Book of Abstracts

ICASMI

3rd International Conference on Applied Science Mathematics and Informatics

"Natural Sciences, Mathematics and Informatics in Industri Revolution (IR) 4.0 Toward The Sustainable Development Goals (SGDs)"

2020

Faculty of Mathematics and Natural Sciences
University of Lampung

Introduction

The 3rd International Conference on Applied Science, Mathematics, and Informatics (ICASMI)

Bandar Lampung, 3-4 September 2020

Faculty of Mathematics and Natural Sciences, University of Lampung (FMIPA, UNILA) is honored and proud to organize the 3rd International Conference on Applied Science, Mathematics, and Informatics (ICASMI). The theme of the conference is theme "Natural Sciences, Mathematics and Informatics in the Industrial Revolution (IR) 4.0 toward the Sustainable Development Goals (SDGs)."

ICASMI is a biennial event with the aims to bring together international and local scientists, researchers, academicians, also students for sharing their research, exchanging ideas, networking, opening collaboration research. Even in the covid19 pandemic, ICASMI is still held this year. This year, all conference will be held online.

The Keynote speakers are competent in their filed of study. They come from different countries, such as, Japan, Malaysia, Turkey and Indonesia. This conference will provide an opportunity for presenters to present their

current research and results, and also for participants to learn up-to-date topics and researches in their field of study.

Best wishes and we welcome you to the 3rd ICASMI held in Bandar Lampung, Indonesia.

Organized by

Faculty of Mathematics and Natural Sciences,
University of Lampung (FMIPA, UNILA)

Speech from the Rector of University of Lampung

Vice Rectors, Dean Faculty of Mathematics, Head of LPPM and LP3M in the University of Lampung. Distinguished Keynote Speaker, and participants.

Ladies and Gentlemen
Assalamu'alaykum Wr. Wb.
Tabik pun
Good morning

First of all I would like welcome all of you for participating in the 3rd International Conference on Applied Science, Mathematics, and Informatics (ICASMI) 2020, held by Faculty of Mathematics and Natural Sciences, University of Lampung. Thank you for participating in this Conference.

I would like to express my appreciation to our keynote speakers:
Prof. Kenji Satou (Kanazawa University, Japan)
Prof. Dr. Antonius Suwanto (IPB University, Indonesia)
Prof. Dr. Hasan Küçükbay (İnönü University, Turkey)

Prof. Harith Ahmad (Univeristy of Malaya, Malaysia)
Porf. Dr. Ismail Bin Mohd (AISMM, Malaysia)
Prof. Ivandini Tribidasari, A (University of Indonesia, Indonesia)
Prof. John Hendri, Ph.D (University of Lampung, Indonesia)
We are honored that you would be participating in this conference.

Even in this Covid-19 pandemic, we are still able participate in this conference.

Indonesia has been participating in ASEAN Economy Community (AEC) and Trans Pacific Partnership (TPP) since several years ago. If Indonesia is not prepared this can be a challenge for us. Global market, innovations and foreign workers with excellence skills will be faced by Indonesia. However, there are also opportunities. By improving research and innovations in Indonesia, also by strengthening the potency of the society in Indonesia, we can face these challenges. Our university, University of Lampung, also encourages strengthen the potency of Indonesian society and values 'Creation and Innovation for the Nation'.

The aim is to improve quality of local products, varieties of invention in all field of study, such as: chemistry, biology, mathematics, physics, and computer science. It

is important to bring together experts in these fields, in hope that we can have better knowledge and produce innovations in Indonesia.

Ladies and Gentlemen,
Hopefully in this Conference, there will be new ideas, discussion, collaboration between participants. I strongly believe that through the 3rd International Conference on Applied Science, Mathematics, and Informatics, we are able to improve our potency to face all challenges, and achieve more opportunities in the future.

I hope this Conference is able to inspire and deliver benefits to all participants, in which together we are able to contribute to science and research.

Once again, welcome to this conference and have a wonderful discussion.
Thank you very much.

Wassalamu'alaikum Wr. Wb.

Prof. Karomani,
Rector of University of Lampung

Speech from the Dean of Faculty of Mathematics and Natural Sciences

Assalamu'alaikum Wr. Wb.
In the Name of Allah, The Most Beneficent, the Most Merciful.
Tabik pun

It is my great honor on behalf of Faculty of Mathematics and Natural Science, to welcome all participants to the 3rd International Conference on Applied Science, Mathematics, and Informatics (ICASMI). The theme of the conference is theme "Natural Sciences, Mathematics and Informatics in the Industrial Revolution (IR) 4.0 toward the Sustainable Development Goals (SDGs)." Even though in this Covid19 pandemic, we are still able to organize this Conference.

We hope this conference can be a platform to gather and disseminate new innovations and research in science, in particular natural science, applied science, mathematics, and also computer science/ informatics. Researchers, academicians, and students are able to share and discuss new findings and applications of science. The aim is to initiate collaborations academics, researches and industries, both national and international. As it stated in

the conference theme we encourage innovations and research to achieve the Sustainable Development Goals (SDGs).

Ladies and Gentlemen,
Faculty of Mathematics and Natural Sciences is one of the popular Faculty in University of Lampung. Currently, Our Faculty has more than 2,900 students, spread across 11 study programs. We have 1 Diploma Program, 6 Undergraduate Program, 4 Master Program, and 1 Doctoral Program. Our faculty member also includes 11 Professors and more than 50 Assistant Professor, therefor with these resources, there are many opportunities to conduct collaborations with Our Faculty. Besides, International Conference, Our Faculty also periodically organize National Conference that we call SNSMIAP. We have held this conference regularly also.

Thank you to the Rector of University of Lampung, Head of LPPM, the Head of LP3M, all the keynote speakers and participant. I would also like to give my gratitude to the organizing committee for their hard efforts in organizing this conference.
Wassalamu'alaykum Wr. Wb.

Dr. Eng. Suripto Dwi Yuwono, M.T
Dean of Faculty of Mathematics and Natural Sciences

Speech from the Conference Chairman

Good morning
Tabik pun

Honorable Rector of University of Lampung Prof. Karomani,

Dean of Faculty of Mathematics and Natural Sciences,
Dr. Eng. Suripto Dwi Yuwono, M.T,
Head of LPPM and LP3M,
Prof. Kenji Satou (Kanazawa University, Japan)
Prof. Dr. Antonius Suwanto (IPB University, Indonesia)
Prof. Dr. Hasan Küçükbay (İnönü University, Turkey)
Prof. Harith Ahmad (Univeristy of Malaya, Malaysia)
Porf. Dr. Ismail Bin Mohd (AISMM, Malaysia)
Prof. Ivandini Tribidasari, A (University of Indonesia, Indonesia)
Prof. John Hendri, Ph.D (University of Lampung, Indonesia),

First of all, I would like to express my gratitude to the Rector of University of Lampung and the Dean of Faculty of Mathematics and Natural Sciences. Thank you for the support and encouragement the 3rd International Conference on Applied Science, Mathematics, and Informatics (ICASMI) can be held, even in this covid-19 pandemic. This year, the

conference is held online. All presentations and posters will be held online.

ICASMI aims is align with the vision and mission of University of Lampung which is to promote education and research in the field of science. On behalf of the committee, we are glad to report that we received great response from participants and from keynote speakers. There are more than 100 participants from various universities and institutions that will present their research in this conference. The keynote speakers are also very qualified in their field of research.

Ladies and Gentlemen,
I would also like to report that the paper presented in this conference like the previous conference, will be Published in Journal of Physics: Conference Series. This is a reputable Proceedings as it indexed by Scopus Q3 and with SJR 0.23.

Finally, I hope this Conference is able to inspire and deliver benefits to all participants, in which together we are able to contribute to science and research.
Thank you very much for your attention and I hope you will enjoy this conference.

Prof. Dr. Rudy T.M. Situmeang
Chairman of the 3rd IC

TABLE OF CONTENT

KEYNOTE SPEAKERS

Problems and Approaches in Animal Behavior Analysis

Kenji Satou
Institute of Science and Engineering, Kanazawa University, Kanazawa 9201192, Japan

ABSTRACT

By virtue of recent advances in machine learning, it is becoming increasingly common to automatically recognize objects in images and videos. Especially, recognition of human is actively studied in various fields including autonomous driving, security, etc. On the other hand, recognition of animal is still on the way of development, but it is an attractive research and has large demands. For instance, if we need to measure the effect of medication treatment for autism, we administer a medicine to an experimental animal like a mouse, then the behavior of it is analyzed and compared with control. Behavior analysis for experimental animals includes measurement of frequency and duration of a specific action and staying time at a specific area (e.g. wall or center of an open field). For the measurement, the simplest way is conducting it by human. However, since it is time consuming and takes much efforts, algorithms and software have been developed for automatic measurement of animal behavior from images and videos. In addition to the analysis of experimental animals, animal behavior analysis has potential applications in the pet industry, management of zoo and aquarium, the aquaculture industry, etc.

In this talk, first I introduce types of researches for animal behavior analysis from images and videos. In addition to a traditional type of researches based on the tracking of animal position, the pose estimation of animals is increasing its importance. Using pose estimation, the position of each body parts (leg, arm, face, etc.) is recognized in each frame image of a video. It enables a representation of action or movement of body parts as a trajectory of position. By combining trajectories of body parts, we could recognize various behaviors of animals. Finally, after addressing some problems in animal behavior analysis, I introduce our approaches to it.

PULSED LASER GENERATION USING THULIUM FLUORIDE FIBER IN S BAND REGION

Harith Ahmad, Siti Aisyah Reduan, Kavintheran Thambiratnam

ABSTRACT

There are needs to work in S band region for the development of alternative data network and photonics technology tools to fulfill the future needs as the demands on photonics applications has become highly saturated in C and L band region. There are only a few reports on generating a S band fiber laser using depressed-cladding erbium-doped fiber (DC-EDF) as a gain medium. For which only able to covers a region from 1480 nm to 1510 nm as mentioned from previous works. Other than that, there is a limitation on finding a rare-element gain medium to generate an emission in S-band region. It is found that thulium-fluoride fiber (TFF) as a gain medium allows the laser amplification that covers a shorter wavelength in S band region. By integrating the saturable absorber (SA) into the TFF fiber laser system, pulsed laser can be generated in S band region especially in a shorter wavelength S band. There are various potential materials that can be used as SA such as transition metal dichalcogenides (TMDs), topological insulator, graphene, metal oxide and carbon nanotubes. Dual-wavelength laser in S band region also can be generated by inserting the photonics crystal fibers into the TFF fiber laser system. Thus, this study can contribute to expanding telecommunication operation band and availability of photonics applications in shorter wavelength of S band region.

Basic Sciences in Molecular Biotechnology: From Genetic Engineering to Genome Editing

Antonius Suwanto

Department of Biology, FMIPA,
IPB University; and Member of the
Indonesian Academy of Sciences (AIPI) Email: asuwanto@indo.net.id

ABSTRACT

Genetic Engineering and Genome Editing are powerful technologies to generate biodiversity. When applied wisely, these gene technologies could lead to bountiful harvest, sustainable environment, healthier and happier human population. Various answers to biological phenomena or the construction of genetically modified organisms (Genetically Modified Organism = GMO) resulted from the applications of nucleic acid technology or genetic engineering. Genome editing, especially those based on CRISPR, has provided new insights in modifying the genetic material of living things with broad implications as it becomes one of the important technologies in this digital era. These two important techniques were born because of human curiosity on very basic things even seemed far from the applied aspects. We have relentlessly tried to understand deeper about the interaction of bacteria or archaea and their phages. The mechanisms of these interactions at the cellular level are no less exciting than the Star Wars series. These natural phenomena not only present important strategies in the development of sustainable agriculture, food, industry, medical and the environment; but also expose the beautiful philosophical aspects of how living things should continually adapt to survive.

A Globally Convergent Interval Newton-Tanti-Zahra's Method for Simple and Multiple Real Roots of a Function with One variable

I b Mohd [1] and Y Dasri[2]

[1] *Akademi Ilmuwan Sains Matematik Malaysia, Institute for Mathematical Research, c/o Universiti Putra Malaysia, UPM 43400 Serdang Selangor, Malaysia*
[2]*Fakulti Pengurusan Teknologi danPernigaan, Universiti Tun Hussein Onn Malaysia (UTHM), Batu Pahat 86400, Johor Malaysia*
Email : ismail_ayah_irma@yahoo.com; yosza@uthm.edu.my

ABSTRACT

Interval arithmetic is one of the best tools to handle (compute and bound) at least three types of error in numerical computation, namely data error, rounding error and truncation error. It is known that the weakness of Newton's method is because it is locally convergent. In this seminar, based on Real Newton's method, we mention several modifications of Newton's method in which interval arithmetic is used for handling the weakness of Newton's method. To obtain more benefits from Real Newton's method, we introduce a new Interval Newton's method named Interval-Tanti-Zahra's method for computing and bounding the simple and multiple roots of a function with a globally convergent property. The numerical computations which will be presented at the end of this seminar, demonstrate the ability of our new proposed nethod and a satisfactory computational behaviour as well as convince us that Newton's method is able to solve nonlinear problems.

Modified-Boron-Doped Diamond for a Direct Urea Fuel Cell

Ivandini Tribidasari Anggraningrum

Department of Chemistry, Faculty of Mathematics and Sciences, Universitas Indonesia, Kampus UI Depok, Jakarta, 16-424, Indonesia.

ABSTRACT

Boron-doped diamond (BDD) modified by nickel-cobalt was prepared using chronoamperometry technique for applications in a direct urea fuel cell. In order to decrease the oxidation potential of urea, some metals including Co, Zn, and Mn were also added to combine nickel as the modifying particles. Characterization was performed by using scanning electron microscopy-energy dispersive using X-rays (SEM-EDX) and X-ray photoelectron spectroscopy (XPS). Further, by using solutions of 0.1 M KOH containing 0.33 M urea as the electrolyte in anode chamber and a mixture of 2.0 M H_2O_2 and 2.0 M H_2SO_4 in the cathode chamber, the prepared electrode was examined in a urea fuel cell. Comparison with the nickel plate, unmodified BDD, and nickel-modified BDD suggested the advantage of bimetal Ni-BDD in enhancing the catalytic activity of urea fuel cell.

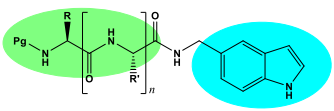
Keyword : bimetal nickel, boron-doped diamond, surface modification, urea, and fuel cell

Benzotriazole-mediated synthesis of indole-peptide conjugates

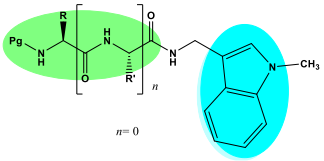
N. Yıldırım[1], H. Küçükbay[2*]

[1]İnönü University, Graduate School of Natural and Applied Sciences, 44280 Malatya, Turkey
[2]İnönü University, Faculty of Arts and Sciences, Department of Chemistry, 44280 Malatya, Turkey
emails: nrglyldrm44@gmail.com1, hasan.kucukbay@inonu.edu.tr2

Indoles are privileged heterocyclic compounds that have been used in a variety of pharmaceuticals applications and are present in many naturally occurring products[1]. Naratriptan, sumatriptan, anobinostat, tegaserod, melatonin and eletriptan are some of the FDA approved drugs containing indole moiety. When the literature is reviewed, it will be understood that short peptide sequences present a broad spectrum of biological activity. The synthesis of this type of compounds is of great importance to the understanding of biological functions. Therefore, much effort has been expended on the design and synthesis of selective, high-affinity ligands by replacing portions of peptides with nonpeptide structures. Therefore, the synthesis of possible biologically active molecules similar to biological systems by the reaction of indole derivatives with different peptides is an important field of research. There are extremely-limited information in the literature on this subject. For this reason, we planned the synthesis of peptide derivatives containing indole in order to contribute to the studies in this field. Due to the efficiency of benzotriazole-mediated methodology[2], N-acylbenzotriazoles were used as precursors for efficient synthesis of several new indole-peptide conjugates in this study. The general structures of the new compounds are shown below.



Pg= Protecting group, n= 0, 1



n= 0

Acknowledgments We thank İnönü University, Turkey (BAPB Grand No:FYL-2019/1953) for financial support.

Bioproduct and Inventory of Biodiversity

John Hendri[a)], Andi Setiawan [a)], Aspita Laila [a)], NLG Ratna Juliasih [a)], M. Komarudin [b)]

[a)]Department of Chemistry, Faculty of Mathematics and Sciences
[b)] Department of Electrical Engineering, Faculty of Engineering,
The University of Lampung
Jalan Prof. Sumantri Brojonegoro No. 1. Bandar Lampung, 35145, Indonesia.
[*)] Correspondence, john.hendri@fmipa.unila.ac.id., andi.setiawan@fmipa.unila.ac.id
m.komarudin@eng.unila.ac.id.

ABSTRACT

Bioproduct and Inventory of Biodiversity **"Bioproduk dan Inventori Keanekaragaman Hayati"** is a candidate for a research center to improve the productivity of innovation. It will be utilized in the industrial sector to increase awareness and research innovation, and increasing regional/national economical growth. This group is being developed by the research advisors and students, as a center of excellence of science and technology "Pusat Unggulan Iptek (PUI)" in The University of Lampung. At the beginning of *Bioproduct and Inventory of Biodiversity*, it will be started to develop four scope of research activities, which are biopolymer, bioactive compounds from marine species, microalgae primary metabolite, and inventory of biodiversity. Shortly, it would be great if other groups could join.

Bioactive compounds: research topic related to the isolation of natural products from marine sponge and the endophytic microorganisms from sponges and mangrove environments such as actinomycetes and fungus. This group's major activities are sampling, screening, and isolating also maintaining the rare

actinomycetes and fungi in the chitin medium to known their activity as chitinolytic related to biopolymer group, which helps to degrade the shells using enzyme avoid chemical processes through it. Moreover, this group aiming to isolation and purification, and structural elucidation of bioactive compounds to medical, pharmaceutical, and cosmetic purposes.

Biopolymer: research topic related to shrimp shells waste and its activities in the biopolymer group are isolation, biotransformation, enzymatic, synthesis of Nanoparticle, study of kinetics from chitin and chitosan and its derivates.

Microalgae: research topic related to bioproduction of primary metabolite from microalgae and utilization of frustule from diatom microalgae. This group activities including culture and isolation of potential microalgae, characterize and analyze the bioproduct compounds.

Inventory: research topic related to capturing data of biodiversity in the form of big data and mining the data by using machine learning

Keywords: Biodiversity, Bioactive compounds, Biopolymer, Microalgae, Big data, Center of excellent "PUI"


ICASMI
3rd International Conference on
Applied Science Mathematics
and Informatics
Scopus
"Natural Sciences, Mathematics and Informatics in Industrial Revolution
(IR) 4.0 Toward The Sustainable Development Goals (SGDs)"

BIOLOGY

Code : BIO_01

The Diversity and the Abundance of Corn Planthopper (Hemiptera: Delphacidae) in Lampung Province

R Hasibuan[1], Y Fitriana[1], S Ratih [1], L Wibowo[1], T N Aeny[1], F X Susilo[1], I G Swibawa[1], and F R Lumbanraja[2]

[1]Department of Plant Protection Department, Faculty of Agriculture, University of Lampung, Indonesia
[2]Department of Computer Science, Faculty of Mathematics and Natural Sciences, University of Lampung, Indonesia
Jln. Prof. Dr. Soemantri Brojonegoro No. 1 Bandar Lampung 35145
email: rosma.hasibuan@fp.unila.ac.id[1]

ABSTRACT

The outbreak of delphacid planthoppers has been detected across corn-growing regions in South Lampung. Survey study was conducted in three corn fields in Natar District, South Lampung Regency. In each study site, five corn plants were randomly sampled. In each sampled plant, one leaf with maximum number of planthoppers was selected for population recording. Based on the morphological identification results, there were two types of corn planthoppers attacking corn fields during sampling periods: the white bellied-planthopper, *Stenocranus pacivicus* Kirkaldy and *Peregrinus maidis* Ashmead. During sampling periods, S. *pacivicus* was most abundant species, while, the *Peregrinus* planthopper was almost undetectable. There was similar trend peak of density *S. pacificus* brachypters & nymph and macropters among the three corn fields. The maximum number of *S. pacificus* brachypters & nymph 412.38 ± 23.12 individuals' leaf^{-1} was recorded at 70 days after planting (DAP). While the *S. pacificus* macropters reached the highest population number 43.81 ± 5,76 individuals leaf^{-1}. Extended feeding activity by planthoppers caused the chlorosis and necrosis of the leaf, reduced plant vigor, and stunting, resulting hopperburn symptoms. The results of this study confirm that the explosion of delphacid planthoppers and corn hopperburn are real and become a threat for corn production in Lampung Province.

keyword : *Stenocranus pacivicus*, Peregrinus maidis, population-outbreak, corn-hopperbur

Code : BIO_02

Identification of SNPs Associated with Iron Toxicity Tolerance in Rice

L Chrisnawati[1], Miftahudin[2], D W Utami[3]

[1] Departement of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
[2] Department of Biology, Faculty of Mathematics and Natural Sciences, Bogor Agricultural University (IPB University, Kampus IPB Dramaga, Bogor 16680 Indonesia
[3] Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development (ICABIOGRAD), Bogor 16124, Indonesia
email: lili.chrisnawati@fmipa.unila.ac.id[1] miftahudinm@gmail.com[2] dnitawu@windowslive.com[3]

ABSTRACT

Iron (Fe) toxicity is one of the limiting factors that can lead to the decrease of rice yield in paddy fields. Association studies to identify potential alleles or markers linked to iron toxicity tolerant trait can be carried out using high throughput single nucleotide polymorphisms (SNPs). We conducted an association study for Fe toxicity tolerance characters, using Forty-five double haploid lines derived from reciprocal double-crossing, i.e. IR54 / Parekaligolara // Bio110 / Markuti in high Fe wetland rice field. Genome-wide association study was carried out using 384 SNP-plex markers distributed on 12 rice chromosomes. A total of 77 SNPs were significantly associated with the Fe toxicity tolerance-related traits. Functional annotation allowed us to shortlist four SNP markers associated with Fe toxicity tolerance trait, i.e.: **TBGI204006, TBGI310247, id9006377,** and **id10000498.** The research suggests that association studies followed by functional annotation can effectively detect potential alleles and candidate genes for the trait. The identified QTL and genes provided valuable sources for future genetic improvement of Fe tolerant rice lines..

keyword : Rice, SNPs, Fe Toxicity Tolerance, QTL.

Code : BIO_03

EXTRACT OF METHANOL LEAVES Avicenia marina AND TAURIN IN THE HELa CANCER CELLS IN VITRO

S Andriani[1], E L Widiastuti [1*], N Nurcahyani [3], Erosa[4], H Busman[5]

[1,2,3,4,5] Departement of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
email: silviaandriani12@gmail.com[1], elwidi@yahoo.com[2], nuning.nurcahyani@fmipa.unila.ac.id[3], emantisrosa@gmail.com[4], hendri_busman@yahoo.com[5]
*Coresponden Email : elwidi@yahoo.com

ABSTRACT

This study aims to exploit phytopharmaca released as an anticancer from Avicenia marina leaf extract, and taurine as a high antioxidant is proven through cytotoxic and antiproliferation tests in vitro using the MTT method (3- (4, 5-dimethylthiazol-2-yl)) - 2, 5-diphenyltetrazolium bromide) against *HeLa* cervical cancer cell culture. The results of the research on cytotoxic and antiproliferation test of A. marina leaves methanol extract, and taurine proved that methanol extract of *A. marina* and taurine had cytotoxic activity with IC_{50} values of 321 ppm and 603 ppm <1000 ppm. While the doubling time value in the antiproliferation test by A. marina leaves extract and methanol taurine showed higher values than the control cells (72.19 hours).

keyword : *Avicenia marina*, taurin, in vitro, cervical cancer, sel *HeLa*

Code : BIO-04

Diversity and Density of Gastropod in the Biluhu Timur Coastal Region of Gorontalo, Indonesia

Ramli Utina[1,2], Dewi Wahyuni K.Baderan[1]

[1] Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Negeri Gorontalo. Jl. Prof.BJ.Habibie, Kabupaten Bone Bolango (96583), Provinsi Gorontalo, Indonesia.
[2] Coastal Ecology based on Local Wisdom Research Center - Department of Biology, Universitas Negeri Gorontalo. Jl. Prof.BJ.Habibie, Kabupaten Bone Bolango (96583), Provinsi Gorontalo, Indonesia.
email: ramli.utina@ung.ac.id[1], dewi.baderan@ung.ac.id[2]

ABSTRACT

This study aims to analyze biodiversity (species diversity, evenness, species richness) and density of Gastropod in the Biluhu Timur coastal region. The method used is a survey, the technique of collecting data directly at the study site using a 5m x 5m observation plot area. Calculation of species diversity using the Sannon-wienner formula, and the density value using the Brower formula. This study found 20 species of the Gastropod class. Species with the highest number of individuals i.e. Nerita polita (17 ind.) and Nerita undata (13 ind.). Diversity index shows moderate category with value H '= 1,934 in criterion value of $1 \leq H' \leq 3$. Evenness index (E) based on criteria of environmental community with a value of 0.644, this shows the community in the study site is in an unstable community ($0.50 < E < 0.75$). Gastropod species richness (DMg) at the study site was 3.97 and the highest density value was found in Dolabella auricularia species (0.00295), Nita polita (0,00085 ind/m2), and Nerita undata (0,00065 ind/m2). The data obtained is used as a data base to support of the realization of Geopark in Gorontalo Province.

keyword : diversity, density, Gastropoda, Biluhu Timur

Code : BIO_05

Molecular characterization of fermentative bacteria on Local Microorganisms of Pomacea canaliculata

Yuliana Retnowati[1], Abubakar Sidik Katili[1]

[1] Biology Department, Faculty of Mathematics and Sciences, Universitas Negeri Gorontalo;
Jalan Prof. Dr.Ing, BJ. Habibie Kabupaten Bone Bolango, Gorontalo 96119.
e-mail. yuliana_ri@yahoo.com[1]; abubakarsidik@ung.ac.id[2]

ABSTRACT

Local Microorganisms (LMo) is a fermented liquid containing various microorganisms otentially as decomposer and bio-fertilizer. P.canaliculata is one of the rice weeds that potential as a basic ingredient of LMo because the high protein content. The objective of this study was to determine the types of fermentative bacteria on Local Microorganisms of P.caniculata. The fermentation of LMo was conducted for 21 days and acidity changing was detected. Microbial population was determined at 7 day intervals based on the Total Plate Count method. Characterization and dentification based on polyphasic taxonomy including macroscopic and microscopic orphological characters, and molecular characters based on 16S rRNA gene sequences. The results showed that LMo of P.canaliculata had a low degree of acidity and tended to decrease during the incubation period, from pH 5.3 to 4.0. Bacterial population tends to increase at 0-14 fermentation days and decreases after 21 days. Isolation results obtained 3 types of bacteria based on morphological differences, namely isolates BFPc-01, BFPc-02, and BFPc-03, with each color of colony as milky white colony, colonypink, and yellow colonies. The molecular characterization of fermentative bacteria isolates showed that the BFPc-01 isolate showed similarities to Klebsiella penumoniae MT604895.1 (99.04%), each of BFPc-02 and BFPc-03 isolates were closely related to Serratia sp (100%) and Microbacterium sp (100%).

keyword : Molecular characterization, fermentative bacteria, Local Microorganisms, *Pomacea canaliculata*

Code : BIO_06

Characterization Of morfology structure flower from variation cultivars of pisang kepok (Musa paradisiaca L.)

E Ernawiati[1*] , G D Pratami[1], E Setyaningrum[1], S S D Ulhaq[1]

[1] Departement of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
email: eti.ernawiati@gmail.com[1]

ABSTRACT

Banana is a fruit that is very popular in the community because it is easy to find and is available in various types, besides the price is very affordable, bananas also have a fairly complete nutritional value. One type of banana that is widely used by the community is pisang kepok. Pisang kepok have more diverse cultivars than other types of bananas. These cultivars have different morphological structures, one of which is the flower. Flowers have a role in the breeding of a plant. This study aims to determine the differences in the morphological structure of flowers between cultivars of pisang kepok with each other. The research was carried out in two stages, namely sampling in the fields of Bandar Lampung City residents, Pesawaran Regency and South Lampung Regency and morphological characterization based on the parameters determined in the Biology Department of the FMIPA Unila Laboratory. The results obtained were cultivar of pisang kepok which had been observed to have almost the same morphological structure except in kepok batu, namely the character of the color of pollen sacs, compound tepal pigmentation, free tepal color, free tepal apex shape and pistil shape.

keyword : Flower, Morphological strucuture, Pisang kepok.

