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BOOK OF ABSTRACT

The 13th INTERNATIONAL CONFERENCE ON GREEN TECHNOLOGY

"Strengthening The Impact of Science, Technology, Engineering, and Mathematics (STEM) for Sustainable Future"

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KEYNOTE SPEAKERS

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University Malaya, Malaysia

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Application of microbubbles technology on maintaining postharvest quality of the tropical fresh produces: A case study in Thailand

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Abstract. A microbubble technology is a novel technique used in various fields of research and industrial application. Microbubbles or fine-bubbles are small bubbles with 10–50 μm diameters, which can assist some gasses to effectively dissolve into the water. The high pressure enclosed inside the bubbles would possibly cause the gasses to dissolve quickly into the water. This technique has been explored for postharvest immersion or dipping treatment of the fresh agricultural products successfully with carbon dioxide, ozone, and 1-methylcyclopropene (1-MCP) gases. It was found to maintain the eating quality, extend storage life, delay senescence, maintain nutritional value, induce the antioxidative system and reduce foodborne pathogens in the fresh produce. Moreover, the combination of microbubbles technology with chemical compounds such as acidified sodium chlorite, hydrogen peroxide and prochloraz was also successfully applied at the postharvest period of the agricultural products for controlling foodborne pathogen and storage diseases. From the above mentioned microbubbles-based technology can be facilitated for increasing the solubility of gases and chemical compounds that are used in the postharvest period. Both gases and chemical compounds in a form of microbubbles are likely easier to absorb into plant cells compared with other forms. Thus, it showed more effectiveness in retarding the alteration of physiological, biochemical and quality in agricultural products such as banana, pineapple, pomelo, ready to eat fruit and vegetables, and orchid. This innovative technology is convenient and easy to carry out with no complication and has high potential for commercial use.

Keywords: microbubbles, storage, shelf life, quality, safety

Revisited the Formation of Bicontinuous Concentric Lamellar Morphology in Mesoporous Materials: Conceptual and Experimental Aspects

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Abstract. Bicontinuous concentric lamellar (*bcl*) morphology has attracted significant attention in designing nanostructured materials due to its unique and excellent features, such as large surface area, open channel structure, and good accessibility. Morphological features of *bcl* morphology enhance general applications of mesoporous materials, i.e., silica, such as adsorption processes, CO_2 capture, biomedicine, catalysis, and photocatalysis. The formation mechanism of *bcl* silica has been studied from both conceptual and experimental sides. A series of classical kinetics of *bcl* silica by varying the synthesis time has been employed to observe their morphological evolution. The formation mechanism of *bcl* silica is proposed as the hydrolysis reaction that occurred outside the reverse micelle, but in the interface vicinity. In contrast, the condensation reaction started just after the diffusion of hydrolysis products into the reverse micelle water pool, followed by the phase segregation process. The particle morphology evolves from bicontinuous lamellar (*bl*) morphology, with the absence of the dense part in the center of the particle, to bicontinuous concentric lamellar (*bcl*) morphology. The conceptual parts of this study are focused on both the topological and thermodynamical approaches. The topological approach covers the spherical particle formation, while the thermodynamical approach explains the formation of bicontinuous lamellar morphology through phase segregation process of polysiloxane. Due to its morphological uniqueness and excellent physical properties, the mechanism of *bcl* morphology formation has been implemented for different mesoporous materials, such as alumina, titania, zinc oxide, and aluminosilicate. Our recent developments on syntheses, quantification, and applications of nanostructured materials with *bcl* morphology are presented and discussed.

Our Research & Education for STEM

Kunifumi Tagawa

Abstract. When I receive the theme of the 13th International Conference on Green Technology, I started to think what is the best to present. Since our Marine Biological Laboratory (MBL) has been authorized as a Joint Usage/ Education Center by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) JAPAN since 2018 and the second term project has been just started at April 1st, in this year 2023. The project title is "Learn Beyond Time and Space: Shimanami-Kaido Broad Area Marine Biology Education Joint Usage International Hub". I will explain what we have been doing for STEM related things and what we try to accomplish during the next four years, collaborating especially with UIN Malang. I do hope our collaborative project will help to strength the impact of STEM for sustainable future.

INVITED SPEAKERS

Prof. Dr. Bayyinatul Muchtaromah, M.Si
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Dr. Fachrul Kurniawan, M.MT, IPM
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Effect of pegagan (*Centella asiatica*) nanoparticle on the sitokin profile of diabetes chronic mice (*Mus musculus*)

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Abstract. Diabetes mellitus is closely related to immune response problems when it occurs chronically. Pegagan (*Centella asiatica*), a medicinal plant with active compounds like asiatic acid, asiaticoside, and madecoside, is beneficial in treating diabetes. Nanoparticle technology can be utilized to enhance the medicinal potential and availability of pegagan's compounds. This study aims to determine the effect of chitosan-coated pegagan nanoparticles on the cytokine profile of chronic diabetic mice which includes $CD4^+TNF\text{-}\alpha^+$, $CD8^+TNF\text{-}\alpha^+$, $CD4^+IFN\text{-}\gamma^+$, $CD8^+IFN\text{-}\gamma^+$ dan $IL\text{-}6^+$. The study was conducted experimentally with randomised complete block design (CRD) consisted of six treatments with six replicates. Group K+ (STZ induced mice + distilled water), Group P1 (STZ + NPK 20 mg/kgBW), Group P2 (STZ induced mice + NPK 30 mg/kgBW), Group P3 (STZ induced mice + NPK 40 mg/kgBW), Group M (STZ induced mice + metformin 130 mg/kgBW) and Group K- (healthy mice + distilled water). Data were tested using one-way ANOVA with a significance level of 5%, and continued with the DMRT test. The results showed that the administration of pegagan nanoparticles coated with chitosan can significantly ($p<0.05$) affect the profile of CD4+ TNF-α+ , CD8+ TNF-α+ , CD4+ IFN-γ+ and CD8+ IFN-γ+ and IL-6 in the dose treatment of 20 mg/kgBW, 30 mg/kgBW and 40 mg/kgBW. The treatment dose of 20 mg/kgBW can reduce CD4+ TNF-α+ , CD8+ TNF-α+ , CD4+ IFN-γ+ , CD8+ IFN-γ+ as in healthy mice (K-) and a dose of 30 mg/kgBW can reduce IL- 6+ as in healthy mice (K-). These findings suggest that chitosan-coated pegagan nanoparticles may hold promise as therapy for diabetes mellitus, as they have the potential to modulate the immune response associated with chronic diabetes.

Keywords: $CD4^+IFN\text{-}\gamma^+$, $CD4^+TNF\text{-}\alpha^+$, $CD8^+IFN\text{-}\gamma^+$, $CD8^+TNF\text{-}\alpha^+$, $IL\text{-}6^+$, immune system

Alleviation of the adverse effects of salinity in food crops: a study of salt-tolerant Trichoderma application on groundnut

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Abstract. Soil salinity has become one of the major concerns in agriculture due to its adverse effects on crops. Many physiological and biochemical processes are affected by this abiotic stress, causing poor nutrient uptake and disturbance in photosynthetic pathway, therefore, affecting plant vigor as well as vegetative and generative growth. Previous studies showed that groundnut growth was affected by soil salinity and the worst negative effects in the crops occurred in groundnut grown in high salinity levels. Beneficial microbes including Trichoderma were also affected by salinity and the response of each species was different based on our previous research. The genera of Trichoderma have been used to reduce biotic and abiotic stresses in many plants. Their antagonistic activities against plant pathogens including hyperparasitism, fungal lytic enzyme production, antibiotic and volatile organic compound production have been utilized as biological control agents. Research activities to select Trichoderma isolates tolerant to salinity have been conducted. The ability of Trichoderma to alleviate abiotic stress particularly in groundnut cultivated in saline soil will be discussed, including screening of salt tolerant Trichoderma *in vitro* and field application of the selected salt-tolerant Trichoderma on groundnut crops.

Keywords: abiotic stress, microbe, groundnut, salinity, Trichoderma

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ADVANCED MATERIAL FOR ENVIRONMENTAL TECHNOLOGY

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The hydrothermal effect of time and temperature on the synthesis of carbon dots (cds) from chicken feathers

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Abstract. Carbon dots (CDs) are carbon-based nanoparticles with a predominantly zero-dimensional structure and a diameter of typically less than 10 nm. CDs are desirable due to their high stability, low toxicity, high solubility in water, and easy synthesis methods. The hydrothermal method is extensively used in the synthesis of CDs because it is simple, environmentally friendly, then particle size and shape can be controlled by initial materials and various hydrothermal conditions. This research involved the synthesis of CDs from poultry chicken feathers with hydrothermal time and temperature variations of 160 °C, 180 °C, and 200 °C, and treatment durations of 5 and 7 hours. The results indicate that the yield of CDs increased with the higher hydrothermal temperatures. The C-dots emitted a blue light when stimulated by ultraviolet light and the band gap values of the CDs ranged from 3.9 eV to 3.28 eV.

Keywords: Carbon dots, hydrothermal, chicken feather

Flat-pack furniture design with biocomposite material of empty palm oil bunches (efb) using the micelium matrix

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Abstract. Based on data from the United States Department of Agriculture (USDA), Indonesia is the largest palm oil producing country in the world in 2022, with Indonesia contributing 58.9% of the world's total palm oil production. It is known that for 1 ton of oil palm produces waste in the form of empty palm fruit bunches (EFB) as much as 23% or 230 kg. To produce environmentally friendly biocomposites, an environmentally friendly matrix is required, one of which is using mycelium which can create a strong fiber network and is 100% biodegradable. Based on research results, mycelial hyphae that grow rapidly can repair cracks in the product structure. This study uses the Material Driven Design (MDD) method which is a systematic design method with new innovative materials that have never been used before. The Flat-pack Furniture prototype then goes through a testing process using the Universal Testing Machine (UTM). From the results of the compressive strength test it can be seen that the maximum compressive strength of the mycelium can reach a value of 12.37 MPam or equivalent to 126.14 kgf/cm². This value meets the ANSI/BIFMA X5.1-17 test standard which applies the chair furniture test to a load of 102 kg.

Keywords: Biocomposite; EFB; flat pack furniture; material driven design; mycelium)

Implementation of Single Objective Particle Swarm Optimization Algorithm to Determine the Optimal NPC Route in Game

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Abstract— The determination of the optimal route for NPC towards players plays a pivotal role in game scenarios, as it enhances the competitiveness of the game. This research aims to elucidate the assessment of the effectiveness level of optimization algorithms in the discovery of the optimal route for NPCs towards players. Among the optimization algorithms employed in this study, Single Objective Particle Swarm Optimization stands out. The algorithm is utilized for resolving optimization problems through the simulation of the collective movement behavior of insects and birds in a colony. Each individual particle within the colony represents a potential solution to the problem at hand. A comparative analysis will be conducted between PSO and two alternative algorithms, namely bee colony optimization and ant colony optimization. This analysis will consider three testing parameters: the duration required for NPCs to find a route towards players, the duration required for NPCs to find a route towards players while navigating obstacles, and usability evaluation of the researched game. The findings demonstrate that the single objective particle swarm optimization algorithm proves to be the most effective when compared to bee colony optimization and ant colony optimization in determining the optimal route for NPCs towards players.

Keywords— Ant Colony Optimization, Bee Colony Optimization, Game, NPC, Optimal Route, Single Objective Particle Swarm Optimization.

The effect of graphite oxide derivate from spent coffee grounds addition in rgo-tio2 composite as photocatalyst

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Abstract. In this research, the synthesis of Graphite Oxide (GO) from spent coffee grounds was carriedout, which was then composited with TiO2 using the hummer method modified by marcano. rGO doped with titanium dioxide semiconductor material is the most widely used material in photocatalyst application. The addition of GO to the rGO-TiO2 composite is expected to improve the performance of the sample as a photocatalyst material. The preparation of the rGO-TiO2 composite was conducted using the in-situ sol-gel method with variations in the addition of GO of (0, 4, 12 mg). This study also used microwave radiation for 20 minutes to assist the changes from GO to reduced Graphene Oxide (rGO). The samples obtained were then tested using X-Ray diffraction (XRD), The Fourier Transform Infra-Red (FTIR), and Ultra Violet-Visible Spectroscopy (UV-Vis). To determine the photocatalyst performance of the samples, a photodegradation test was performed using Methylene Blue as a pollutant.

Keywords: Graphite Oxide, reduced Graphite Oxide, rGO-TiO2, spent coffee grounds, photocatalyst

Photodegradation activity of remazol yellow fg using tio2-fe material with variation of irradiation time and mass of the photocatalyst

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Abstract. Remazol Yellow FG is a dye that pollutes the aquatic environment and is dangerous for aquatic ecosystems. This dye has an azo group (-N=N-), which is carcinogenic and toxic. The waste photodegradation method treats waste with the help of light using a photocatalyst material to produce simple compounds. The material used is TiO2-Fe, which was synthesized using the sonication method and characterized using XRD, XRF, and UV-Vis/DRS Spectrophotometer. The photodegradation activity test uses variations of irradiation time and the photocatalyst mass. The TiO2-Fe that has characterized XRD indicated an anatase crystal structure. XRF characterization shows that the addition of dopant will reduce the percentage of Ti element because it replaces Fe element as dopant with the percentage before and after the doping process is 99.12% and 96.57%. Meanwhile, the results of the characterization of UV- Vis/DRS yielded data on the energy gap value of the TiO2-Fe, which was 2.91 eV. The optimum results of photodegradation for 120 minutes in visible light irradiation at variations of photocatalyst mass of 250 mg with a degradation value of 50.82%, while the optimum irradiation time there were 240 minutes with a degradation value of 57.71%.

