.05$) . Lactic fermented herbal infuses also showed an increase in antioxidant capacity in DPPH assay. The higher antioxidant activity obtained from substrate concentration 15%. This study may suggest a novel use of lactic-fermenting Moringa oleifera in the production of functional food and baverage.

SMR/O-022

Effect of Carbon Cloth Types and Addition of Sterile Molasses – Stillage on Electricity Production Using Microbial Fuel Cell

Raden Darmawan[1*], Muhammad Ricki Romadoni[1], Adith Triady[1], Sri Rachmania Juliastuti[1] and Masato Tominaga[2]

[1]Dept. of Chemical Engineering, Faculty of Industrial Technology, Institut Teknologi Sepuluh Nopember (ITS), Surabaya, Indonesia
[2]Graduate School of Science and Engineering, Saga University, Saga, Japan
[*]Corresponding email: rdarmawan@chem-eng.its.ac.id

ABSTRACT

Microbial Fuel Cell (MFC) utilizing mud as biocatalyst was prepared by using modified carbon cloth 2F and 3F as anodic and cathodic electrodes with connected Ti-wire. The modified electrode was using rice bran to enlarge the contact area. Meanwhile, molasses and stillage were obtained from sugar and bioethanol factories, respectively as carbon source. The purpose of this study was to determine the effect of the modified carbon cloth types and to investigate the influence of the added sterile molasses and stillage to the growth of microbial communities on the electricity production. The results showed that after six week processes, the electricity generated from the modified carbon cloth 3F with mud only, mud added with molasses and mud added stillage was higher than the modified carbon cloth 2F with the power density production of 10.08 mW /m<sup>2<sup>, 3.68 mW /m<sup>2<sup>, 2.69 mW /m<sup>2<sup>, respectively. Keywords: carbon cloth, molasses, stillage, electricity, MFC

SMR/O-023

Formulation and Characteristic Evaluation of Corn Harvest Waste Based Paper

Saptini Mukti Rahajeng*

National Agricultural Training Center of Ketindan
*Corresponding email: smrahajeng@gmail.com

ABSTRACT

Food crops production generates enormous amounts of agricultural waste (biomass) each year and has been estimated that Indonesia produced 146.7 million tons of biomass per year, or equal to 470 GJ/years (Dani and Wibawa, 2018). In general, most of agricultural waste utilization dominated by the application of the waste as organic fertilizer and animal feed, even combustion. The increasing of corn production nowadays generates more waste includes corn husks, corncobs, corn stalks and its leaves up to the roots. This study is aimed to determine the best formulation of the corn waste into paper and to determine the tensile strength, elasticity, and sensory test of the paper resulted. This study used experimental method with a completely randomized design (CRD) factorial, with 3 repetitions. The first factor is the ratio of the corncobs and corn stalks (A1: 100% corncobs, A2: 25% corncobs and 75% corn stalks, A3: 100% corn stalks), while the second factor is the addition of adhesives, those are PVaC and starch (B1: 0 addhesive, B2: PVaC, B3: starch). The result showed that the highest tensile strength and elasticity was found in paper A3B2, those were 14,6 N and 16,67% respectively, with the sensory character were greenish beige colour, visible fiber, and rough texture in the upper side. Keywords: Agricultural waste, corn harvest waste, formulation, characteristic, paper

Prospects For The Development and Analysis of Kenari Shell Biobriquette Product Business As an Alternative Fuel Based on Green Energy in North Maluku

Sundari[1*], Nurmaya Papuangan[2] and Yetty[3]

[1,2]Departement Biology Education, Faculty of Teacher Training and Education, Khairun University, Street Pertamina Kampus II Unkhair Gambesi City of South Ternate, North Maluku 97728 Indonesia.
[3]Management Study Program, Faculty of Economics, Khairun University, Jalan Pertamina Kampus II Unkhair Gambesi Kota Ternate Selatan, North Maluku 97728 Indonesia
[*]Corresponding email: sundariunkhair08@gmail.com

ABSTRACT

A research on the development of biobriquette products from walnut shell waste based on research on the heating value and variation of adhesives has been carried out. The results showed that kenari shell waste has the potential to be used as a material for making biobriquettes. Variation of adhesives has less effect on the quality of the briquettes produced. This study aims to 1) produce Biobriquette products and develop a model for developing regional biobriquette-based manufacturing technology; 2) produce a business plan model for walnut shell biobriquette business management. The walnut shell briquette product in this study has a calorific value equivalent to coconut shell briquettes. Kenari shell biobriquette products have relatively high consumer preferences. The analysis of the biobriquette business shows a profit in kenari sheel biobriquette production activities. Keyword: prospect, busines, biobriket, kenari sheel

SMR/O-025

Allergenic Activity of Steroid Saponins in Dioscorea alata L. Tubers In Silico

Sri Nabawiyati Nurul Makiyah[1*], Sri Tasminatun[2], Tri Wulandari Kesetyaningsih[3]

[1]Histology and Cell Biology Department, School of Medicine, Faculty of Medicine and Health Sciences,
Universitas Muhammadiyah Yogyakarta, Daerah Istimewa Yogyakarta, Indonesia
[2]School of Pharmacy, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Daerah Istimewa Yogyakarta, Indonesia
[3]Parasitology Department, School of Medicine, Faculty of Medicine and Health Sciences,
Universitas Muhammadiyah Yogyakarta, Daerah Istimewa Yogyakarta, Indonesia
[*]Corresponding email: nurul_makiyah@umy.ac.id