Code : BIO_07

Altering Physical Characteristics of Sinking Fish-Feed through Sub-Optimal Fermentation Using Tempeh Mould without Mechanical Extrusion

C Sriherwanto[1], H Rahmanisa[2], E Yunita[2], I Suja'i[1], Amira Nadaviana[1]

[1] Biotechnology Laboratory, Agency for the Assessment and Application of Technology - BPPT, Building 630, Puspiptek Area, Tangerang Selatan, Banten 15314, Indonesia

[2] Department of Biology, Faculty of Science and Technology, Syarif Hidayatullah State Islamic University Jakarta, Jl. Ir. H. Djuanda No. 95 Ciputat, Tangerang Selatan, Banten 15412 Indonesia

email: catur.sriherwanto@bppt.go.id[1], etyn@uinjkt.ac.id[2]

ABSTRACT

Sinking pellets disintegrates easily in water, hence reducing water quality and fish productivity due to oxygen-consuming biodegradation of the unconsumed feed. Modifying sinking pellets into more stable floating pellets using an edible tempeh mould through solid fermentation has previously been studied as an alternative to the more expensive extrusion method. However, the fermentation resulted in the uncontrolled growth of the fungal mycelium, causing the individual pellets to aggregate into a single compact mass. The fermentation also contributed to the dry weight loss of the initial pellets. Thus, using a laboratory-scale bioreactor, this study aimed at generating water-stable and floating properties on sinking-pellets through sub-optimal fermentation using tempeh mould. The conditions varied were the amount of sinking pellets substrate, fermentation duration, and aeration-humidification. Results showed that less pellet aggregation was observed with shorter fermentation time. Based on 40-minute laboratory tests in water, the best 80% floating ability was achieved for 10 g sinking pellets fermented for 72 h with humidified bubble aeration. The fermented pellets showed 42% water stability and 4.86% dry weight loss.

keyword : tempeh mould, floating, fish, sinking pellets, solid fermentation, bioreactor

Isolation and identification of entomopathogen fungi as candidate of bioinsecticide from flies and cockroaches' (Insect vector's disease)

Emantis Rosa[1], C.N Ekowati[1], Tundjung T. Handayani[1], Endang L. Widiastuti[1]

[1] Faculty of Mathematics and Natural Sciences, University of Lampung
email: emantisrosa@gmail.com[1], ecoli.lacto@gmail.com[2], elwidi@yahoo.com[4]

ABSTRACT

Chemical insecticide has been used for many years to eradicate insects as disease vector, in which causing negative effects not only to those of target insects but also to the environment both in the short and long term. Therefore, it is necessary to determine an alternative biological control of this insect by using natural insecticide (bioinsecticide), such as using fungi as entomopathogen. As microorganism, fungi, contain of bioactive compound with their toxicity could kill the target insect from larvae to adults, called entomopathogen fungi. This entomopathogen fungi are presumably eco-friendly and able to produce toxic compound which can kill target insect such as cyclopeptida destruxin A, B, C, D and desmethyldestruxin B. Two of the fungi which known to be entomopathogenic are *Metarhizium anisopliae* and *Beauveria bassiana*. Yet, there should be more others, therefore it is necessary to explore and isolate any potential bio-insecticide of entomopatogen fungi for disease vectors such as from flies (*Musca domestica*) and cockroach *(Periplaneta americana*). This study found three isolated fungi from flies (L1, L2, L3). They were *Geotrichum sp., Penicillium sp., and Aspergillus sp.* Three isolated fungi from cockroach (K1, K2, K3) were also found, they were identified as *Aspergillus sp.*, except for K3 *Penicillium sp*

keyword : bioinsecticide, entomopathogen, *Aspergillus, Penicillium, Geotrichum*

Code : BIO_09

Monosex male formation of juvenile redclaw crayfish using natural steroid hormone from gamma sea cucumber and different doses of honey bee

Gregorius Nugroho Susanto[1], Sutyarso[1], Wahyu Widianto[2]

[1] Department of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia 35145
[2]PT. Central Pertiwi Bahari, Rejomulyo, Tanjung Bintang, Lampung Selatan, Indonesia 35361
email: gnugrohos@gmail.com[1], gregorius.nugroho@fmipa.unila.ac.id[1], sutyarso@yahoo.co.id[1], wahyugpccyouth@gmail.com[2]

ABSTRACT

In a new commercial commodity aquaculture, tropical freshwater crayfish *Cherax quadricarinatus*, it is known that female has a slower growth rate than male. One way to increase production rate is through monosex cultures comprising all-male population by using genital reversion technique. This biotechnology method can be applied by using hormones and natural products. The natural hormones extracted from gamma sea cucumber, Stichopus variegatus has bioactive substances including steroid compounds, while honey bee contains chrysin compounds that act as aromatase inhibitors. Therefore, the combination of both substances expected can increase in testosterone level and accelerate production in the male monosex population of juvenile crayfish. The purpose of the study is to determine the most effective dose of honey bee in masculinization of juvenile freshwater crayfish combined with 2 mg. L-1 steroid extract of gamma sea cucumber. Furthermore, a Completely Randomized Design (CRD) was designed in the experiment with five different dose of honey bee treatment and dipping method in 2 mg. L-1 steroid extract of gamma sea cucumber for 18 h. Each treatment with four replications. The the highest male formation was found in the dose of 20 ml. L-1 honey bee at 83.75% and the lowest was in control. The present of honey bee at different doses in 2 mg. L-1 of gamma steroid extract did not significantly give an effect on percentage of female, intersex formation, survival, and growth rate of juvenile redclaw crayfish.

keyword : masculinization, steroid, chrysin, aromatase inhibitors, testosterone

Code : BIO_10

Micropropagation of Red Ginger (Zingiber officinale Rosc. Var. Rubrum) Using Several Types of Cytokinins

Karyanti[1], Tati Sukarnih[1], Yayan Rudiyana[1], Nurul Fitri Hanifah[1], Nailul Sa'adah[2], Dasumiati[2]

[1] Biotechnology Laboratory, Agency for the Assessment and Application of Technology, BPPT, Puspiptek Area, Serpong, Tangerang Selatan, Banten, Indonesia
[2] Biology Department, State Islamic University (UIN) Syarif Hidayatullah Jakarta, Jln. Ir. H. Juanda No. 95 Ciputat, Tangerang Selatan, Banten, Indonesia
email: karyanti@bppt.go.id[1]

ABSTRACT

One of the medicinal plants that is widely cultivated is the red ginger (*Zingiber officinale Rosc. Var. Rubrum*). The plant contains an active compound gingerol that is used as an ingredient for various treatments such as cough and flu. To meet the demand of medicinal and industrial raw materials, quality ginger seeds are needed. One alternative to producing seeds is to use tissue culture technology. This study aimed to obtain the best type and concentration of cytokinins in increasing the multiplication of red ginger shoots in vitro. This study used a factorial Completely Randomized Design (CRD) with 2 factors, namely the type of cytokinins (BAP, thidiazuron, zeatin, kinetin, and 2ip) and cytokinin concentrations (0, 0.1, and 1 ppm). The results showed that 1 ppm thidiazuron treatment produced the highest number of shoots and the highest shoot length in the first subculture. The responses in the second subculture showed that shoots from thidiazuron, 2ip, and BAP treatment media produced the highest number of shoots, roots, and leaves compared to kinetin and zeatin. Multiplication continued until the sixth subculture, and the best multiplication was found on shoots from 2ip treatment.

keyword : BAP, 2ip, thidiazuron, multiplication, medicine, subculture

Code : BIO_11

Antidiabetic Potency of Jeruju (*Acanthus ilicifolius L.*) Ethanol Extract and Taurine on Histopathological Response of Mice Kidney (*Mus musculus L.*) Induced by Alloxan

Endang Linirin Widiastuti[1], Budi Khoiri Ardiansyah[1], Nuning Nurcahyani[1], Ade Silvinia[1]

[1] Department of Biology, Faculty of Mathematics and Science, University of Lampung
[2]Coastal and Marine Studies Center
Jl. Prof. Soemantri Brojonegoro Gedong Meneng, Rajabasa, Bandar Lampung. 35141
*Corresponding Author: elwidi@yahoo.com/endang.linirin@fmipa.unila.ac.id[1]
#Presenter: Email: budikhoiri.ard@gmail.com

ABSTRACT

Diabetes arises due to interference with the work of the pancreas in secreting the hormone insulin. The disease can cause a decrease in body immunity and complications of various vital organs such as the kidneys. Jeruju (*Acanthus ilicifolius L.*) leaves and taurine is reported to have antioxidant activity that is potential as antidiabetic agents. The purpose of this study was to determine the effect of jeruju and taurine leaves on blood glucose levels, hematopoiesis profile, and the ability to regenerate kidney organs damaged by alloxan induction. This study used a Completely Randomized Design with 5 treatment groups and 5 replications each. K1 group as a negative control (no treatment given), K2 group as a positive control (only induced alloxan), group P1 induced alloxan and given 100% ethanol extract of jeruju leaves 22.4 mg/bw/day, group P2 induced alloxan and given alloxan 50% ethanol extract of jeruju leaves dose 22.4 mg/bw/day, group P3 was induced by alloxan and given a taurine dose of 15.6 mg/bw/day for 14 days. Data were analyzed by ANOVA and LSD follow-up tests at 5 % level. The results showed that the administration of test material affected the bodyweight of mice, and was significantly able to reduce blood glucose levels by 69.39% (P1), 67.06% (P2), 73.77% (P3), able to repair kidney damage and can maintain the total number of leukocytes and the number of mice lymphocytes near normal after alloxan induction

keyword : *Acanthus ilicifolius*, taurine, diabetes, kidney, alloxan.

Code : BIO_12

Growth and Estimation of Potential Carbon Absorption by Transplantation Branching Coral Reefs on Mahitam and Pahawang Islands, Pesawaran Regency, Lampung Province

Endang L Widiastuti [1*], S K D Dani[2#], Tugiyono [1], I G Yudha[2], G Nugroho[2]

[1] Faculty of Mathematics and Natural Sciences, University of Lampung,
[2] Department of Coastal and Marine Management, Multidisciplinary Postgraduate Faculty, Lampung University
*Correspondent: Email: elwidi@yahoo.com
#Presenter: Email: sayukadek030@gmail.com

ABSTRACT

Abstract: This study aims to determine the growth and survival and carbon uptake of transplanted coral reefs in Mahitam and Pahawang Islands. Mahitam Island transplants were carried out using iron media and Pahawang Island using concrete media. Growth and survival measurements for 24 months were carried out 3 times from the start of planting. In addition, measurements of water quality were also carried out at that location. The amount of carbon in coral reefs was measured using spectrophotometry, where samples of coral reefs were dried first then mashed and dissolved using a solution of H_2SO_4 and $K_2Cr_2O_7$ 1N. The results showed that the branching coral transplanted for 24 months had an average growth of 17.21 cm on Mahitam Island and 19.97 cm on Pahawang Island. The coral survival was higher on Mahitam Island compared to Pahawang Island with a percentage of 92.14 % and 88.24 %. The organic carbon (C) content of the transplanted coral reefs on Mahitam Island was 1.107 % and on Pahawang Island was 1.010 %. In conclusion, the transplanting of branched coral reefs at Mahitam and Pahawang Islands was said to be successful with high growth and viability. As well as the transplanted coral reefs at the research location can store carbon (C).

keyword : Coral reef, Transplantation, carbon sink, Mahitam Island, Pahawang Island

Code : BIO_13

Isolation and characterization of mercury-resistance for ammonia-oxidizing bacteria from mangrove sediment, hanura lampung beach

Revny Putri[1], Sumardi[2], Bambang Irawan[2], Rochmah Agustrina[2], and Tugiyono[2]

[1] Postgraduate School of Biology, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Department of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email : sumardi_bio@yahoo.co.id[2]

ABSTRACT

Mangrove forest area is an area that has good water quality. In the sediments of mangrove forests, there are many types of microbes capable of bioremediating inorganic contaminants such as ammonia and the heavy metal mercury. Isolation of bacteria was carried out using specific nitrification media to obtain ammonia-oxidizing bacteria. The sensitivity test for heavy metal mercury was carried out in the laboratory with 9 combinations of concentrations. The results of bacterial isolation from mangrove forest sediments at Hanura Beach, Lampung, obtained four isolates of ammonia-oxidizing bacteria (A1, A1P, A3, and A3P). The sensitivity test for heavy metal mercury showed that the four isolates obtained were able to survive the addition of heavy metal mercury by 0.003 g / L.

keyword : isolation, ammonia-oxidizing bacteria, mangroves, heavy metal mercury

Code : BIO_14

Antibacterial effects of *Pheretima javanica* Extract and bioactive chemical analysis using Gas Chromatography Mass Spectrum

Budayatin[1,2], J Waluyo[2], D Wahyuni[2], Dafik[2]

[1] Graduate School of Science, University of Jember, Jl. Kalimantan no 37, Jember, Indonesia
[2] Department of Science, Faculty of Teacher Training and Education, University of Jember, Jl. Kalimantan no 37, Jember, Indonesia
email: budayatin@gmail.com[1], jokowaluyo.fkip@unej.ac.id[2], dwiwahyuniwiwik.fkip@unej.ac.id[3], d.dafik@gmail.com[4]

ABSTRACT

Pheretima sp is an earthworm from the Oligochaeta group found mostly in Java. The characteristics has segments reaching 95-150 segments. Clitellum is located in segment 14-16. The body fluids contain protein, amino acids and various enzymes. The purpose of this study was to determine the composition of bioactive compounds and evaluate antibacterial activity. The method used was maceration, antibacterial test against Salmonella typhi and GCMS analysis to identify bioactive compounds. Antibacterial test showed the inhibition zone diameter ranged from 1.5 to 2 cm. The identification of bioactive compounds is based on the percentage area, percentage peak height, retention time, molecular weight and pharmacological action. GC-MS analysis showed the presence of 50 peaks of compounds. Bioactive compounds which are antibacterial are 1) Nitrogen oxide (N_2O) (CAS) Nitrous oxide with an area 2.03%, height 7.36%, retention time 1.361, molecular weight 44.013 g/mol; 2) Acetic acid (CAS) Ethylic acid with an area 17.02%, height 29.03%, retention time 1.789, and molecular weight 60.05 g/mol; 3) Butanoic acid, 3-methyl- (CAS) Isovaleric acid with an area of 3.27%, height 2.04%, 3.456, molecular weight 102.13 g/mol; 4) 1,2-Benzenedicarboxylic acid, diethyl ester (CAS) with an area 0.95%, height 1.32%, retention time 36.306 and molecular weight 222.24 g/mol.

Code : BIO_15

Inhibitory Study Of Cassava Leather Ethanol Extract As Natural Antimicrobial In Reducing *Salmonella sp.* And *Escherichia coli* On Contamination Chicken Meat (*Gallus Domesticus*)

Dewi Sartika [1] , Sussi Astuti [2)], Ria Iswandari [3]

[1,2] Lecturer at the Department of Agricultural Product Technology, Faculty of Agriculture, University of Lampung
Jl. Prof. Soemantri Brojonegoro No. 1 Bandar Lampung, Lampung 35145
[3] Student of the Department of Master Agricultural Industry Technology , Faculty of Agriculture, University of Lampung
Email: dewiqincai@gmail.com[1] , sussi_astuti@yahoo.com [2], riaiswandari718@gmail.com[3]

ABSTRACT

Chicken meat is a food product that is damaged easily and it's a good medium for microbial growth. Therefore, it is needed a way to reduce the contamination of microbial pathogens . Cassava leather is a byproduct that contains an active compounds and it has a natural antimicrobial function to reduce pathogenic microbe contaminant . This study to determine the presence of natural antimicrobial activity against *Escherichia coli* and *Salmonella sp*. in chicken meat. The research was conducted using single factor with 7 treatment in Completely Randomized Block Design as many as 5 replications. Seven treatments of this research one positive control treatment (amoxicillin), and one treatment as control (96% ethanol). The results is cassava ethanol extract able to inhibit of *Escherichia coli* with the inhibitory diameter of 10.08 mm and *Salmonella sp*. with an inhibitory diameter diameter of 9.17 mm at a concentration extract of 100%, by extract concentrations of 80%, 60%, 40%, and 20%, with each inhibitory diameter 8.98 mm, 8.67 mm, 8.62 mm, 8.45 mm against *Escherichia coli* and 8.58 mm, 8.22 mm, 7.73 mm, 7.56 mm against *Salmonella sp* . The best concentration of cassava ethanol extract as a natural antimicrobial in chicken meat was 100% with total decrease to *Escherichia coli* 5.8 x 107cfu / g (69.05%) and total decrease of *Salmonella sp* by 4.0 x 107 cfu / g (41.17%).

keyword : Antimicrobial, Cassava leather , Chicken meat.

Code : BIO_16

The Potential of Temephos as Larvacide for Malaria Vector Control in Katibung Subdistrict, South Lampung

E Setyaningrum[1], B Santoso[2], A Rouf[1] and J A Suryaningkunti[1]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2]P2P Dinas Kesehatan Propinsi Lampung
email:endahsetyaningrum375@gmail.com[1]

ABSTRACT

Lampung is one of provinces in Indonesia which still has malaria endemic areas in several subdistricts, including South Lampung District. In this subdistrict, the API recorded 0,212 in 2018 while in 2019 it decreased to 0,103. However, the potential of transmission still occurs due to the presence of extensive lagoons, swamps and puddle along the coast which support the proliferation of malaria vector in that area, one of which is Rangai Tri Tunggal Village, Katibung Subdistrict South Lampung. The purpose of this research is to find out the potential of temephos as a larvacide towards *Anopheles sp*. Mosquito larvae in Rangai Tri Tunggal Village, Katibung Subdistrict South Lampung District. The research used a quasi-experimental design by giving 1g/10 L of temephos to Anopheles sp. larvae at 10 breeding points of Anopheles sp. in Rangai Tri Tunggal Village, Katibung Subdistrict South Lampung started from August to September 2019. Larva density observations were carried out before and after the administration of temephos (day 21). The data analysis was administrated by using paired T-test. The result of the research showed that there is a significant difference (P<0,01) in the density of larvae before (23,8 heads/scoop) and after giving temephos (2,5 heads/scoop). The temperature at the sampling location ranged about 26-28oC with salinity 20 ppt, the types of aquatic plants are kale, mangroves, and water hyacinths and types of aquatic animals are fish, dragonflies and small snails. The conclusion is that temephos is worth to be considered as a larvacide for malaria vector control at Katibung Subdistrict South Lampung.

keyword : Temephos, Larvacide, *Anopheles sp.* Larvae, South Lampung

Code : BIO_17

Effect of Duwet fruit (*Syzgium cumini*) extract on MDA level and Caspase 3 expression in Rat (*Rattus sp*)Testes exposed to cigarette smoke

A A S A Sukmaningsih[1], R Suarni[2], I Wiratmini[3], I Setyawati[4]

[1234]Biology Department, Faculty of Mathematics and Natural Sciences, University of Udayana,
Jl Kampus Bukit Jimbaran, Bali, Indonesia
email: sukmaningsih@unud.ac.id[1],gunggalih@ymail.com[2],
wiratminiintan@unud.ac.id[3], iriani_setyawati@unud.ac.id[4]

ABSTRACT

This research evaluates the MDA levels, number and apoptosis of spermatogenic cells in Rat provided with duwet fruit extract and exposed to cigarette smoke towards. The study involved 4 experimental animal groups and 6 replications, where K0 was the negative control group, K1 was the cigarette smoke, K2 with duwet fruit, and K3 were duwet fruit and cigarettes groups. Therefore, data obtained were analyzed using One way Anova test. The results showed significantly lower number of spermatocytes and MDA levels in the testes in all groups compared to K1 at $p < 0.05$. Spermatogenic cell apoptosis occurred in all groups, and there was also a high tendency for reduction in K2 compared to K1, although not significant at $p > 0.05$. In addition, apoptosis is expressed by Caspase 3 in the testes. The highest MDA levels found in K0. This phenomenon was assumed to have resulted in lower numbers of spermatocytes. These lower levels were affiliated with the decline in number of spermatogenic cells prone to apoptosis. In conclusion, juwet fruit have the ability to reduce free radicals with the tendency to inhibit spermatogenesis. This case features an increase in spermatocytes and a potential decline in the incidence of spermatogenic cell apoptosis.

keyword : Cigarette smoke, Duwet fruit, apoptosis, spermatogenesis, Caspase 3

Code : BIO_18

Bacterial support as a biostimulant agent (BPNIII, Azzofor) for marginal soil fertility and stimulating seedlings growth in nursery

S Widawati[1], Suliasih[1]

[1]Micobiology Division, Research Center for Biology, Indonesian Institute of Sciences,
Cibinong Science Center, Jl. Raya Jakarta-Bogor km 46, Cibinong 16911, Indonesia
Email: widadomon007@gmail.com (All authors contributed equally to this work)

ABSTRACT

A nursery is the first preparation step for the reclamation of marginal land, supported by fertile, strong, and adaptable seedling to the environment. Therefore, the role of bacteria as a bio stimulating agent is needed to stimulate the growth of seedling during nursery and to enable their subsequent adaptation to the environment. The purpose of this study is to determine the effectiveness and survival rate of bacteria as a growing medium in marginal soil fertilization as well as the accelerated effect of the vegetative growth of seedling during the nursery. This research used the Completely Randomized Design with 3 treatments and 10 replications. The two biostimulant agents used were BPN III (*Burkholderia Metallica, B.anthina, Rhizobium radiobacter, Azotobacter sp., Azospirillum sp.*) and AZZOFOR (*Enterobacter sp., Lysinibacillus xylanilyticus, Achrimobacter ruhlandii, Enterobacter hormaechei, Comamonas testosterone, Enterobacter cancerogeneus, Pseudomonas mosselii, Leclercia adecarboxylata, Citrobacter youngae, Enterobacter hormaechei, Chyuseobaterium indologenes, Achrimobacter xylosoxidans, and Citrobacter farmer*), mixed with BPN III and AZZOFOR. The results showed that the biostimulant agents and rhizobacteria (BPN III + AZZOFOR) were suitable and effective in supporting the fertility of the marginal soil with bacterial population 107 CFU gram soil-1. Furthermore, all bacteria stimulated the vegetative growth of seedling, such as plant height, number of leaves, and branch, monthly during the nursery.

keyword : Bacteria, biostimulant agent, marginal soil, nursery.

Code : BIO_19

Antioxidant and Antimicrobial Activity of Endophytyc Fungi Isolated from *Syzygium aqueum* Leaves

U H Habisukan[1,2], Elfita[3], H Widjajanti[4], A Setiawan[4], A R Kurniawati[2]

[1] Graduate School of Sciences, Faculty of Mathematics and Natural Sciences, University of Sriwijaya, Jl. Padang Selasa,Palembang, South Sumatera,Indonesia
[2] Department of Biology Education, Tarbiyah and Teacher Training Faculty, Islamic State University of Raden Fatah, Jl. Prof. K. H. Zainal Fikri, Palembang, South Sumatera, Indonesia
[3] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Sriwijaya, Jl. Indralaya-Prabumulih, South Sumatera, Indonesia
[4] Department of Biology, Faculty of Mathematics and Natural Sciences, University of Sriwijaya, Jl. Indralaya-Prabumulih, South Sumatera, Indonesia
email: ummihirash@gmail.com[12], elfita69@gmail.com[3], haryunsri@yahoo.com[3], setiawanarum@gmail.com[4], alfia.kurniawati@gmail.com[2]

ABSTRACT

Syzygium aqueum is a widely used medicinal plant species with ethnomedicinal values. Despite the plant, the endophytes are recognized as a rich source of secondary metabolites with potentially useful pharmacological properties. This study was aimed to identify the endophytic fungi from *S.aqueum* leaves and discover their antioxidant and antimicrobial activity. The ethyl acetate extracts of the isolated endophytic fungi were investigated for their antioxidant and antimicrobial activity using 1,1diphenyl-2-picryl hydrazyl (DPPH) method and paper disc diffusion assay, respectively. The antimicrobial activity was evaluated against three pathogen bacteria : *Staphylococcus aureus, Salmonella thypi, and Escherichia coli*, and one yeast: *Candida albicans*. Three endophytic fungi were obtained from *S. aqueum* leaves. Based on morphological characteristics, those fungi identified as *Cochliobolus sp (D22), Penicillium sp. (D32), and Fusarium sp. (D41). Penicillium sp. (code D32)* showed significant antioxidant potential activity as an also significant antimicrobial activity with IC50 59,16% and highest zone inhibition against *E. coli* 13.38 ± 0.25 mm. It is worth considering a further investigation of their bioactive

secondary metabolites and isolates the bioactive compound for the antioxidant and antimicrobial agents.

keyword : *Syzygium aqueum*, endophytic fungi, antioxidant, antimicrobial

Code : BIO_20

Analysis of the Effect of Different Types of Coffee Shade on Robusta Coffee Productivity

K Khusnul[1], Suratno[2], Asyah N. I[3], Haryadi S[4]

[1]Graduate School of IPA Education, University of Jember, Jl. Kalimantan No. 37 Kampus Bumi Tegalboto Jember
[2]Departement of Biologi Education, of IPA Education, University of Jember, Jl. Kalimantan No. 37 Kampus Bumi Tegalboto Jember
[3]Departement of Biologi Education, of IPA Education, University of Jember, Jl. Kalimantan No. 37 Kampus Bumi Tegalboto Jember
[4]Departement of Biologi Education, of IPA Education, University of Jember, Jl. Kalimantan No. 37 Kampus Bumi Tegalboto Jember
E-mail: khotimahkhusnul000@gmail.com

ABSTRACT

Coffee is a commodity that plays an important role in economic activity and is Indonesia's leading export which contributes to foreign exchange for the country. The coffee market opportunity is quite potential due to increased export demand and domestic consumption. But when viewed from the development of the number of coffee productivity every year has decreased every year. The decline in coffee productivity was caused by many factors, one of which was the coffee shade plant. The purpose of this study was to analyze the factors that influence the types of coffee shade plants that have an impact on the level of coffee productivity. This study used 25 farmers as respondents in Jember Regency and Banyuwangi Regency. Observations on one of the coffee plantations in the Jember area with four different types of shade. The research variables to be measured included biotic factors, abiotic factors and management and productivity of coffee. Data collection used interviews and direct observations on coffee plantations. The results of this study indicate that different types of shade plants have an effect on coffee productivity. Factors that cause the type of coffee shade plant to affect coffee productivity include biotic factors, namely shade area, shade height and leaf length. Abiotic factors include light intensity, air temperature, humidity, soil humidity. The conclusion of this study is the use of different shade plants affects coffee productivity

keyword : Robusta Coffee, Shade Plant, Coffee Productivity

Code : BIO_21

Analysis of Total Carbohydrate and Chlorophyll Content of The Orchid Plantlet [*Phalaenopsis amabilis (L.) Bl.*] Resistant Fusarium Wilt Disease

E Nurcahyani[1,2], Sholekhah[1*],Sumardi[1], H I Qudus[3]

[1]Master of Biology Study Program, Faculty of Mathematics and Natural Sciences, University of Lampung, Lampung, Indonesia
[2]Applied Biology Study Program, Faculty of Mathematics and Natural Sciences, University of Lampung, Indonesia
[3]Master of Chemistry Study Program, Faculty of Mathematics and Natural Sciences, University of Lampung, Lampung, Indonesia
email: sholekhahbioc@gmail.com*

ABSTRACT

The moon orchid [*Phalaenopsis amabilis (L.) Bl.*] is a popular orchid in the community, and is a native orchid from Indonesia, and is included in the list of endangered species. The pathogenic fungus that often attacks orchid leaves is *Fusarium oxysporum*, which causes fusarium wilt. Control of diseases that do not cause negative impacts can be done by using superior cultivars that are resistant to *F. oxysporum* infection, through in vitro selection in the medium with the addition of fusaric acid. The purpose of this study was to find out the total chlorophyll content, chlorophyll a, chlorophyll b, and total dissolved carbohydrate content. This study used a Completely Randomized Design (CRD) with one factor, namely the concentration of fusaric acid divided into 5 levels, namely 0 ppm, 10 ppm, 20 ppm, 30 ppm, and 40 ppm with 5 replications each. The results showed an increase in the total chlorophyll content, chlorophyll a, chlorophyll b, and total dissolved carbohydrate content.

keyword : fusaric acid, *Fusarium oxysporum*, induced resistance, in vitro, *Phalaenopsis amabilis.*

Code : BIO_22

The Effect of Fermentation on Acidity, Caffeine and Taste Cascara Robusta Coffee

N Komaria[1], Suratno[2], Sudarti[3], Dafik[4], Hobri[5], Mutrofin[6]

[1] Doktoral of Sains Education Program, Faculty of Teacher Training and Education, University of Jember, Indonesia
[2] Department Biology Education, Faculty of Teacher Training and Education, University of Jember, Indonesia
[3] Department Physics Education, Faculty of Teacher Training and Education, University of Jember, Indonesia
[4,5] Department Mathematics Education, Faculty of Teacher Training and Education, University of Jember, Indonesia
[6] Department Primary Teacher Education, Faculty of Teacher Training and Education, University of Jember, Indonesia
email:nurulqomariah2202@gmail.com[1],suratno.fkip@unej.ac.id[2], sudarti.fkip@unej.ac.id[3],d.dafik@gmail.com[4]

ABSTRACT

Robusta coffee is in demand by the global market because of its distinctive aroma. Along with the high demand, robusta coffee waste known as cascara needs processing. Cascara which has a unique taste needs innovation to improve its quality. One of the efforts made is by varying the fermentation process. The purpose of this study is to examine the effect of the fermentation process on pH, caffeine and flavor in cascara robusta coffee. This type of research is experimental. The results showed that the fermentation process had an effect on pH, caffeine and flavor values. The non-fermented cascara has the lowest pH average value of 4.22, the natural fermented cascara has a pH value of 4.58, while the fermented cascara wrapped in banana leaves has a pH value of 5.24. Calculation of caffeine content in non-fermented cascara, natural fermented cascara and fermented cascara wrapped in banana leaves were 1.22%, 1.17%, and 1.14%, respectively. The taste test results of the non-fermented cascara, natural fermented cascara and cascara wrapped in banana leaves were different for each treatment.

keyword : Fermentation cascara, acidity, caffeine, taste.