Keywords– TiO2-Fe, Sonication, Remazol Yellow FG, Photodegradation, Semiconductor

Optimizing Moisture Protection in Wood Using Hematite Pigment: Swelling Analysis and Surface Evaluation

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Abstract. Wood, renowned for its high hygroscopicity, demonstrates a substantial water-absorption capacity. Elevated ambient humidity levels can lead to expansion, necessitating the application of pigments to alleviate water absorption and minimize degradation. Hematite pigment, recognized for its robust UV resistance and outstanding hiding power, is a protective coating on wooden beams to mitigate swelling. Swelling tests are conducted on wooden beams treated with hematite pigment occurring immersion process, followed by comprehensive characterization employing FT-IR and SEM-EDS techniques. The outcomes of the swelling tests reveal a significant reduction in the size of the hematite-treated wooden beams, resulting in a marked decrease in swelling capacity. SEM-EDS analysis highlights substantial modifications on the wood's surface, with untreated wood displaying a porous surface, while pigmented wood showcases a surface cloaked in aggregate-like clusters. This implies that applying hematite pigment effectively impedes water absorption and establishes an efficient protective layer on the wood, diminishing its inclination to bond with hydrates. FT-IR analysis identifies four prominent absorption bands at specific wavenumber ranges, 3364 and 1630, corresponding to O-H stretching. At 535 and 463 cm-1 corresponding Fe-O bonding. These findings offer invaluable insights into the molecular interactions between hematite and wood.

Keywords: Wood, hematite pigment, swelling, water-absorption.

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ENVIRONMENTAL SCIENCE

Effect of storage time and soaking of natural growth regulators on True shallot seedling

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The purpose of this study was to determine the effect of length of storage and soaking of coconut water growth regulators on TSS shallot seedling. The research was conducted in Torongrejo Village, Junrejo District, Batu City from April to May 2023. The experiment used a simple randomized block design (RBD) with the following treatments: The first factor is the freshness of young coconut water consisting of 4 levels, namely S0 = fresh/not stored young coconut water, S2 = young coconut water stored 2 days at room temperature and S3 = young coconut water stored 3 days at room temperature. Factor II was the soaking time for TSS consisting of 3 levels, namely P1 = TSS soaked for 1 hour, P2 = TSS soaked for 2 hours, and P3 = TSS soaked for 3 hours. The results showed that coconut water's natural growth regulators contain many substances that help plant growth, including the hormones auxin, cytokinins, and gibberellins, so that their effectiveness depends on the length of time the coconut water has been soaked and the coconut water's shelf life. If the coconut water is stored longer, the soaking time will be shorter, namely 1 hour, and if the coconut water is stored, the time required is shorter.

Keywords: storage time, natural growth regulators, TSS

TSSDiversity and Infestation of Mistletoes in Cultivation of sengon (Falcataria moluccana (Miq.) Barneby&J.W.Grimes) in Malang Regency East Java Indonesia

Solikin

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Abstract. Mistletoes are hemiparasitic plants growing in the wild and cultivation plants such as sengon (Falcataria moluccana). Research aimed at inventing the diversity and infestation of mistletoes was conducted in cultivation areas of Sengon in Malang Regency East Java Indonesia from September – December 2021. Data on mistletoes and their hosts was collected by exploratory and descriptive methods in ten districts and twenty villages. Purposive sampling was used and determined along tracks in line transects where Sengon cultivation was found. Sample plots of 10x10 m were determined and made in each pattern of cultivation to enumerate the number and species of trees and mistletoes, and to measure the diameter of stems. The results showed that there were only two species of mistletoe discovered in sixteen cultivation patterns of sengon namely *Scurrula atropurpurea* (Blume) Danser and *Viscum ovalifolium* L. *S. atropurpurea* was the most dominant mistletoe in cultivation of Sengon with parasite number of 906 individuals. The highest number of trees, infested trees, and mistletoes were obtained in the monoculture pattern of Sengon. The highest severity index of mistletoe infestation was found in tangerine citrus + Sengon, i.e., 15. The average value of SI in all cultivation patterns was categorized as low, i.e., 5.28.

Key words: diversity, *Falcataria muloccana*, infestation, Malang, mistletoe

Application of life cycle assessment in measuring the environmental impact of waste cooking oil utilization for biodiesel – a review

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Abstract. Utilizing waste cooking oil for fuel is one of the steps to reduce the uncontrolled environmental impact due to the disposal of waste cooking oil into water bodies and onto the ground. Utilization as fuel will contribute to achieving net zero emissions and reducing global warming as the primary target. With increasing attention to the environment, the extent to which the process of making waste cooking oil impacts the environment has also been widely discussed. Using the Life Cycle Assessment (LCA) methodology as a strong tool to assess the environmental impact, many previous studies have carried out the environmental impact concerning waste cooking oil utilization for biodiesel. This paper reviews previous research from around the world in the 2008-2023 period related to the environmental impact assessment of using LCA in manufacturing waste cooking oil for biodiesel. The review results are divided into scope and technology used, manufacturing raw materials, research locations, functional units, system boundaries (cradle to grave, gate to gate, and gate to grave), software used, midpoint impact assessment, impact assessment method, and impact category.

Keywords: biodiesel, environment, life cycle assessment, utilization, waste cooking oil

Study of interception, throughfall, and stemflow on seven types of *Syzygium* sp. tree collected by purwodadi botanical garden

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Abstract. Syzygium genus is one of the abundant and naturally growing collections of Purwodadi Botanical Garden (KRP) with characteristics strong and deep rooting with branching and complex crowns. So it has the potential to support water and soil conservation by reducing erosion and kinetic energy of rainwater to the ground. This study aims to determine the value of interception, throughfall, and stem flow in seven types of Syzygium sp. trees in the KRP collection. The research was conducted from January to February 2023 with the method of measuring tree physical factors, collecting, and calculating rainfall data, throughfall, stemflow, and interception values. The results of the study during 25 rainy days on seven types of Syzygium sp. trees showed that the value of throughfall ranged from 10.86 - 15.30 mm with the highest on Syzygium malaccense trees with dangling branching. The stemflow value ranges from 0.04 - 0.91 mm with the highest in Syzygium acuminatisimum trees whose stems grow upright. While the interception value ranged from 2.3 - 5.8 mm with the highest in Syzygium polycephalum trees whose branching away from the ground surface. The variation values obtained is influenced by the characteristics of the branching crown of each tree.

Keywords: Interception, Purwodadi Botanical Garden, Stemflow, Syzygium, Throughfall

Liquid organic fertilizer effectiveness test and the combination with chemical fertilizer on maize to increase yield in dry land

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Abstract. The aim of the research was to examine the effectiveness of Liquid Organic Fertilizer (LOF) combination with chemical fertilizer on maize to increase yield in dry land. The research was conducted from May to October 2018 in Kediri Regency. The research used a RBD with seven treatments and four replications, namely were: A = Control; B = RRCF; C = 6 l LOF ha-1; D = ¾ RRCF + 3 l LOF ha-1; E = ¾ RRCF + 6 l LOF ha-1; F = RRCF + 3 l LOF ha-1, and G = RRCF + 6 l LOF ha-1. The data were analyzed by ANOVA using SPSS 2.2 software, and result further tested using DMRT at 5% significance level. The addition 6 l LOF ha-1 with RRCF (G), seeds yield of maize reached 8.44 tons ha-1 it yield was higher than the treatment of 3 l LOF ha-1 with RRCF (F) which was 7.85 tons ha-1. The calculation of the RAE value showed that treatment G obtained the highest RAE value of 139.46%, while the second highest RAE value was obtained for treatment F of 119.73%.

Key words: LOF, chemical fertilizer, maize, yield, RAE

Synthesis and Characterization of $Bi_4Ti_{2.95}Fe_{0.05}O_{12}$ Thorough the Molten Chloride Salt Method

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Abstract. It is well known that the morphology and particle size of the photocatalyst material affected the photocatalyst activity. One of the synthesis methods that can produce uniform morphology and particle size is the molten salt method. Many factors affect the particles morphology and size such as temperature synthesized, salt type, mol ratio sample/salt and time synthesized. In this study, Bi4Ti2.95Fe0.05O12 photocatalyst compound was synthesized using the molten salt method and used chloride salt, NaCl, KCl, and a mixture of NaCl/KCl. The influence of chloride salt type was studied using X-ray diffraction (XRD), scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS), and ultraviolet-visible diffuse reflectance spectroscopy (UV-Vis DRS). The diffractogram shows Bi4Ti2.95Fe0.05O12 successfully synthesized; however, the samples synthesized by single salt NaCl have impurity that is Bi2Ti4O11, Bi2O3, and TiO2. In addition, the diffractogram sample showed no effect of salt type on crystallinity. SEM images show all samples have a plate-like morphology, but using NaCl salt produces larger particles. The results of calculations of UV-Vis spectra by the Kubelka-Munk equation show that the band gap energy Bi4Ti2.95Fe0.05O12 is in the range of 2.21-2.29 eV

Keywords: Bi4Ti2.95Fe0.05O12, molten salt method, chloride salt

Identification of microplastics in digestive tract of milkfish (*Chanos chanos*) in sedati district ponds, sidoarjo regency

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Abstract. The problem of plastic waste in Indonesia has the potential to cause damage to aquatic ecosystems. Plastic waste in water will be degraded for a long time by various processes into microplastic particles. The pond ecosystem has the potential to be contaminated with microplastics through the use of river water and activities in the pond itself. This study aims to identify microplastics in the digestive tract of milkfish (*Chanos chanos*) in Sedati district ponds, Sidoarjo regency. This research is a type of quantitative descriptive research with exploratory methods. Sampling was carried out at two locations, namely traditional and semi-intensive ponds. The research procedures carried out were location determination, sampling, sample destruction, microplastic type identification, and data analysis. The research results obtained were types of microplastic fibers, fragments, and films found in the digestive tract of milkfish in traditional and semi-intensive ponds. The highest abundance of total microplastics in milkfish digestion samples was found in Traditional Ponds with an abundance value of 12.4 particles/individual and Semi-Intensive Ponds with an abundance value of 11.5 particles/individual. The types of plastic polymers found include Nylon Polyamides, Polyvinyl chloride (PVC), and Low-Density Polyethylene (LDPE).

Keywords: Microplastic, Milkfish, Semi-Intensive, Sidoarjo, Traditional.

Diversity of plant morphological characters of several superior and local varieties of garlic in various agroecological types

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Abstract. Since 2017, the government has determined garlic (Allium sativum L.) as a priority vegetable commodity. Support for the varieties selection is needed in garlic development areas with various agroecologies. There were 7 varieties of garlic (Lumbu Hijau, Lumbu Kuning, Lumbu Putih, Tawang Mangu Baru, Sangga Sembalun, Geol and Kusuma) planted in Batu, Malang, Pasuruan, Probolinggo and Mojokerto areas. Research activities related to the diversity of plant characters include leaves, tubers and cloves were conducted from 2022 to 2023 with descriptive data processing method. The varieties currently being developed were able to compete with imported garlic. Lumbu Kuning from Sumber Brantas, Batu has a weight of up to 12.9 gr per clove, 100 cloves weight 372.8 gr with around 2-10 cloves per tuber. Meanwhile, Lumbu Hijau from Pujon, Malang has a weight of 4.4 gr per clove, 262.3 gr per 100 cloves and the number of cloves per tuber is around 2-10. Imported garlic has a weight per clove of up to 6.7 gr, 311.6 gr per 100 cloves, and the number of cloves per tuber is 7-13. The plants performance also differ between varieties and tends to be different in quantitative characteristics according to the method of cultivation and agroecology.

Keywords: Character, plants, leaves, bulbs, garlic, varieties, agroecology.

Leaf functional traits and root forms in mangrove ecosystems: studying adaptive strategies among major, associate, and minor mangrove types

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Abstract. The mangrove ecosystem is a highly dynamic and ecologically significant coastal habitat. This study aimed to investigate the leaf functional traits and root forms in three different mangrove types, aiming to gain a deeper understanding of their ecological importance and potential adaptive strategies. We selected two representative mangrove species from the major, associate, and minor types present within the habitat. The results showed there were variations in leaf functional traits and root form among the studied mangrove types. Major mangrove species exhibited higher leaf mass per area and chlorophyll content, indicating efficient light capture and photosynthetic capacity. In contrast, associate mangrove types demonstrated intermediate values, indicating adaptability across environmental gradients. In addition, there were six different root forms found in the three types of mangroves. The diversity of leaf functional traits and root forms among major, associate, and minor mangrove types underscores species-specific adaptations and ecological strategies influenced by zonation and environmental conditions. Understanding the adaptive strategies of various mangroves contributes to comprehending their ecological roles and resilience in coastal environments.