ABSTRACT

Steroid saponin in the tuber of Dioscorea alata L. has the potential to have allergenic activity. The purpose of this study was to examine the allergenic activity of steroid saponins in Dioscorea alata L. tubers in silico. This observational study was conducted using steroid saponin compounds as a result of GC-MS test N-hexan extract, Clionasterol with comparison of native ligand (Celecoxib) which was carried out molecular docking using Histamin-1 receptors with Chimera software. The docking process uses a protein with the code: 3RZE, which is the active side of the Histamin-1 receptor which binds to Doxepin (a drug that selectively binds to the Histamin-1 receptor). Validation results between Histamin-1 receptor proteins binding to native Ligand (Doxepin) show Lower Bond RMSD values below 2 ? (0,659 ?). Validation results between Histamin-1 receptor proteins binding to Clionasterol show Lower Bond RMSD values below 2 ? (0.659 ?). This proves that there is no significant shift during the docking process, so the docking process is valid. It was concluded that steroid saponins in Dioscorea alata L. tubers had allergenic activity in silico. Key words: Steroid Saponins, Dioscorea alata L., in silico, allergenic agent, Clionasterol

Economic Valuation of Critical Land

Sulistya Rini Pratiwi[1*], Erry Purnomo[2] and Said Usman[3]

[1,3] *Faculty of Economics Borneo Tarakan University, North Kalimantan, Indonesia*
[2] *Faculty of Agriculture Tidar University, Central Java, Indonesia*
[*]Corresponding email: miss.rainy@ymail.com

ABSTRACT

The purpose of this research is to analyse the farmers', and to identify the factors influencing the farmers' willingness to pay (wtp) in reducing the impact of critical land. The research method used to calculate the farmers' willingness to pay the land restoration is the willingness to pay (wtp) method, and the ordinal logistic regression method was used to analyse wtp's influencing factors. The result showed that the farmers' avarage of maximum willingness to pay is idr. 21.196.-. This means that the farmers' avarage of maximum willingness to pay is lower than the average cost incurred by the farmers for the land restoration activity which is idr. 58.000.-. This indicated that the farmers' awareness of the efforts to do the critical land restoration is low. The independent variable with the sicnificant influence is the own (the status of the land ownership) variable. The other valiables that the logit coefficient is positive are income, age, education, long stay, family numbers, and status of land ownership. Then the variables that the logit coefficient is negative are marital status, occupation, and land restoration activity.

Potential Compounds of Curcuma xanthorrhiza and Curcuma zedoaria as Mortalin Inhibitor to Control Cancer Cell Growth Through Computational Study

Nur Fitriana[1], Fika Agalia Khairunnisa[1], Muhaimin Rifa'i[1], Widodo[*1]

[1]*Biology Department, Faculty of Natural Science and Mathematics, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: widodo@ub.ac.id

ABSTRACT

C. xanthorrhiza and C. zedoaria, anticancer agents widely used in Asia. Previous studies have identified that active compounds from both Curcuma are capable of inhibiting cancer cells growth and inducing apoptosis. However, the roles from its active compound for Mortalin inhibition in carcinogenesis process was unknown. The recent study shows that Mortalin also known as HSPA9/GRP75/mtHSP70 is a highly conserved heat-shock protein 70 family has various roles in the carcinogenesis process in multiple ways and very complicated. This study analyzed the potential of active compound from both Curcuma as Mortalin inhibitor to control cancer cell growth with the computational study. The results of binding affinity analysis through molecular docking show that some active compounds from both Curcuma have the potential as Mortalin inhibitor with smallest energy and same binding site with commercial Mortalin inhibitors. Protein interaction analysis illustrates that Mortalin can interact with various protein including HSPD1, TIMM17A, and HSPA4. Upregulation is it proteins expression have been identified as a diagnostic marker and poor prognosis factor for cancer. These data indicate that active compounds from both Curcuma have a promising opportunity as anticancer through Mortalin inhibitor mechanism. Additional research is needed to validate the in vitro activity of the compounds. Keywords: Anticancer, C. xanthorrhiza, C. zedoaria, Mortalin inhibitor

POSTER ABSTRACTS

P-001/BOT

Flora Exploration in South Konawe, South-East Sulawesi for Kendari Botanic Garden's Collection

Popi Aprilianti[*1], Sri Hartini[1]

[1] *Research Center for Plant Conservation and Botanic Gardens - LIPI*
[*]Corresponding email: poppy.amb@gmail.com

ABSTRACT

Sulawesi is well known for its distinctive flora, including in South-East Sulawesi. Forest conversion for oil palm plantations and settlements makes the forest area becomes narrower. This causes the existing plants species are threatened. The Research Center for Plant Conservation and Botanical Gardens-LIPI is an ex-situ conservation institution that has role in building many regional botanic gardens based on eco-regions, including Kendari Botanic Gardens (KBG). The exploration was conducted in Konawe Selatan District and its purpose to obtain the plant collection to be conserved ex-situ at the KBG. Activities were carried out at Tanjung Peropa and Tanjung Amolengo Wildlife Reserve, South Konawe. The method used is exploring specific areas where the diversity is still abundant. Observations and identification on the plants collected showed that there were 257 species in 63 family and 171 genera. Some species are rare plants based on IUCN Redlist and several other species are very potential to be used as timber for building material. Detailed explanation about the species and its uses will be described further in this paper.