Code : BIO_24_Ps

Effect of immersion time in extract gonad of sea urchin on masculinization of betta fish (*Betta sp*)

Susi Mufida Hasanah[1]; Gregorius Nugroho Susanto[1]; Hendri Busman[1]; Sutyarso[1]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no1, Bandar Lampung, Indonesia 35145
email : susimufida@gmail.com; gregorius.nugroho@fmipa.unila.ac.id; hendri_busman@yahoo.com; sutyarso@yahoo.co.id

ABSTRACT

Betta sp is a type of ornamental fish that is favoured by the ppublic, because it has a proportional body shape, bright coloration of scales, attractive eye colour, and aggressiveness in maintaining territory,making it a special attraction for hobbyists. However, these characteristics are only owned by male fish, which cause demand for beta fish continues to increase.To increase the number of male individuals can be done by masculinization through soaking using natural steroid hormones. Sea urchins (*Diadema setosum*) contains bioactive contents of the steroid, such as triterpenoid, flavonoid and saponins. The purpose of this study is to determine the effect of immersion time in sea urchin extract solution inmale formation of betta fish larvae. The research was used Completely Randomized Design (CRD) with 5 treatments and 3 replications. The treatment involved immersion in sea urchin extracts dose of 4 mg. $L^{-1}$and duration time of control(0 h), 12, 18, 24, and 30 h. Data wereanalysed using analysis of variance (Anova) and the smallest significant difference test (LSD) at the level of 5% with SPSS 16 software.The resultsindicatedthat the difference of immersion time in the sea urchin extract solution at dose of 4 mgL-1was significantly affects the formation of male individuals. Immersion time for 12 h is quite effective inmale formation by 84%, but there is no significant effect on the survival rate of betta fish larvae.

keyword : sea urchin, gonads, steroids, betta fish, masculinization

Code : BIO_25

Identification of Against Virus Infection on Native Orchid in Liwa Botanical Garden

Mahfut[1], Hanin Shafira[2], Sri Wahyuningsih[1], Tundjung Tripeni Handayani[1], Sukimin[1]

[1]Department of Biology, Faculty of Mathematics and Natural Science, Universitas Lampung. Jl. Prof. Soemantri Brojonegoro 1, Lampung, Indonesia.
[2]Liwa Botanical Garden. Way Mengaku, Balik Bukit, Lampung Barat, Lampung, Indonesia.
Email: mahfut.mipa@fmipa.unila.ac.id[1]

ABSTRACT

Liwa Botanical Garden is one of the regional botanical gardens in Indonesia with the theme "Indonesian Ornamental Plants". Until now, disease infections are still a major obstacle in efforts to preserve and develop the potential of natural orchids. Based on previous research, it is known that some individual orchids exhibit symptoms of viral disease infections, namely mosaic, chlorotic, streak, and necrosis. This research was conducted to determine the identification of diseases and efforts to protect natural orchids against virus infections in the Liwa Botanical Garden through a collection of samples that showed symptoms of infection, analysis of disease symptoms, and analysis of the level of disease resistance. The results showed the response of natural orchids in the Liwa Botanical Garden to viral infections showed symptoms in the form of necrotic black and chlorotic patches, ie yellowing leaves on orchids *Coelogyne sp., Flickingeria sp., Calanthe sp., Trixspermum centipeda, Bulbophyllum sp.* The type of orchid that shows the most symptoms is *Flickingeria sp.* a total of 8 samples. The type of natural orchid in the Liwa Botanical Garden which is most vulnerable to being infected with a virus is *Flickingeria sp.* with a disease intensity of 42%, while the most resistant orchids infected with a virus are *Coelogyne sp.* with an intensity of 15%. The results of this activity are expected to be basic information in efforts to protect plants against diseases to support the application of conservation of natural orchids in the Liwa Botanical Garden.

keyword : identification, virus infection, orchid virus, natural orchid, liwa botanical garden

Code : BIO_26

Solvent extraction effects on Phytochemical Constituents and Antioxidant Activities of Buds of *Punica granatum L.* grown in Adıyaman- Turkey

Zehra Tekin[1], F.Zehra Küçükbay[2]

[1]Adıyaman University, Faculty of Pharmacy, Department of Pharmaceutical Basic Sciences;
[2]İnönü University, Faculty of Pharmacy, Department of Basic Pharmaceutical Sciences
email : ztekin@adiyaman.edu.tr[1] ; zehra.kucukbay@inonu.edu.tr[2]

ABSTRACT

In Turkey, pomegranate (*Punica granatum L.*) fruits are cultivated for fresh or processed products, and its flowers are collected for medicinal uses. This study was carried out to evaluate the impact of different solvents on extraction yields, phytochemical constituents and in vitro antioxidant activities of buds extracts of *Punica granatum L.* The antioxidant activities of methanol, ethanol, water, hexane, 1 % acidified methanol, 1 % acidified ethanol and 1 % acidified water extracts of pomegranate buds were investigated using radical scavenger, metal chelating and reducing power ability methods [1]. Total phenolic, flavonoid and flavonol contents of the extracts were also determined according to the procedure described by Singleton and Rossi [2] Zhishen et al. [3] and Kumaran and Karunakaran [4], respectively. This study showed that the extracting solvent significantly affected the phytochemical content and antioxidant activity of *Punica granatum L.* buds. In this study, it was found that methanol was the optimal solvent with 52.47% extraction efficiency, 436.68 mg (GAE / g extract) phenolic, 553.30 mg (mg QUE / g) flavonoid, 16.19 mg (mg QUE / g) flavonol compounds and high antioxidant activity (83.72% inhibition value of 25 µg / mL extract) According to the results, buds of pomegranate may be used in food, health, cosmetic and pharmaceutical industries.

Code : BIO_27_Ps

Effect different doses of extract gonad of sea urchin on masculinization of betta fish (Betta sp)

Nyoman Rolly Kurniawan[1], Gregorius Nugroho Susanto[1], Hendri Busman[1], Sutyarso[1]

1Department of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung,
Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia 35145
email: rollykurniawan6@gmail.com[1], gregorius.nugroho@fmipa.unila.ac.id[1], hendri_busman@yahoo.com, sutyarso@yahoo.co.id

ABSTRACT

Betta fish is one of the ornamental fish that is in great demand by fish lovers, because in addition to having an attractive colour and various tail shapes, the price of male fish is more expensive than female. To increase the number of male individuals, it can be done by means of sex reversal. One way of sex reversal is by soaking using natural steroid hormones. Sea urchins (Diadema setosum), as a natural hormone contains bioactive of the steroid substances. The purpose of this study is to determine the effective doses of sea urchin extract solution in male formation of betta fish larvae. The method used in this study was a completely randomized design (CRD) with 5 treatments and 3 replications. The treatments involved different doses of sea urchin extracts (0, 2, 4, 6 and 8 mg. L-1) soaking for 12 h. Data were analysed using analysis of variance (Anova) and the smallest significant difference test (LSD) at the level of 5% with SPSS 16 software. The results showed that on the treatment dose of 4 mg. L-1 extract gonad of sea urchin was significantly different from dose of 0 and 6 mg. L-1 on the male formation, but it was not difference from dose of 2 and 8 mg. L-1. The highest male percentage was found on dose of 4 mg. L-1 at 84.10%, while the lowest was in control (0 mg. L-1).

keyword : sea urchin, gonads, betta fish, masculinization, sex reversal, steroids

Code : BIO_PRES_01

Application of Xylanolytic Fungi Inoculum of Aspergillus Tubingensis R. Mossery In Bamboo Litter (Bambusa Sp.) Composting

Bambang Irawan[1]; Salman Farisi[1]; Suratman[1]; Lati Fiari Putri[1]

Departement of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
email : bambang.irawan@fmipa.unila.ac.id[1]

ABSTRACT

Bamboo is a plant that is easily found in various regions in Indonesia. Bamboo leaves are abundant and usually difficult to decompose naturally, so they are usually only burned. In fact, bamboo leaves can be a good source of organic material if processed properly. One way that can be used to overcome these problems is composting. The purpose of this study was to determine the effect of Aspergillus tubingensis (xylanolytic Fungi) inoculum with corn medium on the bamboo litter composting process. This research was conducted in a Completely Randomized Design (CRD) with 4 treatments consisting of Control (bamboo litter only), P1 (bamboo litter + 1% inoculum), P2 (bamboo litter + 1.5% inoculum), and P3 (bamboo litter + 2% inoculum) with 3 replications in each treatment. Chemical analysis is carried out at the 4th, 8th, and 12th weeks of composting. The result indicates that application of xylanolytic fungi inoculum of A. tubingensis gives dynamic results to C, N, P, and C / N ratio of bamboo litter compost during weeks 4, 8 and 12.

Code : BIO_PRES_02

ANTICANCER POTENCY OF JERUJU LEAF (Acanthus ilicifolius) AND SEAGRASS (Enhalus acoroides) METHANOL EXTRACT AND TAURIN IN CELL CULTURE OF HELA CERVICAL CANCER

Endang L. Widiastiuti[1] K. Rima[2], N. Nurcahyani[3], H. Busman[4], E. Rosa[5]

[12345]Departement of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
email : elwidi@yahoo.com[1]

ABSTRACT

Anticancer potential of methanol extracts of jeruju leaves, seagrass, and taurine was proven through cytotoxic and antiproliferation tests by MTT method (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide) on *HeLa* cervical cancer cell culture. The results showed that the methanol extract of jeruju leaves, seagrass, and taurine had a cytotoxic activity with IC_{50} values are 206 ppm, 122 ppm, and 603 ppm. While the doubling time value in the antiproliferation test by methanol extracts of jeruju leaves, seagrass, and taurine showed higher values than cell control (72.19 hours).

Code : BIO_PRES_03

Resistance of Red Chilies *(Capsicum annum L.)* to *Fusarium oxysporum* Attack as a Result of 0.2 mT Magnetic Field Induction

Rochmah Agustrina[1], Yulianty[2], Lili Chrisnawati[3], Martha L. Lande[4]

[1234]Departement of Biology, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
email : rochmah.agustrina@fmipa.unila.ac.id[1]; youlisoeradji@yahoo.co.id[2], lili.chrisnawati@fmipa.unila.ac.id[3] , martha_lande@yahoo.com[4]

ABSTRACT

Results of previous prove that magnetic fields can increase seed vigor which then has an impact on increasing growth, development and crop production. In this study, it was examined whether the increase in seed vigor as well as plant growth and development induced by magnetic fields also had an impact on plant resistance to it's pathogens. The study was conducted using a Completely Randomized Design (CRD) with 2 treatments. The first treatment is exposure to 0.2 mT magnetic field for 0 '(M0); 7'48 "(M7), and 15'36 "(M15) and the second treatment was infection with suspension of *Fusarium oxysporum* spore with a density of 1x107 for 0 '(F0) and 60' (F60) and using 5 replication. Anova results at α = 5% showed that exposure to magnetic fields and *Fusarium oxysporum* infection significantly increased dry weight and lignin thickness in the vegetative phase, likewise with the interaction of magnetic field exposure and *Fusarium oxysporum* infection. All treatments had no significant effect on carbohydrate content and peroxidase activity. The above results indicated that exposure to magnetic fields in the seeds made the seeds resistant to *Fusarium oxysporum* infection.

keyword : Magnetic field, *Fusarium oxysporum*, plant resistance.


ICASMI
3rd International Conference on
Applied Science Mathematics
and Informatics
Scopus
"Natural Sciences, Mathematics and Informatics in Industrial Revolution
(IR) 4.0 Toward The Sustainable Development Goals (SGDs)"

CHEMISTRY

Code : CHEM_01

The Use of SIMCA Method and NIR Spectroscopy with Two Different Hand Held and Portable Spectrometers Equipped with Integrating Sphere for Classification of Two Different Indonesian Specialty Coffees

M. Yulia [a,1], D. Suhandy [b,c]

[a] Department of Agricultural Technology, Lampung State Polytechnic, Jl. Soekarno Hatta No. 10, Rajabasa, Bandar Lampung, 35141, Indonesia
[b] Department of Agricultural Engineering, Faculty of Agriculture, The University of Lampung, Jl. Prof. Dr. Soemantri Brojonegoro No.1, Bandar Lampung, 35145, Lampung, Indonesia
[c] Spectroscopy Research Group (SRG), Laboratory of Bioprocess and Postharvest Engineering, Faculty of Agriculture, The University of Lampung, Bandar Lampung, 35145, Lampung, Indonesia
E-mail: meinilwitayulia@polinela.ac.id[1]

ABSTRACT

Lampung Robusta coffee got a geographic indication (GIs) protection from Indonesian government since 2014 with certificate number of ID G 000 000 026. This GIs coffee come from three different geographic origins in Lampung province: Lampung Barat, Tanggamus and Way Kanan. In this research, we evaluate the possible application of simple analytical method based on UV-visible spectroscopy coupled with SIMCA (soft independent modelling of class analogy) for authentication of Lampung Robusta coffee with GIs. Two types of Lampung Robusta coffee were used: GIs coffee from Lampung Barat and non-GIs coffee from Pesawaran. Each type consists of 50 samples of ground roasted coffee with 1 gram weight. The all samples were extracted using a hot distilled water and 3 mL aqueous samples were pipetted into 10 mm quartz cuvette. UV-visible spectral data were recorded in the range of 190-1100 nm. The chemometrics (PCA and SIMCA) was performed using selected preprocessed spectral data in the range of 240-430 nm. The PCA result showed that GIs coffee and non-GIs coffee can be well separated. The SIMCA classification was accepted with 100% of correct classification.

Code : CHEM_02

Simple analytical method based on UV-visible spectroscopy coupled with SIMCA method for authentication of Lampung robusta coffee with geographic indications (GIs)

D Suhandy[a,c,[1]], M Yulia[b,c] , S Kuroki[d] , K Nakano[e]

[a] Department of Agricultural Engineering, Faculty of Agriculture, The University of Lampung, Jl. Prof. Dr. Soemantri Brojonegoro No.1, Bandar Lampung, 35145, Lampung, Indonesia
[b] Department of Agricultural Technology, Lampung State Polytechnic, Jl. Soekarno Hatta No. 10, Rajabasa Bandar Lampung, 35141, Lampung, Indonesia
[c] Spectroscopy Research Group (SRG), Laboratory of Bioprocess and Postharvest Engineering, Faculty of Agriculture, The University of Lampung, Bandar Lampung, 35145, Lampung, Indonesia
[d] Laboratory for Information Engineering of Bioproduction, Graduate School of Agricultural Science, Kobe University, 1-1 Rokkodai, Nada, Kobe, 657-8501, Japan.
[e] The United Graduate School of Agricultural Science, Gifu University, 1-1 Yanagido, Gifu City, Gifu, 501-1193, Japan
E-mail: diding.sughandy@fp.unila.ac.id[1]

ABSTRACT

The objective of this study is to evaluate the use of SIMCA method and NIR spectroscopy with two different hand held and portable spectrometers equipped with integrating sphere for classification of two different Indonesian specialty coffees. Two specialty coffees from two different geographical origins were used: Gayo coffee from Aceh 10 samples and Wamena from Papua 10 samples. All samples were roasted at same condition (medium roasting at temperature of 200°C for 10 minutes). Samples were grinded using a home coffee grinder and sieved using 50 mesh to obtain homogenous particle size of 297 micrometer. Spectral data in the short and long near infrared range was measured in a diffuse reflectance mode using two hand held and portable spectrometers equipped with an integrating sphere (ISP-REF, Ocean Optics, USA) in the range of 650-1650 nm. The integrating sphere is coated with Spectralon® and installed a built-in tungsten-halogen light source. The supervised classification method based on SIMCA method was applied for original full spectral data (650-1650 nm). The result demonstrated that the classification was satisfied with 100% of accuracy, sensitivity and specificity.

Code : CHEM_03

Solar-Powered Electrocoagulation System for Tofu Wastewater Treatment and its Characteristic

Muryanto[1], A A Sari[2], Muchlis[2], D A Prasetyo[3], Sudarno[3]

[1]Research Center for Chemistry, Indonesian Institute of Sciences, Kawasan PUSPIPTEK Serpong, Tangerang Selatan, Indonesia, 15314
[2]Research Unit for Clean Technology, Indonesian Institute of Sciences, Komplek LIPI Bandung Gedung 50, Jalan Cisitu Lama, Bandung 40135, Indonesia
[3]Department of Environmental Engineering, Faculty of Engineering, Diponegoro University, Jl. Prof. H. Sudarto, SH Tembalang, Semarang, Indonesia, 50275
email: moeryanto.mrt@gmail.com[1], ajeng_as@yahoo.co.id[2],

ABSTRACT

The objective of this study is to investigate the ability of solar-powered electrocoagulation for tofu wastewater, especially for reducing COD and TSS. This feasibility was compared with conventional electrocoagulation using electricity from state electricity company. The study was conducted on a laboratory scale using a batch reactorelaectrocoagulation and aluminum electrode. The types electrolytes used are NaCl and KCl. The contact time is 0, 2, 4, 6, and 8 hours. The results showed that removal of COD and TSS in tofu wastewater increases with an increasing electrolysis time. During 2 hours of electrolysis time, theremoval of COD and TSS were 25 and 53.85%, respectively. This process yielded the highest COD and TSS removal of 75 and 76.9%, respectively, at 6 hours. A pseudo-second order kinetics about COD removal, both in conventional and solar panel system, is concluded. By addition of NaCl electrolytes and solar power sources, the conductivity of wastewater was increased, and then the removal of COD and TSS were also increased. In the end of electrolysis time, the pH of wastewater was towards neutral. The results of mud characterization using FTIR showed the presence of hydroxyl groups groups, amide compound, and aromatic compound.

keyword : Electrocoagulation, tofu wastewater, electrolyte NaCl, solar panel.

Code : CHEM_05

Microcapsule from PCL/PEG as Controlled Nifedipine Drug Delivery Carrier

W A Rahma[1], E Budianto[1]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Indonesia, Depok, Indonesia
email: wandaamelia32@gmail.com[1], emilb@ui.ac.id[1]

ABSTRACT

Problems related to controlled drug release are important to immediately find a solution because of the dangers of drug side effects if consumed repeatedly every day. The drug used is Nifedipine which is a hydrophobic drug. This research used a synthetic combination of poly(caprolactone) and poly(ethylene glycol) with surfactants in the form of tween 80 and span 80 while the method used was the evaporation of solvents. Initially, the drug will be encapsulated so as not to degrade in the stomach. Once the drug is in the intestine, it is released in a controlled manner to minimize side effects and maximize drug release. The results showed that the composition of the best PCL: PEG combination was 80:20 with a molecular weight of PEG 400 g/mol. The results of the encapsulation efficiency percentage obtained 97.84± 0.01% while dissolution after 3 hours (pH 1.2) and 52 hours (pH 7.4) of 44.77%.

keyword : nifedipine, poly(ethylene glikol), poly(caprolactone), polyblend, span 80, tween 80.

Code : CHEM_06

Controlled Drug Delivery Carrier of Nifedipine Using Biodegradable Microcapsule Polymer from Poly (D,L-Lactic Acid) and Polyethylene Glycol

P P Lestari[1] and E Budianto[1,2*]

[1] Department of Chemistry, Faculty of Mathematics and Natural Science, Universitas Indonesia, Gedung G FMIPA UI, Jl. Prof. Dr. Sudjono D. Pusponegoro, Kampus UI Depok, Depok, West Java, 16424, Indonesia
[2] School of Enviromental Science, University of Indonesia, JL. Salemba Raya No. 4, KampusUI Salemba, Gedung C (FKG) fl 5 and 6, 10430, Kota Jakarta Pusat, Indonesia
e-mail: emilb@ui.ac.id[1], pratiwii.tiwii@gmail.com[1]

ABSTRACT

Biodegradable microcapsules as a controlled drug delivery carrier of Nifedipine was prepared from poly (D,L-lactic acid) (D,L-PLA) and Polyethylene Glycol (PEG). Nifedipine works by blocking the amount of calcium that goes to cells in the heart and blood vessels. Nifedipine is used in the treatment of angina pectoris and hypertension. The microcapsules was forming use o/w emulsification method, where the core of microcapsules are polyblend of D,L-PLA and PEG. D,L-PLA and PEG are dissolved into dichloromethane than emulsified with nifedipine and dispersed into water to form microcapsules. PEG with different molecular weights can affect pore formation in microcapsules. This study was observed the appearance of microcapsules when using PEG with different molecular weights of PEG and the dissolution at the various composition ratio of D,L-PLA:PEG. The best composition are shown in the variation composition of D,L-PLA (10) : PEG 400 (90) with a dissolution value of 22.83% while variations in the composition of D,L-PLA (10) : PEG 4000 (90) had a dissolution value of 10.43%. This indicates that use PEG with a smaller molecular weight will be able to form better pores in the nifedipine microcapsules and the dissolution value is better if the PEG molecular weight is smaller.

keyword : Hypertention, Poly (D,L-lacic acid), Polyethylene glycol, Nifedipine, Dissolution Test

Code : CHEM_07

Efficiency of Natural Folic Acid in Infant Poured Cream Soup using Mocaf for Complementary Feeding

A Susilowati[1,*], Aspiyanto[1], Y Maryati[1], P D N Lotulung[1], H Melanie[1]

[1]Research Center for Chemistry, Indonesian Institute of Sciences, Kawasan PUSPIPTEK, Serpong, Tangerang Selatan – 15314
[*]Email : agustine_1408@yahoo.co.id[*]

ABSTRACT

Food additives using mocaf flour is a novelty as carrier of natural folic acid. This experiment work aims to find out optimization in adding mocaf to infant poured cream soup fortified by fortificant A (mixture of soy tempeh, nixtamalized yellow dent corn and fermented broccoli) and fortificant B (mixture of mung bean tempeh, nixtamalized yellow dent corn and fermented broccoli) on the whole compositions, particularly folic acid, characteristic, and efficiency for each component before and after pouring. Adding mocaf was conducted at concentrations of 0, 6, 12, 18, 24, and 30% (w/w, base formula of cream soup). The result of experiment showed that optimization for both folic acid in infant poured cream soup A and B were achieved at mocaf concentration of 24% (w/w, base formula of cream soup), which was able to increase folic acid 121.75% (1.22 folds) and 164.69% (1.65 folds), and total sugars 268.92% (2.7 folds) and 58.69% (0.59 fold), respectively compared with concentrations of folic acid and total sugars without adding mocaf (0%). In these conditions, both poured cream soup A and B gave efficiency on recoveries of folic acids of 46.62% and 51.34%, dissolved protein of 16.87% and 4.53%, total solids of 10.94% and 10.59%, total sugars of 57.86% and 39.73%, reducing sugars of 30.46% and 40.16%, respectively compared with concentration for each component without pouring which yields one (1) of dominant folic acid monomer with molecular weight 442.57 Da. and 2 folic acid monomers with MW of 442.12 Da. and 442.27 Da.. Meanwhile, particle size distribution at quantities of 10, 50, 90% were subsequently 8.94, 16,54, 125.02 µm and 9.54, 17.34, 106.49 µm, average particles size of 39.81 and 41.07 µm dominated by volatile compound as acetic acid of 14.86% and 27.97%, sucrose

compound of 43.99% and 23.46%, methyl ester of 23.29% and 15.28%, ethanol of 14.10% and 11.67%, and fatty acids of 3.77% and 21.61%.

keyword : : folic acid, mocaf, poured cream soup, efficiency.

Code : CHEM_08

Adsorption Kinetic and Isotherm of Solution Pair of Methylene Blue and Crystal Violet by Algae-Silica-Magnetite Hybrid Adsorbent on *Porphyridium sp.* Algae

D Permatasari[1,2], Buhani[2], M Rilyanti[2], and Suharso[2]

[1] Graduate School of Chemistry, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
[2] Department of Chemistry, Faculty of Mathematic and Natural Sciences, University of Lampung, Prof. Soemantri Brojonegoro street number.1, Bandar Lampung, 35145, Indonesia
email: desypermatasari81@gmail.com[1], buhani@fmipa.unila.ac.id[2]

ABSTRACT

Algae-silica-magnetite hybrid (PSM) from *Porphyridium sp.* algae has been successfully synthesized using precursor tetraethyl orthosilicate (TEOS) and coating with magnetite particles (Fe_3O_4) via a sol-gel process. The resulting adsorbent was applied for adsorption of solution pair of methylene blue (MB) and crystal violet (CV). The result of the analysis using the Infrared Spectrometer (IR) showed that in the PSM adsorbent there is an organic groups derived from Porphyridium sp. algae while silanol and siloxane group derived from silica matrix. In addition, surface morphology analysis results using Scanning Electron Microscopy With Energy Dispersive X-Ray (SEM-EDX) showed PSM surface has more heterogeneous than algae-silica hybrid (PS). The adsorption of solution pair of MB and CV by PSM was done under the experimental conditions of adsorbent of 0.1 g, interaction pH of 8, contact time of 90 min, and adsorbate concentration of 0.5 mmol L-1. The adsorption kinetics data indicate that it tends to follow the pseudo second order model with a correlation coefficient (R2) of 0.989 and 0.965 respectively. While, the adsorption isotherm model tends to follow Freundlich model.

keyword : *Porphyridium sp*. algae, adsorption, methylene blue, crystal violet.

Code : CHEM_09

Transition Energy, Spectral Fine Structure, and Absorption Coefficient of Norbixin (9'-cis-6,6'-diapocarotene-6,6'dioic acid) in Different Polar Solvents

W Rahmalia[1], U A Naselia[2]

[1,2]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Tanjungpura University, Jl. Prof. Dr. H. Hadari Nawawi, Pontianak, 78124
email: winda.rahmalia@chemistry.untan.ac.id[1]

ABSTRACT

Transition energy, spectral fine structure, and absorption coefficient of norbixin in different polar solvents has been investigated. Eight polar solvents were used for dissolving norbixin separately; they are methanol, ethanol, propylene carbonate, acetone, dichloromethane, ethyl acetate, chloroform, and dimethyl carbonate. Spectra of norbixin in the resulting solutions were determined by UV-visible spectrophotometry at atmosphere condition. The effect of solvents on transition energy was analyzed according to Onsager cavity model and Hansen theory. The approximate absorption coefficient was determined with the Beer-Lambert law. The result show that the UV-visible absorption spectra of norbixin depend on the solvent. The greater the refraction index of the solvent and the norbixin-solvent dispersion interaction cause the transition energy of norbixin was smaller. There was four tendencies of values of spectral fine structure of norbixin in various solvents used in this investigation. The absorbance of norbixin in various solvents, increased linearly with concentration.

keyword : absorption, norbixin, spectrophotometry, transition energy

Code : CHEM_10

Modification of Activated Carbon from *Elaeis guineensis Jacq Shell* with Magnetite (Fe3O4) Particles and Study Adsorption-Desorption on Ni(II) Ions in Solution

A S Zulaicha[1], Buhani[2], Suharso[2]

[1]Graduate School of Chemistry, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
[2]Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: annisaazulaicha@gmail.com, buhani@fmipa.unila.ac.id

ABSTRACT

Activated carbon coated with magnetite (ACA-Fe_3O_4) was synthesized in this study. Activated carbon was synthesized using an *Elaeis Guineensis Jacq* (EGJ) as a raw material followed by physical and chemical activation. Physical activation is carried out by heating at a temperature of 700°C and followed by a reaction with H_3PO_4 solution as chemical activation. Furthermore, the activated carbon was reacted with a mixture of $FeCl_3$ and $FeSO_4$ solution then followed by the addition of NaOH solution up to a pH of 10. Characterization with X-Ray Diffraction (XRD) and Scanning Electron Microscopy - Energy Dispersive X-Ray (SEM-EDX) on ACA-Fe_3O_4 was done to confirm that magnetite has succeeded to coating on ACA. Brunauer-Emmett-Teller Surface Area Method Method (SBET) confirmed that pore volume and average pore diameter increase with the presence of magnetite. Optimum conditions for Ni(II) ion adsorption with ACA- Fe_3O_4 was under conditions of 0.5 grams adsorbent, 25 mL of Ni(II) ion solution 100 ppm, and contact time of 1 hour with the acquisition of 99.11%. Adsorption process more suitable with pseudo-second-order and Langmuir adsorption isotherm pattern. Desorption of Ni(II) ion of 70.84% using HCl.

keyword : Elaeis Guineensis Jacq, Magnetite activated carbon, Adsorption, Desorption, Ni(II)

Code : CHEM_11

Preparation and Characterization of $LaCr_{0.99}Fe_{0.01}O_3$ Nanomaterial

M Erianti [1] , R Situmeang[2*,] , S Sembiring[3]

[1] Graduate Student of Chemistry Department, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
[3] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
Corresponding email: rudy.tahan@fmipa.unila.ac.id[*]

ABSTRACT

Perovskite compounds show great potential in a variety of applications due to their diverse and unique properties and can be modified. Nanomaterial $LaCr_{0.99}Fe_{0.01}O_3$ has been prepared using sol-gel and freeze drying methods. The nanomaterial was then calcined at 700ºC for 10 hours and characterized by the analysis techniques of Diffuse Reflectance UV-Vis Spectroscopy (DRS UV-Vis), X-Ray Diffraction (XRD), Fourier Transform Infrared (FTIR) and Transmission Electron Microscope (TEM). The result of XRD analysis showed that two main crystal phases were formed from the ABO_3 perovskite structure, namely $LaCrO_3$ and $LaFeO_3$ which were superimposed and the crystalline phase size based on the Scherrer method was 23.5 nm. Furthermore, the TEM analysis result shows that there are various forms and hollows. Then, the FTIR spectrum states that there is an interaction between transition metals, and the band gap energy is 2.71 eV.

keyword : Perovskite, nanomaterial, hollow, bandgap energy

Code : CHEM_12

BIOGASOLINE PRODUCTION BY ZEOLITE-A CATALYZED CO-PYROLYSIS OF TORREFIED CASSAVA ROOT AND PALM OIL

W Simanjuntak[1,*], K D Pandiangan[1], Z Sembiring[1], Y P Sihombing[1]

[1]Department of Chemistry, University of Lampung, Bandar Lampung, Indonesia
email: wasinton.simanjuntak@fmipa.unila.ac.id[*]

ABSTRACT

In this study, cassava root was subjected to torrefaction pretreatment prior to catalytic pyrolysis, with the main objective to investigate the effect of torrefaction time on chemical composition of bio crude oil (BCO) distillate resulted. For this purpose, the root was torrefied at 200^{o}C for 30, 60, 90, and 120 minutes. The torrefied samples were then mixed with palm oil and then pyrolyzed at 450^{o}C in the presence of zeolite-A, prepared from rice husk silica (RHS) and food grade aluminum foil, as catalyst. A sample without torrefaction was pyrolyzed in a similar condition for comparison. The bio-crude oil (BCO) obtained was distilled at 150^{o}C, and the chemical composition of the distillate was determined using gas chromatography-mass spectrometry (GC-MS) method. The components of the distillates produced from torrefied samples are composed of mainly C_6-C_{13} hydrocarbons, which are considered as biogasoline, while that produced from the sample without torrefaction was found to contain ketone in addition to hydrocarbon. The experimental results also demonstrate that the chemical compositions of the BCO distillates produced from the samples torrefied at 30, 60, and 90 minutes are not significantly different, but significantly different composition was observed for the sample torrefied at 120^{o}C.

keyword : torrefaction, cassava root, pyrolysis, zeolite-A, bio-crude oil, biogasoline

Code : CHEM_13

Synthesis of Zeolite-Y from Rice Husk Silica and Food Grade Aluminium Foil Using Modified Hydrothermal Method

G G Pangesti [1,*], K D Pandiangan[1], W Simanjuntak[1], S Sascori[1], M Rilyanti[1], Z Sembiring[1],

[1]Department of Chemistry, University of Lampung, Bandar Lampung, Indonesia
email: gesagustami@gmail.com[*]

ABSTRACT

In this investigation, zeolite-Y prepared from rice husk silica (RHS) and food grade aluminium foil using modified hydrothermal method. In this proposed method, rice husk silica was dissolved in NaOH solution to obtain sodium silicate solution and then small pieces of aluminium foil were directly mixed with silicate solution, producing zeolite precursor in the form of gel. The gel was transferred into PTFE lined autoclave and aged for 24 hours and subsequently subjected to the crystallization process for 24, 48, 72, 96, and 120 hours at fixed temperature of 100oC. The solid product was washed with distilled water and dried in oven at 80oC and calcined at 550oC for 6 hours. Characterization using XRD and SEM confirm the formation of zeolite-Y, and showed that crystallization time influenced both structure and surface morphology of the zeolites quite significantly.

keyword : Zeolite-Y, rice husk silica, food grade aluminium foil, hydrothermal method, PTFE lined autoclave.