Keywords: adaptation, leaf functional traits, mangrove, root forms

Utilization of Aloe Vera as a Biocoagulant for Turbidity, Total Dissolved Solid (TDS), and Iron (Fe) Removal in Well-water

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Abstract. Well-water contains several contaminant loads that need to be removed before use, such as turbidity, TDS, and Fe metal. One method of well-water treatment is coagulation. Aloe vera has the potential to be an appropriate coagulant because it contains polygalacturonic acid, carboxyl groups (-COOH), and amide groups (-NH) that can help increase coagulation efficiency. The purpose of this study was to analyze the removal efficiency of turbidity, Fe metal, and TDS using aloe vera extract with HCl and H2O solutions. The coagulant doses used were 0,5 ml, 1,0 ml and 1,5 ml, with fast stirring at 120 rpm for 1 minute while slow stirring was carried out at 30 rpm for 10, 20, and 30 minutes. In the extraction of aloe vera with HCl solution, the optimal dose and slow stirring time were obtained as 0,5 ml and 10 minutes for turbidity, 0,5 ml and 20 minutes for TDS and 1 ml and 10 minutes for Fe metal with efficiencies of about 96,99%, 8,05%, and 70,85%, respectively. In the H2O solution, the optimal dosage and slow stirring time were 0.5 ml and 10 min for turbidity and TDS with efficiencies of 91,76% and 3,09%, respectively. For Fe metal, the optimal dose and time were 1,5 mL and 20 minutes with a removal efficiency of 6,39%.

Keywords: Aloe vera, Coagulation, Flocculation, Well-water

An indonesian adaptation of the igroup presence questionnaire (ipq) for assessing user's sense of presence in virtual environment

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Abstract. Technological capabilities in creating virtual environments have been growing and can be used by organizations in Indonesia as an option to replace the real environment for their activities. As a substitute for the real world, the sense of presence in the virtual world needs to be measured by evaluating the sense of presence from the user's perspective. One of the most widely used evaluation methods is the Igroup Presence Questionnaire (IPQ). Although it has been widely used, the languages currently available are German, English, Dutch, French, and Japanese. We adapted the English IPQ to the Indonesian version using cross-cultural adaptation and reliability testing. The Indonesian version of the IPQ questionnaire is expected to assist practitioners and researchers in evaluating the sense of presence of the technology they are developing. The Indonesian adaptation of IPQ was 0.826, which concludes that this version is reliable to be used by practitioners and researchers.

Collapse Analysis of Weathered Rock Layers at the Level of Slide Based on the Uniaxial Test

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Abstract. The rock weathering process is characterized by a change in the characteristics of the rock to become soil; this process produces chemical and physical transformations in the rock mass, which can decrease the strength and stability of the soil and affect the process of rock collapse. This study aims to determine the effect of the degree of saturation and weathering on the maximum compressive strength, safety factor, and slope failure line. This study used the Uniaxial Compressive Strength method based on variations in saturation with 20 test specimens taken from three locations in Payung, Batu City. The sample consisted of three types of rock, breccia, clay, and lapilli, with 5 variations of saturation time of 0-8 minutes. The results of the analysis were processed using the Hoek-Brown and Mohr-Coulomb correlation equations to obtain the internal shear angle and cohesion values as the basis for determining the safety factor value, while the slope failure line using the Plaxis 2D program. Based on the compressive strength test results, in the first condition of immersion, the sample tends to experience a drastic decrease in strength; this is linear, with the number of landslide events increasing at the start of the rainy season.

Keywords: 2D Plaxis, Degree of Saturation, Rock Weathering, Safety Factor, Uniaxial Compressive Strength.

Identification of medicinal plants for reproductive health in dempo barat village, pasean district, pamekasan regency

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Abstract. Plants are a source of biodiversity, among which there are medicinal plants. People use medicinal plants because they are considered safer than modern medicine. The purpose of this study was to determine medicinal plants for reproductive health which are used as herbal medicine by the people of Dempo Barat Village. Dempo Barat is one of the villages where the community still practices herbal medicine using plants as medicine, one of which is for reproductive health. This research was conducted in December 2022. The method used in this study was an exploratory survey method, namely interviews and direct field observations with 10 respondents. Based on the results of the study, 11 types of plants were used as medicine, namely betel, turmeric, meniran, beluntas, areca nut, jasmine, tamarind, soursop, basil, curcuma, and garlic. Plant organs used are leaves, flowers, fruit, rhizomes/roots, and tubers. 11 types of plants found a way of processing boiled and soursop can be boiled and pounded. Diseases that are cured for vaginal discharge, irregular menstruation, postnatal care, urination, anti-cancer, increase vitality, menstrual pain, vaginal cancer, premature ejaculation, increase male stamina, tighten genital organs, and fertility.

Keywords: herbs, medicinal plants, reproductive health

Study on the Potential of Indonesian Medicinal Plants as Aphrodisiacs

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Abstract. Sexual dysfunction is one of the health problems that require serious treatment because it can impact the quality of human life. Various medical treatments have also been developed to overcome these problems. However, most people tend to choose treatment independently by utilizing traditional medicinal products in the market and empirical ingredients that are believed to be efficacious. Most of the traditional medicinal products or empirical ingredients for treating sexual dysfunction problems today are plant-based and thought to have aphrodisiac effects. However, not all these plant species have been scientifically proven to have the potential as aphrodisiacs. This article aims to study scientifically the various types of plants that have been used, both components of traditional medicinal products on the market or empirical ingredients. The study results are expected to be scientific support for the development of these plant species as raw materials for traditional medicines for sexual dysfunction until they are produced on an industrial scale. This study was conducted by first analyzing various medicinal plants listed in the Natural Medicines List book and the Research Database for Medicinal Plants and Herbs (RISTOJA) belonging to the Indonesian Ministry of Health. Next, examine some of the scientific literature obtained through electronic database portals such as Google Scholar, PubMed, and Research Gate using the keywords of each species of medicinal plants, aphrodisiacs, and sexual dysfunction with a publication period of up to August 2021. Several plant species are known to have the potential to treat sexual dysfunction, and the presence of significant pharmacological activity evidences this, although in general, it is still limited to pre-clinical research. Empirical and scientific evidence offers new hope for further development into traditional medicinal products beneficial to society.

Keywords: aphrodisiac, medicinal plants, sexual dysfunction, traditional medicine

Study of flies behavior as a parameter of the impact of toxic compounds on living things

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Abstract. Various toxic compounds still often contaminate the environment and food of living things to this day. Drosophila is often used as a model organism to study the negative effects of exposure to toxic compounds on organisms. The purpose of this systematic literature review (SLR) is to analyze the distribution, contribution, and gap analysis of studies reporting the effect of toxic compounds on behavior in Drosophila. A total of 57 Scopus indexed articles that met the inclusion and exclusion criteria were successfully collected for analysis. The three countries that most frequently research Drosophila behavior are the US, the UK, and China. A total of 5 clusters resulted from the results of bibliometric analysis. Various behavioral studies have included developmental variables, gene expression, and Circadian, to the endocrine system. Toxic compounds that are often studied generally come from the group of metal compounds. On the other hand, multigenerational studies to analyze the long-term effects of toxic compounds and the plasticity of phenotypic changes into gap analysis have been successfully identified.

Keywords: Drosophila behavior, Drosophila melanogaster, Toxic assay, Toxicity.

Utilization pome as growth substrate for local indigenous bacteria *Bacillus* sp. alp d1 in producing biosurfactant

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Abstract. Biosurfactant is a secondary metabolite product that can be produced by microorganisms. This study aims to obtain biosurfactants from the local bacteria Bacillus sp. ALP D1 by utilizing POME as a growth substrate. The steps are the production of the biosurfactant extraction using the acid precipitation method and characterization of the biosurfactant using TLC, FTIR, and LC-MS. The results showed that the local indigenous bacteria Bacillus ALPD1 can produce biosurfactant under conditions of growth of POME 3%, NaNO3 3%, pH 6, salinity 7% with an IE24 of 69.44%, diameter of oil spreading test at 8.5 cm, and positive at drop collapse test. The extraction stage produces a brownish-yellow crude extract of 0.068 g/L. Biosurfactant characterization using TLC showed pink spots with ninhydrin reagent indicating the presence of nitrogen groups from peptide in the biosurfactant. This is supported by the results of FTIR analysis with the presence of an N-H peak from the peptide group in the absorption area 3384 cm-1. The results of the LC-MS analysis showed that the biosurfactant obtained had Rt 14.64 minute and 332 m/z. Based on the results, it is suspected that the biosurfactant produced by Bacillus sp. ALP D1 is a lipopeptide.

Keywords: Biosurfactant, Bacillus sp ALP D1, FTIR, LC-MS, Lipopeptide, TLC, POME

Analysis of library accessibility for disabilities in the public library in Malang city based on ifla standards

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Abstract. This study aims to determine and analyze the accessibility of persons with disabilities at the Regional Public Library and Archives Service in Malang City. The research method used in this study is a descriptive qualitative research method with a case study approach. The data collection techniques used were observation, interviews, and documentation studies. The form of government support to uphold equal rights among people with disabilities is by issuing Law No.28/2002 concerning Buildings and Minister of Public Works and Public Housing Regulation No.30/PRT/M/2006 concerning Technical Guidelines for Facilities and Accessibility to Buildings and the Environment which states that every public building to meet accessibility standards as regulated by the Government. As one of the public institutions engaged in the information sector, the Malang City Regional Library and Archives Service has tried and attempted to improve its services so that it can be used by all groups, from children, adults, parents to people with physical limitations or intellectual abilities. sensory and mental like people with disabilities. Overall the Public Library and Regional Archives Service for Malang City has implemented library accessibility for disabilities based on IFLA standards although its implementation is still focused on blind and physically disabled people.

Keywords: Disabled accessibility; Library; Public Library

Optimizing library service of lapas iia Malang city through library collaboration strategy

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Abstract - Class II A Penitentiary Library in Malang City is a literacy facility for prisoners in the Correctional Institution environment. The Malang City Class II A Penitentiary Library has a lot of potential that can be developed due to the high enthusiasm of reading by the inmates at the Malang City Class II A Penitentiary. However, the high interest in reading is hampered by the lack of existing facilities. Therefore, it is necessary to optimize the library services of the Class II A Correctional Institution in Malang City through a collaborative strategy. The purpose of this study was to formulate service optimization and appropriate cooperation strategies in the library of the Class II A Women's Correctional Institution in Malang City. The method used in this research uses a descriptive method through a qualitative approach. The data obtained by researchers came from observations, interviews and literature studies. The results obtained from this study are an analysis of collaborative design that can be carried out by the library of the Class II A Women's Correctional Institution in Malang City based on aspects of policy, correlation, human resource development, cross-service and information technology. The collaboration that has been carried out by the Malang City Class II A Correctional Institution library with the National Library, UMM, the Library Service of Malang City and East Java Province, and PKBM Ki Hajar Dewantara.

Keywords: Malang City Class II A Penitentiary, Library Collaboration, Library Services

Biomonitoring of heavy metal pollution using bioindicator ectoparasite *Octolasmis* spp. in blue swimming crab lekok beach pasuruan

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Abstract. Bioindicators are species whose presence or absence can be used to provide a qualitative assessment of the level of environmental health and biogeographic changes, especially heavy metal pollution in the aquatic environment. One group of organisms that can be used as bioindicators of heavy metals is the ectoparasite Octolasmis spp. which infects crabs. Lekok coastal waters are one of the areas that become a large capture fishery center in Pasuruan Regency that flanked by several anthropogenic centers exerts the influence of heavy metal contamination accumulated in crabs. This study aims to determine the content of heavy metals Fe, Cd and Pb in crabs and determine the potential of Octolasmis spp. as a bioindicator of heavy metals. The crab sampling locations are at three stations, located adjacent to residential areas, and fish auction sites, and power plants. This study used purposive sampling methods, heavy metal analysis using AAS, and calculation of Octolasmis spp. infestation which includes prevalence, intensity, and abundance. The results showed that Octolasmis spp. has the potential to be used as a bioindicator of heavy metal accumulation by looking at the value of parasite infestation which is directly proportional to the level of heavy metal accumulation in crabs.

Keywords: Bioindicator, heavy metal, *Octolasmis* spp.

The Relationship between Mangrove and Bivalves Abundance in Cengkrong Beach, Trenggalek Regency

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Abstract. Cengkrong Beach in Trenggalek Regency has extensive mangrove forest. Mangrove forests play an important role in maintaining aquatic productivity and supporting people's lives. Bivalvia is one of the biota that lives in mangroves and is used by the people around the mangrove forest. The research aims to identify mangroves and bivalves, analyze the abundance of mangroves and bivalves, and determine the relationship between mangroves and bivalves. Mangrove sampling was carried out on 6 transects. Each transect was made 7 with plots measuring 10 m x 10 m with a distance of 5 m, bivalve samples were taken using a 1 m x 1 m plot with 5 plots in that plot. Research data were analyzed using PAST 4.13. The results of the study found 15 species of mangroves and 4 genera of bivalves. The highest mangrove abundance value was Rhizophora apiculata with a value of 0.0092 ind/m2 and bivalves were of the genus Isognomon with a value of 4.138 ind/m2. The results of the analysis showed that there was a relationship between the mangrove Sonneratia caseolaris and the bivalves of genus Pilsbryoconcha, the mangrove Aegiceras floridum and the bivalves of genus Geloina, the mangrove Avicennia alba and the bivalves of genus Saccostrea and the mangrove Rhizophora apiculata and the bivalves of genus Isognomon.