P-002/BOT

HPLC–ESI–MS analysis of the chemical constituents of Bletilla Tuber

Yuto Nishidono[1], Toshinari Ishii[2], Ryo Okada[2], Hisayoshi Norimoto[3], Chiaki Murayama[3], Dingxiang He[4], Tetsuya Okuyama[2], Mikio Nishizawa[2], Ken Tanaka[*1]

[1] College of Pharmaceutical Sciences, Ritsumeikan University, 1-1-1 Noji-Higashi, Kusatsu, Shiga 525-8577, Japan
[2] Department of Biomedical Sciences, College of Life Sciences, Ritsumeikan University, 1-1-1 Noji-Higashi, Kusatsu, Shiga 525-8577, Japan
[3] PuraPharm Japan Corporation, Room 406, 4th FL., JOHO BLDG., 527 Takata, Toyama 930-0866, Japan
[4] Gold Sparkle (Guizhou) DZ Chinese Medicine Co., Ltd, Danzhai 557500, China
[*]Corresponding email: ktanaka@fc.ritsumei.ac.jp

ABSTRACT

Background: Bletilla Tuber (dried tuber of *Bletilla striata*) is used as an astringent hemostatic medicine for the treatment of ulcers, bleeding, and burns in traditional Chinese medicine (TCM). In this study, we compared the chemical constituents of well processed Bletilla tuber (BT1) and normally processed Bletilla tuber (BT2) in order to clarify the effect of heat processing. **Method:** HPLC–ESI–MS was used to analyze chemical constituents of Bletilla Tuber. Based on the fragmentation and elution behavior of reference compounds, major peaks (peak No. **1**–**18**) were annotated. **Results and discussion:** From both crude drugs, three types of compounds, glucosyloxybenzyl 2-isobutylmalates (peak No. **1**–**10**), bibenzyl derivatives (peak No. **14**, **15** and **18**) and phenanthrene derivatives (peak No. **11**–**13**, **15** and **17**), were detected. Among them, peak **5** was tentatively identified as an unreported compound. Comparison of the chemical profiles of the extracts indicated that the relative contents of glucosyloxybenzyl 2-isobutylmalates had changed by heat processing, whereas the relative contents of bibenzyls and phenanthrenes had not changed. These results suggested that hydrolysis reaction occurred in heat processing. **Keywords:** *Bletilla striata*, heat processing, HPLC–ESI–MS

P-003/BOT

Pollen Morphology of Four Indonesian Begonia (Begoniaceae)

Hartutiningsih-M.Siregar[1*] and Sudarmono[1]

[1]*Research Center for Plant Conservation and Botanic Gardens*
Indonesian Institute of Sciences. Jl. Ir. H.Juanda No. 13, Bogor 16003, West Java, Indonesia.
[*]Corresponding email: hartutiningsih@yahoo.co.id

ABSTRACT

Begonia (Begoniaceae) are characterized as erect or trailing herb, succulent stem, and asymmetrical leaves (begoniifolia). Pollen *Begonia* has a very small size and very much. Morphological observations can be used to facilitate taxon at familia, genus, species, and under species levels, or doubtful taxon placement, rearrangement, merging and repairing, and other backup amplifiers. The study was conducted in the Bogor Botanic Gardens's green house. The first stage is pollen collection of four species of flowering native Indonesian Begonia, *Begonia natunaensis* C. W. Lin & C.-I Peng, *B. puspitae* Ardi, *B. hooveriana* Wiriad and *B. sudjanae* Janson. Fresh pollen is stored first put into small size tubes (1.5 ml - 10 ml) then examined in a scanning electron microscope (SEM) Zoology laboratory, Cibinong Science Center - LIPI. Pollen observations by SEM were carried out qualitatively by describing images containing pollen units, polar axia size, equator diameter, striated ornaments, margo, colpus membrane, endoaperture registered. The results showed that Begonia pollen was single, isopolar. The pollen size of *B. puspitae* has the largest size compared to pollen other Begonia types have polar axia size x equatorial diameter (21.85 x 10.25) µm, *B. natunaensis* (21.40 x 6.65) µm, *B. sudjanae* (20,70 x 6.65) µm and *B. hooveriana* (17.70 x 9.10) µm. While the P / E ratio, ornament, margo, colpus membrane, endoaperture will be discussed. It is expected that the results of this study can be used to study the pollen morphology of the *Begonia* collection of the Indonesian Botanical Gardens. Besides that, research on pollen can also inform the reproductive organs in plants and new knowledge about pollen.

P-004/ZLG

Nutritional, and metabolic characterization of Streptozotocin (STZ)-induced diabetes in male Wistar rats with jugular and intragastric cannulation.

N. Qomariyah [*1,3], J.K. Kruit [2], G. van Dijk[*1]

[1] *Department of Behavioural Neurosciences, GELIFES, University of Groningen, The Netherlands*
[2] *Department of Pediatrics, University Medical Center Groningen, The Netherlands*
[3] *Department of Biology, Faculty of Mathematics and Natural Sciences, The State University of Surabaya, Indonesia*
[*]Corresponding email: nurqomariyah@unesa.ac.id

ABSTRACT

Abstract : Streptozotocin (STZ) is a compound which is particularly toxic for pancreatic beta cells. However, data on dosing and subsequent characterization of diabetes is limited. Therefore we performed an STZ dose-response study in male Wistar rats and characterized nutritional, and metabolic aspects of diabetes. Rats of 3 months underwent surgical implantation of jugular vein and stomach catheters. After recovery, rats were subdivided into groups receiving STZ intraperitoneally dosed at 0, 40, 45, 50 and 55 mg/kg-bw. Nutritional and metabolic status were recorded over a 21-day period following STZ. Body fat content (by petroleumether-extraction) was analysed. While STZ 50-55 caused basal hyperglycemia and insulin insufficiency in all rats, this was only visible in 50-60% of cases using STZ 40-45. Body weight/fat content following STZ 50-55 decreased significantly, despite dramatically increased levels of food and water intake. STZ 40-45 also caused increased food and water intake, yet body weight remained with slightly decreased. Intraperitoneally injected STZ in doses of 40-45 mg/kg-bw produces a mild form of diabetes type 1 Wistar rats with indwelling catheters, which can be used for subsequent investigation of diabetes etiology and treatment. Keywords: streptozotocin, stomach cathether, jugular cannulation