Code : CHEM_14

Structure Elucidation of Betulinic Acid from Sesbania grandiflora Root

Noviany[1], H Osman[2]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] School of Chemical Sciences, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia
email: noviany@fmipa.unila.ac.id[1] (corresponding author), ohasnah@yahoo.com[2]

ABSTRACT

Betulinic acid, a known triterpene compound that has been successfully isolated from the ethyl acetate extract of the root of *Sesbania grandiflora*. The structure elucidation of betulinic acid was performed using one- and two-dimensional nuclear magnetic resonance, ultraviolet and infrared spectroscopy, and fast atomic bombardment mass spectrometry as well as by comparing with the literature data. This compound was found for the first time from the Fabaceae family, in particular *Sesbania grandiflora*

keyword : betulinic acid, *Sesbania grandiflora*, triterpene, structure elucidation

Code : CHEM_16

Transesterification of coconut oil (*Cocos nucifera L.*) into biodiesel using zeolite-A catalyst based on rice husk silica and aluminum foil

Herliana[1], Ilim[2*], W Simanjuntak[2], K D Pandiangan[3]

[1] Postgraduate Student of Chemistry Department, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
[2,3] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia

corresponding author: ilim@fmipa.unila.ac.id[*]
email: herliana.h19@gmail.com[1], wasinton.simanjuntak@fmipa.unila.ac.id[2], kamisah.delilawati@fmipa.unila.ac.id[3]

ABSTRACT

In this research, zeolite-A was synthesized from rice husk silica and aluminum foil by hydrothermal method. For zeolite preparation, a specified amount of rice husk silica is dissolved in NaOH solution which is then aged with variation time of 24-96 hours, the mixed solution is then added with aluminum foil and again aged for 24 hours, the crystallization process is carried out in an oven of 100 °C 96 hours. The resulting zeolite was then calcined at 550 °C for 6 hours. The zeolite characterization by XRD showed that zeolite-A had been formed and had characteristics following the zeolite-A standard from IZA. The resulting zeolite-A has good crystallinity as indicated by the sharp peaks on the resulting diffractogram. The zeolite-A catalytic test on transesterification of coconut oil showed high catalyst performance, characterized by the conversion of fatty acids in coconut oil to methyl esters with 100% conversion percent. The formation of the methyl ester was evident based on the results of the analysis with FTIR and GCMS which showed the characteristics of methyl ester at wavenumbers 1744 cm-1 (C═O), 2922 cm-1 (C─H), 1170 cm-1 (C─O), with the highest percentage in the form of methyl laurate at 31.80%.

keyword : zeolite-A, hydrothermal, transesterification, biodiesel.

Code : CHEM_17

Pyrolitic Conversion of Palm Oil into Using Protonated Zeolite-X Prepared from Rice Husk Silica and Aluminum Foil as Catalyst

T D Febriyanti [1] , W Simanjuntak[2*] , K D Pandiangan[2]

[1] Postgraduate Student of Chemistry Department, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia

corresponding email: wasinton.simanjuntak@fmipa.unila.ac.id*
email: tikadwifebriyanti16@gmail.com[1], kamisah.delilawati@fmipa.unila.ac.id[2]

ABSTRACT

Zeolite-X was successfully synthesized based on silica of rice husk and aluminum foil with the variation of sodium silicate aging time of 24, 48, 72, and 96 hours with a crystallization time of 96 hours as evidenced by XRD analysis with a 2θ angle peak diffractogram pattern similar to the IZA standard. Zeolite-X with sodium silicate aging time of 24 hours is the best zeolite-X with XRF analysis with components Na_2O 0.436%, Al_2O_3 33.933%, and SiO_2 65.631%, and the SEM surface morphology shape crystal is homogeneous cubes. Protonated zeolite-X or zeolite H-X has been successfully synthesized through the ion exchange process of zeolite-X with 2M NH_4NO_3 solution which has been proven by XRF analysis to reduce Na2O from 0.436% to 0.179%. Zeolite-X and zeolite H-X have the same 2θ angle diffractogram pattern. In SEM analysis, the surface morphology of zeolite H-X has a formless surface morphology. Zeolite H-X was applied in pyrolysis experiments using palm oil to produce liquid fuel. Liquid fuel was analyzed by GC-MS with components 77% hydrocarbon, 16% acid, and 7% ketones.

keyword : zeolite-X, zeolite H-X, pyrolysis, liquid fuel.

Code : CHEM_18

Isolation and Identification of Endophytic Fungi Associated with Indonesian *Sesbania grandiflora* Plant

A Nurhidayat[1], N Noviany[2*], A Setiawan[2]

[1] Postgraduate Student, Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia

email: noviany@fmipa.unila.ac.id[2*] (corresponding author), chemhidayat01@gmail.com[1], asetiawan0922@gmail.com[2]

ABSTRACT

In the present study, endophytic fungi associated with Indonesian *Sesbania grandiflora* plant were isolated and identified for the first time. The objective of this study was to report new data regarding the endophytic fungi found in *S. grandiflora* as one of Indonesian medicinal plant. Six isolates of endophytic fungi were isolated from the leaves, bark, seed, flower, and root of *S. grandiflora* collected from Labuhan Ratu, Kedaton, Bandar Lampung, Indonesia. Based on the prediction of their morphological characteristics visually, four isolates from all parts of plant were identified as *Fusarium sp*, while two isolates obtained from the bark and the seed were identified as *Hormiscium sp* and *Penicillium sp*, respectively. In addition, TLC profile result of secondary metabolites extract of endophytic fungi indicated that more than one major compound was observed. Furthermore, the antibacterial screening of isolated endophytic fungi did not show inhibition growth against resistant *E. coli*. However, the phytopharmacological study on the isolated fungi associated with *S. grandiflora* as well as their biological properties are still in progress. The results of this study revealed that *S. grandiflora* plant is reliable source of endophytic fungi for the future investigation

keyword : Endophytic Fungi, *Hormiscium sp., Fusarium sp., Penicillium sp., Sesbania grandiflora.*

Code : CHEM_19

STUDY OF PHENOL TRANSPORT USING POLYMER INCLUSION MEMBRANE (PIM) METHOD WITH COPOLY(EUGENOL-DIVINYL BENZENE) AS CARRIER

S Widiarto[1], Rinawati[2,] Ilim[3], D T E N Sari[4], A A Kiswandono[*5]

[1,2,3,5]Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[4]Undergraduate School of Chemistry, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia

email: sonny.widiarto@fmipa.unila.ac.id[1], rinawati@fmipa.unila.ac.id[2], ilim@fmipa.unila.ac.id[3], dessytiara04@gmail.com[4]; agung.abadi@fmipa.unila.ac.id[5]

ABSTRACT

Phenol is a toxic organic compound, dangerous and hardly degradable which is commonly found as the waters pollutants. The study of phenol transport using the Polymer Inclusion Membrane (PIM) method with copoly(eugenol-DVB) as the carrier compound was carried out to resolve this problems. Some parameters that influence phenol transport have been investigated, including the pH of the source phase phenol, receiver phase NaOH concentration, PIM membrane thickness and transport time. PIM membranes that have been used for transport for 24 hours were characterized using SEM and FT-IR. The concentration of phenol after transport was determined by UV-Vis spectrophotometry using 4-amino antipyrine reagents and the absorbance was measured at wavelength λ = 456 nm. The results showed that PIM membranes with copoly(eugenol-DVB) 10% as carrier compounds were able to transport phenol effectively by 89.40% at optimum conditions: pH of the source phase phenol 5.5, 0.1 M NaOH concentration, T27 type PIM membrane thickness and transport time for 24 hours.

Code : CHEM_20

The effect of initiator concentrations on corrosion inhibition activity of polymeric derivatives of 2-vinylpyridin

Ilim[1*], S Bahri[1], R Marjunus[2], W Simanjuntak[1]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia

Corresponding email: ilim@fmipa.unila.ac.id*
email: ilim@fmipa.unila.ac.id[1], syaiful.bahri@fmipa.unila.ac.id[1], ronius.marjunus@fmipa.unila.ac.id[2], wasinton.simanjuntak@fmipa.unila.ac.id[1],

ABSTRACT

This study aims to investigate the effect of initiator concentrations of polymeric derivatives of 2-vinylpyridine, P(2VP) as corrosion inhibitors of mild steel in CO2-satured brine solution. Polymerization of the monomer was conducted using hydrogen peroxide initiator with four different concentrations of 0.25; 0.33; 0.50; and 0.80 mole, to produce four oligomers referred to as P(2VP)A, P(2VP)B, P(2VP)C, and P(2VP)D, respectively. A series of corrosion experiments was conducted to determine the corrosion rate of the mild steel using weight loss and linear polarization resistance (LPR) methods. The effect of inhibitor concentration, and temperature, on the corrosion rate was also investigated. The oligomers synthesized were found to have different physical appearance. Two oligomers, the P(2VP)A and P(2VP)B, were found as yellow viscous liquids, with O(2VP)B is more viscous than P(2VP)A, while the other two oligomers, P(2VP)C and P(2VP)D exist as yellow solids. The experimental results reveal that the use of monomer led to higher corrosion rate compared to that of blank experiment, but reduced corrosion rate was achieved with the use of the oligomers. P(2VP)A as an oligomer synthesized with the lowest concentration of H2O2 initiator inhibited the corrosion more effective than the higher concentrations. It was also found that the higher the concentration of the oligomer, the better the protection.

For temperature, the opposite is true, indicating that the oligomer was physically adsorbed onto the surface of mild steel.

keyword : : 2-vinylpyridine monomer, oligomer, corrosion inhibitor, mild steel, brine solution.

Code : CHEM_21

Crosslinking effects of borate additives on the structure and properties of sago starch - polyvinyl alcohol blend films

S Widiarto[1], A A Kiswandono[1], S D Yuwono[1], Rinawati[1]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia

email: sonny@fmipa.unila.ac.id[1]

ABSTRACT

The effects of incorporating cross-linking agents into sago starch/poly(vinyl alcohol) (PVA) blend were examined by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), mechanical characterization, dynamic mechanical analysis (DMA), thermogravimetric analysis (TGA), moisture absorption tests, and scanning electron microscopy (SEM). Sodium tetraborate (Borax) was used to cross-link the films at the same weight percent. The films were prepared by gelatinization followed by a solution casting method. SEM microstructures revealed that the destructuring of starch granules was significantly influenced by the presence of cross-linkers during the gelatinization process

keyword : sago starch, poly vinyl alcohol, crosslink, sodium tetraborate, borax

Code : CHEM_22

Identification and activity test of flavonoid compounds from wood branches of the pudau plant (*Artocarpus kemando Miq.*) as antibacterial

T Suhartati [1*], Z Wulandari [1], M Wulandari [1], Yandri[1] , S Hadi [1]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Bandar Lampung, 35145, Indonesia

email: tati.suhartati@fmipa.unila.ac.id*

ABSTRACT

In this research, isolation, identification, and antibacterial bioactivity test of flavonoid compounds have been carried out. These compounds were obtained from the branches of the branches of the pudau plant originating from Karang Anyar village, Penengahan, South Lampung Regency, Lampung Province. Flavonoid compound extraction was carried out by maceration method using methanol, while fractionation and purification using chromatography. The purity of the compounds was determined by the melting point test and thin layer chromatography, the identification of compounds was carried out by UV-Vis and IR spectroscopy. The results of the isolation obtained two compounds, artocarpin (1) and cycloartocarpin (2). Compound (1), 92 mg, in the form of a yellow needle crystal with a melting point of 184.9 -187.5 °C; compound (2), 20 mg, in the form of yellowish white needle crystals with melting point 280 - 283 °C. In the antibacterial bioactivity test against Bacillus subtilis, compounds (1) had very strong antibacterial activity at a concentration of 0.4 mg/disk and against Escherichia coli in the strong category at a concentration of 0.5 mg/disk; whereas compound (2) has antibacterial activity against bacteria *B. subtilis* and *E. coli* in the strong category at a concentration of 0.5 mg/disk.

keyword : *Artocarpus kemando Miq*, flavonoids, artocarpin, cycloartocarpin, B. subtilis, E. coli.

Code : CHEM_23

Production, purification and characterization of the α-amylase from local bacteria isolate Bacillus subtilis ITBCCB148

Yandri [1*], Y Witazora[2], T Suhartati[1], H Satria[1] dan S Hadi[1]

[1] Department of Chemistry, Faculty of Mathematics and Nautral Sciences, Universitas Lampung, Bandar Lampung, Indonesia
[2] Graduate Program in Chemistry, Department of Chemistry, Faculty of Mathematics and Nautral Sciences Universitas Lampung, Bandar Lampung, Indonesia
email: yandri.as@fmipa.unila.ac.id*

ABSTRACT

Production, purification and characterization of the α-amylase from local bacteria isolate *Bacillus subtilis* ITBCCB148 has been successfully carried out. The purified enzyme increased 149.9 times with specific activity of 115,500 U/mg compared to enzyme crude extracts. This enzyme has an optimum pH of 5.5 and an optimum temperature of 60^{o}C and can maintain its stability at a temperature of 60-80^{o}C, thus this enzyme is categorized as a thermostable enzyme.

keyword : α-amylase, *B. subtilis* ITBCCB148, characterization, purification

Code : CHEM_24

Effect of glutaraldehyde addition on the stability of the α-amylase from Bacillus subtilis ITBCCB148

Y Witazora[1], Yandri[2*], T Suhartati[2], H Satria[2] dan S Hadi[2]

[1] Graduate Chemistry Program, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Bandar Lampung, 35145, Indonesia
[2] Chemistry Program, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Bandar Lampung, 35145, Indonesia
email: yandri.as@fmipa.unila.ac.id*

ABSTRACT

α-Amylase is widely used in industry because of its ability to hydrolyze starch to glucose. Limited enzyme activity in extreme pH and temperature makes it necessary to increase enzyme stability. The purpose of this study was to improve the stability of the α-amylase from the bacteria *Bacillus subtilis* ITBCCB148 by chemical modification using glutaraldehyde (GA). The results showed that the specific activity of the α-amylase from the purification of 4,008.733 U/mg increased 5 times compared to the crude extract of the enzyme which had a specific activity of 787.851 U/mg. This native enzyme has an optimum pH of 5.5; optimum temperature of 50oC; KM = 2.08 mg/mL substrate; Vmax = 188.68 µmol mL-1 min-1; ki = 0.0298 min-1; t1/2 = 23.26 min and ΔGi = 99.829 kJ mol-1. Modified enzymes using glutaraldehyde 0.01; 0.03 and 0.05% have an optimum pH of 5.5; optimum temperature of 55oC; KM of 4.74; 5.03 and 3.87 mg/mL substrate,; the Vmax of 285.71; 270.27 and 212.77 µmol mL-1 min-1; ki of 0.0183; 0.0111 and 0.0160 min-1; half-life (t1/2) 37.87; 62.43 and 43.31 min; ΔGi 101.091; 102.365 and 101.407 kJ mol-1, respectively. Chemical modification of the α-amylase from *B. subtilis* ITBCCB148 using glutaraldehyde can increase thermal stability by 1.6-2.7 times which can be seen from a decrease in the value of ki, an increase in half-life and ΔGi.

keyword : α-amilase, *B. subtilis* ITBCCB148, glutaraldehyde, enzyme stability

Code : CHEM_25

Synthesis, characterization, and antioxidant activity of some organotin(IV) 2-nitrobenzoate using the 2,2-diphenyl-1-picryl-hydrazyl (DPPH) method

Nopitasari[1], T Suhartati[2], Suharso[2], D Herasari[2], K D Pandiangan[2], S Hadi[2,*]

[1] Graduate Chemistry Program, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Bandar Lampung, 35145, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Bandar Lampung, 35145, Indonesia

email: nopitasarikimia2011@gmail.com[1], sutopo.hadi@fmipa.unila.ac.id[2,*], tati.suhartati@fmipa.unila.ac.id[2]

ABSTRACT

Synthesis, characterization, and antioxidant activity of diphenyltin(IV) di-2-nitrobenzoate, dibutyltin(IV) di-2-nitrobenzoate, and triphenyltin(IV) 2-nitro benzoate using the 2,2-diphenyl-1-picryl-hydrazyl (DPPH) method has been successfully carried out. All compounds were well characterized by some spectroscopy techniques of UV, IR, NMR and based on physical technique by microelemental analysis. The synthesized compound that showed very active antioxidant activity, namely diphenyltin(IV) di-2-nitrobenzoate with an IC_{50} of 8.6 µg/mL while the compound dibutyltin(IV) di-2-nitrobenzoate and triphenyltin(IV) di-2-nitrobenzoate showed active antioxidant activity with IC_{50} of 12.29 µg/mL and 27.28 µg/mL.

keyword : synthesis, characterization, organotin(IV) 2-nitrobenzoate, DPPH method.

Code : CHEM_26

Synthesis, characterization and the antifungal activity test of some organotin(IV) benzoates

S Hadi[1*], B Irawan[2], Yandri[1], T Suhartati[1]

[1] Department of Chemistry, Faculty of Mathematics and Nautral Sciences, Universitas Lampung, Bandar Lampung, Indonesia
[2] Department of Biology, Faculty of Mathematics and Nautral Sciences Universitas Lampung, Bandar Lampung, Indonesia
email: sutopo.hadi@fmipa.unila.ac.id[*]

ABSTRACT

In continuing search on the biological activity of the organotin compounds we are working with, we here reported the synthesis and the antifungal activity test of three organotin(IV) complexes of dibutyltin(IV) dibenzoate **(3),** diphenyltin(IV) dibenzoate **(6**) and triphenyltin(IV) benzoate **(9)**. These three compounds were prepared by the reaction of dibutyltin(IV) dichloride **(1)**, diphenyltin(IV) dichloride **(4)**, and triphenyltin(IV) chloride **(7)** via dibutyltin(IV) oxyde **(2)**, diphenyltin(IV) oxyde **(5)**, and triphenyltin(IV) hydroxide **(8)** with benzoic acid. The product obtained in each step was characterized by UV, IR and NMR spectroscopies and also microelemental analysis. The antifungal activity test was carried out against Fusarium oxysporum strain. The results showed that the inhibition zone shown by these organotin(IV) benzoate were found by far much more active compared to the free benzoic acid, the starting materials 1, 4, 7, and the intermediate products, 2, 5 and 8. The inhibition zone of each of the compounds tested was compared with the control where the fungus alone was grown in the media. The results showed that triphenyltin(IV) benzoate (9) was the most active compound against the fungus and the minimum inhibitory concentration obtained was about 0.7 mM.

keyword : antifungal, organotin(IV) benzoate, minimum inhibitory concentration, synthesis

Code : CHEM_27

The use of MgO/SiO2 as catalyst for transesterification of rubber seed oil with different alcohols

K D Pandiangan[1*], W Simanjuntak[1], N Jamarun[2], S Arief[2]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Andalas University, Kampus Limau Manis, Pauh, Padang, Indonesia
email: kamisah.delilawati@fmipa.unila.ac.id[*], wasinton.simanjuntak@fmipa.unila.ac.id[1], novesar62@yahoo.com[2], syukriarief@gmail.com[2]

ABSTRACT

In principle, biodiesel production relies on the transesterification reaction of fatty acids contained in vegetable oil or waste rich in fatty acids with short-chain alcohols with the help of a catalyst. The purpose of this study was to obtain information about the most suitable alcohol for the transesterification of rubber seed oil into biodiesel. In this study, the transesterification of rubber seed oil was carried out with three different types of short-chain alcohols, namely methanol, ethanol, and 2-propanol. Each alcohol was used with a ratio of 3:1 to oil and transesterification was carried out in the presence of MgO/SiO2 catalyst with an amount of 10% (by weight of catalyst/volume oil) at 70 °C for 6 h. Transesterification products were analysed using Gas chromatography-mass spectrometry (GC-MS) analysis to confirm the conversion of fatty acids in the oil into esters. The results showed that the reactivity of alcohols is in the order of methanol > ethanol > 2-propanol with the percentages of conversion of oil to esters are 90, 73, and 63%, respectively. These results indicate that methanol is the most suitable alcohol for transesterification of rubber seed oil.

keyword : MgO/SiO2 catalyst, transesterification, rubber seed oil, biodiesel, alcohols

Code : CHEM_28

Isolation and Identification of Terpenoid Compound from Vetiver Grass-Root (*Vetiveria zizanioides Stapf*) as a Repellent against Termite (*Cyrptotermes sp.*) through Bioactivity Assay

S Bahri[1,*], T T Raharjo[1], Y Ambarwati[1], Nurhasanah[1]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: syaiful.bahri@fmipa.unila.ac.id[*]

ABSTRACT

Termites are one of the most problematic pests when they damage structural timber and other materials in structures. Currently, in controlling termite, chemical measures are most widely used to reduce the infestation of termites. However, several termiticides are containing toxic ingredients such as Copper Naphthenate, Copper Azole, Chromate Copper Arsenate (CCA), and Disodium Octoborate Tetrahydrate (DOT), as well as other active ingredients that have registered under the various brand names around the world. In this study, the terpenoid compounds from vetiver grass-root (*Vetiveria zizanioides* Stapf) have extracted using n-hexane solvent by the soxhletation method. Separation and purification of fraction $B_{1.3}$, which is an isolation compound, have produced in the form of colorless oil approximately 0.0225 g by vacuum liquid chromatography (VLC). Of the thin-layer chromatography (TLC) assay using eluents of n-Hexane eluent 100%, n-Hexane : DCM 95%, and n-Hexane : Acetone 70%, a red-purple spot, and R_f values which are 0.27, 0.59, and 0.91 has acquired, respectively. To bioactivity assay as a repellent, it has carried out on acetone solvent, crude extract, and the isolation of the compound. Fourier Transform Infrared (FTIR) and Gas Chromatography-Mass Spectrometry (GC-MS) are used to analyze and identify the structure of the isolation compound. The spectrum examination gives an absorption band of N-H stretching vibrations (primer amine) at 3415.30 cm^{-1} and 3477.16 cm^{-1} regions that are supported by N-H bending at 1618.56 cm^{-1} regions. In other areas, it shows the absorption of C-H stretching vibration (short-chain alkanes) at 2924.85 cm^{-1} that are

supported by uptake at 1386.14 cm^{-1} and 1457.43 cm^{-1}, which is C-H absorption of methyl and methylene. Meanwhile, on the mass spectrum, it was obtained a molecular ion peak at $M^+ = 57.2$ (100%) as a base peak and the molecular weight of 87.1 g/mol. All these analyses indicated that the molecular formula is $C_5H_{13}N$, suggesting it is a precursor terpenoid because of C<10 as a single form isoprene unit. Therefore, based on investigated that the proposed structure for fraction $B_{1.3}$ is a 2-methyl butane-1-amine with the elucidation information. The bioactivity assay of the vetiver grass-root isolation compound was active as a repellent against termite (*Cryptotermes sp.*). These conclusions designate through parameters of % attractive and attractiveness index (AI), which is an average value of 0.025% and (-0.039), respectively. A negative value of AI indicates the compound effective as a repellent.

keyword : : Isolation, Terpenoid, Vetiver grass-root (*Vetiveria zizanioides* Stapf), Repellent, Termites (*Cyrptotermes sp.*).

Code : CHEM_29

Docking Interaction of Chromium(III) Picolinate and Chromate Ion Compounds with Protein Tyrosine Phosphatase as Insulin Receptors

Y Ambarwati[1], M A Martoprawiro[2], I Mulyani[2], Ismunandar[2], D Onggo[2]

[1]Inorganic Chemistry Division, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jalan Sumantri Brojonegoro No 01, Lampung 35141, Indonesia
[2]Inorganic and Physical Chemistry Division, Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Jalan Ganesha 10, Bandung 40132, Indonesia

email: yuli.ambarwati@fmipa.unila.ac.id*

ABSTRACT

The Chromium(III) compounds have been shown to reduce glucose levels in type 2 diabetics, however, the role of chromium(III) in glucose metabolism cannot be clearly explained. Based on in vitro studies, there are two opinions regarding the mechanism of the role of chromium(III), the first opinion states that the chromium(III) that enters the body directly interacts with protein tyrosine phosphatase. Second opinion, chromium(III) which enters the body undergoes oxidation to become chromium(VI), and chromium(VI) interacts with protein tyrosine phosphatase. To determine the mechanism that occurs, modeling using chromium(III) picolinate as a chromium(III) complex and chromate ion as chromium(VI) interacts with protein tyrosine phosphatase. The structure optimization of chromium(III) picolinate compounds and chromate ions was carried out using the Hartree-Fock computation method based on the 6-31G (d) set. The interaction study was studied using the Autodock Vina and ONIOM docing methods. The interaction results of chromium(III) picolinate docking interact with Leu(13), Ile(16), Ser(47), Trp(49), Asn(50), and Tyr(131) with interaction energy of -7.00 kcal.mol-1. Chromate ion interacts with amino acids Leu(13), Gly(14), Ile(16), Cys(17) and Arg(18) with an interaction energy of -4.10 kcal.mol-1. The result of interaction energy of chromium(III) picolinate is lower than that of chromate ion, which indicates that the interaction of

chromium(III) picolinate with protein tyrosine phosphatase is better than that of chromate ion.

keyword : chromium(III) picolinate, chromate ion, docking, protein tyrosine phosphatase.