Keywords: Abundance, Beach Mangrove, Bivalvia, Cengkrong, Diversity

Library anxiety analysis of foreign students at state university of the city of Malang

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Abstract. Anxiety often arises when in the library, including for foreign students who visit libraries in Indonesia. The phenomenon of library anxiety needs to be considered because it can affect the information-seeking process and the use of library facilities by foreign students. This study aims to find out how much the anxiety level of foreign students is when they are in the libraries of the universities that host them, namely the Brawijaya University Library, Malang State University Library, and Maulana Malik Ibrahim State Islamic University Library Malang. Researchers used indicators of user anxiety based on the theory of library anxiety developed by Constance A. Mellon. A descriptive quantitative method was used in this study. In the data analysis stage, the researcher applied grand mean analysis to calculate the average total of several statements on the sub-variables. The results obtained in this study show that the level of anxiety experienced by foreign students in the Library of Brawijaya University, State University of Malang Library, and Library of State Islamic University of Maulana Malik Ibrahim Malang is low.

Keywords: Foreign student; Library; Library Anxiety

The Impact of the Social Inclusion of the Batu City Public Library on the Welfare of the Batu City

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Abstract. Social inclusion activities in the Batu City Public Library are an interesting study today. The implementation of activities that are carried out regularly and attract the interest of the wider community, makes the Batu City Public Library named the best social inclusion-based city library by the National Library of the Republic of Indonesia. This study aims to determine the effect of social inclusion activities in the Batu City Public Library on the welfare of the people of Batu City. The research method used is a quantitative method with sampling techniques using purposive sampling. The data collection techniques used were observation and questionnaires, with a total of 96 respondents. The data analysis carried out is a simple correlation and linear regression analysis using the help of SPSS (Statistical Product and Service Solutions) software version 29. Calculations indicate a coefficiency value of determinations of 0.301. It shows the influence of variable social inclusion (X) activities of 30.1% on welfare variables (Y). The influence given to the variable of social inclusion activities exists but is not great, with 69.9% affected by other factors

Keywords : Community Welfare, Social Inclusion, Training

The diversity of aerial insects in east java coffee agroforestry

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Abstract. Coffee is one of the export commodities in Indonesia. East Java is one of the largest coffee suppliers with land that is widely spread, such as in Malang and Pasuruan Regencies. The agroforestry system is applied in coffee cultivation, the system has different management from plantations for example the use of shade trees which will affect the structure of aerial insect diversity. Aerial insects play an important role in maintaining the balance of the ecosystem. The research objective was to determine the diversity and dominance of aerial insects in coffee agroforestry in East Java. The research method is exploratory, taking aerial insects using a yellow pan trap. The abiotic factors observed were light intensity, wind speed, temperature, and humidity. Data analysis with past 4.03 program. The results of the study found 407 individuals in Dampit coffee agroforestry and 470 individuals in Purwodadi coffee agroforestry. The diversity and dominance index values were found to be the highest in Dampit coffee agroforestry. Meanwhile, Dampit coffee agroforestry also has a higher value on the abiotic factors of the temperature and humidity environment. Meanwhile, Purwodadi coffee agroforestry has the highest score on wind speed and light intensity factors. The differences in the number and types of insects as well as the differences in the diversity and dominance index obtained, explained that the two study sites had differences in abiotic factors and shade trees.

Keywords: Coffee Agroforestry, Diversity, East Java, Insect

The diversity of herpetofauna in utilization land of mount baung natural tourism park, Pasuruan district, East Java

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Abstract. Indonesia has 16% herpetofauna species of the world, with more than 1100 species. The Mount Baung Natural Tourism Park was designated as a Natural Tourism Area by the Minister of Agriculture on September 11, 1980. The herpetofauna in this area is not known for certain. The study aims to determine the species diversity of herpetofauna in the Mount Baung Natural Tourism Park Utilization area. The location was divided into 2 stations, sampling conducted by Visual Encounter Survey. We found 13 species: 7 species of reptiles and 6 of amphibians. The highest amphibian population was Fejervarya cancrivora (38), while the highest reptile's population was Cyrtodactylus marmoratus (30). The value of the species diversity index (H') was 1.914. The species evenness index (E) value obtained was 0.78. The value of the species richness index is 0.092. The average temperature of water and air were 25.50c and 25.50c respectively, the average humidity was 77%.

Keywords: Diversity, Herpetofauna, Mount Baung

Map of potential tsunami inundation hazard on the south coast of Trenggalek Regency, East Java Province

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Abstract. There were earthquakes in 1994 and 2006 which caused a tsunami on the south coast of Java Island. Tsunamis become dangerous when the waves travel inland causing a disaster. The purpose of this study was to map the potential for a tsunami hazard in Watulimo District, Trenggalek Regency. The parameters are slope, surface roughness coefficient, coastline with a tsunami height scenario ranging from 1 m, 2 m, 5 m, 15 m, 27 m and 30 m. With the help of the model builder in the ArcGis software, the area potentially affected by a tsunami is obtained. There are six villages in Watulimo District whose settlements have the potential to be affected by the tsunami. In the 1-2 m wave height scenario, no settlements will be affected. For the 5m scenario, there are three settlement villages affected by up to 20%. Nearly 82% of settlements in four villages were inundated by the tsunami in the 15 m scenario. In scenarios of 27 m and 30 m, the average settlement in six villages is inundated by 76% and 77%. Specifically, for Margomulyo Village, all of its settlements were inundated by this tsunami.

Keywords: Map of Potential, Tsunami, Inundation, Trenggalek Regency.

Hospital infection surveillance using Dashboard Business Intelligence

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Abstract. Background: Patient safety or patient safety is implemented to answer the challenges of Infection Prevention and Control (PPI). In this case, the main goal of Patient Safety is to reduce the risk of Healthcare Associated Infections (HAIs). The impact of nosocomial infections is very severe, especially on the mortality and morbidity of inpatients. Infection reports are monthly, not real-time. This makes supervision poorly run. Goal: develop a web-based infection intelligence surveillance dashboard for hospitals. Method: evolutionary prototype with interview research instruments. Results: Display real-time and routine (daily) visual monitoring reports in monitoring and evaluating the performance of the PPI team. Conclusion: business intelligence dashboards can overcome challenges in presenting surveillance reports at Harapan Anda Tegal Islamic General Hospital. By providing real-time and continuous information, this model can be an effective tool in supervising, monitoring, and evaluating the performance of PPI teams.

Identification of Macrozoobenthos in the Upstream of Welang River, Lawang District, Malang Regency

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Abstract. Welang River is a source of water that is widely used by the community which can change the water quality of the Welang River. Macrozoobenthos are aquatic organisms living in the bottom of water areas or waterlogged areas, which are attached to rocks, and can be bioindicators of water area quality. This study aims to determine the diversity of macrozoobenthos in the Upperstream of Welang River, Lawang District, Malang Regency. This is a quantitative descriptive study. It was conducted from February to April 2023. The sampling technique used is purposive sampling using four stations in Upstream Welang River Lawang District Malang Regency and three repetitions. Samples were taken using a net with a mesh size of 1x1 mm. The results showed that 1067 specimens consisted of 14 orders, 18 families and 21 macrozoobenthos genera, namely *Idiopoma, Hirudo, Physa, Mieniplotia, Gyraulus, Macrobrachium, Poramunautes, Chironomus, Trichocera, Baetis, Caenis, Callibaetis, Oligoneuriopsis, Thiara, Tarebia, Euphaea, Perlodes, Glossiphonia, Sulcospira, Hydropsyche*, and *Polycentropus*. The most common genus found is the genus *Baetis*.

Keywords: Identification, Macrozoobenthos, Welang River

Community perception of bamboo conservation in sulek village, Tlogosari District, Bondowoso Regency

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Abstract. Bamboo is Wrong One plant important economy _ for public rural areas in Indonesia and several developing countries other. Besides important in a manner economy, bamboo too beneficial for environment For protect erosion soil, water conservation as well absorb gas because impact House glass, and release oxygen to atmosphere. Bamboo have role significant For protection And water conservation and ground. Study This reveal about How perception public Village Sulek Subdistrict Tlogosari Regency Bondowoso about conservation environment . Description knowledge And awareness public Village Sulek about conservation environment based on tradition And culture public Village Sulek played a role in conservation environment . Study This use method descriptive-qualitative. Data collection was carried out with interviews, observation, documentation, and studies References results study before. Perception public about conservation environment determined by character, age, individual interests, place stay, and economic motives. Linkages public Village Sulek on tradition And related culture _ with conservation environment it seems always experience improvement. this _ showed with happening a number of business guard sustainability, continuity cooperation with a number of organization And service empowerment environment locally done _ by society. With thus, perception public Village Sulek to tradition And the culture need Keep going improved And preserved as effort conservation environment.

Keywords: Bamboo, Community Perception, Conservation, Kampung Bambu Sulek

Isolation and Morphological Characterization of Trichoderma sp. from Soil Cocoa Plantation

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Abstract. Cocoa is a plantation crop that has an important role in the national economy, one of which is the third rank contributor to foreign exchange in the plantation sector. However, cocoa production in Indonesia tends to decrease due to cocoa rot disease caused by the fungus *Phytophthora palmivora*. One of the biological controllers that can be used is *Trichoderma* sp. which has antagonistic properties against the pathogenic fungus *Phytophthora palmivora*. The methods used in this study were isolation, purification and morphological characterization to obtain pure *Trichoderma isolates*. Isolation of *Trichoderma* sp. from cocoa plantation soil using serial dilution method. *Trichoderma* sp. isolates were obtained then subjected to morphological characterization. Morphological characterization was carried out by observing the growth of *Trichoderma* sp. including colony color, mycelium, and growth patterns. The results of the isolation of cocoa plantation soil samples obtained *Trichoderma* sp. colonies. Trichoderma sp. colonies are characterized by round-shaped colonies and have a dark green color with spreading growth. Characteristics of purified Trichoderma sp. showed the development of white mycelium to greenish by forming concentric rings at 5-6 days of culture. In conclusion, *Trichoderma* isolates were obtained from cocoa plantation soil which can be used as biological control agents.

Keywords: Cocoa, Isolation, *Phytophtora palmivora*¸ *Trichoderma*

Pest-potential organisms on begoniaceae collection of eka karya bali botanic garden

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Abstract. Begonia thrives in shady plantations but can tolerate more sun if the soil moisture is maintained. Therefore, the collection of begonia in Eka Karya Bali Botanic Gardens (BBG) is planted in a greenhouse. This increases the potential damage due to pest attacks. The purpose of this study was to identify the pest-potential organisms on begonia. The research was carried out in April–June 2019 at Begonia Park of BBG using survey methods to identify the pest-potential organisms and their damage symptoms. As a result, five organisms were found as potential pest on begonia. We found three species of insects, i.e. *Spodoptera litura* (Lepidoptera: Noctuidae), *Aleurodicus* destructor and *Bemisia tabaci* (Hemiptera: Aleyrodidae), *Parmarion martensi* (Gastropoda: Ariophantidae), and two species of Gastropods namely *Bradybaena similaris* (Gastropoda: Bradybaenidae). This result could be utilized as a reference to determine the pest-controlling technique on Begoniaceae.

Keywords: Armyworm, Asian cotton leafworm, Gastropoda, identification, slug/semi slug snail, tramp snail, whitefly.

Antibacterial activity of ZnO from zinc nitrat hexahidrat precursor and *Phaleria macrocarpa* (scheff.) boerl fruit extract

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Abstract. This research presents an efficient, environmentally friendly, and simple approach. Green synthesis of ZnO nanoparticles using the precursor zinc nitrate hexahydrate (Zn (NO3)2.6H2O) and a sensitizing agent for the ethanol extract of Phaleria macrocarpa (Scheff.) Boerl. fruit. It also aims to find a photocatalytic material from ZnO synthesized using ethanol extract of Mahkota dewa and test its antibacterial activity against Pseudomonas aeruginosa and Staphylococcus aureus bacteria. The formation and stability of ZnO nanoparticles were proven by Fourier transform infrared (FT-IR) spectroscopy and UV-vis spectroscopy. Functional group analysis (FTIR) showed the presence of O-H bonds, C-H stretching of methylene, aromatic C=C-C, and Zn-O. The results of the Uv-Vis analysis showed that the UV-Vis spectrum of the synthetic material showed that the absorbance value for 30 minutes tended to be stable. The results of UV-Vis spectra analysis showed that ZnO nanoparticles have a high band gap energy value. Antibacterial activity test of ZnO nanoparticles using the ethanol extract of Phaleria macrocarpa (Scheff.) Boerl.) had an inhibition zone of 17.08 mm respectively on Staphylococcus aureus bacteria and 14.26 mm on Pseudomonas aeruginosa bacteria), which allows future contributions to the development of new antibacterials.