P-005/ZLG

SEQUENCE, STRUCTURE, FUNCTION COMPARISON OF FIVE INSULIN ANALOGUES FOR DIABETES MELLITUS THERAPY

Galuh W. Permatasari[1,2*], Didik H. Utomo[1,2], Djoko Soeatmadji[3]

[1] *Department Biology, Faculty Of Sciences, Brawijaya University, Malang, Indonesia, Indonesia*
[2] *Indonesian Institute of Bioinformatics, Malang, Indonesia*
[3] *Department Of Internal Medicine Laboratory, Faculty Of Medicine, Brawijaya University, Malang, Indonesia, Indonesia*
[*]Corresponding email: galuh.wening@gmail.com

ABSTRACT

Nowadays, insulin analog production has been improved and getting popular. The advantages of insulin analog were extensively reviewed in terms of effectiveness compared to human insulin. Each of insulin analog industry claimed their safety and efficacy based on the in vivo and in vitro to overcome type 2 diabetes. Here, we report on the identification of highly effective insulin analog-based on the structure and binding affinity computationally, to confirm its potential and give a broader point of view to the insulin analogs users. Five types of insulin analogs include insulin Aspart, Glargine, Detemir, Lispro and Degludec were analyzed. We compared and clustered the sequence by alignment to identify the closeness and sequence similarity between samples, continued by superimpose analysis and binding affinity identification utilizing a docking analysis approach. Insulin Lispro has the farthest sequence similarity to other types, close to the Aspart (96%) and Glargine (90.5%), while Detemir and Degludec showing 100% similarity so that we use only Degludec for the next analysis. Furthermore, Insulin Lispro, Aspart, and Glargine exhibit the structure similarity strengthen by the no significant difference in the RMSD data (RMSD < 2 Amstrong). Importantly, Insulin Lispro has the highest binding affinity score (-49.99 Kcal/mol) in the docking analysis to the insulin receptor (INSR) and similar binding sites area with the native insulin. We revealed that Insulin Lispro identified as the unique one due to the distinction in amino acid sequence and proven computationally mimic native insulin as a diabetes mellitus medication.

The Potential Of Plant Leaf Litter As A Raw Material For Soil Humic Acid In The Various Of Land Use Types On The West Slope Of Mount Bromo

Purnomo Edi Sasongko[1,3*], Purwanto[2], Widyatmani Sih Dewi[2] and Ramdan Hidayat[3]

[1] *Department of Agriculture Science Doctoral Program – Postgraduate Program, Faculty of Agriculture, University of Sebelas Maret, Surakarta, Indonesia*
[2] *Department of Soil Science, Faculty of Agriculture, University of Sebelas Maret, Surakarta, Indonesia*
[3] *Department of Agrotechnology, Faculty of Agriculture, University of Pembangunan Nasional Veteran Jawa Timur, Surakarta, Indonesia*
[*]Corresponding email: purnomoedis@gmail.com

ABSTRACT

This study investigated the potential of plant litter as a source of soil humic substances in five land utility types: secondary forest, rainfed mixed garden, apple plantation, coffee plantation, and vegetable garden. The study was conducted in the conservation forestry and cultivated the land of the west slope of Mount Bromo at Tutur village - Pasuruan District. This study aims to determine the potential of leaf litter of various types of vegetation on the formation of soil humic acid in the rhizosphere in five types of land use on the western slope of Mount Bromo. The results showed that overall mean soil humic substances (6.24 + 0.35%) higher under forest land use compared with other land use types, more than in coffee gardens, apple orchard, rainfed mixed garden and vegetable gardens respectively. In conclusion, plant species under conservation forest conditions signi?cantly affected the humification process in rhizosphere soil. Among the leaf litter of the plants studied, wild plant species under secondary forests contribute as the most beneficial source of humic acid. Keywords: Plant litter, Soil humic acid, Land utility types Mount Bromo

P-007/ECO

Mapping Divers Terrestrial Orchids Grown in the Orchids Garden of the Ranu Darungan Resort, Bromo Tengger Semeru National Park

D. Inayah[1*], T. Artaka[2], and E. Arisoesilaningsih[1]

[1]*Biology Department, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia*
[2]*The Orchids Garden of Ranu Darungan Resort, Bromo Tengger Semeru National Park, Lumajang, Indonesia*
[*]Corresponding email: durotul16.inayah@gmail.com

ABSTRACT

The aim of this research was to map divers terrestrial orchids grown in the Orchid Garden of Ranu Darungan Resort, the Bromo Tengger Semeru National Park. Garden is divided into four zones, namely A, B, C and D. Garden and orchids were mapped by recording their coordinates using GPS, then integrated into the Google Earth. Terrestrial orchids were identified, while their density of each subzone was determined. Results showed that there were 45 species belonging to 25 genera, some variants and a natural hybrid. Among them, Calanthe triplicata and Nephelaphyllum pulchrum showed the highest density. There were four endemic species of Java such as Paphiopedilum javanicum, Macodes javanica, Liparis javanica, and Acanthephippium javanicum. We found two variants of Eria javanica, two variants of flower colors in Phaius amboinensis, and two variant of labellum tip colors in Arundina graminifolia. We recorded a natural hybridization between C. triplicata and C. sylvatica, and then the hybrid flowers were light purple with a labellum shape of C. triplicata. The A zone was the richest one and grown by 31 species followed by the D zone. However, the C and B zones showed the lowest diversity and codominated by N. pulchrum and C. triplicata.