Code : CHEM_30

Biodegradation of Agricultural Residues Containing High Cellulose by Local Isolate Fungi

Mulyono[1,*], Helda[2], Prasetyaning T. C. [1], Herasari D.[1]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Graduate School of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia

email: mulyono@fmipa.unila.ac.id[*]

ABSTRACT

Agricultural residues such as rice straw, onggok, corncobs, and pineapple pulp, which high cellulose contains, potentially to be used as animal feed. Biodegradation of cellulose on those natural sources was expected to improve the digestibility for animal feed. Local isolated microbes were selected based on Congo Red staining method on CMC Agar and cellulase activity measurement on CMC and rice straw as substrates. Three out 23 fungal isolates showed cellulase activity on both solid and liquid medium, named as E-2-1, S-5-19 and S-5-24 had cellulolytic index on CMC and rice straw solid medium for 7.3 and 2.4, 8.3 and 2.9, and 7.6 and 2.7, respectively. The cellulase activity of the isolates were 2.6 U/mL, 1.6 U/mL, 0.9 U/mL respectively. The consortia of the isolates were able to degrade 40.2% of rice straw in liquid culture within 6 days. Further investigation on biodegradation ability on rice straw, onggok, corncobs, and pineapple pulp, both as a single isolate and a consortia was conducted. Biodegradation of rice straw, onggok, corncobs, and pineapple pulp by isolate E-2-1 as the best single isolate within 6 days were 35.0%, 24.1%, 25.0%, and 26.6%, respectively. Biodegradation by the consortia of three isolates were 40.1%, 42.2%, 41.5%, and 43.9%, respectively. Thus the degradation of those agricultural waste cellulose by a consortium of three isolates is better than a single isolate.

keyword : biodegradation, fungi, cellulase, agricultural residues, animal feed

Code : CHEM_31

Utilization of zeolite H-MOR based on bagasse ash silica as a catalyst for the hydrolysis reaction of cassava peel cellulose for glucose production

M Rilyanti[1*], U N Faidah[1,2], S Suharso[1], K D Pandiangan[1], Ilim[1]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Graduate Student of Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email corresponding: mita.rilyanti@fmipa.unila.ac.id.[*]
email : ulfiatun.nurul@gmail.com, suharso@fmipa.unila.ac.id[1,2], kamisah.delilawati@fmipa.unila.ac.id[1], ilim@fmipa.unila.ac.id[1]

ABSTRACT

Bagasse and cassava peel are waste that can be increased economic value. In this study, we have successfully synthesized zeolite H-MOR from sugarcane bagasse ash (SCBA) silica using the Steam-Assisted Crystallization (SAC) method at 170˚C for 120 hours and determined its catalytic activity on the hydrolysis of cassava peel starch to produce glucose. H-MOR synthesized using LUDOX (commercial silica) was used as a comparison. The results showed that the MOR zeolite synthesized using SCBA and LUDOX silica had a crystallinity of 92.12% and 81.17%, respectively. The cellulose content in cassava peel flour is 57.8%. Optimization of the catalytic test variable showed that the hydrolysis of cellulose occurred at 140˚C for 4 hours with a 1: 1 ratio of catalyst and substrate. The glucose concentrations obtained from cellulose hydrolysis using zeolite H-MOR catalyst from SCBA and LUDOX were 398.5 ppm and 237.45 ppm with conversion degrees of 60.4% and 61.2%, respectively

keyword : H-MOR, sugarcane bagasse ash, hierarchically porosity, steam-assisted crystallization, cellulose and glucose

Code : CHEM_32

The effect of Vanadium dopant on Bandgap Energy of $Ni_{1-x}V_xFe_2O_4$ nanospinel

R Situmeang[1*], A A Saputra[1], Y Andayani[1], M I Imanudin[1], S Sembiring[3]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
[2] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brodjonegoro no 1, Bandar Lampung 35145, Indonesia
email: rudy.tahan@fmipa.unila.ac.id[*]

ABSTRACT

V^{n+} doped $NiFe_2O_4$, $Ni_{1-x}V_xFe_2O_4$ (where x = 0.1, 0.3, and 0.5) nanomaterials were synthesized by sol-gel and freeze drying method simultaneously using nitrates of iron, and nickel, and ammonium vanadate as the starting materials. Powder X-ray Difraction (XRD) showed that all composition was found to have cubic spinel, hexagonal and monoclinic structure. The average crystallite size using scherrer calculation was found to be in the range of 20 - 42 nm. The band gap energy (Eg) of undoped $NiFe_2O_4$ was estimated to be 1.9 eV from UV-Vis diffuse reflectance spectroscopy (DRS). With the increase of V^{n+} dopant, the Eg value both decreased and increased from 1.6 eV to 2.0 eV, due to the difference of particle size of the samples.

keyword : spinel, nanomaterial, dopant, bandgap energy

Code : CHEM_33

Virtual Screening of Active Ligands from Natural Compounds as Anti-Asthma Candidates using PAF-r Protocol and Rupatidine as Lead Compound

G Nugraha[1], H Afriyani[2*]

[1] Department of Pharmacy, STIKES 'Aisyiyah Palembang, South Sumatra, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung, Lampung, Indonesia
email: ge6nugraha@gmail.com[1], hapin.afriyani@fmipa.unila.ac.id [2*] *(corresponding author)*

ABSTRACT

Structural-based virtual screening of natural compounds had been conducted using the Platelet-activating factor receptor (PAF-r) protocol, the receptor that significantly plays a role in asthma. This study aims to determine natural compounds with specific bioactivity as candidates for antiasthma drugs. The construction of the protocol used the PAF-r crystal structure obtained from the Protein Data Bank (PDB ID: 5ZKP) and the lead-compound in the form of an antagonistic ligand using a rupatadine compound. Internal validation of the protocol by re-docking the ligand a thousand times resulted in an RMSD value of 0.508 Å. Retrospective validation of the protocol yielded an F-measure value of 0.77, precision, and accuracy of 0.83 and 0.75, respectively. The results showed that from the one hundred and ten thousand compounds scanned, 12 compounds were identified as potential bioactive against PAF-r. Structure with ZINC ID: ZINC000002092355 is recommended as the best compound based on its bond stability.

keyword : anti-asthma, virtual screening, natural compounds, PAF-r, rupatidine

Code : CHEM_34-Ps

The Potency of Cinnamon as An Anti-Diabetic and Anti-Covid19 based on Its Mineral Content and Phenolic Compounds

N R P Hapsari[1a], C Wijayanti[1b], Subandi[1c*], Suharti[2a], R R Mariana[2b]

[1,2a] Chemistry Department of Mathematics and Science Faculty, State University of Malang, Jl. Semarang no 5, Malang, East Java, Indonesia
[2b] Culinary Arts Department of Engineering, State University of Malang, Jl. Semarang no 5, Malang, East Java, Indonesia

email: kynadia14@gmail.com[1a], chandrawijayanti@gmail.com[1b], subandi.fmipa@um.ac.id[1c], suharti.fmipa@um.ac.id[2a], rina.riefqie.ft@um.ac.id[2b]
*Corresponding author

ABSTRACT

The purpose of this study are to determine the mineral content (Cr, K and Ca) as well as total phenolic (TPC) and total flavonoids (TFC) in cinnamon, then to know the potency of some phenolic compounds in cinnamon as alpha amylase inhibitors and its binding activity to S protein of covid19. The mineral content was determined by the ICP method, while the TPC and TFC levels were determined spectrophotometrically. In silico analysis was carried out by docking techniques using human salivary alpha amylase and S covid19 protein as receptors and several polyphenol compounds in cinnamon as ligands. The results have shown that the levels of Cr, K, Ca, TPC and TFC of cinnamon, were 0.524 ppm, 4033ppm, 17453 ppm, 1.55% and 4.26%, respectively. The results of in silico analysis has shown that kaempferol 3-O-glucoside and quercetin in cinnamon are able to bind to human saliva α-Amylase on its active with a binding affinity that are relatively the same as acarbose has. The docking analysis also proved that kaempferol, quercetin and rutin of cinnamon were able to bind to the Receptor Binding Domain (RBD) of S protein of covid19, so that these compounds also have the potency to be anticovid19.

keyword : cinnamon, anti-diabetes, anticovid-19, phenolic compounds, mineral content

Code : CHEM_35

Dynamics of Lid lipMNK on Lys229Gln Mutation by Molecular Dynamics Simulation Approach

D Herasari[1], R Hertadi[2] , F M Warganegara[2] and Akhmaloka[2,3]

[1] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jl. S. Brojonegoro No. 1, Bandar Lampung, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Jl. Ganesha Nol 10, Bandung Indonesia, Indonesia
[3] Department of Chemistry, Faculty of Science and Computer, University Pertamina, Jakarta, Indonesia

email: dian.herasari@fmipa.unila.ac.id[1], rukman@chem.itb.ac.id[2], fida@chem.itb.ac.id[2], loka@chem.itb.ac.id[2,3]

ABSTRACT

A double lid Manuk lipase (lipMNK) is a local lipase isolated from Manuk crater, Jawa Barat, Indonesia. The catalytic activity of lipMNK is determined by the change in the conformation of lipMNK from a closed lid (c-lipMNK) to an open lid (o-lipMNK). The identification of salt-bridge interactions that stabilize the dynamic changes from c-lipMNK to o-lipMNK has shown several ionic interactions involving lid residues as the responsible interaction. One of them is Asp178 - Lys229, which is an interlid salt-bridge. To obtain more information about the role of the interaction and or the residue, in-silico mutation was carried out. Lys185Gln mutations were performed on the primary structure of c-lipMNK using Pymol. In the mutant structure obtained, then the solvation process is carried out at 20% acetonitrile conditions, parameterization, and molecular dynamics simulations. MD was carried out with an NPT ensemble at 358 K for 40 nanoseconds in 20% acetonitrile. The results showed that Lys229Gln mutation accelerated lid opening movements. Simulations for 40ns in wild type only opened the lid c-lipMNK as far as 3.64 Å and 6.90 Å (for lid A and lid B, respectively), while in the mutant the lid movement distances were 13.82 Å and 18.58 Å (for lid A and lid B, respectively). However, this mutation also shows unfolding in another segment beyond the lid. The existence of this unfolding, for example, can be seen in the change in the distance between the residues of His223 and Glu202, which was originally 14.41 Å further away to 24.47 Å. This suggests that the Asp178 - Lys229 salt

bridge has an important role in maintaining the overall stability of the c-lipMNK structure.

keyword : lipMNK, in-silico mutation, molecular dynamics

Code : CHEM_36_Ps

Preparation of Watermelon Mesocarp Powder (*Citrullus lanatus Thunb.)* with Freeze Drying Method and Test its Potensial as Anti Obesity and Anti COVID-19.

D A Mulyasari, H C Sari, S R Lestari S R, R R Mariana, Subandi.

Department of Chemistry, State University of Malang; Department of Chemistry, State University of Malang;
Department of Biology, Faculty of Mathematics and Natural Sciences, State University of Malang;
Department of Culinary Arts, Faculty of Engineering, State University of Malang;
Department of Chemistry, State University of Malang.

ABSTRACT

The purpose of this study is to obtain powder from watermelon mesocarp by freeze-drying, brew it with hot water, then determine its phytochemical content, including total phenol (TPC) and flavonoids content (TFC), determine its in vitro activity as an inhibitor of pancreatic lipase and determine the binding activity of the active compound with the enzyme alpha-amylase and protein S COVID-19. In vitro inhibitory activity has been done using the titrimetric method, while in silico analysis was used with human salivary alpha-amylase and S COVID-19 protein as receptors and compounds in watermelon as ligands. The results have shown that the yield of the powder from watermelon mesocarp is 4.83%. The water extract (0.836 g 150 mL) of watermelon mesocarp powder contains alkaloids, polyphenols, flavonoids, and saponins with TPC and TFC levels of 0.13% and 1.85%, respectively. The extract had a stronger inhibitory power than orlistat, at the same mass, and the in silico analysis also showed that the luteolin which contained in watermelon has the potency as an alpha-amylase inhibitor, while the catechin, apigenin, and routine, which are also present in watermelon, have the potency to inhibit the infection of the COVID-19 virus into host cells.

Code : CHEM_37

Simultaneous Bioconversion of Rice Straw into Intermediate Product using Ionic Liquid and Native Extracellular Hydrolytic Enzyme from Indigenous Actinomycetes

H Satria[1*], Yandri[1], Nurhasanah[1], D Herasari[1], A Laila[1], S D Yuwono[1]

[1] Department of Chemistry Faculty of Mathematics and Natural Sciences University of Lampung, Jl. Soemantri Brojonegoro No.1 Bandar Lampung 35145, Indonesia

email: heri.satria@ fmipa.unila.ac.id[*]

ABSTRACT

Bioethanol production technology using lignocellulosic substrates has become a focus to overcome the limited supply of fossil fuels in the current century. Simultaneous saccharification require to understand of suitable efficient procedures in bioconversion row material into fermented sugar. In this study, effect of pretreated rice straws using ionic liquid on enzymatic saccharification by isolated actinomycetes were investigated. Ionic liquid to rice straw in ratio (IL/RS) were set up 0 to 3 (g/g), and remaining of the ionic liquids in pretreated biomass was examined for its effect on the hydrolytic enzyme activity of the actinomycetes. Three of actinomycetes were isolated from decomposed rice straw and were purified and screened for their cellulolytic and xylanolytic activity; one strain, namely Act-4rs, was selected as an optimum isolate for the further hydrolysis examination. Both of cellulase and xylanase activity exhibit a peak at a ratio IL/RS of 1 (g/g), the activity was 58.43 and 66.16 U/ml respectively. The highest yield of sugar also achieved at this IL/RS ratio for 8 days incubation. The pretreatment indicate that it could promote an increase in the yield sugar up to 1.9 times. This study was promising to develop a one-pot conversion of lignocellulosic biomass into bioethanol using the biological process.

keyword : hydrolisis, cellulase, xylanase, actinomycetes, ionic liquid, rice straw.

Code : CHEM_PRES_01

Synthesis of TiO2 nanowires with molten-salt method and effect of metal addition on its characteristics and application for reduction of 4-nitrophenol

D Shinta; A A Dwiatmoko; J-M Ha; R TYunarti

Department of Chemistry, Faculty of Mathematics and Natural Sciences (FMIPA), University of Indonesia, 16424 Depok, West Java, Indonesia;
Research Center for Chemistry, Indonesian Institute of Sciences (LIPI, Lembaga Ilmu Pengetahuan Indonesia), Kawasan Puspitek, Serpong, Tangerang Selatan 15314, Indonesia;
Clean Energy Research Center, Korea Intitute of Science and Technology, Seoul 02792, Republic of Korea
email : dewiishintaa@gmail.com*

ABSTRACT

The study of catalysis using nanoparticles is one of the things that widely studied in the field of modern nanoscience. The application of TiO_2 in the field of catalysis has been developed through the formation of TiO_2 nanoparticles. The synthesis of one-dimensional material to produce sufficient yields is still being developed. The molten-salt method was used to synthesize large quantities of single-crystalline TiO_2 nanowires and controlled dimensions. In this study, the synthesis of TiO_2 nanowires was carried out using the molten-salt method and its modification with the addition of transition metals so that changes in characteristics occurred. Anatase TiO_2 in the form of powder, NaCl, and Na_2HPO_4 mixed and then calcined using furnace at 825 °C for 8 hours and cooled slowly to reach room temperature. Metal addition was added to see the effect on the ability of catalysis. Synthesis was done in the same way as adding metal during mixing with mortar. The synthesized TiO_2 nanowires and M-O/TiO_2 nanowires were characterized using XRD, SEM, TEM, and UV-Vis DRS. The addition of transition metals does not affect the structure and morphology of TiO_2 nanowires, but there are changes in the size of the crystal and the value of the band gap. The prepared catalyst was used in the 4-nitrophenol reduction reaction in the presence of $NaBH_4$. The presence of a catalyst in the reaction accelerates the process of reducing 4-nitrophenol to 4-aminophenol which is characterized by a change in colour. A significant decrease in reaction speed was shown in the use of Ag_2O/TiO_2 nanowires

catalysts with a reaction time of 18 seconds for catalyst use of 0.1 gram. Reusability tests were also carried out on Ag_2O/TiO_2 nanowires catalysts.

Code : CHEM_PRES_02

Development of an LC-MS/MS method for simultaneous determination of aflatoxins in nutmeg

D P Ramadhaningtyas[1,*], Y Aristiawan[1], Dyah Styarini[1]

[1]Indonesian Institute of Sciences; National Standardization Agency of Indonesia
email : dillaniputri@gmail.com[*]

ABSTRACT

Aflatoxins (AFs) are known to be a severe threat to human health because they are classified as the carcinogenic compounds. The quantitative analysis of aflatoxins in foods required a sensitive and selective method due to its low concentration (ppb level). In this study, an LC-MS/MS method for the simultaneous determination of aflatoxin B1, B2, G1, and G2 in nutmeg was developed. The samples were extracted using 75% methanol and followed by immunoaffinity column clean-up before analyzed. The reverse-phase chromatographic separation was performed in the C18 column by applying a gradient elution of 10 mM ammonium formate (containing 0.1% of formic acid) and methanol for a total run time of 10 min. The results showed excellent linearity with coefficient determination at 0.998 – 0.999 for all AFs in the range concentration from 1 to 20 ng/g. The LOD and LOQ were found to be 0.2 and 0.5 respectively for all compounds, while the recoveries were in the range of 60-108%. The intraday precisions for all AFs were found to be lower than 7%. The method then successfully applied to the local nutmeg samples, and the results showed that some local nutmeg samples had contained AF B1 that exceeded the permitted limit.

Code : CHEM_PRES_03

The effect of temperature during casting prccess for Polyvynilidone Fluoride membrane and its derivative

R A Lusiana[1,*], A Indra[1], N Basid A P[1], N Wijayanti[2]

[1]Department of Chemistry, Universitas Diponegoro, Semarang
[2]Department of Chemistry,Universitas Negeri Semarang, Semarang
email : retno.lusiana@live.undip.ac.id[*]

ABSTRACT

This work studies the effect of coagulation temperature on the process of making PVDF membranes on physicochemical character and permeation ability of creatinine and urea. The membrane is made through an inversion precipitation system in solvent N, N-dimethyl acetaminda (DMAc) and non-water solvents. The membrane solidification process is carried out on three variations of the temperature of the coagulation bath temperature (CBT), namely: 30, 45, 60 ℃. Seven membrane types namely: PVDF, PVDF / PEG and PVDF / PEG sulfonated (SPVDF / PEG) in 3 variations of CBT: 30, 45, and 60 ℃ are characterized including: FT-IR, TGA / DSC, porosity, hydrophilicity, water uptake, swelling degree, tensile strength, and permeability ability to creatinine and urea. Based on changes in FTIR spectra shows that the PVDF modification reaction has been successfully carried out. The porosity, hydrophilicity, water uptake, and swelling degree values increase with the modification of functional groups. Permeation ability increases with the addition of PEG, sulfonation and CBT temperature rise. Creatinine clearance values increased from 0.29-0.58 mg / dL. Urea clearance values increase from 6.38 - 20.63 mg / dL.

Code : CHEM_PRES_04

Simultaneous Analysis of Benzoic Acid, Methylparaben, and Butylparaben in Soy Sauce by Liquid Chromatography: Method Validation and Uncertainty Evaluation

Y Aristiawan[1,*], D P Ramadhaningtyas[1]; D Styarini[1]

[1]Badan Standardisasi Nasional; Lembaga Ilmu Pengetahuan Indonesia; Badan Standardisasi Nasional
email : yosi@bsn.go.id[*]

ABSTRACT

Food preservation by using chemicals is the common way advantaged to maintain the natural properties of food and to lengthen the shelf life of food. Although preservatives are useful to keep the food fresh by stopping the bacterial growth, the presence in food of some preservatives are becoming dangerous to human if fortified excessively or more than the prescribed amount. Considering this condition, the analytical method to quantify the preservatives in food is undoubtedly needed, focused in condiment, one of the main components in Asian cuisine. This work is aimed to establish simultaneous analysis of benzoic acid, methylparaben, and butylparaben by using liquid chromatography with diode array detector (LC-DAD) method. Liquid extraction was employed in this analytical procedure and solid phase extraction with C18 was performed prior to LC-DAD analysis. The three compounds were successfully separated in gradient elution of a 10 mM format buffer and acetonitrile containing formic acid. Repeatability, linearity, sensitivity, recovery and measurement uncertainty were tested to evaluate the method characteristics. The offered method allowed the accurate determination of benzoic acid, methylparaben, and butylparaben in soy sauce and can be applied as a routine method at low ppm level with a relative expanded uncertainty of around 3-6%.

Code : CHEM_PRES_05

Cloning, Heterologous Expression and Purification of Serine Hydroxymethyltransferase from thermophilic bacteria Pseudoxantomonas taiwanensis AL89

I F Ma'ruf[1], E Restiawaty[2], Akhmaloka[1,3*]

[(1)]Biochemistry Research Group, Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Indonesia;
[(2)]Chemical Engineering Process Design and Development Research Group, Faculty of Industrial technology, Institut Teknologi Bandung, Indonesia;
[(3)]Department of Chemistry, Faculty of Science and Computer, Universitas Pertamina, Indonesia
email : ilma.fauziah.m@gmail.com;erestiawaty@che.itb.a,*loka@chem.itb.ac.id

ABSTRACT

Thermostable enzyme exhibits many advantages for industrial applications. Serine Hydroxymethyltransferase (SHMT, EC 2.1.2.1) catalyzes the reversible condensations between various aldehydes and glycine into particular β-hydroxy amino acids. A shmt gene from thermophilic bacteria Pseudoxantomonas taiwanensis AL89 has been cloned into pET-30a(+) and heterologously expressed using *Eschericia coli Rosetta (DE3)*. Soluble crude extract was achieved by lysozyme-heating method. The recombinant enzyme was modified to has His-tag on C-terminus and successfully purified using Ni-NTA affinity chromatography. Native-PAGE and zymography revealed that the enzyme has activity on cleavage of DL-3-phenylserine when incubated at 60˚C for 20 minutes.

keyword : Serine hydroxymethyltransferase, β-hydroxy amino acids, Heterologous expression, Enzyme purification.

Code : CHEM_PRES_06

SYNTHESIS OF Cr(ASPARTATE)3 AND Cu(ASPARTATE)2 COMPLEXES AS ANTIDIABETIC COMPOUNDS

Y Ambarwati[1], D S Firguna[1], S Bahri[1], S Hadi[1], A Laila[1]

[1]Chemistry Department, Faculty of Mathematics and Natural Sciences
Lampung University
Email:yuli.ambarwati@fmipa.unila.ac.id*

ABSTRACT

The synthesis of $Cr(Asp)_3$ and $Cu(Asp)_2$ complexes has been successfully carried out, by reacting $CrCl_3.6H_2O$ and $CuCl_2.2H_2O$ metals with aspartic acid. This study aims to synthesize $Cr(Asp)_3$ and $Cu(Asp)_2$ and to test the antidiabetic. The results of the synthesis of $Cr(aspartate)_3$ in the form of light purple solid as much as 0.3001 grams with a yield of 95.14% and $Cu(Asp)_2$ produced blue solids of 0.3095 grams with a yield of 95.02%. The antidiabetic test used 27 male mice (Mus musculus) with 9 treatments for 21 days and the data obtained were analyzed statistically using ANOVA (Analysis of Variance) and the antidiabetic activity was expressed in %GL (glucose lowering). The antidiabetic test showed a decrease in blood glucose levels in mice after alloxan induction, with %GL values of 74.1874% for $Cr(Asp)_3$ compounds and 76.1337% for $Cu(Asp)_2$ compounds. This study proves that the $Cr(Asp)_3$ and $Cu(Asp)_2$ complex compounds can be used as antidiabetic in mice.

Code : CHEM_PRES_07

SYNTHESIS AND CHARACTERIZATION OF MAGNETIC MOLECULARLY IMPRINTED POLYMERS FOR PRACONCENTRATION OF BISPHENOL A

Andreas, M. B Amran, L Z Udin

Research Center for Chemistry,Analytical Chemistry, Faculty of Mathematics and Natural Sciences ITB,
Research Center for Chemistry LIPI

ABSTRACT

Migration of bisphenol A (BPA) from plastic bottles may occur due to several environmental factors. The BPA found in drinking water and other beverages may harm to human health and can cause androgen receptor disorders and thyroid gland receptors, one of the causes of prostate cancer, and induce the occurrence of breast cancer. The BPA in beverage bottle is might presence at trace level and it would be difficult to be detected. In this study, synthesis of magnetic molecularly imprinted polymers (MMIPs) for preconcetration of Bisphenol A (BPA) is evaluated. The MMIPs was made by mixing 2-vinylpyridine (2-VP) as monomer, ethylen glycol dimethacrylate (EGDMA) as cross-link, and Fe3O4 as the magnetite core. The prepared MMIPs were evaluated by comparing with non-imprited polymers (NIP) of their capacity to adsorb of BPA using batch system and dynamic method. The results shows that the optimum condition for BPA adsorption was found pH analyte solution at 9.0, contact time for 60 minutes and the methanol was found to be the best solvent for desorption process. The maximum adsorption capacity (qm) experiment and modeling were 102.75 and 107.52 mg/g, respectively. Under the experimental condition of this study, the adsorption of BPA in aqueous solution was found to follow Langmuir adsorption isotherm model

Code : CHEM_PRES_08

Preparation of Magnetic Activated Carbon from Cassava Peel for Removal of Tetracycline Antibiotic in Aquatic Environment

Rinawati[1,*], R. Supriyanto[1], Y O Kasih[1]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciencs, University of Lampung
email:rinawati.1971@fmipa.unila.ac.id[*]

ABSTRACT

The widespread use of antibiotics has become a serious problem because of their adverse effects on the environment and humans health. Adsorption technique using low-cost adsorbent from agricultural waste could be a promising technique for removal of antibiotics from an aquatic environment. This study prepared magnetic active carbon from cassava peel for removal of tetracycline antibiotics. The $FeCl_3 \cdot 6H_2O$ and $FeSO_4 \cdot 7H_2O$ are used as magnetic sources to obtain magnetic properties that are separated with a simple magnetic field. Physical characterization of the activated carbon obtained was performed by Scanning Electron Microscope (SEM) and X-ray diffraction (XRD). The effects of dose adsorbent, pH, and contact time on adsorption of tetracycline have been investigated. Characterization using SEM showed the difference between active carbon and magnetic active carbon. Morphology of activated carbon showed large pores, while magnetic active carbon revealed iron oxide particles that cover and surround on the pores of the activated carbon. The result from XRD characterization showed a similarity of diffraction peak of iron oxide and magnetic activated carbon with a specific peak. The results of adsorption optimization were observed at adsorbate concentration of 1 mg/L, 20 mg adsorbent mass with pH 6 conditions, and contact time for 10 minutes. The study shows that magnetic activated carbon from cassava peel has a future perspective of low-cost adsorbents which effectively removes antibiotics from an aquatic environment.

Code : CHEM_PRES_09

Fractination of Fucoxantin from *Cyclotella striata* using Medium Performance Liquid Chromatography (MPLC)

N L G R Juliasih[1,*], A D Sagita[1], Z Nurachman[2], A Setiawan[1]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung
[2]Department of Chemistry, Bandung Insitute of Technology
email:niluhratna.juliasih@fmipa.unila.ac.id[*]

ABSTRACT

Fucoxanthin has a high value because of its potential as an antioxidant compound that plays an important role in counteracting free radicals, which shown to have anti-inflammatory, anti-tumor, and anti-obesity in humans. Fucoxanthin can be obtained from brown algae and diatoms, one of the sources is *C. striata*. Cultivation of *C. striata* was carried out on agricultural fertilizer media, then harvesting was carried out in the stationary phase using the centrifugation method. Extraction of fucoxanthin was carried out with ethanol and fractionation was carried out by Medium Performance Liquid Chromatography (MPLC), while the analysis was carried out using a UV-Vis spectrometer. Fractionation of fucoxanthin from *C. striata* obtained four fractions, however, asymmetric peaks were seen in fraction 3, which showed a little impurities, and it is confirmed by Thin Layer Chromatography (TLC) analysis, showed elongated stains with Rf 0.56-0.93. Subsequent analysis using a UV-vis spectrophotometer showed a broad peak at a wavelength of 447 nm and a sharp peak at 663 nm which showed the characteristics of fucoxanthin. These studies indicate that the MPLC method can be used for fractionation of fucoxanthin from *C. striata.*

Code : CHEM_PRES_10

NiO/ZSM-5 catalyzed transesterification of rubber seed oil with methanol

K D i Pandiangan; Wasinton Simanjuntak, Diska Indah Alista; Ilim

University of Lampung; University of Lampung; University of Lampung; University of Lampung

ABSTRACT

In this study, NiO/ZSM-5 composites have been synthesized by the wet impregnation method. Impregnation was carried out by immersing 5 g of ZSM-5 in 100 mL of $Ni(NO_3)_2$ solution in which concentrations were varied, namely 0, 5, 10, 15, and 20%. The samples were stirred for 6 h then allowed to stand for 22 h, filtered and washed, and then dried in an oven at 80 °C, and finally calcined at 550 °C for 3 h. For simplicity, the products were referred to as NiO/ZSM-5-0, NiO/ZSM-5-5, NiO/ZSM-5-10, NiO/ZSM-5-15, and NiO/ZSM-5-20. Each composite was used as a heterogeneous catalyst in the transesterification reaction of rubber seed oil with methanol. The reaction was carried out with ratio of oil/methanol of 1:6; the amount of catalyst 10% (composite weight/oil volume) at 70°C for 3 h. The results showed that composites were found to indicate good catalytic activity to convert the fatty acids contained in the oil into their corresponding methyl esters. It was found that the highest percentage of conversion of the oil (98%) was achieved using NiO/ZSM-5-10 as a catalyst.

keyword : NiO/ZSM-5 composites, impregnation, transesterification, rubber seed oil

Code : CHEM_PRES_11

ISOLATION AND CHARACTERIZATION OF BIOACTIVE COMPOUNDS OF MANGROVE *Avicennia marina* ENDOFIT MUSHROOM IN THE BAY OF LAMPUNG

SBahri, A Elcentia Fajarwati, E Apriliana

University of Lampung

ABSTRACT

Research on endophytic microbes in mangrove Avicennia marina as a producer of new medicinal compounds is still limited, especially in Lampung. This study aims to isolate and characterize endophytic microbes in mangrove *Avicennia marina*. In this study, 12 samples of mangroves as a source of microbes were taken randomly, namely 6 parts of roots, 3 parts of stems and 3 parts of leaves from the mangrove area of Pesawaran, Lampung. Single colony microbes have been isolated and enriched using chitin agar media to produce 15 single colony microbial isolates that have different colony colors. The isolates each came from 10 root isolates, 2 stem isolates, and 3 leaf isolates. The results of the isolation were checked again using thin layer chromatography (TLC) to ensure that the isolates obtained had different compounds. Furthermore, the microbes were cultivated using chitin liquid media in limited media (25 mL). Initial screening stages using 96-hole microtiter plates resulted in CDM2 isolates having potential as antibacterial against Pseudomonas aeruginosa. Furthermore, CDM2 isolates were cultivated and co-cultivated using Pseudomonas aeruginosa on a large scale in liquid media using sterile sea water and 1.5 L 5% shrimp shell powder to obtain crude extracts of MeOH of 5.2 g and 4.8, respectively. g. The crude MeOH extract was partitioned with a separating funnel using ButOH and n-Hexane to separate it into several phases. The n-hexane extract resulted from cultivation as much as 0.3 g was purified through several chromatography stages based on bioassay guided separation. Further analysis was carried out using Gas chromatography-mass spectrometry (GC-MS) and Fourier Transform Infrared Spectroscopy (FTIR).