Keywords: Antibacterial, Phaleria macrocarpa (Scheff.) Boerl.) fruit extract, Zinc nitrat hexahidrat, ZnO

Analytic network process in traditional market solid waste management in Malang Regency, Indonesia

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Abstract. One type of decision support process assists in decision-making during Multi-Criteria Decision Making (MCDM) is the Analytic Network Process (ANP). ANP can determine the best pattern of sustainable traditional market solid waste management in Malang Regency. The six categories used in ANP analysis consist of environmental impacts (DL), technical operations (TO), regulations (PH), institutions and organizations (KO), financing (P), and community participation (PSM). The weighting results of the criteria that had the greatest weight was the sub-criteria of Strengthening the Active Role of the Community (PSM1) with a limiting weight of 0.058271. The biggest alternative weighting result was scenario 3 (integrated solid waste management). Scenario 3 had a priority with the highest weight of 0.213951. The results of the sensitivity test when all criteria values were changed to 0.999, the value of the alternatives also changed. Changes in alternative weights when the sensitivity test is carried out consisted of 3 sub-criteria that were sensitive to the changes, namely the land pollution sub-criteria (DL2), direct benefits (P4), and operational ease (TO2). This research shows that the use of ANP provides a more efficient decision-making process in traditional market solid waste management.

Effect of NPK Fertilizer and Soil Amendments of Soybean Productivity in Saline Soil

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Abstract. Salinity on agricultural land due to global warming occurs almost all over the world. Salinity stress was harmful to cultivated plants, including soybean. Saline soils require the management of nutrients and water to reduce salt from the soil so that plants can grow optimally. This study aims to obtain effective doses of NPK fertilizer and soil amendments for soybean cultivation in saline soils. The research were conducted during the 2019 rainy and dry seasons in Lamongan and Tuban Regencies, East Java Province, Indonesia. Electrical conductivity (EC) of soil during the growing season was 5-12 dSm-1, with irrigation water was 6-7 dSm-1. The treatment consisted of NPK fertilization, ameliorant gypsum, manure, and straw mulch, which were arranged in a randomized block design, replicated 15 times. The results showed that Anjasmoro variety of soybean productivity on saline in Lamongan Regency during the rainy season was higher (90%) than in Tuban Regency in the dry season. Application of NPK Fertilizer (46 kg N + 108 kg P2O5+ 60 kg K2O ha-1 or 400 NPKS kg ha-1 + gypsum 1.5 t ha-1; manure 2.5-5.0 t ha-1) + straw mulch (3.5 t ha-1) has the potential to increase soybean yield up to 2 t ha-1 on saline soil.

Keywords: amendments, Glycine max, fertilizer, saline soil

Phytochemical constituent and antioxidant activity of *Euchaema cottonii* for eteric methane mitigation

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Abstract. This study aimed to determine the phytochemical content and antioxidant activity of the red sea weed Euchaema cottonii. The phytochemical component of this seaweed can be used as an agent for enteric methane mitigation. The antioxidant can be used to reduce the reaction of free radicals when the animals are in heat stress conditions. The study presented used fresh and oven-dried E. cottonii. The methods of study started with the extracting process of two seaweed samples (fresh and sundried) using 3 types of solutions, namely water, hexane, and dichloromethane (DCM). The phytochemical content was analyzed using spektro-tanat, while antioxidant activity was determined using the DPPH test (1,1-diphenyl-2-picrilhidrazil). The result showed that the extract seaweed E. cottonii contained alkaloid, flavonoid, saponin, and steroid/triterpenoid. The seaweed did not contain tannin. The seaweed contains 0.249 to 2.430 mg TAE/gram of total phenolic. Based on the results of the antioxidant activity test using DPPH obtained extract seaweed E. cottonii is active as an antioxidant. The highest phytochemical and phenolic content resulted when the dried seaweed was extracted using the DCM. It is concluded that sea weed E. cottonii contains some phytochemicals and has an antioxidant activity.

Keywords: red seaweed, *Euchaema cottonii*, enteric methane, phytochemical, antioxidant

Water quality monitoring of Welang river basin

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Abstract. The Welang watershed located in three districts/cities: Malang Regency, Pasuruan Regency and Pasuruan City, is a priority watershed for the East Java Provincial authority. The Welang watershed influenced by various human activities. This activity impacts the hydrology of the watershed, one of which is related to river water quality. The purpose research is to determine the current water quality in the Welang watershed. The research was conducted in 2022-2023 using random purposive sampling for environmental parameters (sunlight intensity, humidity and air temperature) and water quality parameters (water temperature, pH, TDS and 14 other chemical parameters). The results of this research, the Welang river upstream on the Arjuno and Bromo sides, contain chlorine (Cl), bromine (Br), iron (Fe), lead (Pb), nitrate (NO3-), nitrite (NO2-), fluoride (F-) and carbonate (CO32–). The middle part of the Welang river now has predominantly the same content, although no iron (Fe), but cyanuric acid ($C_3N_3(OH)_3$). Meanwhile, chlorine (Cl), copper (Cu), lead (Pb) and fluoride (F-) were found in the lower reaches of the Welang river.

Keywords: water resources, management hydrological, water test strip, river basin

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Operation-driven modeling of depot charging station for electric bus rapid transit (ebrt) power demand projection for the new capital city of indonesia

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Abstract. The use of electric mobility (e-mobility) for urban eBRT is expanding globally as more carbon abatement backend technologies are put into practice. Supportive electric power build-up capacity and adequacy readiness infrastructure must be accurately prepared or reconfigured to accelerate the sector's decarbonization. However, due to the integration of new technologies, which has never been done before, the unavailability of historical data gathered from practical field data or artificially-generated data is likely unavoidable. Meanwhile, using as-built data referring to other countries or common presumptions is becoming problematic due to the high possibility of mismatches and uncertainty variables of the diverse scenario-related, which could lead to oversights and, thus, investment misconduct. Therefore, we construct a model replicating operation-driven eBRT depot charging stations, which focuses on the uncertain domains related to the fleet's attributes, lane destination, and recharging interval based on the predictive Monte Carlo model (PMCM) to generate time series charging demand required in the early stage of infrastructure expansion within the logical and scientific acceptance. The findings provide insights for all relevant actors, i.e., grid planners, stakeholders, and operators, emphasizing the evidence-based research for climate mitigation action toward the 2045 target in Indonesia's new capital city (INCC).

Keyword. *Depot Charging Station, Electric Bus Rapid Transit, Indonesia New Capital City, Power Demand Projection, Predictive Monte Carlo Model*

Improving service quality through customer relationship management using the framework of dynamic model

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Abstract. The number of new students at several educational institutions decreases every year due to competition between educational institutions. To keep new students from decreasing, service improvement is needed. This research applies Customer Relationship Management (CRM) by using the Dynamic framework model to carry out a series of stages in the application of CRM which produces output in the form of Relationship Management. The quality of service provided by the school is measured using Servqual and Importance Performance Analysis (IPA). The data tested ranged from 59 respondents with a margin of error of 10%. With a sample of student guardians, school officials, and alumni. The results of calculations using the servqual method on statement item 18 are ranked first with a gap value of -0.763 so that this statement item is not satisfactory. while on statement item 17 is ranked last with a gap value of -0.034 so that this item must be better maintained. The results of the IPA calculation can be seen in the first quadrant of statement items number 6,7,15,18. Quadrant two statement items number 1,3,9,11,12,14. Quadrant three statement items number 4,5,8. Quadrant four statement items included in quadrant 4 are statement numbers 2,10,12,13,17.

Keywords: Customer Relationship Management, Framework of Dynamic, Service Quality, Importance Performance Analysis

Operation-driven modeling of electric freight and logistic vehicle charging station power demand projection for the new capital city of indonesia

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Abstract. The initial stage of the gradual, ongoing carbon-cutting backend implementations of electric mobility (e-mobility) for urban logistics and on-road freight delivery is surging globally. Redesigning and replanning for supportive electric power infrastructures related to capacity and adequacy readiness requires a reference platform to decarbonize the sector faster. However, the unavailability of historical data (measured in actual operation or synthetic artificially-generated data) is likely inevitable due to new technology integration. Meanwhile, using typical data referring to other countries or generic assumptions is becoming troublesome due to the high possibility of discrepancies and the uncertainty factors of the different act-related, which could lead to miscalculations and wrong-doing investments. Based on that issues, this paper aims to construct a model-driven using the predictive Monte Carlo model (PMCM) to generate the time series of synthetic data on power consumption, imitating operation-driven of electric freight and logistic vehicles (eFLVs) charging stations. The proposed method combines uncertain parameters related to the fleet's properties, designation and coverage routes, and the on-road delivery timeframe within scientific and logical acceptance. Thus, this work is deemed evidence-based research for climate mitigation action for Indonesia's new capital city (INCC) and further enlightens relevant parties, i.e., policymakers, energy planners, and utilities.

Keyword. *Charging Station, Electric Freight and Logistic Vehicle, Indonesia New Capital City, Power Demand Projection, Predictive Monte Carlo Model*

The Impact of Compression Ratio on Performance and Exhaust Emissions in a 100 CC Spark Ignition Engine for Green Technology

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Abstract. The compression ratio has a significant role in vehicle performance. The arrangement of air entering and leaving the combustion chamber is determined by the design of the air inlet and outlet locations. The design of the combustion chamber is crucial to prevent backflow in the remaining combustion air. Backpressure is the emission of gases flowing back into the combustion chamber, causing non-stoichiometric combustion. The purpose of this research is to find the effect of compression ratio on performance and exhaust emissions of motorcycles, especially spark ignition engines. The research procedure begins with a standard piston modification process to get compression ratios of 9:1, 10:1, 11:1, and 12 :1. In order to get uniform weight, pistons with low compression ratios will be equipped with holes at the bottom. Experimental data taken were; dynamometer, gas analyzer, and SFC. An increase in compression ratio causes an increase in vehicle performance in the form of torque and power. The air-fuel mixture is compressed to a smaller volume, leading to increased density. This increased density promotes better flame propagation and faster combustion. When the combustion process is faster and more efficient, there is less time for unburned hydrocarbons to be released into the exhaust gases.

Key words; Spark Ignition engine, Compression Ratio, Combustion

Process optimization and characterization of gold nanoparticle synthesis mediated by *centella asiatica* leaf extract

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Abstract. **Abstract**. One process for synthesizing gold nanoparticles (AuNPs) is called green synthesis. This work synthesized the AuNPs using *Centella asiatica* leaf extract as bioreductor of Au^{3+} to Au^{0}. The green synthesis method was selected for this investigation based on several benefits, including being simple, quick, and affordable. In this study, several pH values, temperatures, and concentrations were used to optimize the green synthesis process. The concentrations were 2%, 4%, 6%, 8%, and 10% at the following temperatures: 25°C, 37°C, 50°C, and 70°C. This optimization uses pH 5 (acid), pH 7 (neutral), and pH 9 (alkaline) as the pH scale. AuNPs synthesized using pH 9 tends to experience aggregation. While Au^{3+} can transform into Au^{0} at pHs 5 and 7, however according to the absorbance data, pH 7 produces the best AuNPs. The results showed that the best conditions for synthesizing AuNPs were at 70 °C, pH 7, and 4% concentration. The UV-Vis spectrum's findings revealed an SPR with a maximum wavelength of 533 nm. The synthesized AuNPs were further characterized using SEM, EDX, and XRD. The chemical elements contained13.6% of Au. The pattern of the synthesized AuNPs forms a pattern according to the Bragg reflection of the gold nanocrystals. Further research could be done on the biosynthesized AuNPs to determine their efficacy for cosmetic use.

Keywords: Centella asiatica, gold nanoparticles, green synthesis.

xImproved Color Attenuation Prior for Kelud Crater Dehazing Process

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Abstract- An image contains degradation due to haze, resulting in contrast reduction and color fading. In this research, a system has been implemented that is able to remove noise, haze effects or can be called dehazing on images of Mount Kelud. Because Mount Kelud is the most active mountain in Indonesia and the images on Mount Kelud are often covered with haze so that it hinders monitoring. In addition, the image contains a number of information that can be used in removing haze, therefore a method has been implemented for the removal of haze from the image, namely the Improved Color Attenuation Prior method, which is a method used in order to remove haze. Where the output results will also be calculated by various calculation methods to find the best value of the image. The results of the improved color attenuation prior method will also be compared with several methods that have been used in the context of haze removal, especially in the case of the crater of Mount Kelud. in terms of image quality and quantity calculation in the image will be compared which one is the most effective. The visual output obtained is an image that has been separated from the haze effect with better quality.

Keywords—Dehazing; Image Processing; Improved Color Attenuation Prior; Kelud Mountain; Noise

Comparative studies on chemically synthesized and biosynthesized zinc oxide nanoparticles using aqueous extract of *Desmodium sp.* and their potential as UV filters

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Abstract. Plant-based synthesis of nanoparticles has been a great interest topic due to reducing the use of toxic materials and the presence of bioactive compounds. This study investigated the green synthesis of zinc oxide nanoparticles using an aqueous extract of *Desmodium sp.* and the chemical synthesis of zinc oxide. These ZnO were characterized using FE-SEM, EDX, XRD, and FTIR. The in-vitro Sun Protector Factor (SPF) was evaluated using a spectrophotometer. SEM image revealed the flower shape morphology of biosynthesized ZnO and chemically synthesized ZnO with different particle sizes. The biosynthesized ZnO nanoparticles exhibited smaller particle sizes than chemically synthesized ZnO. XRD analysis demonstrated that the average crystallite sizes of biosynthesized and chemically synthesized ZnO were 10.34 nm and 15.08 nm, respectively. The biosynthesized ZnO showed an SPF value of 25.12, indicating stronger UV protection ability than chemically synthesized ZnO (SPF=9.72). These results suggested that the biosynthesized ZnO nanoparticles could be a great candidate as a UV filter for further sunscreen formulations.