P-008/ENV

The Pesticide Residues in Kalisat River, Selorejo Village, Dau District, Malang Regency

Nanik Retno Buwono[*12], Devina Andriani Putri[1], and Mulyanto[1]

[1] *Faculty of Fisheries and Marine Sciences, Universitas Brawijaya, Malang 65145, Indonesia*
[2]*AquaRES Research Group, Brawijaya University, Malang 65145 Indonesia*
[*]Corresponding email: buwonoretno@ub.ac.id

ABSTRACT

Kalisat River is a river that flows in Selorejo Village, Dau District, Malang Regency. Around this river is agricultural land and plantations land. The active plantation and agriculture activities using pesticide can affect the ecosystem of river. The use of pesticide continuous and excessive can cause the pesticide residues. The pesticide residues be carried away by rainwater to a lower place and flow into the river. It is necessary to measure pesticide residues on water and periphyton in the Kalisat River in this research. This research method is descriptive with survey approach. The result of pesticide residues on water and periphyton showed four active substances of pesticide. The active substances are propoxur, beta cyfluthrin, carbaryl, and carbofuran. The results of pesticide residues in Kalisat river is still below the specified maximum threshold and is not classified as polluted.

Macro Nutrient Consentration of Oil Palm Leaves in Peat and Mineral Soil

Oksana[1*], Tiara Septirosya[1], Rosmaina[1],Syukria Ikhsan Zam[1]

[1]*Departement of Agrotechnology, Faculty of Agricultural and Animal Science, Universitas Islam Negeri Sultan Syarif Kasim Riau, Panam-Pekanbaru 28293, Riau-Indonesia.*
[*]Corresponding email: oksana@uin-suska.ac.id

ABSTRACT

The immature oil palm plant is the innitial growth of plant during the period before harvest. Problem often encountered in immature oil palm plants is land capability in supplying nutrient continuously to the growth and development of the it is limited.Oil Palm trees immature (young trees) is the initial growth of plants in the field during the period before the harvest. Problem often encountered in immature oil palm plants is land capability in supplying nutrient continuously to the growth and development of the it is limited. The research was conducted in Tapung Sub-District, Kampar District, Riau Province. The objectives of the research were to determine levels of nutrients content, nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca) in oil palm plantation grown on peat soil and minerals soil. The results displayed that potassium contentrations in leaf oil palm cultivated on mineral soil is significant higher than peat. Based on the analyzing nutrient uptake of leaves oil palm age of 1,5 years can be concluded that they were not deficient in nutrients. Nitrogen (N), phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca) in palm oil plantation planted on peat soil and mineral soil classified at the optimum condition. Keywords: peat, soil; Oil Palm; plant nutrient Concentration.

P-010/ENV

An analysis of the deformed erythocytes correlated to varied dose of nanoparticles emitted by diesel engine bus

Arinto Yudi Ponco Wardoyo[1*], Unggul Pundjung Juswono[1], Johan Andoyo Effendi Noor[1], and Arif Budianto[1]

[1]*Department of Physics, Faculty of Mathematics and Natural Science, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: a.wardoyo@ub.ac.id

ABSTRACT

This study was aimed to investigate the morphological changes of the mice's erythrocytes corresponded to the bus exhaust nanoparticle exposures. Male mice were used as the experimental animals. The exhaust emissions emitted by bus samples B1, B2, and B3 were filtered using a nanoparticulate filtering system consisting of an N95 mask and a sucking pump, and the concentration was measured using a TSI P-Trak Ultrafine Particle Counter. In order to the erythrocyte deformation, we used the unexposed and the exposed mice to the bus exhaust emission with the varied particle concentration of Ld - low dose, Md - medium dose, and Hd - high dose as long as 100 seconds per day in eight consecutive days. Then, all mice were sacrificed for the erythrocytes analysis. We found two deformation types that were most highly increased in the erythrocytes such as: helmet-shaped cells and teardrop-shaped cells. The deformation percentages were in the range of 27% to 47%, depending on the nanoparticle concentration dose. Ld had the lowest deformation percentages: 28% for B1, 34% for B2, and 44% for B3. The highest deformation was found in Hd, with the values of 30%, 37%, and 47%, respectively for B1, B2, and B3.

P-011/ENV

Copper and Lead Removal Test of Indigenous Bacteria from Leachate of Supit Urang Landfill, Malang City

Chasan M. Wibisono, Aghnia N. Fadhilla, Irfan Mustafa*

Biology Department, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang
*Corresponding email: irfan@ub.ac.id

ABSTRACT

Leachate in Supit Urang landfill area is flowed to settling pond without any further treatment. Copper and lead in leachate of Supit Urang landfill were detected as much as 13.2 mg/L and 1.13 mg/L, respectively. Its copper and lead concentration exceeded the allowed limit from the regulation of Ministry of Environment and Forestry. The objectives of this study were to obtain Cu and Pb tolerant bacteria from leachate in Supit Urang landfill and tested their potential in reducing Cu and Pb concentration. Bacteria were isolated from leachate in settling pond using nutrient agar (NA) medium containing 100 mg/L Cu and 300 mg/L Pb. Screening of tolerant isolates was carried out by streaking on NA medium with gradual increase of Cu and Pb concentration. Growth curves of selected were constructed to determine their age of inocula at exponential stage and harvesting time at early stationary stage for removal efficiency test. Cu and Pb concentration was determined with AAS method. A total 40 isolates for each heavy metal were obtained and four isolates (A16, B2, B9, and B11) were tolerant to Cu of 400 mg/L. In other side, four isolates (A5, B1, C8, and C10) were highly tolerant to Pb of 1000 mg/L. Heavy metal removal test showed that B2 isolate had the highest potential in removing Cu to 33.4% and C10 isolate had the highest potential in removing Pb to 94.87%. In regards of 16S rDNA sequences, the isolates B2 and C10 were identified as Enterobacter cloacae subsp. cloacae and Ochrobactrum intermedium with similiarity value of 99.3% and 99.91%, respectively.