Code : CHEM_PRES_12

Synthesis of Curcumin Analogs Under Ultrasound Irradiation

Devi Nur Anisa; Ilim; Chairil Anwar; Endang Astuti

Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of Lampung
email: devinur@fmipa.unila.ac.id

ABSTRACT

Curcumin is a secondary metabolite compound which is known to have important biological activities, such as antibacterial, anticancer, antioxidant, antidiabetic and anti-inflammatory properties. In this research, synthesis of curcumin analog compound based on veratraldehyde has been performed. The synthesis stage involves the Claisen-Schimdt condensation of veratraldehyde and cyclopentanone using a base catalyst (KOH) in ethanol as a solvent and performed by ultrasound method for 15 minutes, producing a curcumin analogue compound ((2E, 5E) -2,5-bis (3,4-dimethoxibenzylidine)) cyclopentanon). The results of these compounds were analyzed using DI-MS, and FTIR spectra. The results showed that 15.4 mmol veratraldehyde synthesized with 7 mmol cyclopentanone using a base catalyst (KOH) in ethanol solvent resulted in a yield of 85.71% and a molecular weight of 380 g/mol. The results of the synthesis of curcumin analog compounds from the ultrasound method are yellow solids with a melting point of 194 °C.

Code : CHEM_PRES_13

Characterization of Selected Lipolytic Bacteria from Domestic Waste Composting Process

Nurhasanah[1,*], H Satria[1], L.Fransiska[1]

[1]Laboratorium Research of Biochemistry, Department Chemistry, Faculty Mathematics and Natiral Science, University of Lampung
email : nur.hasanah@fmipa.unila.ac.id[*]

ABSTRACT

Compost is the result of the partial decomposition of a mixture of organic materials which is accelerated by a population of various microbes under environmental and aerobic or anaerobic conditions. The microbes present during the composting process differ in each phase. The purpose of this study was to characterize lipolytic bacterial isolates at each phase of domestic waste composting. The methods used include isolation and screening of lipolytic bacteria from each composting phase using Rhodamine B, biochemical characteristics test of selected isolates, lipolytic activity test of selected bacteria by titration method. The results showed that there were 59 isolates in the early mesophilic phase, 32 isolates in the thermophilic phase and 27 isolates in the late mesophilic phase which had lipolytic activity marked with an orange zone around the colony. The results on selected isolates and different biochemical characters, obtained 8 lipolytic isolates to determined their growth curves and lipolytic activity, namely LKMA3, LKMD1, LKMG1, LKTB1, LKTD4, LKTF2, LKMC2 and LKMD4 isolates. The results of determining the specific activity of the selected isolates showed that there were 3 isolates that had relatively high specific activity, namely LKMA3 isolates of 0.4689 U / mg, oLKMG1 isolates of 0.4227 U / mg and LKTD4 isolates of 0.4598 U / mg. Based on these results it can be concluded that there are microbial variations in each composting phase and each microbe has a different ability to produce lipolytic activity.

Code : CHEM_PRES_14

CHARACTERIZATION OF MESOPHILIC LIPASE ENZYME FROM COMPOST ISOLATE BACTERIA

D M Indriyani[1]; Nurhasanah[2]; D Herasari[3]

[2,3]Laboratorium Research of Biochemistry, Department Chemistry, Faculty Mathematics and Natural Science, University of Lampung;
[1]Tanjungkarang Health Polytechnic
email : dwimay124@yahoo.co.id[1], nur.hasanah@fmipa.unila.ac.id[2], dian.herasari@fmipa.unila.ac.id[3]

ABSTRACT

Lipase is a group of hydrolase enzymes that is widely used in various industrial and biotechnology fields such as the food industry, cosmetics, detergents, pharmaceuticals, organic synthesis and polymer biodegradation. This study aims to characterize the lipase of local isolate mesophilic bacteria from composting domestic waste. The research method used includes production of the enzyme lipase from compost isolate bacteria, partial purification of the lipase enzyme and characterization of the enzyme. The lipase enzyme activity test was performed using the titrimetric method and protein measurement was carried out by the Lowry method. The results showed that the production of the lipase enzyme produced crude extract of 15 U/ml. purification by fractionation of ammonium sulfate obtained enzyme activity of 16.17 U/mL and increased to 17.33 U/mL after dialysis. The results of mesophilic lipase characterization obtained the optimum conditions of pH 7 and temperature of 30 ^{o}C. The presence of Fe^{3+} metal ions increases lipase activity while metal ions K^{+}, Na^{+}, Mg^{2+}, Ba^{2+} and Al^{3+} decrease the activity of the lipase enzyme. The presence of benzene and toluene organic solvents can also increase the activity of the lipase enzyme from compost isolate bacteria.

INFORMATICS

Code : INF_02

Implementation protein sequence segmentation in AAC and DC as protein descriptors for improving a classification performance of acetylation prediction

A Rizqiana[1,a], M R Faisal[2,b], F R Lumbanraja[3,c]

1 Undergraduate School of Computer Science, Faculty of Mathematics and Natural Sciences, Lambung Mangkurat University, Banjarbaru, Indonesia
2 Department of Computer Science, Faculty of Mathematics and Natural Sciences, Lambung Mangkurat University, Banjarbaru, Indonesia
3 Department of Computer Science, Faculty of Mathematics and Natural Sciences, Lampung University, Lampung, Indonesia
email: rizqiananisa@gmail,com[a], reza.faisal@ulm.ac.id[b], favorisen.lumbanraja@fmipa.unila.ac.id[c]

ABSTRACT

PTM identification is carried out to determine the position of the PTM in protein. Acetylation in the lysine protein is one of the many types of PTM that play an important role in biological processes. In existing research, identification of lysine acetylation was developed by computational methods, using several available protein descriptors along with classification methods. Research on protein classification usually only uses the length of the protein sequence to describe the state of the whole protein, not its local state. Knowing the local state of the protein sequence will have a good effect on the classification results. To find out the situation, the protein sequence segmentation approach is done by adjacent and overlapped segments. Adjacent and overlapped segments divide the length of the protein into several segments, then numerical features will be calculated so that information about the protein is also obtained locally. Calculation of numerical features using the Amino Acid Composition and Dipeptide Composition descriptors, then the data is classified with Support Vector Machine. The experimental results show that protein segmentation increases the performance of protein classification by 0.7-2.5%. Segmentation using adjacent and overlapped segments provides improved performance. In this research, it was found that protein segmentation affected the

performance of protein classification, especially in overlapped segments.

keyword : lysine acetylation, sequence segmentation, Amino Acid Composition, Dipeptide Composition, protein classification, Suport Vector Machine

Code : INF_03

Risk Analysis in the Application of Financore Information Systems Using FMEA Method

Y S Triana [1], R A M Pangabean [2]

[1,2]Information System, Faculty of Computer Science, Universitas Mercu Buana,
Jl. Meruya Selatan no 1, Jakarta, Indonesia
email: yaya.sudarya@mercubuana.ac.id[1], 41815120166@student.mercubuana.ac.id[2]

ABSTRACT

In the banking world maintaining customer data is very important so as not to experience various risks, including leakage of customer data. Leakage of customer data is one of the big risks that may occur in the banking world, whereas customer confidentiality should be guaranteed. Possible risks such as misuse of identity or theft of transaction data by unauthorized parties. This will certainly harm both the customer and the bank. So that customer data is not leaked, lost or misused, it is necessary to have a regulation or verification system of customer data that can be reviewed for security and use. The solution that can be done to prevent this event is to use the FMEA methods that can be used to reduce errors and system failures. Information system security has a positive and very significant effect on decision making, therefore it is necessary to have an information system risk analysis that supports it comprehensively so that it can help in decision making.

keyword : Data Leakage, FMEA, Security of IS.

Code : INF_04

Web GIS based assessment using SAW methods to identify high risk area of tuberculosis transmission and incidence in Lampung Province

A Hijriani[1, 1] , A Cahyani[2, 2]

[1,2] Department of Computer Science, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email:, astria.hijriani@fmipa.unila.ac.id[1], asti.cahyani1531@students.unila.ac.id[2]

ABSTRACT

Tuberculosis (TB) is still a major problem in the public health sector, even in 2016 Indonesia was included in the five countries with the highest TB case burden in the world. In 2017 the number of TB cases in Lampung Province was 7,040 cases and one of the obstacles faced was the tendency for TB sufferers to be difficult to open so that many cases were not detected. Based on these facts, a Geographical Information System (GIS) is proposed which can process data into maps to see high risk areas where TB disease was found in Bandar Lampung. It will make it easier for health agencies to make policies in handling or preventing TB disease in Bandar Lampung. In this study, a decision-making system with the Simple Additive Weighting (SAW) method was also proposed to produce a map of the area with the level of TB risk factors. The criteria used to summarize the weights are TB cases, population density, mortality, healthy and clean behavior, and health facilities. The result of data processing is presented in a color polygon map that has 4 levels of risk factors, namely very high, high, medium, and low.

keyword : GIS, Simple Additive Weighting (SAW), Tuberculosis

Code : INF_05

Development of the Fuzzy Profile Matching Model for Prediction and Medical Recommendation of Thalassemia Disease

E. R. Susanto[1,2], A. Syarif[3,*] K Muludi[3], R. R. W. Perdani[4], A. Wantoro[1,2]

[1]Doctoral Program of Mathematics and Science Faculty, University of Lampung. Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia.
[2]Faculty of Engineering and Computer Science, Universitas Teknokrat Indonesia. Jl. ZA. Pagaralam No.9-11, Bandar Lampung, Indonesia.
[3]Department of Computer Science, Faculty of Mathematics and Science, University of Lampung. Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia.
[4]Faculty of Medical, University of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
Corresponding email: admi.syarif@fmipa.unila.ac.id (Admi Syarif)

ABSTRACT

Thalassemia is known as one of the blood disorder diseases that is inherited by parents. There are several types of Thalassemia, namely as Thalassemia major, minor, and intermedia. Among them, Thalassemia major is the most dangerous and needs more attention. Generally, it can be detected since the child is one year old. Late detection of this disease can have adverse consequences and various complications. This study aims to develop a new model for the prediction of the thalassemia major of the children. The model adopts a fuzzy-based rule and profile matching. It can determine the thalassemia disease and also predict the emergency level of the disease. Furthermore, this model also provides further recommendations for medication. We validate the model by using some real data and information from thalassemia experts.

keyword : Blood disorder diseases, Thalassemia, Fuzzy-based model, Profile matching, Artificial Intelligence

Code : INF_06

Confidence Analysis of Hotspot as Peat Forest Fire Indicator

D A Shofiana [1], I S Sitanggang[2]

[1] Department of Computer Science, Universitas Lampung, Bandarlampung 35141, Indonesia
[2] Department of Computer Science, IPB University, Bogor 16680, Indonesia
email: dewi.asiah@fmipa.unila.ac.id[1], imas.sitanggang@apps.ipb.ac.id[2]

ABSTRACT

Indonesia has recorded 14.9 million hectares of peat forest that continue to be deforested due to fire across Sumatra and Kalimantan. To operate a successful firefight, fast detection is a key element. Hotspot that appeared consecutively in more than two days is a strong indicator of fire existence. As the interest in data mining arose, an advanced technique can be implemented toward hotspot dataset into finding solutions. Many previous works have been carried out to mine sequence patterns and succeeded in determining as well as predicting areas with high occurrence of fire. However, none of the studies analyses the outliers, such as several hotspots which confidence decrease significantly in an adjacent interval of time. Confidence determines the quality of hotspot, with a value above 70% strongly indicates that fire spot exist. This study analyses 21 hotspots considered as outliers using the Landsat-8 image by implementing a data mining technique. The result shows that 85.71% of hotspots have decreased confidence due to haze cover.

keyword : confidence, hotspot, Landsat 8, peatland fire, sequential pattern mining.

Code : INF_07

User-Centered Design for Website and Mobile Application to Monitor Recovery Process of Post-Treatment Mental Disorders

Y T Utami[1], A Hijriani[2], Sulastri[3], R Damayanti[4], A S Prasetya[5] A A Tabrani[6], A Lestari[7], M Y Adiyaksatama[8]

[1,2,8] Department of Computer Science, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[3] Polytechnic of Health Tanjung Karang
[4] Raden Intan State Islamic University
[5] Panca Bhakti College of Health Science
[6] Psychiatric Hospital Lampung Province
[7] University of Muhammadiyah Pringsewu
email: yohana.utami@fmipa.unila.ac.id[1], astria.hijriani@fmipa.unila.ac.id[2], sulastri@poltekkes-tjk.ac.id[3], rikadamayanti@radenintan.ac.id[4], as_prasetya@yahoo.com[5], azis41@yahoo.co.id[6], arena_lestari@yahoo.co.id[7], myunantama28@gmail.com[8]

ABSTRACT

Mental health is still considered as a significant health problem in the world, including in Indonesia. Most patient's family are lacking the knowledge on how to assess the patient in the post-treatment period is one main factor of this problem, causing many post-treatment psychiatric patients left ignored. A proper implementation of information technology can resolve this problem by developing an application that can help the patient's family indirectly connected with the hospital or health center, making the communication in the post-treatment period easier. However, several aspects need to be carefully prepared when building a software, including determining the interface and functions available within the application. The developer must understand the user requirements in using the application, as well as how to make it user friendly. Therefore the design process is an important measurement tool in terms of software development. One method that can determine the user requirement is the User-Centered Design method. This method directly involves the user at an early stage of software development so that the users can tell what they need in the application, provide suggestions for the interface design, and fill in the usability scale system questionnaire to help the developer assess whether the

interface design is acceptable or not. This study successfully developed the interface design of JiwaMuKu application and has been able to meet all the user requirements by using the User-Centered Design method. The interface design test was carried out using the system usability scale and scored 75.33 which is considered good and acceptable for further development.

keyword : user-centered design, mental disorder, system usability scale, user interface, user experience,

Code : INF_08

Effect of mono corpus quantity on statistical machine translation Indonesian – Lampung dialect of nyo

Z Abidin[1], Permata[2], I Ahmad[3] and Rusliyawati[4]

[1,3,4] Department of Information System, Faculty of Engineering and Computer Science, University of Teknokrat Indonesia, Jl. ZA Pagar Alam no 9-10, Bandar Lampung, Indonesia

[2] Department of Informatics, Faculty of Engineering and Computer Science, University of Teknokrat Indonesia, Jl. ZA Pagar Alam no 9-10, Bandar Lampung, Indonesia

email: zabin[1], permata[2], imamahmad[3], rusliyawati[4]@teknokrat.ac.id

ABSTRACT

Lampung Province is located on the island of Sumatra. For the immigrants in Lampung, they have difficulty in communicating with the indigenous people of Lampung. As an alternative, both immigrants and the indigenous people of Lampung speak Indonesian. This research aims to build a language model from Indonesian and a translation model from the Lampung language dialect of Nyo. Both models will be combined in a Moses decoder. This research focuses on observing the effect of adding mono corpus to the experimental statistical machine translation of Indonesian - Lampung dialect of Nyo. This research uses three scenarios in every scenario there are 3000 parallel corpus in Indonesia language and Lampung language dialect of Nyo. In the first scenario, the experiment uses 1000 mono corpus sentences in the Lampung dialect of Nyo. The second experiment used 2000 sentences in the Lampung dialect of Nyo and the third experiment used 3000 mono corpus sentences. The results showed that the accuracy value when using 1000 sentences, 2000 sentences, 3000 sentences mono corpus show the accuracy value of the bilingual evaluation understudy, respectively, namely 40.97 %, 41.80 % and 45.26 %.

keyword : mono corpus, language model, translation model, statistical machine translation, bilingual evaluation understudy.

Code : INF_09

Canny Edge Detection for Goldfish (*Carrasius auratus)* Identification

Arsitoteles[1], Y Heningtyas[2], M Kristiani[3]

[1,2,3] Department of Computer Science, Faculty of Mathematics and Natural Science, Lampung University, Lampung, Indonesia
email: aristoteles.aden@gmail.com1, yunda.heningtyas@fmipa.unila.ac.id3, mariakriss131gmail.com3

ABSTRACT

Goldfish (*Carrasius auratus*) is one of freshwater ornamental fishes that has interested by community. The uniqueness of goldfish is body shape, scale, and color. goldfish have similar morphology so many goldfish enthusiasts and many goldfish fans and marine and fisheries biologists find it difficult to identify goldfish species. Fantail, Oranda, dan Ranchu are three of 130 strains of goldfish that are difficult to identify. Canny Edge Detection is a feature extraction method that detects the edges of the goldfish image object. This research using 225 images of goldfish with 180 images for training data and 45 images for testing data. Distribution of datasets used 5-fold cross validation. Clasification of goldfish image using PNN with the great greatest accuracy is obtained at the smoothing value (σ) = 1.5 reaching 99.11%.

keyword : Canny Edge Detection, Goldfish, Goldfish Identification, Image Processing, Probability Neural Network.

Code : INF_10

Donasi Babe: Android Applications for Used Goods Donations using Location-based Service

R I A Pribadi[1], A Pambudi[2], Ardiansyah[3]

Department of Computer Science, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: irwan.adipribadi@fmipa.unila.ac.id[1], agungpambudi139@gmail.com[2], ardiansyah@fmipa.unila.ac.id[3]

ABSTRACT

Used goods can now be found anywhere during the buying cycle. Used goods are also can be reused and even still have value. Used items such as books, clothes, bags, shoes that are still suitable for use, can also be donated or donated to others in need. In the current technological development, many donations have been made online. This can provide donors and social institutions in raising donations. But the donations consist only of money and are not goods. In overcoming this, the Donasi Barang Bekas Layak Pakai apps can help donors in donating their used goods. This application also helps social institutions in raising broader donations. By utilizing location-based services, donors can find out the location of social institutions in the vicinity, so donors can choose the location of the nearest social institution that receives donations in the form of used goods that are suitable for use.

keyword : Donations, Used goods, Location Based Service.

Code : INF_11

Implementation of K-Means Algorithm for Clustering Corn Planting Feasibility Area in South Lampung Regency

A A Aldino[1], D Darwis[2], A T Prastowo[3], C Sujana[4]

[1] Department of Informatics, Faculty of Engineering and Computer Science, Universitas Teknokrat Indonesia, Jl. ZA. Pagar Alam No.9 -11, Bandar Lampung, Indonesia
[2] Department of Accounting Information System, Faculty of Engineering and Computer Science, Universitas Teknokrat Indonesia, Jl. ZA. Pagar Alam No.9 -11, Bandar Lampung, Indonesia
[3] Department of Computer Engineering, Faculty of Engineering and Computer Science, Universitas Teknokrat Indonesia, Jl. ZA. Pagar Alam No.9 -11, Bandar Lampung, Indonesia
email: aldino@teknokrat.ac.id[1]

ABSTRACT

South Lampung is a regency with the capital of Kalianda which has an area of 2,007.01 km^2 that dominates the agricultural area. Based on the data of corn crops in the South Lampung Regency Agriculture Office through BPS (Central Bureau of Statistics), showing several areas with corn crops that vary in number. Therefore, a grouping of potential corn-producing regions is required to know which areas produce large or small amounts of corn. The distribution of crops is usually done based on the name of the corn-producing sub-district. The K-Means clustering method is one of the data mining methods that is non-hierarchical clustering that groups data in the form of one or more clusters. Data that have the same characteristics are grouped in one cluster and the remaining is grouped into another cluster so that the data that is in one cluster has a small degree of variation. So the authors tried to apply the K-Means clustering method from the corn crop data of the last 2 years to produce feasibility information from each sub-district.

keyword : Data Mining, K-Means Clustering, Corn Planting Feasibility, South Lampung Regency

Code : INF_12

Comparison of Least Significant Bit, Pixel Value Differencing and Modulus Function on Steganography to Measure Image Quality, Storage Capacity and Robustness

D Darwis[1], N B Pamungkas[2], Wamiliana[3]

[1 2] Faculty of Engineering and Computer Science, Universitas Teknokrat Indonesia, Indonesia
[3] Department of Mathematics, Universitas Lampung, Indonesia
email: darwisdedi@teknokrat.ac.id[1], nurhuda.budi@teknokrat.ac.id[2], wamiliana.1963@fmipa.unila.ac.id[3]

ABSTRACT

Information security is an important aspect of information. The importance the value of information in every aspect can result in attempts to transfer access or theft of data and information by unauthorized parties. One technique for securing data and information is by applying the digital image steganography technique. There are many methods that can be used in steganography, some of which are Least Significant Bit (LSB), Pixel Value Differencing (PVD) and Modulus Function (MF). Good steganography must produce a stego-image with an image quality that is not far from the original image or what is called a cover image and has the storage capacity to store confidential data and is resistant to robustness. The purpose of this study was to compare the LSB, MF and PVD methods to serve as alternatives to the use of steganography techniques. The results of this study indicate that the use of the LSB method has the highest image quality compared to the MF and PVD methods, while the storage capacity of the PVD algorithm has a better capacity compared to the LSB and MF methods, and for robustness resistance of the LSB, PVD and MF methods based on the results. In the tests conducted, the three methods succeeded in extracting the message as a whole with a cropping percentage of 10% at the bottom of the stego-image.

keyword : Fidelity, Image Steganography, LSB, MF, PVD, Robustness

Code : INF_13

Abstract Classification Using Support Vector Machine Algorithm (Case Study: Abstract in a Computer Science Journal)

F R Lumbanraja[1], E Fitri [1], Ardiansyah[1], A Junaidi [1], Rizky Prabowo[1]

[1] Department of Computer Science, Faculty of Computer Science, University of Lampung, Bandar Lampung, Indonesia
email: favorisen.lumbanraja@fmipa.unila.ac.id, elizafitri@gmail.com, ardiansyah@fmipa.unila.ac.id, akmal.junaidi@fmipa.unila.ac.id, rizky.prabowo@fmipa.unila.ac.id

ABSTRACT

Jurnal Komputasi is an online journal written by researchers and published by the Department of Computer Science, University of Lampung. Specific scientific information contained in journals is difficult to find because journals have not been structured and are classified into more specialized categories of computer science. Text mining can convert the shape of a journal into structured by homogeneous data form in it. 144 journal abstracts are collected into one corpus document in CSV format used as a research dataset. Journal abstract classification is done using one of the supervised machine learning methods, namely Support Vector Machine (SVM) so that the classification process is faster than the manual method. The TF-IDF technique is used to transform sentences in the abstract into vector so that they can be modelled with SVM. The classification model will be validated by applying the 10-fold cross validation technique. From these classifications a calculation of the resulting performance will be calculated based on the confusion matrix calculation of the resulting performance will be calculated based on the confusion matrix calculation and the use of 3 SVM kernels. The conclusion based on this research is that there are two factors that affect classification accuracy, that is the number of members between scientific classes that are not balanced and the number of features generated from text mining. The highest accuracy of testing result obtained on the use of 205 features and SVM Linear kernel with a value of 58,3%.

keyword : Supervised Machine Learning, Text Mining, Support Vector Machine, TFIDF, 10-Fold Cross Validation

Code : INF_14

IT Model and Design for Village Government in compliance with the Smart Village Concept
(Case Study: Pekon Wonodadi)

A R Irawati[1], D Kurniawan, D Sakethi[3], F R Lumbanraja[4]

[1,2,3,4] Computer Science, University of Lampung, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: anie.roseirawati@fmipa.unila.ac.id[1]; didik.kurniawan@fmipa.unila.ac.id[2]; dwijim@fmipa.unila.ac.id[3]; favorisen.lumbanraja@fmipa.unila.ac.id[4]

ABSTRACT

Pekon Wonodadi, Gadingrejo district, Pringsewu regency, Lampung is one of the best villages in Pringsewu Regency, Lampung Province [1]. Apart from having good economic potential, this village has also run the village administration well. This condition is sufficient provision to transform Pekon Wonodadi into a smart village so that village services and functions can be even better. There are three elements that make up a smart village, namely government, society and the environment. All three elements must be accommodated by the smart village because they are an integral part of mutual influence [2]. Conceptually, smart village is the management of resources by government agencies by utilizing technology in a sustainable manner [3]. Based on the models and concepts described, this study aims to build a smart village implementation technology model that focuses on two elements of smart village, namely government and society by taking case studies in Pekon Wonodadi, Gadingrejo district, Pringsewu regency, Lampung Province. The results of this study can be used as a basis for consideration or reference in policy making by stakeholders concerned to develop Pekon Wonodadi.

keyword : Smart Village, Pekon Wonodadi, IT design and concept.

Code : INF_15

Implementation of Various Artificial Intelligence Approach for Prediction and Recommendation of Personality Disorder Patient

H Sulistiani[1,2], K Muludi[3*], A Syarif[4]

[1] Doctoral Program of Mathematics and Natural Sciences Faculty, University of Lampung, Jl. Sumantri Brojonegoro No. 1, Bandar Lampung, Indonesia.
[2] Faculty of Engineering and Computer Science, Universitas Teknokrat Indonesia, Jl. ZA. Pagaralam No. 9-11, Bandar Lampung, Indonesia.
[3,4] Departement of Computer Science, Faculty of Mathematics and Science, University of Lampung, Jl. Sumantri Brojonegoro No. 1, Bandar Lampung, Indonesia.
email: henisulistiani@teknokrat.ac.id[1], kmuludi@fmipa.unila.ac.id[3], admi.syarif@fmipa.unila.ac.id[4]

ABSTRACT

Personality disorder is known as chronic psychological disorders. It is a serious problem of the individual character and behavior that affect work, family and social life of a person. In many cases, the possibility of people do not realize that they have a personality disorder as a way of thinking and behaving seems natural to the patient, and the patient may blame others. To diagnose a personality disorder early, it is necessary to develop a system that is able to predict personality disorders and recommendation type of therapy patients should undergo. Artificial Intelligence is a technique that is very popular today. Various kinds of approaches and algorithms can be applied in the world of health, such as expert systems, neural networks, fuzzy logic, and genetic algorithms. The aim of this study is to assess the artificial intelligence approach in predicting and recommending the type of therapy for patients with personality disorders.

keyword : artificial intelligence, expert system, fuzzy logic, neural network, personality disorder.

Code : INF_16

A Fuzzy Expert System Design for Diagnosis of Prostate Cancer

Rusliyawati [1,2], K Muludi[3], A Syarif[3], A Wantoro[1,2]

[1]Doctoral Program of Mathematics and Science Faculty, Uniersity of Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia.
[2]Faculty of Engineering and Computer Scince, Universitas Teknokrat Indonesia, J. ZA. Pagaralam No. 9-11, Bandar Lampung, Indonesia.
[3]Department of Computer Science, Faculty of Mathematics and Science, University of Lampung, , Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia.
corresponding email: kmuludi@fmipa.unila.ac.id *

ABSTRACT

Cancer is one of the leading causes of death worldwide. One type of cancer that causes death in the male population is prostate cancer. This disease occurs only in men because women do not have a prostate gland. This study is to compare the accuracy of the fuzzy expert system to predict of prostate cancer specialists. Prediction was made based on prostate specific antigen data, and the patient's prostate volume. The independent variables in this study were prostate specific antigen, age, and prostate volume. The dependent variable is prostate cancer risk using a fuzzy expert system. The results of this study indicate that the fuzzy expert system can be used to help diagnose prostate cancer, where the results of the calculation give the percentage of prostate cancer risk that is within the percentage interval of the expert doctor's prediction of prostate cancer risk with an accuracy level of 100%. The fuzzy expert system model can diagnose prostate cancer in terms of a person's probability of being at risk of prostate cancer. Thus, the fuzzy expert system model can be taken into consideration for doctors in making decisions in biopsy for prostate cancer patients.

keyword : fuzzy expert system, prostate specific antigen, usia, prostate volume pasien, dan prostate cancer risk

MATHEMATICS

Code : MATH_01

The Sufficient Condition of Submodule C*m as a Subcomodule over C

N P Puspita[1,2,a], I E Wijayanti[3,b], B Surodjo[3,c]

[1] Doctoral Student, Department of Mathematics, Universitas Gadjah Mada, Yogyakarta, Indonesia
[2] Department of Mathematics, Universitas Diponegoro, Semarang, Indonesia.
[3] Department of Mathematics, Universitas Gadjah Mada, Yogyakarta, Indonesia
email: nikken.prima.p@mail.ugm.ac.id[a], nikkenprima@gmail.com[a]
ind_wijayanti@ugm.ac.id[b], surodjo_b@ugm.ac.id[c]

ABSTRACT

Let R be a commutative ring with identity and M be a comodule over R-coalgebra C. It was already well-known that any C-comodule M is a module over dual algebra C* where C* is the set of all R-module homomorphisms from C to R. Furthermore, the category of comodule is a subcategory of the category of C*-module. Hence, any C-subcomodule of M is a C*-submodule of M, and the conversely is not true. For any non zero element m in M, C*m is a C*-submodule of M. In general, C*m is not to become a C-subcomodule of M. By using the theory of exact sequences in modules and the theory of categories, we give a condition such that C*m to be a C-subcomodule of M.

keyword : submodule, subcomodule, dual algebra, coalgebra, comodule.