Keywords: green synthesis, plant extract, ZnO nanoparticles, sunscreen

CTRS: A Recommender System for Culinary Tourism Based on User Ratings

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Abstract. The city of Malang, located in East Java, is recognized for its distinctive climatic and natural features that attract tourists. Spanning across an area of 111.077 square kilometers, the city is segmented into five districts, each replete with its unique culinary attractions. To bolster Malang's revenue stream from its culinary sector, we propose a recommendation system designed to assist tourists seeking to dine in the city. Our research utilizes a Multi Criteria Recommender System (MCRS) which focuses on ten prominent culinary tourist sites within Malang. The MCRS employs a rating system based on six criteria, including an overall rating (R0). These ratings, received from at least three different culinary tourist sites, are stored in a database for future analysis. The ratings are subsequently utilized to compute user similarity, implementing the Adjusted-cosine similarity algorithm. This process yields the highest average similarity score which is further used to rank the sites employing Similarity Average and Aggregate Similarity methodologies. Consequently, the system generates a set of five top-ranking recommendations that are deemed most relevant to the tourist's preferences. The system's effectiveness was gauged through a Confusion Matrix test, revealing an accuracy of 74.31% for the Adjusted-cosine similarity algorithm. Hence, the proposed system demonstrates a satisfactory degree of precision in generating culinary tourism recommendations.

Performance of complex compound Zn-TPP (5,10,15,20-Tetrafenylporphyrin) as a Dye Sensitizer in increasing the Current and Voltage of Dye Sensitized Solar Cells

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Abstract**.** Solar cell technology has been widely used, one of them is Dye Sensitized Solar Cell (DSSC), which is a semiconductor device that can convert sunlight into electrical energy. The objective of this research is to learn the character of metal complexes from derivatives porphyrin Zn-TPP (5,10,15,20-tetraphenylporphyrin) and apply it as a dye sensitizer in DSSC. Zn(II)-TPP complex compound showed a maximum wavelength at 423 nm on the Soret band. Zn-N bond formed between metal and ligand is indicated at 324,04 cm^{-1}. Zn (II)-TPP complex compound is ionic and best used in DSSC applications. The performance (efficiency) of Zn (II)-TPP complex as dye sensitizer in DSSC shows a maximum current of 8 mA/cm^2 with a maximum voltage of 0.60 V and an efficiency value of 9.43%.

Keywords : metal, complexes, Zn(II)-TPP, Dye-Sensitized Solar Cell

Analysis of Growth and Development of Hydroponic Plants in IoT-Based Vertical Gardens Using Completely Randomized Design (CRD) Methods

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Abstract- Hydroponic plant planting is usually done in vertical garden or horizontal garden growing media. In this study, vertical gardens are used to create green areas in dense and confined urban environments. In utilizing vertical gardens for hydroponic cultivation, Internet of Things technology can be used to increase the efficiency and quality of plant growth. In addition, to monitor and optimize plant growth in vertical gardens, Internet of Things technology can be the right solution to use. This research will be conducted by analyzing two types of vertical gardens, namely the use of conventional vertical gardens and also IoT-based vertical gardens. This method will treat every plant in the vertical garden in the same way and the use of IoT technology will be installed on one of the vertical garden media. The results showed that the growth of hydroponic plants in IoT-based vertical gardens gave different results between different treatment groups. This shows that IoT-based vertical gardens are more effective and efficient than conventional vertical gardens.

Keywords—CRD, hydroponics, IoT, kale, vertical garden

Exploring neighbourhood green space to mitigate UHI effect based on a spatial approach in Malang, Indonesia.

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Abstract. UHI (urban heat island) harms climate and ecological conditions. Malang has a tropical climate, high temperature and humidity. Combined with the UHI effect, this can result in high temperatures; overcrowding exacerbates UHI due to increased human activities, energy consumption and waste heat production. Therefore, future mitigation efforts are required. This study aims to explore green space for UHI mitigation efforts with a spatial approach. The research sample is sub-districts in Malang City, each representing five sub-districts in Malang City. They were selected based on the highest LST value according to sentinel data 2. Data collection was carried out using ArcGIS with a spatial approach. The results showed that green open spaces with a non-linear spatial pattern with a high distribution of green open spaces are the most effective for the UHI effect. This study makes guidelines for reducing the negative impacts of UHI on sustainability planning and development.

Keywords: Green Space, Neighbourhood, Spatial Approach, UHI mitigation

" Simulation of Landscape Visual Quality in High-rise Mixed Use Building Using the Visual Impact Assessment Method "

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Abstract – The City of Malang possesses a captivating visual landscape potential; hence, government oversight is necessary regarding the visual impact of high-rise building designs on the landscape quality. The objective of this study is to determine the appropriate composition of visual elements in high-rise mixed-use buildings such as enhancing its effectiveness and aesthetics and providing guidance for Architects and designers. Visual Impact Assessment (VIA) is a method to gauge the visual effects of buildings on their surroundings. The research process involves capturing photographs from various angles and analyzing the impact of the building's mass on the natural visual environment. high-rise mixed-use buildings have issues related to the city's visual quality, such as increased environmental heat and obstruction of views. The shape and color of the building also influence the visual observations. This study provides crucial insights into designing high-rise buildings that consider visual elements and reduce visual pollution. By implementing VIA, the government and architects can develop strategies to preserve natural beauty and maintain visual harmony in the daily environment. It is evident that besides the building design itself, its location significantly influences the magnitude of the impact on the visual landscape quality.

Classification of air pollutants gas concentration patterns using iot-based e-nose (Case Study: Malang City and Batu City)

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Abstract. Rapid population growth in the city of Malang has worsened the problem of air pollution. Nose electronic designed To copy the ability of smell man to detect pollution. System This consists of 6 gas sensors and a datalogger device. The NodeMcu Esp8266 board is used for IoT-based data transmission. This data is then tabulated in Excel, and Main Component Analysis (PCA). PCA analysis was used to identify differences in air pollution patterns in the cities of Malang and Stone. Classification of air pollution can be explained based on the first PC values from the score plot. Moment Morning day, PC1 delivers 78% contribution to data variance, while PC2 contributes 13% to data variance. Next, when noon, PC1 contributed 77% and PC2 13% towards data variance. In the afternoon, PC1 contributed 74% and PC2 15% towards data variance. If reviewed in a comprehensive way difference pattern air pollution in the city Rock and Malang city, PC1 provides a contribution of 75%, while PC2 contributes by 12% against data variance. The score plot on all charts shows classification quite a significant difference in the second city.

Keywords: electronic nose; air pollution; gas sensor; IoT; PCA

Revitalization of the guyub rukun traditional market and utilization of the metro river bank area Karangbesuki

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Abstract. Guyub Rukun Traditional Market is located in Karang Besuki, Malang. This market covers an area of approximately 520 square meters. This market hold potentials to be an economic source and a central hub for the local community's activities, unfortunately its current functioning falls short of maximizing these opportunities. This research aims to revitalize the market by providing solutions to the existing issues and introducing a fresh branding approach for the community to utilize the market effectively, thereby enhancing the economic opportunities of the locals. The research project commenced from March to August 2023. Data collection methods involved direct observation at the Guyub Rukun Market and interviews with the surrounding residents, taking into account both physical and non-physical aspects. The findings indicated that the arrangement of stalls and circulations within the market was ineffective due to the absence of clear zoning and a market design that is overly enclosed. This led to untidiness, inadequate lighting, and poor circulation. The revitalization of the Guyub Rukun Market will emphasize spatial flexibility and the utilization of spatial elements as solutions to address the inefficiencies in space usage. This design approach aims to empower the locals by transforming the market into a more functional space.

Keywords: Architecture, Revitalization, Space effectiveness, Spatial Flexibility, Traditional Market

Evaluating causes of construction waste in east java province of indonesia using rii method

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Abstract. Indonesia's construction industry is still expanding. The construction sector is a major contributor to global waste production. Over 30% of construction waste is disposed of in landfills, leading to a detrimental impact on the environment. This study aims to identify the causes of construction waste in East Java's construction industry. The causes of construction waste were divided into two categories: causes of natural material waste and causes of fabricated material waste. Data for this study were collected using the questionnaire. The sample consisted of 32 respondents from medium-to large-scale construction enterprises involved in 4 building construction projects. The method used to identify the causes of construction waste is Relative Importance Index (RII) analysis. The results show that the main cause of natural material waste is inaccurate field measurements resulting in excess volume, and the main cause of fabricated material waste is the cutting of leftover materials that cannot be used anymore. Through the findings, the prevention or minimization of construction waste can be carried out according to the causes.

Keywords: causes of waste, construction waste, relative importance index, waste material

Space optimization of traditional market planning in relocation area after semeru eruption using space syntax analysis

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Abstract - The basis of this research is the importance of circulation and evacuation of a facility for the users if a disaster occurs. For this reason, the design of a resilient market in Sumbermujur, Candipuro District with resilience architecture approach must optimize the circulation and evacuation design in it. The potentials and problems from this study were reviewed to produce a market layout with a good spatial configuration to minimize casualties when a disaster occurs. Space syntax analysis has been used to find out how far the movement of market users has reached in the circulation space. Previously, the depthmapX8.0 program was used to create modeling from existing data with several assumptions. The result of the data obtained space syntax mapping in the form of an axial map and visual graph (VGA) type. The techniques used are connectivity and integration methods. As the final result, this research using space syntax analysis will produce a market layout as a design reference that is in line with the resilience architecture approach, where as much as possible to minimize casualties when a disaster occurs at Sumbermujur Market, Candipuro with several assumptions that have been analyzed.

Keywords – Resilience, Space Optimizaton, Space Syntax, Traditional Market Planning Sumbermujur Village Candipuro District

The Assessment of Green Buildings Performance at Student Housing: Edge Building Analysis

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Abstract. The campus of UIN Malang integrates the principles of Green and Smart buildings into its architectural design, intending to actively participate in energy conservation efforts and mitigate the release of CO2 emissions. This article analyzes the energy efficiency observed at student housing on Campus III, namely Ma'had Sunan Ampel Al-Aly UIN Malang. The procedure entails acquiring data from functional drawings through computer simulation analysis and, afterward, transferring the data via REVIT. Ultimately, the Edge Building software is employed during the final phase. Three key components are calculated; energy, water, and materials, each with a minimum threshold of 20%. The study's results demonstrate a noteworthy association between building materials, water usage, and the energy dimension. Therefore, it is crucial to regularly observe changes in conservation methods for water and materials to minimize buildings' energy requirements. The investigation results indicated a decrease of 9.34% in energy consumption, an increase of 32.64% in water usage, and a significant decrease of 84.66% in material consumption. According to the calculations conducted by the Edge Building software, it can be concluded that this building has yet to successfully achieve the goals of being environmentally sustainable and technologically advanced in terms of energy and material utilization.

Keywords:Analysis Performance; Edge Building; Energy Efficiency; Green Building; Ma’had

Appropriate site development analysis at the library of Merdeka University Malang

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Abstract. Along with the development of the times, various environmental problems have arisen, especially global warming. This gave rise to the concept of green building as an anticipation of global climate change. Green building has four principles that must exist, namely conserving energy, working with climate, respect for the site and respect for the user. The research uses qualitative methods and descriptive analysis to analyze and clearly describe the condition of the Merdeka University Malang library building based on various types of data that have been collected through observations. In this research used a rating system from the Green Building Council Indonesia (GBCI), which is commonly called Greenship. This rating system consists of six criteria, one of which is Appropriate Site Development (ASD). This research aims to analyze the application of green building on the criteria of Appropriate Site Development (ASD) in the Merdeka University Malang Library. The results showed that 7.9% of the 16.8% of the Merdeka University Library of Malang could fulfill the aspects contained in Appropriate Site Development (ASD). So that the Merdeka University Malang Library requires a mature effort, So that the Merdeka University Malang Library requires a mature effort and policy to optimize the green rating.

Keywords: Appropriate Site Development, Green Building, Green Technology,

The renewable energy sources impact on vernacular architecture's ability to be built sustainably: case study of rumah gadang

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Abstract. Rumah Gadang has the physical appearance of traditional architecture and was founded on human interaction with the environment, the natural resources of each area in Indonesia are said to have the greatest environmental effect on traditional vernacular architecture. Rumah Gadang is a prominent for its ability to successfully combine elements of sustainability with a variety of other factors, including the environment, aesthetics, and social character. However, only few studies discuss about sustainability elements combination within Architecture Nusantara, Rumah Gadang. Therefore, this study will aim to reveal how these elements affect the sustainability of Rumah Gadang and how they contribute to the development of regional architectural styles. The qualitative method was used in this study with literature studies followed by practical analysis. The result of the study indicates two things, 1) The nature of these elements' characteristics in Rumah Gadang fit with social, environmental, and aesthetic sustainability standard. 2) The practical analysis reveals that the impact of the variations in natural energy sources on these elements' characteristics in Rumah Gadang is reflected in its physical appearance such as the elevated living floor level, which is raised on a strong stone foundation and with a sizable, well-ventilated roof cavity above. It is a fantastic remedy for the hot, humid, tropical environment with recurring monsoon rains, as well as providing the house with good air circulation.