THE LONG WAY OF ECOLABEL SCHEME ACCEPTANCE IN INDONESIA: CASE STUDY IN TUNA FISHERIES

Andre Notohamijoyo[*1], Martani Huseini[2], Raldi H.Koestoer[3], Syafril Fauzi[4]

[1] *School of Environmental Science, Universitas Indonesia, FKG Building 5th and 6th Floor, Jalan Salemba Raya No. 4, Jakarta 10430*
[2] *Faculty of Administrative Science, Universitas Indonesia, Kampus Baru UI Depok*
[3] *Coordinating Ministry of Economic Affairs, Republic of Indonesia*
[4] *Ministry of Marine Affairs and Fisheries, Jalan Medan Merdeka Timur No. 16, Jakarta 10110*
[*]Corresponding email: andre.hamijoyo@gmail.com

ABSTRACT

Since the emergence of Blue Angel in 1977, the ecolabel scheme develop along with the growing awareness of the people about the need for the sustainable resources. Most developing countries rely on commodity trade but the sustainability is often ignored. These conditions cause a threat to the resources. The ecolabel scheme has not been of particular concern of developing countries. Unfortunately, the existing schemes are more business-oriented. High requirements and costs of certification are the main problems of implementing ecolabel in developing countries. Indonesia is a developing country that gets around this condition through the issuance of various laws and regulations that encourage the scheme that is recognized internationally especially in the fisheries sector. As the largest archipelagic country in the world, the fisheries sector has extraordinary resources as well as a threat to its sustainability, especially tuna, the highest economic value species in the world. Various government regulations have been prepared to facilitate the implementation of the ecolabel scheme for tuna fisheries. The main challenge is the stakeholder understanding of the regulations. An intensive education and dissemination process is needed to build community awareness. The success of implementation depends on sustainable education process. Keywords: Sustainability, ecolabel, tuna fisheries, government regulation, education process

P-013/ENV

Law Enforcement On Environmental Protection And Resource Conservation

Jeanne Darc Noviayanti Manik[1] and Wirazilmustaan[2]

[1]*Faculty of Law, Universitas Bangka Belitung*
[2]*Faculty of Law, Universitas Bangka Belitung*
[*]Corresponding email: jeannenovi@gmail.com

ABSTRACT

Conservation of natural resources is a natural resource management whose utilization is done wisely to ensure the continuity of its availability by maintaining and improving the quality of diversity and value. Conservation of natural resources and ecosystems aims to achieve the realization of the sustainability of natural resources and the equilibrium of the ecosystem so that it can better support the efforts to improve the community welfare and the quality of human life. The problem are the implementation of conservation of natural resources and its ecosystem in the region based on Act No. 5 of 1990 and law enforcement against perpetrators of the conservation of natural resources and ecosystems. The research method used is legal research using a statutory and conceptual approach. The conservation of natural resources and ecosystems is based on preserving the ability and utilization of natural resources and their ecosystem in a harmonious and balanced environment. The conservation of natural resources and ecosystems is conducted through the protection of life-supporting systems, preserving the diversity of plant and animal species along with its ecosystem and the sustainable utilization of natural resources and ecosystem.

Competitive Advantage of Biogas Technology using The Value Chain Approach

Dian Sukma Yusnita[*1], Benito A. Kurnani[*1], Budhi Gunawan[*1,2]

[1]*Environmental Science Program, Postgraduate School, Padjadjaran University, Bandung*
[2]*Dept. of Anthropology, Padjadjaran University, Bandung*
[*]Corresponding email: ninayusnita@yahoo.com

ABSTRACT

Biomass is one of the potential resources, that available at the center of the cattle development region. The potential of biomass resources can be processed into bioenergy and converted into economic potential. Bioenergy is produced using biogas technology through activities starting from the supply of raw materials, transportation, pre-treatment or additional treatment of raw materials, anaerobic fermentation, upgrading, distribution and utilization of biogas and sludge or also called value chain systems biogas production. One of the challenges in developing biogas that based on bioenergy is the sustainability of the biogas unit. Efforts are needed to make biogas superior to compete with other energy sources, so that the existence of biogas as environmentally friendly energy can continue to survive. In the biogas production value chain system there is a mechanism for internal processes with characteristics and behavior. The behavior of the system was studied to find recommendations for the competitive advantage of biogas technology through dynamic model simulations. The results show that the average value added by cattleman using biogas is Rp. 56,457, - per month. Then, for non-cattleman and using biogas, the average value added is Rp. 8,164, - per month. This added value is a reduction in the purchase of cooking fuel. Then, the average carbon trace produced by biogas by cattleman and non-cattleman using biogas is 2,799.92 and 2,814.03 kgCO2 per kilogram of raw material per year. The cattleman who do not use biogas it is 0.0148480 kgCO2 per kilogram of raw material per year. Economic value added and the carbon trace produced by non-cattleman respondents is not too high, this is due to the more difficult constraints of access and transportation, so that biodigester grants should be given to cattleman and not to non-cattleman. Biogas will be more attractive to the community if

there is a market for biogas pulp which is processed into fertilizer and pre-treatment is carried out to improve the quality and quantity of biogas.