Code : MATH_02

Numerical method in riemann invariant form for a submerged bar breakwater model

I Magdalena[1], H Q Rif'atin[2,4] and I J Kristianto[3]

[1,2,3] Faculty of Mathematical and Natural Sciences, Institut Teknologi Bandung, Bandung, Indonesia 40132
[4] Corresponding author
email: ikha.magdalena@math.itb.ac.id[1], hany.qoshirotur@gmail.com[2,4]

ABSTRACT

Recently, Geotextiles are widely used for coastal protection in Indonesia. Geotextile is one of the implementations of a submerged bar as a breakwater. Here, we will study the damping mechanism of the Geotextile to reduce the incoming wave amplitudes through a mathematical model. The model that we use based on the Shallow Water Equations. Analytical solutions for wave transmission coefficient are derived using the Separation of Variables Method. Numerically, we construct a scheme using the Riemann Invariant Method to approximate the analytical model. For validation, the numerical results are compared against the analytical wave transmission coefficient, which resulted in a very good agreement between the two findings. Further, we investigate the effect of the changes in the dimension of a submerged bar to the reduction of the transmitted wave amplitude.

keyword : Submerged bar breakwater, Shallow Water Equations, Riemann Invariant Method, Transmission coefficient.

Code : MATH_03

Ordinal Regression Analysis to see the Effect of Online Learning Media on Student Enthusiasm in the Covid-19 Pandemic Era

A Meiza[1], F S Hanifah[2], Y Natanael[3]

[1,2,3] Departement of Psychology, UIN Sunan Gunung Djati Bandung, Indonesia
email: asti.meiza@uinsgd.ac.id[1], fithriash@uinsgd.ac.id[2], yonathan@uinsgd.ac.id[3]

ABSTRACT

Covid-19 pandemic makes social distance arrangements applied in all Educational institutions in Indonesia and even throughout the world, including Universities. All teaching and learning activities on campus turn to online learning that uses a variety of teaching media, such as Zoom, WhatsApp group, Google classmate, E-learning, and many other media. For Universities that are just starting online learning, the enthusiasm of students to take part in online learning is a very important issue to discuss. This study was conducted by the Statistics Course Team using quantitative research by analyzing secondary data, namely the Lecture Monitoring Report collected by the Academic team. The data analysis technique used is Ordinal Regression because enthusiasm as the dependent variable has 3 levels of answer choices, while the independent variables used are the types of online learning media used. The results obtained that Zoom is the most media that makes students enthusiastic about attending lectures.

keyword : enthusiasm, covid-19, online learning media, ordinal regression.

Code : MATH_04

Incident and reflected wave separation on wave propagation over breakwater

I Magdalena[1], M F Atras[2]

[1] Indutrial and Financial Mathematics Research Group, Bandung Institute of Technology, Jl. Ganesha no 10, Bandung, Indonesia
[2] Graduate Bachelor of Mathematics, Bandung Institute of Technology, Jl. Ganesha no 10, Bandung, Indonesia
email: ikha.magdalena@math.itb.ac.id[1], fadhelatras88@gmail.com[2],

ABSTRACT

The quantification of the reflection waves is of paramount importance in coastal engineering. The reflection wave that affects the incoming waves over time will gradually affect the calculation of the transmitted waves after passing through a submerged breakwater. In this study, the reflection waves that affect the incident waves will be separated so that the appropriate transmission coefficient is obtained. The accuracy of this separation method of the incident waves and reflections will be evaluated using a numerical scheme. The numerical scheme that we use here is a staggered finite volume method. A small error in the comparison indicates the wave separation process is good enough to produce a reflection coefficient following the numerical results.

keyword : Incident wave, wave separation, numerical scheme

Code : MATH_05

Survival Analysis with the Cox Proportional Hazard Method to Determine the Factors that Affect the Effectiveness of the PSBB System in Various Areas affected by the covid-19 pandemic

A A Fauziah[1], Budiman[2], D L Safitri[3], A Meiza[4]

[1234] Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia
email: ajeng.08maret@gmail.com[1], budimanbudi126@gmail.com[2], dianlinda.safitri88@gmail.com[3] , asti.meiza@uinsgd.ac.id[4]

ABSTRACT

The length of time for large-scale social restrictions, in Indonesia is known as the PSBB, which requires a region to reduce the number of different covid-19 cases. Associated with the implementation of the PSBB, it turns out that many things can influence the PSBB to be able to run effectively in the community. Factors that influence the effectiveness of PSBB can come from internal and external factors. This research was conducted for 15 days from 1 June 2020 to 15 June 2020. This research was conducted to find out the factors that had a significant influence on the effectiveness of PSBB in the community whose regions implemented the implementation of CLC, using Cox Proportional Hazard Regression. From the results of the analysis of the effectiveness of CBSC in communities whose regions implement the implementation of PSBB, the conclusion is that the socialization variable (X1) has a significant effect on the effectiveness of PSBB.

keyword : survival analysis, cox proportional hazard, significance value, covid-19.

Code : MATH_06

Dispersive Model for Undular Hydraulic Jump Behind a Weir

I Magdalena[1], F J Sutjianto, Andrew, A Sani, R Anastasia

[1] Department of Mathematics, Faculty of Mathematics and Natural Sciencces, Institut Teknologi Bandung, Jl. Ganesha No. 10, Bandung, Indonesia
email: ikha.magdalena@math.itb.ac.id[1]

ABSTRACT

In this paper, we investigate a suitable weir design which yields in an undular jump phenomenon using both hydrostatic and non-hydrostatic models. We solved the hydrostatic model using numerical and analytical methods. After that, we validated the output from both methods using the experimental data. In order to simulate the undular jump better, modification towards the hydrostatic model is needed. Hence, for the non-hydrostatic model, we consider the existence of hydrodynamic pressure and solved the model numerically. The outcome of this paper can be beneficial for hydraulic structures design and the management of water resources

keyword : undular jump, weir, dispersive, shallow water equation, non-hydrostatic

Code : MATH_07

Solution Formula of the Compressible Fluid Motion in Three Dimension Euclidean Space using Fourier Transform

A H Alif[1], S Maryani[2], S R Nurshiami[3]

[1,2,3] Department of Mathematics, Faculty of Mathematics and Natural Sciences, Jenderal Soedirman University, Jl. Dr. Soeparno No 61, Purwokerto, Indonesia
email: abiyyualif7@gmail.com[1], sri.maryani@unsoed.ac.id[2], siti.nurshiami@unsoed.ac.id[3]

ABSTRACT

We derive a detailed determination of the solution formula for the compressible viscous fluid flow in three dimensional Euclidean space using Fourier transform. For the further research, we can not only generalized the model problem to the N-dimensional Euclidean space (N>3) but also we can estimate the solution operator families of the model problem.

keyword : Compressible, Euclidean space, Fourier transform, Viscous fluid,.

Code : MATH_09

The Locating Chromatic Number of some Modified Path with Cycle having Locating Number Four

M Damayanti[1], Asmiati[1,*], Fitriani[1], M Ansori[*]

[1]Mathematics Department, Faculty of Mathematics and Natural Sciences, Universitas Lampung
Jl. Prof. Sumantri Brojonegoro No.1 Bandar Lampung 35145, Indonesia.
Corresponding email: asmiati.1976@fmipa.unila.ac.id[*]

ABSTRACT

The locating-chromatic number was introduced by Chartrand in 2002. The locating-chromatic number of a graph is a combined concept between the coloring and partition dimension of a graph. The locating chromatic number of a graph G is defined as the cardinality of minimum color classes. In this paper, we discuss about the locating chromatic number of three types modified path with cycle having locating chromatic number four.

keyword : locating chromatic number, path, cycle.

Code : MATH_10

The Locating Chromatic Number for Split Graph of Cycle

K Prawinasti[1], Asmiati[1,*], M Ansori[1], Notiragayu[1]

[1]Mathematics Department, Faculty of Mathematics and Natural Sciences, Lampung University,
Jl. Brodjonegoro No.1 Bandar Lampung, Indonesia 35145
Corresponding email: asmiati.1976@fmipa.unila.ac.id[*]

ABSTRACT

The minimum number of colors in a locating coloring of G is called the locating chromatic number of graph G, denoted by $\chi_L(G)$. Split graph of cycle with a set of vertex $\{v_1, v_2, v_3, \dots, v_n\}$ is graph obtained by adding on vertex v_i as many new k vertex $v_i^1, v_i^2, v_i^3, \dots, v_i^k$, so that each vertices $v_i^1, v_i^2, v_i^3, \dots, v_i^k$ neighbouring with each vertex that is neighbouring to vertex v_i in the cycle graph. Split graph of cycle, denoted by $spl(C_n)$ In this paper will be discussed about the locating chromatic number for split graph of cycle.

keyword : color code, locating chromatic number, split graph of cycle

Code : MATH_11

A Two-Dimensional Map Derived From An Ordinary Difference Equation of mKdV and Its Properties

E Yuliani[1], La Zakaria[2,*], and Asmiati[2]

[1] Mathematics Master Program, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jalan Soemantri Brojonegoro No. 1 Bandar Lampung 35145, Indonesia

[2] Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jalan Soemantri Brojonegoro No. 1 Bandar Lampung 35145, Indonesia

email: lazakaria.1969@fmipa.unila.ac.id[*]

ABSTRACT

The discrete modified Korteweg–de Vries (mKdV) is a class of discrete integrable systems that may be distinguished are integrable partial difference equations (PΔE), and integrable ordinary difference equations (OΔE). By considering travelling wave solutions, the OΔE mKdV can be obtained from PΔE mKdV. Meanwhile a mapping can be constructed from an OΔE mKdV. In this paper we will focus on constructing a new map using a process (replacement) the interchange of a single parameter and an integral and investigate its properties.

keyword : OΔE mKdV, PΔE mKdV, Anti measure preserving.

Code : MATH_12

Survival Analysis Using Cox Proportional Hazard Regression Approach in Dengue Hemorrhagic Fever (DHF) Case in Abdul Moeloek Hospital Bandar Lampung in 2019

M. , Mustofa , S. , Warsono[1], D Kurniasari[1], Widiarti[1]

[1]Departement of Mathematics, Faculty of Science and Mathematics, Lampung University, Indonesia
email: miftahulirfan311@gmail.com

ABSTRACT

Survival analysis is one of the statistical procedures analyzing data in the form of survival time and variables that affect survival time, namely survival time data starting from the beginning of the study (time origin / start point) until the time an event or end point occurs. In the field of health data is obtained from observations of patients who were observed and recorded the time event of each individual. The event in question can be in the form of death, recurrence of new diseases, or recovery. This study will discuss the application of cox proportional hazard regression to determine the cox proportional hazard model on DHF patients. Determaine the factors that affect the recovery rate of DHF patients and determine the hazard ratio value of DHF patients at Abdul Moeloek Hospital in Bandar Lampung in 2019. Regression cox proportional hazard is used because the cox proportional hazard model does not depend on the assumption of the distribution of the time of occurrence; the results are almost the same as the parametric model . They can estimate hazard ratio without knowing the baseline hazard (h (t)). Based on the selection of the best model with backward elimination and the Akaike Information Criterion (AIC), the best model is obtained with a four-variable model, namely Leukocyte, Hemoglobin, Hematocrite and Thromobocyte. These four variables are factors that have a significant effect on the patient's length of stay. Then this study also looked at the value of the hazard ratio which thromobocyte are the

variables with the largest hazard ratio value, which means the thromobocyte variable has the highest risk level.

keyword : Survival Analysis, Cox Proportional Hazard Regression, Backward Elimination, Akaike Information Criterion, Hazard Ratio

Code : MATH_13

Application of Vector Autoregressive with Exogenous Variable

A R Putri[1,*] , M Usman[1], Warsono[1], Widiarti[1]

[1]Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas
Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: almirarizkaputri@gmail.com[*]

ABSTRACT

Multivariate time series are widely used in various fields such as finance, economics, and the stock market. One analysis model that is widely used for multivariate time series data is the VAR model. Vector autoregressive (VAR) is a model used to describe the relationship between several variables. The VAR model provides an alternative approach that is very suitable for forecasting purposes and is very suitable for solving economic data problems. The variables used in this study consisted of endogenous variables with closing prices of ICBP and INDF shares and exogenous variables with exchange rates collected from January 2017 to July 2020. In this study, the best model, VARX (1.0), was obtained. also the relationship between variables through the impulse response function and granger causality. Furthermore, forecasting is also carried out for the next 30 days using the best model, VARX (1.0).

keyword : vector autoregressive with exogenous variable, granger causality, impulse response function, forecasting

Code : MATH_14

MODELING MULTIVARIATE TIME SERIES BY VECTOR ERROR CORRECTION MODELS (VECM)

(Study: PT Kalbe Farma Tbk. and PT Kimia Farma (Persero) Tbk)

L Loves[1,3] , M Usman[1*], Warsono[1], Widiarti[1], E Russel[2]

[1]Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Indonesia
[2]Department of Management, Faculty of Economic and Business, Universitas Lampung, Indonesia
[3] Graduate Students of Mathematics, Faculty of Mathematics and Natural Sciences,Universitas Lampung, Indonesia
email: usman_alfha@yahoo.com*

ABSTRACT

Time series analysis (time series) is one method with the aim to find out events that will occur in the future based on data and past circumstances. Time series are widely used in economics, business, environmental science, and finance. The analytical tool that is widely used to answer quantitative research problems is the Autoregressive Vector (VAR). The VAR model is used if the data is stationary. If the variable has cointegration and stationary at the first difference value, the VAR model is modified to become the Error Correction Model (VECM). Then we can find out the influence of variables with other variables by looking at the Impulse Response Function and Granger Causality. In this research, PT Kalbe Farma Tbk's stock data will be analyzed. (KLBF) and PT Kimia Farma (Persero) Tbk (KAEF). The data used are weekly data from January 2010 to June 2020. Based on data analysis, it is known that the data is not stationary and there are unit roots. Furthermore, first differencing is done so that the data is stationary. Because there was cointegration, a VECM analysis was performed and a VECM (p) was obtained with a lag of p = 4. So the best model for this research is VECM (4) with rank = 2. Causal relationships between variables using Granger Causality showed that KLBF influenced KAEF in the past. Based on IRF analysis, each variable gives a fluctuating response with itself and with other variables.

keyword : VAR model,VECM, cointegration, Granger Causality, Impulse Response Function

Code : MATH_15

Dynamic Modeling Data Return by Using Bekk-Garch

(Study: PT. Indofarma Tbk (INAF) and PT.Kimia Farma Tbk(KAEF) from June 2015 to July 2020)

N Indryani[1,2], M Usman[1,*], Warsono[1], S U Nabila[1,2], Widiarti[1], D Kurniasari[1]

[1] Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung,
[2] Graduate Students of Mathematics, Faculty of Mathematics and Natural Sciences,Universitas
Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: usman_alfha@yahoo.com*
email: usman_alfha@yahoo.com[1], indry.loa@gmail.com[3], sitiulfanabila@gmail.com[2]

ABSTRACT

The Vector Autoregressive (VAR) model is a statistical model that can be used for modeling multivariate time series data which is commonly applied in the fields of finance, management, business and economics. However, economic data, especially return values, have quite high data fluctuations, so we need to add the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model in the analysis to obtain efficient results. This study will discuss the formation of the best model for multivariate time series data, namely return data of PT. Indofarma Tbk. (INAF) and PT. Kimia Farma Tbk. (KAEF) from June 2015 to July 2020, where data retuned for the two variables tended to have a high volatility shock at some time and low volatility at other times which characterizes the data as having an ARCH effect so that the GARCH model will be used in this analysis, namely the BEKK-model. GARCH. This model was first proposed by Baba, Engle, Kraft, and Kroner (1990) and then further developed by Engle and Kroner (1995) and proposes a new parameterization which is easily given a restriction, namely the requirement that H_t must be positive for all values of ε_t and x_t in sample room. Based on the selection of the best model using the AICC, HQC, AIC and SBC criteria, it is found that the VAR (1) - GARCH (1,1) model is the best model for the data used. Then this research will also examine the behavior and relationship between INAF and KAEF based on Granger Causality and Impulse

Response. In addition, based on the forecasting results of the VAR (1) -GARCH (1,1) model, it shows that this model is good for short-term forecasting.

Code : MATH_16

DYNAMIC MODELING DATA RETURN BY USING BEKK-GARCH

(Study: PT. Indofarma Tbk (INAF) and PT.Kimia Farma Tbk(KAEF) from June 2015 to July 2020)

S U Nabila[1,], M Usman[1,*], Warsono[1], [2]N Indryani[1,2], Widiarti[1], D Kurniasari[1]

[1] Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung,
[2] Graduate Students of Mathematics, Faculty of Mathematics and Natural Sciences,Universitas
Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: usman_alfha@yahoo.com[1], indry.loa@gmail.com[3], sitiulfanabila@gmail.com[2]

ABSTRACT

The Constant Conditional Correlation-Generalized Autoregressive Conditional (CCC-Garch) model as one of the multivariate time series models is used to model economic variables, especially in stock price data with high volatility characteristics that result in heterogeneous variations. The higher the volatility, the higher the level of uncertainty of the stock returns that can be obtained. The CCC-Garch Multivariate model is the simplest model in its class. The principle of this model is to decompose the conditional covariance matrix into conditional standard deviation and correlation. In this study, we will discuss and determine the best model that can describe the relationship between two vector data timeseries, namely stock return data for companies engaged in mining and construction in Indonesia, namely United Tractor Tbk (UNTR) and Petrosea Tbk (PTRO) where the data is the daily stock return data for the period July 2015 to August 2020. Several models that involve modeling the mean and variance with CCC-GARCH parameterization are applied to data such as the VAR (1) -Garch (1,1), VAR (2) -Garch (1) model. , 1), VAR (3) Garch (1,1) and VAR (4) -Garch (1,1). The result was that the VAR (1) -Garch (1,1) model was selected as the best model with the criteria for selecting the AICC, SBC, AIC and HQC models. The dynamic behavior of both UNTR and PTRO stock return variables is explained by Granger Causality and Impulse Response. Furthermore, the

forcasting of this data was carried out for some time in which the VAR (1) -Garch (1,1) model which was selected as the best model was only suitable for forcasting in a short time.

keyword : : Forecasting, Vector Autoregressive (VAR), GARCH, BEKK-GARC

Code : MATH_17

Application of Vector Error Correction Model (VECM) and Impulse Response Function for Indonesia Plantation Stock Prices Data Analysis

S. Winarno[1,*], M. Usman[1], Warsono.[1], D. Kurniasari[1], Widiarti[1]

[1]Departement of Mathematics, Faculty of Science and Mathematics, Lampung University, Indonesia
email : salsanursabilanw@gmail.com[*]

ABSTRACT

VECM is a cointegrated VAR model. This idea of Vector Error Correction Model (VECM), which consists of a VAR model of the order p - 1 on the differences of the variables, and an error-correction term derived from the known (estimated) cointegrating relationship. Intuitively, and using the stock market example, a VECM model establishes a short-term relationship between the stock prices, while correcting with the deviation from the long-term comovement of prices. An Impulse Response Function traces the incremental effect of a 1 unit (or one standard deviation) shock in one of the variables on the future values of the other endogenous variables. IRFs trace the incremental effect of the marketing action reflected in the shock. The data used in this analysis are 4 (four) daily plantation stocks prices in Indonesia with time period of January to July in three years which are 2018, 2019, and 2020. The objective of this study is to determine the relationship among 4 (four) stocks prices with VECM and to know the behaviour of each stocks prices with Impulse Response.

keyword : Impulse Response Function, VAR, VECM, Granger Causality

Code : MATH_18

MODELING AND FORECASTING DATA TIME SERIES

(Study: Weekly Closing Share Price of PT. Aneka Tambang,tbk from January 2010 to April 2020)

L M Hamzah[1,*]

[1]Department of Economic Development, Faculty of Economic and Business, University of Lampung
Jl. Prof. Dr. SoemantriBrojonegoro No. 1, Bandarlampung, Indonesia
email: liesmh55@gmail.com[*]

ABSTRACT

In this study, the weekly data on the closing price of PT. Aneka Tambang Tbk from January 2010 to April 2020 will be analyzed, as well as specifically the development of share prices during the Covid-19 pandemic. In time series data analysis from weekly closing price data PT. Aneka Tambang, tbk will use Autoregressive Moving Average (ARMA) modeling. To determine the best model, Akaike's Information Criterion Corrected (AICC) criteria will be used. Based on the AICC criteria, the best ARMA model is a model with order AR, p = 1, and order MA, q = 3. This model results in all significant model parameters. Based on this best model, ARMA (1,3), Impulse Response Function analysis and Forecasting for the next twenty-four weeks (six months) are carried out.

keyword : Weekly closing price, AICC, ARMA model, Impulse Response Function, forecasting.

Code : MATH_19

MODELING AND FORECASTING DATA FARMER'S TERM OF TRADE

L M Hamzah[1,*], U Ciptawaty[1], Nairobi[1], E Russel[2]

[1]Department of Economic Development, Faculty of Economic and Business, Universitas Lampung Jl. Prof. Dr. SoemantriBrojonegoro No. 1, Bandarlampung, Indonesia

[2]Department of Management, Faculty of Economic and Business, Universitas Lampung Jl. Prof. Dr. SoemantriBrojonegoro No. 1, Bandarlampung, Indonesia

email: liesmh55@gmail.com[*]

ABSTRACT

In this study, the monthly data for the Farmers' Term of Trade (FTT) from January 2005 to June 2020 will be analyzed. The data are from Central Bureau of Statistics (BPS) Indonesia. In this study, the FTT time series data modeling will use the ARMA model. To determine the best model, the minimum value of the Akaike's Information Criterion Corrected (AICC) will be used. Based on the AICC criterion, the ARMA model is a model with the AR order, p = 4, and the MA order, q = 1. The ARMA model (4,1) will then be used for Impulse Response Function (IRF) analysis and forecasting data for the next twelve months.

keyword : Farmers' term of trade, ARMA model, Impulse Response Function, forecasting

Code : MATH_20

The Locating-Chromatic Number of Certain Barbell Origami Graphs

A Irawan[1,2,a], Asmiati [3,b], S Suharsono [3,c], K Muludi [4,d]

[1] Doctoral Student, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Information System, STMIK Pringsewu, Jl. Wisma Rini No.09, Pringsewu, Lampung, Indonesia
[3] Department of Mathematics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[4] Department of Computer Science, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email:agusirawan814@gmail.com[a]; asmiati.1976@fmipa.unila.ac.id[b], suharsono.1962@fmipa.unila.ac.id[c], kurnia.muludi@fmipa.unila.ac.id[d]

ABSTRACT

The locating-chromatic number of a graph combined two graph concept, coloring vertices and partition dimension of a graph. The locating-chromatic number, denoted by $\chi_L(G)$, is the smallest k such that G has a locating k-coloring. In this paper, we discuss the locating-chromatic number for certain barbell Origami graphs.

keyword : coloring, locating-chromatic number, barbell origami graphs

Code : MATH_21

Quantitative Method For Analysis of Non-Performing Financing Return: A Case Study on Assets of PT. BSM

D E Nurvazly[1], U Muharramah[2], L Zakaria[3], S L Chasanah[4], P Ferdias[5]

[1]Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2]Universitas Islam Negeri Raden Intan Lampung, Jl. Letnan Kolonel H. Endro Suratmin, Bandar Lampung, Indonesia
[3]Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[4]Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[5]Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: dina.eka@fmipa.unila.ac.id[1], ulfahmuharramah1004@gmail.com[2], lazakaria.1969@fmipa.unila.ac.id[3], siti.chasanah@fmipa.unila.ac.id[4], pandri.ferdias@fmipa. unila.ac.id[5]

ABSTRACT

There are several ways to describe data mathematically. Likewise with the computing tool. As a computational aid, Mathematica® is designed to make it easier for users to carry out the calculation process symbolically or numerically. This article will discuss the use of Mathematica® to describe banking data through quantitative methods. A case study that discussed in this article is the results of the analysis of the influence of Non-Performing Financing (NPF) against the financial performance of PT. Bank Syariah Mandiri (BSM) through indicators of Return on Asset (ROA). Research conducted using a quantitative approach to the data of the financial statements of PT BSM. The sampling technique used was purposive sampling criteria the Public Sharia Banks publish annual financial statements in the period 2009-2018 with > 75 trillion rupiahs in assets. Based on quantitative method using Mathematica® programming, the research data has a normal distribution and no deviation from the rules of classical assumptions. In addition, the diversity of the data being used can explain the regression models constructed by the NPF variable towards the ROA variable, and the

hypothesis testing results show that the variables of NPF have a significant, negative effect on ROA.

keyword : NPF, ROA, BSM, Quantitative method.

Code : MATH_22

Asymptotically Unbiased, Efficient, and Consistent Properties of the Bayes estimator in the Binomial Distribution with Prior Beta

E G Simanjuntak[1,a], Widiarti[1,b], D Kurniasari[1], and Amanto[1]

[1]Departement of Mathematics, Faculty of Mathematics and Natural Sciences, University of Lampung, Indonesia, Jl. Soemantri Brojonegoro No. 1, Bandar Lampung, Indonesia.
email: ericasimanjuntak2@gmail.com[a], widiarti08@gmail.com[b]

ABSTRACT

This study will examine the characteristics of the Bayes estimator in the Binomial distribution with prior Beta theoretically and empirically. The theoretical result shows that the Bayes estimator in this distribution is an asymptotically unbiased and consistent, but inefficient estimator. Meanwhile, empirically, Bayes's estimator is an unbiased estimator, efficient, and consistent.

keyword : Bayes estimator, unbiased, efficient, consistent, binomial distribution

Code : MATH_23

Characteristics of Bayes Estimator in the Geometric Distribution with Prior Beta

T Susilo[1,a], Widiarti[1,b], D Kurniasari[1], D Aziz[1]

[1]Departement of Mathematics, Faculty of Mathematics and Natural Sciences, University of Lampung, Indonesia, Jl. Soemantri Brojonegoro No. 1, Bandar Lampung, Indonesia.
email: teguhsusilo097@gmail.com[a] , widiarti08@gmail.com[b]

ABSTRACT

This study aims to examine the unbiased, minimum variance (efficient), and consistent characteristics of Bayes estimator in the Geometric distribution with prior Beta. Based on the results of simulation studies it is found that the Bayes estimator in the Geometric distribution with prior Beta are symptotically unbiased estimator for values $\theta<0,5$ and is biased for others, are efficient for the number of samples sizes large and values $\theta\leq0,6$ and not efficient for others and consistent when value $\theta\leq0,5$ and inconsistent for other.

keyword : Bayes estimator, unbiased, efficient, consistent, geometric distribution.

Code : MATH_24

Robust Principal Component Trimmed Clustering of Indonesian Provinces Based on Human Development Index Indicators

S D A Larasati[1,2],, K Nisa[2*], N Herawati[2]

[1] Graduate School of Mathematics, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Department of Mathematics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: siskadiahayularasati@gmail.com[1,2], khoirin.nisa@fmipa.unila.ac.id[2], netti.herawati@fmipa.unila.ac.id[2]
*corresponding author

ABSTRACT

Cluster analysis is a multivariate technique for grouping observations into clusters based on the observed values of several variables for each individual. The existence of outliers in the data can heavily influence standard clustering methods, i.e. the outliers will cause the standard clustering results to be not optimal. Therefore, it is necessary to use a robust clustering method. Trimmed clustering is one of robust clustering methods which is non-hierarchical and known for its good performance in cluster analysis when data contain outlier. The purpose of this study is to classify 34 provinces in Indonesia based on the 2019 Human Development Index (HDI) indicators and see the achievements of human development in each province. The results of this study indicate that there are three optimal clusters. The first cluster consists of 17 provinces with good HDI criteria, the second cluster consists of 9 provinces with a fairly good HDI, and the third cluster consists of 7 provinces with the lowest HDI criteria.

keyword : robust, trimmed cluster analysis, human development index

Code : MATH_25

SUB-EXACT SEQUENCE ON HILBERT SPACE

B H S Utami[1,2], Fitriani[3], M Usman[3], Warsono[3], J I Daoud[4]

[1]Doctoral Program of Mathematics and Natural Science, Faculty of Mathematics and Natural Science, University of Lampung, Bandar Lampung, Indonesia
[2]Department of Information System, STMIK Pringsewu, Pringsewu, Indonesia
[3]Department of Mathematics and Natural Science, Faculty of Mathematics and Natural Science, University of Lampung, Bandar Lampung, Indonesia
[4]Department of Science and Engineering, Faculty of Engineering, International Islamic University Malaysia, P.O. Box 10, 50728 Kuala Lumpur, Malaysia
email: ind.indri1245@gmail.com, fitriani.1984@fmipa.unila.ac.id, usman_alfha@yahoo.com

ABSTRACT

The notion of the sub-exact sequence is the generalization of exact sequence in algebra especially on a module. A module over a ring R is a generalization of the notion of vector space over a field F. Refers to a special vector space over field F when we have a complete inner product space, it is called a Hilbert space. A space is complete if every Cauchy sequence converges. Now, we introduce the sub-exact sequence on Hilbert space which can later be useful in statistics. This paper aims to investigate the properties of the sub-exact sequence and their relation to direct summand on Hilbert space. As the result, we get two properties of isometric isomorphism sub-exact sequence on Hilbert space.

keyword : complete inner product space, direct summand, Hilbert space, sub-exact sequence Introduction.