Keywords: Architecture Elements; Environmental Sustainability; Rumah Gadang;Vernacular Architectures.

Implementation of the ST-DBSCAN Clustering for Grouping Earthquake in Indonesia

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Abstract. Earthquake is one of the significant natural disasters in Indonesia. Every day, an earthquake occurs in various regions in Indonesia. Predicting the time, location, and intensity is difficult, leading to severe damage and victims. It is essential to identify the earthquake-vulnerable area to reduce the negative impact of earthquakes. One method that can be used to identify the area is the clustering technique. In this research, the clustering method used is the ST-DBSCAN algorithm (Spatial Temporal-density-based Spatial Clustering Application with Noise), a clustering algorithm that groups the data based on the spatial and temporal aspects. The dataset used in this research is the earthquake points in Indonesia from November 2022 to January 2023 with magnitudes ranging from 1 to 8 on the Richter scale. research used parameters such as spatial distance (Eps1 = 0.50), temporal distance (Eps2 = 7), and minimum point of members in the group (MinPts = 7). The best analysis results produced four clusters with 200 noises, giving a Silhouette coefficient value of 0.319.

Keywords: Earthquake, Data mining, Clustering, ST-DBSCAN

The Intersection between Knowledge, Government Support, and Technological Support in Ecotourism Entrepreneurship: A PLS-SEM Analysis

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Abstract. Students will be prepared to become a milestone in the progress of a country, one of which is by creating new jobs as a counter to the negative impact of AI and technological advances. The desire to become an ecotourism entrepreneur is one manifestation of this statement. This study analyses how the latent variables of procedures, formalities, difficulties opening a business; financial constraints; technological support; government support; and challenges in starting an ecotourism business affect the desire for ecotourism entrepreneurship. The research method is a quantitative descriptive approach through the SEM-PLS analysis technique. Data collection used a questionnaire with 51 questions distributed online through G-Form to 346 active student respondents throughout Indonesia. The results of the study show that the latent variables of procedures, formalities, and difficulties in opening a business; financial constraints; technological support; government support; and challenges that will be faced in starting an ecotourism business have a significant favourable influence on both directly and indirectly on the desire for student ecotourism entrepreneurship. The high desire to start ecotourism entrepreneurship is influenced by the support of green technology that can attract students' attention. Student awareness of ecotourism continues to increase by committing to innovate to create fundamental business ideas.

Keywords: ecotourism entrepreneurship, government support, technology support, young generation

Comparative advantage of Indonesian mushroom commodities in the era green technology

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Abstract. Mushroom is a commodity in the agricultural sector that has the potential to be developed in global trade competition. As part of the ASEAN regional cooperation institution, Indonesia can contribute to achieving excellence in mushroom commodities. Developing mushroom cultivation to support green technology innovation also helps achieve food security for future generations. This research aims to analyze and overview the comparative advantages of ASEAN with China related to mushroom commodities in 2018-2022. This research uses descriptive analysis methods and RCA-Revealed Comparative Advantage analysis in calculating the RCA of this mushroom, using HS codes 0709, 0711, and 0712. HS code 0709 represents mushroom commodities based on the sub "Fresh or chilled mushrooms of the genus "Agaricus" and Fresh or chilled edible mushrooms and truffles. The results show that China has a comparative advantage over ASEAN regarding mushroom commodities in 2018-2022. China outperforms in 3 mushroom commodity sectors in HS Codes 071159, 071151, and 071239. In comparison, ASEAN regional institutions have a low and weak level of comparative advantage in each mushroom commodity code. These results indicate that countries that are members of ASEAN pay less attention to mushroom commodities. Therefore, strategic efforts are needed to develop mushroom commodities supporting green technology innovation by prioritizing humidity control to achieve national food security goals.

Keywords**:** comparative advantage, mushroom agricultural commodities, food security, green technology

Motor Selection in The Game Using Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) Method

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Abstract. In this paper, designing a recommendation system for the motor selection menu in the game "Blar Rising". This recommendation feature in the game replaces the randomize function commonly used to suggest items for players. Unlike randomization, this feature considers the value of each criterion for motorcycle choices. The weights are determined using the Rank Order Centroid (ROC) method, which takes into account the criteria's importance. The game uses track or terrain selection to differentiate importance levels. The motorcycle recommendation process employs the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method. The TOPSIS method is employed to solve this problem, where TOPSIS will rank the final results and provide recommendations for the alternative motorcycle choices given which calculate the positive ideal distance and negative ideal distance. Furthermore, usability testing was conducted based on 5 aspects, resulting in an overall average score of 3.43, with details of learnability at 2.95, efficiency at 3.87, memorability at 3.67, error at 3.20, and satisfaction at 3.45. This indicates a fairly good user acceptance of the recommendation feature by players.

Keywords : Game, ROC, TOPSIS, Recommendation system;

Long Short-Term Memory Model to Predict Cryptocurrency Prices

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Abstract. Bitcoin is one of the cryptocurrencies as a means of investment. However, investing in Bitcoin still carries a high risk. To anticipate bitcoin investment, a model is needed to predict bitcoin exchange rate movements. Long short-term memory (LSTM) is a variation of a recurrent neural network (RNN) created to avoid the problem of long-term dependence on RNNs. LSTM has advantages when compared to ordinary RNNs. This study aims to determine the prediction results and the efficiency level of bitcoin prices using LSTM. In making predictions, several parameters are needed such as hidden layers, hidden neurons, batch size, max epoch, optimizer, and activation function. Formation of the LSTM model and its application to time series data, with 3 hidden layers, determining the number of batch sizes of 32, determining the optimizer is adam, 50 epochs results in calculating the price of bitcoin data, this is indicated by the predicted value of root mean square error (RMSE) in from 2017 to 2021 is smaller than the standard deviation value of the test dataset of 1828.66 and the mean absolute percentage error (MAPE) of 2.65%.

Keywords: LSTM, RNN, Cryptocurrency, Bitcoin

Implementation of MEWMA Control Chart Using Time Series Model for Controlling the Quality of WCS Production

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Abstract. The basic assumption of implementing a control chart is that the observed process values should be normally distributed and independent. However, the production process at the factory is carried out repeatedly with the same machine, so there is a possibility that the observation data is not independent and the resulting control chart becomes inaccurate. Therefore, a time series model approach is needed to create an accurate control chart. This study aims to conduct statistical quality control of white crystal sugar (WCS) production at Madukismo Sugar Factory (MSF) Yogyakarta to maintain product stability and quality according to the standards. MSF performs quality control on WCS products with several quality characteristic variables, including drying shrinkage (%), grain size (mm), polarization, and ICUMSA. The four characteristics influence each other, so a MEWMA control chart is used. This study shows the VARIMA(1,1,2) as the best time series model and the implementation of the MEWMA chart shows uncontrollable results with an optimal weighting value λ of 0.8. For process capability, the results show that the process is capable.

Keywords**:** MEWMA, Process Capability, VARIMA, WCS

Analysis of the Drivers for Understanding Butterfly Pea Flower Cultivation in Local Communities through MSMEs to Support Green Technology-Based Industries

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Abstract**.** The green technology industry is a business with environmentally friendly production and optimization of renewable resources. The realization of the green technology industry can be taken in the cultivation of butterfly pea flower commodities. This research aims to link the understanding of butterfly pea flower cultivation by MSMEs to realize the green technology industry. This research also further explores the factors that promote local people's understanding of the importance of butterfly pea flower cultivation as an effort to realize the green technology industry. This study used a quantitative method with the Partial Least Square-Structural Equation (PLS-SEM) model and obtained primary data from 20 community members and business actors of butterfly pea flower MSMEs in Prunggahan Kulon Village. The results showed that the knowledge of butterfly pea flower food-beverage management significantly affected the understanding of butterfly pea flower cultivation in local communities directly and indirectly through the mediating variables of business partner skills and IT. According to the study results, when the knowledge of processing butterfly pea flower cultivation and the ability to partner with IT are high, the understanding of butterfly pea flower cultivation in local communities will increase. The increasing understanding of the local community about the cultivation of butterfly pea flowers certainly encourages the intention to develop MSMEs based on the concept of the green technology industry.

Keywords: butterfly pea flower cultivation, green technology, local communities, MSMEs

Optimizing Application Green Sustainable Building Criteria on Trisakti University Nagrak Campus Mosque Design Using Autodesk Revit

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Abstract. Trisakti University initiated a campus master plan that elevates the criteria of green buildings in its planning. One of the facilities in the master plan is the campus mosque. In the modern era, the roof design of the mosque tries to get out from the paradigm of the Andalusian and Mediterranean domed roofs. This study aims to determine optimal design strategies for implementing the green building concept on campus mosque design. Simulation methods are applied using Autodesk Revit to create the main mosque design of Trisakti University Nagrak Campus. BIM models can be more accurately integrated into simulated, analyzed, and decided schematic designs. Based on the simulation results of the square bowl roof design, it optimized the maximum power obtained from Photovoltaic is 1.369.104 kWh/year and can harvest rainwater 22,507,929.6 Liters per year. In Addition, in the surrounding parks, which can be used as additional outdoor prayer spaces, the concept of integrated bio-pores and composter is applied, which can increase the absorption of rainwater that precipitates in the surrounding area of the mosque, increase groundwater reserves in the environment, and maximalize sustainable mosque design.

Keywords: Green Building, Square Bowl Roof, Sustainable Mosque Design

Visualization of IoT-Based Urban Heat Island Monitoring System Using Heatmap

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Abstract: Urban Heat Island (UHI) is a phenomenon of increasing air temperature in urban areas compared to the surrounding areas, causing an imbalance in the environment and requiring an Urban Heat Island monitoring system. This study discusses the Urban Heat Island monitoring system using the Internet of Things (IoT) based heatmap method connected to the NodeMcu device to collect data from light sensors (LDR), anemometer sensors, GPS modules, and DHT22 sensors (temperature and humidity). Data is sent via WiFi to the Thingspeak server. The results of the data that has been entered into the server will be visualized on a map using the heatmap method. In the heatmap map there are several conclusions, namely the Malang city temperature heatmap map, the Malang city air humidity heatmap map, the Malang city light intensity heatmap map, and the Malang city wind speed heatmap map. With the existence of a heatmap map from several sensors, it is hoped that it can provide information about temperature distribution patterns, help identify areas susceptible to the effects of urban heat, and support decision making for sustainable urban development. This research is useful for the government in dealing with mitigating the effects of urban heat.

Keywords: Urban Heat Island, Internet Of Things, Heatmap, Malang City

Analysis of landscape visual quality using via between batu museum design and ponorogo art building design

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Abstract. High-intensity development requires arrangement of visual aspects that are not prioritized. In fact, the visual aspects of the building and environmental aesthetics are related to each other and it is important to pay attention to maintaining harmony between components in the environment. VIA research or Visual impact assessment is a simulation type research that seeks an overview through a small or simple system in which a series of research steps and manipulation or control will be carried out in the model to see the effect. VIA aims to obtain building ideas in order to achieve visual quality and environmental aesthetics between museum building ideas and art building ideas that have the same typology of the site area in the middle of the surrounding buildings, but with different details. The results of this study are in the form of a final simulation of a building idea that has a minimal visual impact contained in the final conclusion in the form of how to achieve the composition of visual elements in the building idea model to achieve visual quality and environmental aesthetics based on the research that has been done.

Keywords: Aesthetics; Building; Environment; Quality; Visual

Preliminary study: potency metal complexes with uv-active ligands as dye sensitizer in dye sensitized solar cells

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Abstract**.** The use of metal complexes as a dye sensitizer in DSSC (Dye-Sensitized Solar Cells) provides many promising opportunities. Complex compounds with ligands that actively absorb UV rays have the potential to be applied in technology solar cells in areas rich in UV rays such as Indonesia. This research aim is to investigate the potential of several complex compounds with UV active ligands and apply them as dye sensitizer in DSSC. Ligand phenanthroline (phen), morin, and catechin will be synthesized with several transition metals. The formation of metal complexes will be proven by characterization using spectrophotometer FTIR. The performance of metal complexes as dye sensitizer will be analyzed from the current and voltage obtained. The highest current produced by complex Fe-phen is 0.280 mA; Co-phen is 0.323 mA; and Ni-phen is 0.370 mA. The highest voltage produced by complex Fe-phen is 577 mV; Co-phen is 550 mV; and Ni-phen is 555 mV.