Level of Soil Humification In Some Land Use In Kecamatan Tutur, Pasuruan District

M. Ghufron Chakim[1], Wanti Mindari[1*], Purnomo Edi Sasongko[1] Siswanto[1]

[1]*Department of Agrotechnology, Faculty of Agriculture, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Surabaya, 60294 Indonesia*

[*]Corresponding email: wanti_m@upnjatim.ac.id

ABSTRACT

Changes in land use will have an impact on the level of humification in addition to abiotic factors (climate, topography, minerals) and biotics (microorganisms, vegetation). The aim of the experiment was to assess the level of soil humification against changes in land use from forests, agroforests in coffee plants and apples, and vegetable plants that were thought to affect the level of humification. The study was conducted in several villages in Tutur sub-district, Pasuruan district. The research included observation of land use systems, vegetation, sampling of overlayed soil at 6 SPL, analysis of soil samples which included physical characteristics (texture), chemical analysis (pH, C-org, N-total), analysis and interpretation of data. The results of the experiment showed that the use of coffee land provided the best soil fertility results indicated by the content of humic acid, total pH, N, C-soil soils were 1.85%, 4.82, 0.59% and 3.21%, respectively. These values are higher than other land use models. Humic acid is a part of humus which has the ability to absorb nutrients and high water as measured by the value of the E4 / E6 ratio <5. Abiotic and biotic factors which include humidity, temperature, slope, and vegetation greatly affect the level and character of humic. Low temperatures inhibit the decomposition of soil organic matter. The number and character of humic in coffee plantations is thought to be donated from lignin-containing vegetation and its humic content is almost equal to that of mixed gardens.
Keywords: humic, land use change, lignin, c-org, abiotic

P-016/SMR

Potency of Indigenous Bacteria Isolated from Fermented Sumbawa Mare's Milk as Exopolysaccharide Producers

Tika Faradina[1], Yoga D. Jatmiko[1*]

[1]*Dept. of Biology, Brawijaya University, Malang*
[*]Corresponding email: yjatmiko@yahoo.com

ABSTRACT

The research on exopolysaccharide (EPS) and its potency in various fields (health, foods, cosmetics, and environment) has increased recently. Therefore, it is necessary to explore EPS-producing bacteria from fermented Sumbawa mare's milk. The objective of this research was to evaluate the potency of EPS-producing bacteria isolates, to determine the characters of EPS produced by selected indigenous bacterial isolates and to identify the species of bacteria that produced the best EPS based on 16S rDNA sequences. The method consisted of several stages, namely qualitative screening of EPS-producing bacteria using MRS and M17 media containing sucrose 5%, quantitative screening of EPS production based on EPS concentration produced, EPS characterization, antibiotic sensitivity test, haemolysis test, EPS production, and identification of the bacteria species with the best EPS. The characterization of EPS used were flocculation activity, emulsifying activity, water solubility, and antimicrobial activity. The best EPS-producing isolates with desired characteristics were identified based on 16S rDNA sequences and phylogenetic trees were constructed using MEGA6 software. The research results obtained four isolates that were able to produce EPS with a high concentration. The isolate of BC8 was the best EPS producer isolate with the some expected EPS characteristics such as higher flocculation activity, good as emulsifier, dissolve in water, able to inhibit pathogenic bacteria (E. coli and S. aureus). The BC8 isolate was resistant to Kanamycin, Erythromycin, and Cinoxacin, and it was classified as intermediates to Trimetoprim. This isolate also demonstrated alpha-hemolysis. The EPS concentration and the decrease of pH value were optimally achived at incubation of 36th hour. This isolate was identified as Bacillus subtilis with similarity value of 99.85% towards Bacillus subtilis DSM 10T. Keywords: Bacillus subtilis, exopolysaccharide, naturally fermented milk, Sumbawa mare's milk

P-017/SMR

The Physicochemical Properties Comparison of Natural Coconut Water and Packaged Coconut Water

Christyanita P. Ekasari[1] and Sri Widyarti[2*]

[1]*Undergraduate Student, Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[2]*Department of Biology, Faculty of Mathematics and Natural Sciences, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: swid@ub.ac.id

ABSTRACT

Coconut water as healthy beverages can be used as any solvent which heating can increase the solubility of the solute. The nature of coconut water easily changes in the open air. Therefore, natural coconut water is processed into packaged coconut water. The aim of this research was to compare the physicochemical properties between natural coconut water (NCW) and packaged coconut water (PCW). The samples consist of 4 groups: (1) unheated-NCW (uh-NCW), (2) heated-NCW (h-NCW), (3) unheated-PCW (uh-PCW), and (4) heated-PCW (h-PCW). The physicochemical properties were analysed based on the UV-Vis spectrum λ 190-790 nm, pH, turbidity, and conductivity. The NCW and PCW respectively have specific wavelengths on 229, 262 nm and 286, 296 nm. PCW has higher absorbance value than NCW. Heating does not affect the physicochemical properties of NCW as well as PCW, except the turbidity which is affected to be lower after heating (20,72 to 17,47 NTU for NCW and 69,63 to 68,92 NTU for PCW). PCW has higher turbidity than NCW. The higher absorbance value and turbidity in PCW are caused by the additional ingredients. All samples have pH value which ranges from 5,37 - 5,49 and conductivity 15,48 - 19,95 mS. Keywords: coconut water, physicochemical properties, UV-Vis spectrum

P-018/SMR

Selection and Potential Test of Lactic Acid Bacteria from Fermented Sumbawa Mare's Milk as Starter Cultures

Ilmiyatus S. Devi [1], Yoga D. Jatmiko[1*]

[1] *Dept. of Biology, Brawijaya University, Malang*
[*]Corresponding email: yjatmiko@yahoo.com