Code : MATH_26

The Formula to Count The Number of Vertex Labeled Order Six Loopless Connected Graphs with Maximum Thirty Edges without Loops and May Contain at Most Fifteen Parallel Edges

F C Puri[1] , Wamiliana[1,*], Amanto[1] , M Ansori[1], Y Antoni[1], K S Dewi[1]

[1] Dept. of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung
corresponding aemail: wamiliana.1963@fmipa.unila.ac.id[*]

ABSTRACT

A G(V,E) is called a connected graph if for every pair of vertices in that graph there exist minimum one path joining them, otherwise the graph is called disconnected. If n vertices and m edges are given then numerous graphs are able to be created. The graphs created might be disconnected or connected, and also maybe simple or not. A graph is called simple if that graph is not contained paralled edges nor loops. A loop is an edges that connects the same vertex while paralled edges are edges that connecting the same pair of vertices. In this research we will discuss the formula to count the number of connected vertex labeled order six graph containing at most thirty edges and may contain fifteen parallel edges without loops.

Code : MATH_27

Determining the Number of Disconnected Vertices Labeled Graphs of Order Six with the Maximum Number Ten Parallel Edges and Containing No Loops

D Putri[1], Wamiliana[2], Fitriani[3,*], and A Faisol

[1,2,3] Department of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Jl. Sumantri Brojonegoro No 1, Bandar Lampung, Indonesia
email: fitriani.1984@fmipa.unila.ac.id[*]

ABSTRACT

A graph is disconnected if at least two vertices of the graph are not connected by a path. If given a graph G(V,E) with n vertices and m edges, then a lot of graphs can be constructed. In this paper, we provide the number of disconnected vertices labeled graphs of order six (n = 6) with the maximum number of parallel edges that connecting different pairs of vertices is twenty and containing no loops (isomorphic graphs are counted as one).

keyword : counting graph, disconnected graph, vertices labelled graph.

Code : MATH_28

Real time epidemic modeling using Richard's model: application for the Covid-19 outbreak in East Kalimantan, Indonesia

M N Huda[1], Sifriyani[2], Fitriani[3]

[1]Study Program of Mathematics, Departement of Mathematics, Faculty of Mathematics and Natural Sciences, Mulawarman University, Samarinda Indonesia
[2]Study Program of Statistics, Departement of Mathematics, Faculty of Mathematics and Natural Sciences, Mulawarman University, Samarinda Indonesia
[3]Departmen of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Lampung Indonesia
email: muh.nurulhuda@fmipa.unmul.ac.id[1], sifriyani@fmipa.unmul.ac.id[2], fitriani.1984@fmipa.unila.ac.id [3]

ABSTRACT

The coronavirus pandemic has spread to all provinces in Indonesia within a few months. Coronavirus has entered East Kalimantan province in early March 2020. The number of people confirmed as COVID-19 increased dramatically after March. In this paper, we propose a simple mathematical model to predict coronavirus cases in East Kalimantan province. We applied the Richards growth model to the active case and probable case (PDP case) curves. We used the initial parameter values obtained from China's Jiangsu province. This means that the strategy for handling coronavirus in East Kalimantan province is assumed to be the same as in China's Jiangsu province. We have presented the final prediction for the coronavirus pandemic over a range of periods.

keyword : mathematical model, growth model, Richard's model, Covid-19, East Kalimantan

Code : MATH_29

Modeling Autoregressive Integrated Moving Average (ARIMA) and Forecasting of PT Unilever Indonesia Tbk Share Prices During the COVID-19 Pandemic Period

R N Putri[1], M Usman[1], Warsono[1], Widiarti[1], E Virginia[2]

[1]Departement of Matemathics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Lampung, Indonesia
[2]Departement of Accounting, Faculty of Economics and Bussines, Universitas Indonesia.

email: rimanugrahiya@gmail.com

ABSTRACT

ARIMA method is one method that can be used in predicting the movement of company shares. This study aims to obtain a time series model with the ARIMA method and predict stock price data of PT Unilever Indonesia Tbk from January 2020 to June 2020. The best model that fits the data based on the MSE value is the ARIMA(1,1,1) model. The ARIMA model (1,1,1) shows a match between real data and the predicted value. This model is then used for forecasting the next 14 days. Data on UNVR stock price from January 2020 to June 2020 are below 8000, this seems to correlate with the current conditions, namely the Covid-19 pandemic. Forecasting for the next 14 days (two weeks) from July 1, 2020 to July 14, 2020, the forecast values have a trend decrease, the trend of PT. Unilever Indonesia Tbk has been going down since January 2020. This seems to have occurred as an implication of the Covid-19 pandemic from January 2020 to the present.

keyword : time series, ARIMA, COVID-19, forecasting.

Code : MATH_30

Determining the Noetherian Property of Generalized Power Series Modules by Using X-Sub-Exact Sequence

A Faisol[1], Fitriani[2], and Sifriyani[3]

[1,2]Department of Mathematics, Universitas Lampung, Bandar Lampung, Indonesia
[3]Department of Mathematics, Universitas Mulawarman, Samarinda, Indonesia
email: ahmadfaisol@fmipa.unila.ac.id[1], fitriani.1984@fmipa.unila.ac.id[2], sifriyani@fmipa.unmul.ac.id[3]

ABSTRACT

The Noetherian property of the generalized power series module can be determined in several ways. In this paper, we use the sub-exact sequence of modules over a ring R to determine this property. This investigation not only determines the Noetherian property of the generalized power series module but also the Noetherian property of its submodule. Furthermore, we give a construction of R[[S]]-homomorphism between the generalized power series modules.

keyword : noetherian, strictly ordered monoid, generalized power series modules, exact sequence, sub-exact sequence

Code : MATH_31

Calculating the Number of vertices Labeled Order Six Disconnected Graphs which Contain Maximum Seven Loops and Even Number of Nonloop Edges Without Parallel Edges

F. A. Pratiwi[1], Amanto[1,*] , Wamiliana[1], Asmiati[1], and Notiragayu[1]

[1] Dept. of Mathematics, Faculty of Mathematics and Natural Sciences, Universitas Lampung
Corresponding email: pakamanto@gmail.com[*]

ABSTRACT

A labeled graph is a graph where each vertex or edge is given a value or label. A line/edge with the same starting and ending vertex is called a loop. If given n vertices and m edges, then there are lot disconnected vertices labeled graphs that can be formed. Among those graphs, there are graphs with maximum seven loops and whose non-loop edges are even. In this research, we will discuss the formula for finding that kinds of graphs

Code : MATH_32

A Structural Equation Modeling of Factors Affecting Student Motivation in Thesis Preparation

E Setiawan[1], A Pratiwi[12,] N Herawati[1], K Nisa[1]

[1] Department of Mathematics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Undergraduate School of Mathematics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: erstatis@gmail.com[1], amellia.pratiwi1053@students.unila.ac.id[12], netti.herawati@fmipa.unila.ac.id[1], khoirin.nisa@fmipa.unila.ac.id[1]

ABSTRACT

Structural equation modelling is a multivariate statistical analysis technique that is used to analyse structural relationships. This technique is the combination of factor analysis and multiple regression analysis, and it is used to analyse the structural relationship between measured variables and latent constructs. The purpose of this study is to use structural equation modelling to better understand student motivation in thesis preparation and its causal determinants. The study creates a plausible structural equation model (SEM) and tests it. The data used were students' responses of a questionnaire survey about the student motivation in thesis preparation. Based on the results of the study, it was found that the relationship between lecturer and student and the environmental conditions have significant influence to student motivation in thesis preparation.

keyword : multivariate analysis, structural equation modelling, thesis preparation

Code : MATH_33

Mathematical Modeling of Heat Transper in Agriculture Drying Machine Room (Box Dryer)

T Ruby[1,*], A Sutrisno[1]

[1]Mathematics Department, Faculty of Mathematics and Natural Sciences, Lampung University
Jl. Prof. Sumantri Brojonegoro No.1 Bandar Lampung 35145, Indonesia.
Corresponding email : tiryono.1962@fmipa.unila.ac.id[*]

ABSTRACT

Differential equations arise in many fields of science and technology, when the deterministic relationships involving a continuously changing quantity (modeled by a mathematical function) and its rate of change (expressed as a derivative) are known or postulated. This can be seen for example in the problem of heat transfer.The problems raised in this study are how to model the heat equation and how to solve the heat equation model.The research was conducted to find a model of the heating equation in a rice dryer and solve the heat equation using the variable separation method. This discussion is carried out in two conditions, namely the steady state (constant time) and unsteady (changing time).

keyword : Keywords: heat, steady, unsteady

Code : MATH_PRES_01

Gamma and Lognormal Models in the Generalized Linear Model Perspective

Nusyirwan[1,*], N Herawati[1], K Nisa[1]

[1]Mathematics Department, Faculty of Mathematics and Natural Sciences, Lampung University
Jl. Prof. Sumantri Brojonegoro No.1 Bandar Lampung 35145, Indonesia
email : nusyir1010@gmail.com[*]

ABSTRACT

The aim of this study is to examine the influence of scale parameters that determine the coefficient of variance of both gamma and log-normal models in perspective of generalized linear model (GLM). The gamma and lognormal models are compared using the level of accuracy and precision through data simulation with scale parameters c = 0.5, 1.5, 2.5 and two different sample sizes n = 10, 20. The results show that the increasing value of the scale parameter c and sample size n make the estimated coefficient of the gamma regression coefficient more stable and more precise than the log-normal model, as well as the precision.


ICASMI
3rd International Conference on
Applied Science Mathematics
and Informatics
Scopus
"Natural Sciences, Mathematics and Informatics in Industrial Revolution
(IR) 4.0 Toward The Sustainable Development Goals (SGDs)"

PHYSICS

Code : PHY_01

Influence of Dy-doping in $Nd_2Fe_{14}B$ on its structural and magnetic properties

S Sukmara[a], A Manaf[a], W A Adi[b]

[a]Postgraduate Program of Materials Science Study, Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Jakarta-Indonesia

[b]Centre for Science and Technology of Advanced Materials, Kawasan Puspiptek Serpong, Tangerang Selatan 15314, Indonesia

email: sony.sukmara@gmail.com[a], azwar@ui.ac.id[a],dwisnuaa@batan.go.id[b]

ABSTRACT

This paper reports on the study about manufacture of permanent magnet based $Nd_2Fe_{14}B$ which modification from smelting process with the presence Dy metal substitution with different composition of variation. The combination of $Nd_{2-x}Dy_xFe_{14}B$ with x = 0, 0.33, 0.67, and 1 were using the conventional method of arc melting. The result of ingot then milled and compacted to produce a permanent magnet sample. The results of phase analysis with XRD show that the sample contained 3 phases, namely $Nd_2Fe_{14}B$, Fe, and Nd phases. The dominant phase above 50% is $Nd_2Fe_{14}B$. Magnetic properties was measured using permeagraph and produce saturation magnetization of 0.6, 0.56, 0.42, and 0.4, remanent of 0.15, 0.19, 0.26, and 0.25, and coersivitas field of 0.35, 0.39, 3.0, and 1.29 kOe for composition 0, 0.33, 0.67, and 1, respectively. The remanent magnetization ratio toward saturation of Br/Bs of this increases significantly from 0.34 to 0.62 for the composition x = 0.67, and has the highest energy product of 0.195 MGOe. To determine the effect of Dy substitution towards micro structure was observed with an optical microscope. It was concluded that the effect of Dy substitution towards optimum magnetic behavior was found in the composition x =0.67.

keyword : Permanent Magnet, $Nd_2Fe_{14}B$, Substitution, Dysprosium, Cristal Structure, Optical and Magnetic.

Code : PHY_02

Impact of Mn4+ ion substitution on $La_{0.4}Sr_{0.6}Fe_{1-x}Mn_xO_3$ perovskite conductivity (x = 0.2, 0.4 and 0.6) as a solid fuel cell cathode

Y E Gunanto[1,a], M P Izaak[1,b], H Sitompul[1,c], W A Adi[2,d]

[1]Dept. of Physics Edu., Faculty of Edu., Universitas Pelita Harapan, Karawaci, Tangerang 15811, Indonesia
[2]Center for Science and Technology of Advanced Materials, BATAN, Tangerang Selatan 15314, Indonesia
email:yohanes.gunanto@uph.edu[a],maya.izaak@uph.edu[b],henni.sitompul@uph.edu[c], dwisnuaa@batan.go.id[d]

ABSTRACT

The samples $La_{0.4}Sr_{0.6}Fe_{1-x}Mn_xO_3$ (x = 0.2, 0.4, and 0.6) as solid fuel cell cathodes have been successfully synthesized and characterized. Samples were made using the solid-state reaction method with the wet milling technique. X-ray diffraction is used to see the phases formed. Surface morphology in the form of particle shape and size is characterized using scanning electron microscopy, while electronic conductivity at room temperature is measured by measuring its resistivity. Sample x = 0.4 has a single phase, while two other samples, x = 0.2 and 0.6 are still detected secondary phase. Surface morphology has a heterogeneous grain shape with a size between 63-250 nm. At room temperature the maximum electronic conductivity achieved was 3.39 x 10-3 S.cm-1 for sample x = 0.4.

keyword : solid oxide fuel cells; $La_{0.4}Sr_{0.6}Fe_{1-x}Mn_xO_3$; milling; electronic conductivity

Code : PHY_04

Sintering Temperature Effect on Optical Properties of Zinc Oxide Thin Film on Glass Substrate Prepared by Sol-Gel Spin Coating Method

L Rumiyanti[1,2], D Aryanto[2], S Garcia[3], Syafriadi[4], I Firdaus[5]

[1] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Indonesian Institute of Science - LIPI, Research Center of Physics, Puspitek Serpong, Tangerang, Indonesia

email:leny.rumiyanti@fmipa.unila.ac.id[1], didi027@lipi.go.id[2], shaniagrc24@gmail.com[3], syafriadi@fmipa.unila.ac.id[4], iqbal.firdaus@fmipa.unila.ac.id[5]

ABSTRACT

Research on the optical properties of the ZnO thin film with the use of sol-gel method and spin coating method using 0.5 M concentrate solution of ($Zn(CH_3COO)_2 \cdot 2H_2O$) and 30 mL isopropyl alcohol as a solvent has been carried out. The production process of ZnO solution and the fabrication of the thin film with the optical properties test of the thin film are included in the scope of this research. UV-Vis Spectroscopy is used to obtain the transmittance and absorbance values on each wavelength and the band gap energy value using the Tauc Plot method. The transmittance value obtained is directly proportional with the temperature. The absorbance value obtained is inversely proportional with the temperature due to higher temperature causes the reaction rate to become faster and in turn causes the absorbance value to become lower. The band gap energy value obtained is on the range of 3.23 eV – 3.27 eV and it fit with the literature.

keyword : ZnO, thin film, sol-gel, spin coating.

Code : PHY_05

Structure Analysis of Electromagnetic Waves Absorbing Material A Lanthanum Manganite System of $(La_{0.8}Ba_{0.2})$ $(Mn_{(1-x)/2}Zn_xFe_{(1-x)/2})O_3$

L Rumiyanti[1,2], I Wandira[2], W A Adi[3]

[1] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency, Indonesia.

email: lenirumiyanti@fmipa.unila.ac.id[1], intanwandira7@gmail.com[2], dwisnuaa@batan.go.id[3]

ABSTRACT

Solid compound of lanthanum manganite system of $(La_{0.8}Ba_{0.2})(Mn_{(1-x)/2}Zn_xFe_{(1-x)/2})O_3$ has been synthesized via conventional solid state reaction route using lanthanum oxide (La_2O_3), barium carbonate ($BaCO_3$), zinc oxide (ZnO), ferric oxide (Fe_2O_3) and manganese carbonate ($MnCO_3$) powders as it raw materials. High energy ball milling was used to mix the material for 5 hours. It is then sintered at 1000°C for 5 hours. X-ray powder diffraction method (XRD) and scanning electron microscopy (SEM) was used to analyze the change of structure of the solid compound. The refinement pattern result of the XRD shown that a single phase was occurred in the form of $(La_{0.8}Ba_{0.2})(Mn_{0.4}Zn_{0.2}Fe_{0.4})O_3$. It has trigonal lattice crystal structure of (r-3c) point group with lattice parameter of a = b = 5.515 Å and c = 13.551 Å, $\alpha = \beta = 90°$ and $\gamma = 120°$, a volume unit cell of V = 356.904 $Å^3$ and a density of $\rho = 6.745\ g.cm^{-3}$. The SEM result shown that the surface morphology of $(La_{0.8}Ba_{0.2})(Mn_{0.4}Zn_{0.2}Fe_{0.4})O_3$ has a homogeneous sphere structure. The XRD and SEM structure analysis result of the lanthanum manganite system of $(La_{0.8}Ba_{0.2})(Mn_{0.4}Zn_{0.2}Fe_{0.4})O_3$ shown that the compound is feasible for further studied.

keyword : lanthanum manganite, structure analysis, $(La_{0.8}Ba_{0.2})(Mn_{(1-x)/2}Zn_xFe_{(1-x)/2})O_3$, x-ray powder diffraction (XRD), scanning electron microscopy (SEM)

Code : PHY_06

Rietveld analysis of geopolymer prepared from amorphous rice husk silica with different thermal treatment

A Riyanto[1], S Sembiring[1], S Husain[2], R S Karimah[1], I Firdaus[1]

[1] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Department of Physics, Lambung Mangkurat University, Banjarmasin, Indonesia

email: agus.riyanto@fmipa.unila.ac.id[1], simon.sembiring@fmipa.unila.ac.id[1], sadanghusain@ulm.ac.id[2], sofikarimah23@gmail.com[1],iqbal.firdaus@fmipa.unila.ac.id[1]

ABSTRACT

The work aims to study the temperature effect on the crystal structure of the geopolymer prepared from amorphous silica rice husk. The samples were prepared via the sol-gel method and then subjected to thermal at a temperature of 250-650 ^{o}C. EDS identified the element and compound composition on the surface of the sample. The crystal structure of samples identified by Rietveld refinement of XRD. The sample was dominated by the gibbsite phase at relatively low temperatures (250 ^{o}C). The boehmite phase dominates at a temperature of 350-450 ^{o}C. The amorphous structure of the geopolymer was formed at a temperature of 550-650 ^{o}C. The geopolymer mainly formed from the reaction of boehmite and silica. This study shows a significant effect of temperature on the formation of the geopolymer structure.

keyword : geopolymer, rice husk, Rietveld analysis, structure

Code : PHY_07

Effect of heating Phenomenon on Silica-asphalt Composite Properties using Amorphous Rice Husk Silica

S Sembiring[1,*], A Riyanto[1], I Firdaus[1] , Junaidi[1], R Situmeang[2]

[1]Department of Physics, Faculty of Mathematics and Natural Sciences, Lampung University,
[2]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Lampung University,
Street Prof. Soemantri Brojonegoro No.1 Bandar Lampung, 35145, Indonesia
corresponding email: simon.sembiring@fmipa.unila.ac.id[*]

ABSTRACT

This study aims to investigate the effect of thermal treatment on the phase formation and physical characteristics of silica asphalt composite prepared from rice husk silica and asphalt powders. The mass ratio of asphalt to silica is 1:2, and subjected to calcining temperatures of 200-450 °C. Development of structures was characterized using X-ray diffraction (XRD), Fourier Transform Infrared (FTIR) spectroscopy and scanning electron microscopy (SEM). Further evaluation was made by comparing the characteristics of the silica-asphalt composite include the density, porosity, and compressive strength. The XRD study revealed that the major phases were carbon and silica amorphous, The XRD study revealed that the major phases were silica and carbon amorphous, which were associated with are Si-OH, Si-O-Si and C-H functional groups according to FTIR analysis. In addition, an increased calcination temperatures was followed by an increase in the density and compressive strength. Based on these characteristics, the samples are considered for the roof material, suggesting their potential use in substitute lightweight steel roof devices.

keyword : Rice husk, Silica, Asphalt, Microstructure, Structure, Thermal

Code : PHY_08

Deep Learning for Detection Cassava Leaf Disease

H R Ayu[1,*], A Surtono[1], and D K Apriyanto[1]

[1] Department of Physics, University of Lampung, Soemantri Brodjonegoro street, Bandar Lampung, Indonesia
email: humairoh.ratu@fmipa.unila.ac.id[*]

ABSTRACT

In this research, an intelligent system for detecting cassava leaf disease has been developed by utilizing the MobileNetV2 deep learning model and displaying it using a python graphical user interface (GUI). There are five disease classes used in this study, namely Cassava Bacterial Blight (CBB), Cassava Brown Steak Disease (CBSD), Cassava Green Mite (CGM), and Cassava Mosaic Disease (CMD) and Healthy. The results showed that the overall accuracy of the test data obtained was superior to previous studies. The GUI application program was made to be operated efficiently for beginners and can be used by cassava farmers in the field.

keyword : deep learning, cassava leaf, mobilenetv2, GUI

Code : PHY_09

Nonrelativistic One-Hadron-Exchange K-P Interaction Model

H Fadhlurahman[1], A Salam[1], I Fachruddin[1]

[1] Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok 16424, Indonesia
email: hamzah.fadhlurahman@ui.ac.id[1], agussalam@gmail.com[1], imam.fachruddin@sci.ui.ac.id[1]

ABSTRACT

We have derived a nonrelativistic K-p interaction model as one-hadron-exchanges. The exchanged particles are the scalar meson σ, the vector mesons ω, ρ, the hyperons Λ, Σ, and the resonances Λ*(1600), Σ*(1385). Parameters in this model are determined by fitting to experimental data of spin-averaged differential cross section for kaon laboratory energy range of 51.27 MeV up to 900.64 MeV. The K-p scattering is calculated using a 3D technique without partial wave expansion.

keyword : : KN interaction, 3D technique, nonrelativistic interaction.

Code : PHY_10

Application of nano electrode Ag/AgCl on potentiometric sensor based on molecularly imprinted polymer (MIP) to verify caffeine

F Yanto[1a], I Royani[1b*], Suheryanto[2]

[1] Department of Physics, Faculty of Mathematics and Natural Sciences, Sriwijaya Univeristy Jl. Palembang Prabumulih km 32, Ogan Ilir, Indonesia
[2] Department of Chemistry, Faculty of Mathematics and Natural Sciences, Sriwijaya Univeristy Jl. Palembang Prabumulih km 32, Ogan Ilir, Indonesia
email: febto.febri@gmail.com[a] idharoyani@unsri.ac.id[b*]
*corresponding author

ABSTRACT

Caffeine of Molecularly Imprinted Polymer (MIP) has been synthesized by the cooling-heating method and to obtain sensor material to detect caffeine. The caffeine is verified through a potentiometric method based on galvanic cells involving anodes and cathodes. MIP of caffeine that has been made function as a cathode or working electrode and the modified of the Ag /AgCl reference electrode that made by reducing the AgCl membrane to nano size (44.50 nm) function as an anode. Then the modified Ag/AgCl reference electrode performance test is compared to the standard AgCl reference electrode. The result has shown the modified Ag/AgCl reference electrode produces linearity of the calibration curve in testing caffeine solutions with a concentration range of 0.10 ppm to 5.0 ppm. Based on the result of the modified Ag/AgCl reference electrode's test range, we got the linearity coefficient value of 0.9993, with a slope of 0.9693 and an intercept of 0.1306. Generated accuracy calculation resulted in a value of 98.85% and a precision of 0.951%. The result of the lower limit of detection (LoD) was at a concentration of 0.20 ppm and the limit of quantification (LoQ) at a concentration of 0.40 ppm. Thus, it concluded that the modified Ag/AgCl reference electrode has the same or equivalent capability as a standard electrode.

keyword : Nano electrode, MIP, caffeine, AgCl, potentiometric

Code : PHY_11

Comparative study of *Cladophora sp.* cellulose by using FTIR and XRD

S W Suciyati[1,2], P Manurung[2], S Sembiring[2], R Situmeang[3]

[1] Ph.D Student, Doctoral Program of Mathematics and Natural Science, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[2] Department of Physics, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
[3] Department of Chemical, Faculty of Mathematics and Natural Sciences, University of Lampung, Jl. Sumantri Brojonegoro no 1, Bandar Lampung, Indonesia
email: sri.wahyu@fmipa.unila.ac.id[2], reip65@yahoo.com[2], simon.sembiring@fmipa.unila.ac.id[2], rudy.tahan@fmipa.unila.ac.id[3]

ABSTRACT

Cellulose Crystalline *Cladophora sp.* (CCC) was successfully isolated from the freshwater algae *Cladophora sp.* by used the hydrolysis method. The alkaline treatment can affect the structure of CCC that is showed by the spectrum of Fourier Transform Infrared (FTIR). The typical range for lignin does not appear here, which indicates the delignification process using NaOH plus hydrolysis of HCl has succeeded in removing lignin. The spectrum associated with functional group impurity (1800-1050 cm-1) with lipid, protein, and nucleid acid content are still seen after alkaline treatment and acid hydrolysis. Analysis of crystallinity with X-ray Diffraction (XRD) data showed that CCC had the highest crystallinity index on CD-K (93.4%), Cd-P (66.6%), and Cd-S (63.04%). The smallest particle size for each cellulose is Cd-K (9.5 nm), Cd-S (25.23 nm), and Cd-P (49.57 nm). Based on these results, the CCC production from *Cladophora sp.* using alkaline and acid hydrolysis treatment is enough to get samples with high crystallinity. The CCC product has the potential to be an excellent reinforcing material for biomaterial-based polymer materials.

keyword : *Cladophora sp.*, hydrolysis method, crystallinity index

Code : PHY_12

One Hadron Exchange Non-Relativistic Model for K^+p Potential

Glenno[1], I Fachruddin[2], A Salam[3]

[1,2,3] Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok 16424, Indonesia
email: glenno.sugi@gmail.com[1], imam.fachruddin@sci.ui.ac.id[2], agussalam@gmail.com[3]

ABSTRACT

We have derived a nonrelativistic K^-p interaction model as one-hadron-exchanges. The exchanged particles are the scalar meson σ, the vector mesons ω, ρ, the hyperons Λ, Σ, and the resonances Λ*(1600), Σ*(1385). Parameters in this model are determined by fitting to experimental data of spin-averaged differential cross section for kaon laboratory energy range of 51.27 MeV up to 900.64 MeV. The K-p scattering is calculated using a 3D technique without partial wave expansion.

keyword : KN interaction, 3D technique, nonrelativistic interaction.

Code : PHY_14

Design of modulated infrared laser as a radiation source of portable photoacoustic spectroscopy

D K Apriyanto[1,*], G A Pauzi[1], and H R Ayu[1]

[1]Department of Physics, University of Lampung, Soemantri Brodjonegoro's Street No. 1, Bandar Lampung, Indonesia
email Corresponding: donni.kis@fmipa.unila.ac.id[*]

ABSTRACT

Photoacoustic spectroscopy can appl in various fields including in the fields of biology (measuring trachea volume and observing insect breathing patterns), medicine (a measurement of internal disease biomarkers through respiratory gases), environment (measuring NO_2 gas in the environment near roads), and agriculture (measurement ethylene gas in postharvest fruit). The existing photoacoustic spectroscopy still has a large size and high operating costs, so it is necessary to design photoacoustic spectroscopy that is portable and low operating costs. In this research, designing an infrared diode laser that can be modulated using software using Visual Studio. There are two tests to see the characteristics of the devices made in this study, namely Arduino testing and testing of the software programs created. Arduino testing resulted in a calibration factor of $f_o = 0.9068 f_i + 109.33$. Meanwhile, software testing resulted in a calibration factor of $f_o = 0.7343 f_i + 462.74$. The two tests that have been carried out have different output results. The software output that is created has a smaller calibration factor than the direct output of the Arduino program.

keyword : diode laser, infrared, modulation, spectroscopy.

Code : PHY_15

Simulation of NO_2 work function-based sensor signal on ZnO

R. Marjunus[1,*], D. C. Kekalenteu[1], A. Riyanto[1], W. Widanarto[2]

[1]University of Lampung, Jl. Prof. Dr. Soemantri Brodjonegoro No.1, Bandar Lampung 35145, Indonesia
[2]University of Jenderal Soedirman, Jl. Profesor DR. HR Boenyamin No.708, Dukuhbandong, Grendeng, Kec. Purwokerto Utara, Kabupaten Banyumas, Jawa Tengah 53122
email: roniyus.1977@fmipa.unila.ac.id*

ABSTRACT

Simulation of sensor signal based on the ZnO work function for NO_2 gas has been conducted. This research is aimed at approaching the experiment results of nitrogen dioxide (NO_2) gas detection using the ZnO sensor. This study uses three reactions i.e., adsorption-desorption of O_2 (oxygen), adsorption-desorption of NO_2, and the reaction of O_2 and NO_2 on ZnO. This simulation has optimized 12 parameter values that are responsible for those reactions. After the optimized values were obtained, the final simulation was reached. The final simulation still cannot perfectly fit the experiment results because of the number of reactions which are used still three reactions. It is predicted, if it is used much more reactions, it could close the experiment results better. Although this simulation is still not as the experiment result, it has a trend as the laboratory result. The last result of this model i.e. it can predict the coverage of O atom, O_2 molecule, and NO_2 molecule.

Code : PHY_16

Measurement of Physical Parameters of Water Quality in Real-Time Based on Arduino

Junaidi[1*], T M Putra[1], A Surtono[1], G A Puazi[1], S W Suciyati[1], I Firdaus[1] and L Rumiyanti[1]

[1]Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Lampung, Bandar Lampung-Indonesia 35145

email: junaidi.1982@fmipa.unila.ac.id*, tommymandalaputra@gmail.com

ABSTRACT

In this study, a physical parameter measurement system has been implemented for real-time monitoring of Arduino-based water quality for catfish farming applications. This system aims to detect physical parameters of water quality such as pH and water temperature using the Analog pH Meter and DS18B20 sensors. Data were collected by inserting the two sensor probes into the catfish pond water medium. The results showed that the system can detect parameters, display and store sampling data on the Visual Studio 2013 interface application in real-time. The sensors in this system are able to detect pH and water temperature with an average accuracy rate of 90.94% and 99.71%.