ABSTRACT

Diversification of mare's milk products and processes was still limited to traditional or naturally fermented products (without addition of starter cultures). Therefore, it is necessary to make starter cultures that can increase the diversity and quality of fermented Sumbawa mare's milk. The objectives of this research is to screen lactic acid bacteria (LAB) isolates from fermented Sumbawa mare's milk that meet the requirements as starter cultures, and to find out the effect of the selected starter culture in improving the organoleptic quality of mare's milk fermentation. The LAB isolates (13 isolates) derived from naturally fermented Sumbawa mare's milk were screened, then the selected isolates were tested for the technological properties (proteolytic test, lipolytic test, and exopolysaccharide production test), food safety test (hemolytic test and antibiotic sensitivity test), protective properties (antimicrobial activity test), and fermentation of mare's milk using the selected starter culture (SKB), yoghurt starter cultures (SKK), and a mixture of both (SKC). Six LAB isolates (DB7, BC10, DC4, BC9, DC10, and BC7) were obtained from acidification screening. Isolate of BC10 was the most potential isolate as starter culture because it showed the best ability in terms of acidification and proteolytic activity, lack of lipolytic activity, no indication of pathogenic potency, as well as able to inhibit Eschericia coli ATCC 25922. However, this isolate was resistant to Kanamycin, Trimethoprim, and Cinoxacin antibiotic. The selected starter culture BC10 (SKB) was able to improve the organoleptic quality of fermented mare's milk especially flavour compared to the other starter cultures. Therefore, BC10 isolate is a potential isolate to be used as starter cultures for fermented milk products. Keywords: lactic acid bacteria, organoleptic, starter cultures, Sumbawa mare's milk, technological characterization,

P-019/SMR

MOLECULAR DOCKING STUDY TO REVEAL MORINDA CITRIFOLIA FRUITS AS A NOVEL INHIBITOR OF ESTROGEN RECEPTOR AND EPIDERMAL GROWTH FACTOR RECEPTOR

Didin Wahyu Agustina [1], Sri Widyarti[1], Muhaimin Rifa'i[1*]

[1] *Dept. Biology, Faculty of Science, Brawijaya University, Malang, Indonesia*
[*]Corresponding email: rifa.immunology@gmail.com

ABSTRACT

Lung cancer is the leading cause of cancer death in the world and represents a major public health burden. Estrogen and Epidermal Growth factor Receptor (EGFR) as targets for hormonal cancer therapy shown to decrease cell proliferation and tumor growth. Indonesian People usually consumed Health tonic from Morinda citrifolia fruits known as Noni juice. Morinda citrifolia fruits have been known for a therapeutic benefit such as antidiabetic, anticancer and pain. This study aims to investigate molecular interaction between Morinda citrifolia fruits compound with the active site of ERb antagonist and EGFR tyrosine kinase inhibitor for lung cancer therapy. Morinda citrifolia fruit compounds were retrieved from Dr. Duke\'s Phytochemical and Ethnobotanical Databases (https://phytochem.nal.usda.gov) meanwhile ligand was retrieved from PubChem and 3D protein from PDB. The first step was ligand and receptor preparation before docking process using VegaZZ. Molecular docking process was calculated using Autodock Vina in PyRx v.0.8. The Result of this study reveals 8 major compounds of Morinda citrifolia fruits Anthraquinone, Benzo acid, Beta carotene, Eugenol, Limonene, Quercetin, Rutin, Scopoletin. Based on the molecular binding analysis, Anthraquinone and Rutin are best docking complex with ERb and EGFR. The result showed that Anthraquinone is the best antagonist for ERb, indicated by the highest affinity (-8.6 Kcal/mol). In addition, Rutin has the highest affinity to EGFR tyrosine kinase inhibitor (-9.0 Kcal/mol). It can be concluded that Both active compounds could act as a novel inhibitor and bind directly to the active site of ERb and EGFR.

P-020/SMR

The Study of Spectral UV-Vis on Coconut Water as Flour Solvent of Soybean, Black Rice and Red Rice

Kurnia Rahmawati[1], Nanda D. Kristanti[1], Sandriakana[1], Sutiman B. Sumitro[2] and Sri Widyarti[2*]

[1]Undergraduate student, Department of Biology, Faculty of Mathematic and Natural Sciences, University of Brawijaya, Malang, Indonesia
[2]Department of Biology, Faculty of Mathematic and Natural Sciences, University of Brawijaya, Malang, Indonesia
[*]Corresponding email: swid@ub.ac.id

ABSTRACT

Coconut water (CW) is a nutritious drink containing highly complex components. Therefore, CW has interesting unique physicochemical nature to investigate. This study aims to know the UV-Vis spectral of CW as flour solvent of soybean, black rice, and red rice. Each flour was homogenized with ratio of 1:10 (w/v) in fresh CW (f-CW) or heated-CW at 50 ºC (h-CW). The homogenized flour was centrifuged at 4500 rpm, 4ºC, for 5 minutes. The supernatant was analysed based on UV-Vis spectral, pH, and turbidity. Flour that dissolved in CW shows peaks only in the UV spectrum, whereas the flour dissolved in water shows peaks in the UV-Vis spectrum. Generally, flour component more dissolves in the CW than in the water. Turbidity value of flour dissolved in the CW lower than those dissolved in the water. The flour dissolved in the CW slightly acid than in the water. The flour dissolved in h-CW shows a slight decrease in absorbance value compared to the f-CW, meanwhile, flour dissolved in water generally have relatively the same spectrum profile. Keyword: black rice, coconut water, red rice, soybean, UV-Vis spectrums