Keywords: UV-active, ligands, metal-complexes, Dye-Sensitized Solar Cell

Significant effects of building block patterns on conditions and thermal comfort in a hot-humid tropical climate: a case study of informal settlements in central Surabaya, Indonesia

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Abstract. Environmental geometry plays a significant role in determining microclimatic conditions. Similarly, the pattern of building blocks, specifically the degree of connectivity and the distance of building blocks from open spaces in an area, influences thermal conditions. This study examines the impact of block patterns on environmental conditions and thermal comfort. The research analyzes twelve building blocks, encompassing six block patterns (BB+H2RTBs; BB+H2RT; BB+HBsRT; BB+HRT; BB+BsRT-H; and BB-HRT), oriented in two directions (N-S and E-W). The model, which was created from informal settlement blocks in Surabaya, was simplified and translated. Furthermore, the block model was simulated under the hottest day condition (October 22, based on the Surabaya climate) using ENVI-met 3.1. The findings of this study indicate a direct relationship between the block pattern and the level of airflow in the block, as well as the thermal comfort of the environment. Furthermore, it has been found that the impact of the block pattern on the environmental conditions and thermal comfort is closely tied to the block orientation as well as the wind speed within the block.

Keywords-Compact low-rise, ENVI-met 3.1, hot day condition, hot-humid tropical climate, PET

Non-local haze removal for mount Kelud hazy image

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Abstract. Mount Kelud is one of the active volcanoes located in East Java, Indonesia. Monitoring conducted through closed-circuit television (CCTV) is the activity to observe the volcano's activity. However, the images displayed by the CCTV are often inaccurate due to dense haze. There are several methods for haze removal to improve the degraded image quality caused by these issues, one of which is Non-Local Dehazing. The Non-Local Dehazing method has several advantages that can overcome the shortcomings of other haze removal methods, such as producing more consistent images under various lighting conditions. This study uses images of Mount Kelud taken over a period of 10 days from October 3, 2017, to October 13, 2017. The test results are based on the Peak Signal-to-Noise Ratio (PSNR) and Mean Square Error (MSE), where higher PSNR values indicate better quality of the processed image, and smaller MSE values indicate that the processed image approaches the original image. The non-local dehazing method has better PSNR and MSE values compared to the dark channel prior method but is still inferior to the color attenuation prior method. Therefore, the non-local dehazing method is effective and can be considered as one of the methods for reducing haze on Mount Kelud.

Optimizing Polyphenol Extraction: A Kinetic Model of Green Extraction from Tea (*Camellia sinensis*) Using Ultrasonic-Assisted Extraction (UAE) for Total Phenols from Wonosari Tea Plantation in Malang City

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Abstract. This research examines the kinetic mass transfer rate of polyphenols from Camellia sinensis tea leaves using Ultrasonic-Assisted Extraction (UAE) with water as a solvent. The study explores polyphenol extraction variations at different extraction times (30, 45, and 60 minutes). Total polyphenol content, mass transfer coefficients, and antioxidant activity were analyzed via FT-IR and UV-VIS spectroscopy, revealing increased extract yield and tea leaf swelling with longer extraction times. Distinct trends emerged for polyphenol content and antioxidants. Initial data indicated an increase in polyphenols with extended solvent diffusion time, but further increases led to a decrease. The optimal release time for polyphenol mass and antioxidants was found to be 45 minutes among the tested times. Ultrasound extraction with water as the green solvent, a safer alternative, yielded favorable results at 45 minutes, with a total phenol content of 316.599 mg GAE/g and an IC50 of 3.2 ppm. Optimal yield and swelling were observed at 60 minutes. FTIR characterization confirmed the presence of phenolic compound-specific functional groups like -OH, aromatic C=C, and C-O. This research provides valuable insights into polyphenol kinetic extraction from tea leaves and emphasizes the importance of choosing an appropriate extraction method to obtain potent antioxidants.

Keywords: *Camellia sinensis, Green Extraction, Ultrasonic-Assisted Extraction* (UAE)

Development of bamboo composites for wind turbine blade applications

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Abstract. Wind turbine is one of the electricity generation devices that utilizes wind energy as the driving force, typically through its wind turbine blades. Currently wind turbine blades often use composite materials made from synthetic materials, which can be relatively expensive. The objective of this research is to transform synthetic composite materials into natural fiber composites that are relatively inexpensive and environmentally friendly. This is achieved by conducting testing on black bamboo fiber composites to determine their strength values using different resin ratios. This testing utilizes tensile testing with ASTM D3039 and ASTM D638 standards. The manufacturing of wind turbine blades is carried out by creating a mold, followed by forming them according to the SG6042 standard. Subsequently, a coating process is applied to ensure the evenness of the blade's surface using epoxy resin. The tensile testing results show that the highest tensile strength was achieved with the 3:9 ratio, both using ASTM D3039 and ASTM D638 standards. The tensile strength values were 7.50 MPa with a 3.2% increase for ASTM D3039 and 10.76 MPa with a 4.92% increase for ASTM D638. This research shows that wind turbine blades can be made from bamboo fiber composite.

Using Mung Bean as a Trap Crop and Biopesticide for Control of Soybean Pest

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Abstract. Many pests attack soybean plants and can cause high-yield losses. To reduce crop damage, using chemicals in the field can potentially cause harmful effects on the environment. Using traps-crops, and biopesticides will be tested as an effective and safe control method. The research was done in the dry season of the tidal land of Tumih Village South of Kalimantan. The design used was RCBD which consisted of six treatments and was repeated four times. The treatment tested were 1). Check, 2). Biopesticides 6 times, 3). Biopesticide 4 times, 4). Biopesticides 6 times + mung bean as trap crop 6%, 5). Biopesticides 4 times + mung bean as trap crop 6%, 6. Insecticides 6 times. The results indicated that armyworms *Spodoptera litura* and *Lamprosema indicata* were important pests. Armyworm attacks in the vegetative phase reached 82%. However, the yields obtained were around 2,069 to 2,463 t/ha. Soybean yields in treatment plots with 6% trap crop were 1,664 to 1,969 t/ha. Anjasmoro varietal is not recommended In endemic areas of the armyworm.

Keywords**:** Biopesticide, chemical-insecticides, soybean, trap-crop.

Utilization of *Ipomoea batatas L.* Tuber Extract for the Development of Dye-Sensitized Solar Cell with Modified Electrode from Rice Husk Ash

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Abstract. A dye-sensitized Solar Cell (DSSC) is a solar cell device that works based on electrophotochemical principles in which sensitive dyes are absorbed in the layer of photoelectrode. The utilization of natural dyes as a substitute for high-cost material in DSSC has been developed. Purple sweet potato (*Ipomoea batatas* L.) has high anthocyanin content, is safe to use, and has renewable properties that can be used as dyes in a layer of DSSC. Purple sweet potatoes contain a lot of fiber, carbohydrates, vitamins C and B1, and minerals needed in DSSC. The semiconductor compiler to produce solar cells is expensive and requires many. Rice husk has a relatively high silica content, about 87-97%, that can be used as a low-cost and environmentally friendly silicon. The result of this study showed the absorbance peak for the mixture of extract and rice husk ash at 320 nm. DSSC fabrication obtained the highest efficiency of 1.1 x 10^{-3} with I_{max} = 0.0015 mA and V_{max} = 0.02 mV. The physical characteristics were observed using SEM and XRD. Natural dye from purple sweet potato and rice husk ash semiconductors can be alternatives for DSSC production.

Keywords: DSSC, natural dyes, purple sweet potato, rice husk, solar cell.

3D Rooms Map Concept based Augmented Reality for Green Library

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Abstract. Library have become an important part of people's lives as centers for managing and disseminating knowledge. As a service space, the library has a responsibility to provide the best service to its users, even though the demands of increasingly complex community needs are a challenge. However, libraries must also be able to develop innovative products to answer these needs, one of which is the library location guide service in the form of a library rooms map. Advances in technology have become an opportunity for libraries to develop library location guidance services through Augmented Reality-based library plans. Room maps generally use 2D images that provide information or instructions for all the rooms in a building. The Augmented Reality approach as a 3D-based room map will of course provide a different experience to library visitors.

Keyword: Augmented Reality, Rooms Map, 3D, library

Eco-friendly biopesticide of *Beauveria bassiana* to control of sweet potato weevil *Cylas formicarius* (Coleoptera: Curculionidae)

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Abstract**.** *Cylas formicarius* is the main pest of sweet potato which can cause up to 100% yield loss. Control technology using chemical pesticides has not been successful. This study aims to examine the efficacy of the entomopathogenic fungus *Beauveria bassiana* to control C. formicarius. The research was conducted in Lumajang Regency, East Java, from May to September 2021. This research tested innovative technologies using *B. bassiana* and existing technologies with chemical insecticides, each technology consisting of 10 farmers as replicates. The results showed that the highest productivity occurred in innovative technology reaching 43 tons/ha with 1% tuber damage. While the productivity of the existing technology was only 20 ton/ha with tuber damage reaching 21%. The superiority of the innovative technology using *B. bassiana* applied to the base of the stem, apart from being effective, was the abundance of predatory and parasitoid insects. In addition, the tubers obtained were more organic so that the selling price of these commodities was more expensive than conventional ones. *B. bassiana,* an entomopathogenic fungus has a great opportunity to be used as a potential biopesticide candidate to be developed as a technological innovation to replace the efficacy of chemical pesticides.

Keywords**:** *Beauveria bassiana*, *Cylas formicarius*, existing, innovative, sweet potato.

Deep Autoencoder Learning Features for Classifying Peptides Data as Recombinant Bacterial Material Using PTVPSO-Deep ELM Algorithm

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Abstract. Codon codes directly in the form of vector or 3D molecular to support feature learning often impede machine learning reading for the epitope classification process in extracting feature values that are more easily understood by computers. The rendering time required for molecular 3D is also quite significant, which is directed more to a good visualization art approach only because the DNA visualization method for determining epitope and non-epitope classes is more suitable for observation by human experts, not computers. In addition, the length of each codon code in the peptides varies greatly. Therefore, computers for such dataset processing require standardized visualization transformation results before the classification process is carried out. In this research, a 2-stage approach was carried out. First, the deep autoencoder approach was used as a pre-process to transform the learning features from multi-dimensional variations to 2D or 3D which is more powerful than PCA and kernel trick. Then, the classification stage was carried out using the PTVPSO-Deep ELM algorithm. PSO is used to optimize the transformation and classification results. The test results showed that the proposed method is very significant in simplifying peptide data visualization and is able to produce better metric values than the previous research.

Keywords: Autoencoder-ptvpso-deep-elm, codon, epitope, classification-peptides, recombinant-bacterial.

Identification of residential environment comfort based on participatory mapping in RW 01 Samaan Village, Malang City

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Abstract. Population density in urban environments is often the cause of low environmental comfort. Poor environmental hygiene can trigger various diseases and cause discomfort. The method used is participatory mapping by involving local communities to identify environmental problems and determine appropriate solutions. The results showed that the variables that most determine environmental discomfort are air temperature and lack of community participation in environmental greening.

Trend analysis of Indonesian presidential candidates in the 2024 general election

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Abstract. The presidential general election is a routine agenda every five years in the Republic of Indonesia. This research aims to identify and analyze trends that have the potential to influence the results of the Indonesian presidential election in 2024. The data source used is comments from the social media platform Twitter. In this research, an exploration of public conversations on Twitter was carried out which provided views, opinions as well as important insights regarding the presidential nomination process in Indonesia. The data collection method used is the web scraping technique, which is then analyzed descriptively and presented in graphical form. The research subjects are Twitter users who provide comments, both negative and positive, about the 2024 presidential candidates, while the research object is these comments.

Keywords: Presidential election, social media, opinion

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Analysis of Chemical-Mineralogical Content of Brick Waste as a Pozzolan Substitute Material in Blended Cement

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Bricks are building materials that contain compounds that can increase the compressive strength of a building. This research utilized waste bricks as a substitute for pozzolan for cement manufacture. Testing of waste bricks using the reactivity index test method, characterization with XRD and XRF. Cement powder was tested chemically, and determined the value of its compressive strength on the mortar test object. The results of the characterization of XRF instruments are SiO2, Al_2O_3, Fe_2O_3 with minor compounds including CaO, ZnO, TiO_2, K_2O, P_2O_5, CuO, V_2O_5, Cr_2O_3, MnO, SrO, Eu_2O_3, and Re_2O_7. Meanwhile, BaO is owned only by the first and third bricks, while PbO is owned by the first. The number of SiO_2, Al_2O_3, and Fe_2O_3 compounds has met the quality requirements as pozzolanic materials (>70%), namely 84.20% of the first sample, 83.70% of the second sample, and 84.30% of the third sample. The reactivity index test also met the target (>75%), namely 75.60% of the first sample, 75.00% of the second sample, and 77.90% of the third sample. The higher the content and the reactiveness of an oxide compound in the waste bricks are directly proportional to the quality of the cement.

Keywords: Waste Brick, Pozzolan, Blended Cement, Mortar Compressive Strength

Screening and Characterization of Potential Bioethanol Production Yeast from Tropical Fruits

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The purpose of this study to isolate and identify indigenous yeast (IY) in tropical fruit waste. The methods are isolation and identification of yeast in various types of fruit waste, yeast test for glucose resistance ethanol resistance, and bioethanol production in vitro. The yeast morphological identification using visual observation and microscope. The yeast biochemical selection are tolerance test on glucose and a tolerance test on ethanol measured Optical Density using a Spectrophotometer. Testing the ethanol content using a Gas Chromatography-Flame Ionization Detector (GC-FID). Isolation results from yeast using selective media obtained 6 isolates with code A1 isolated from grapes, codes NG1, NG2 isolated from jackfruit and codes N1, N2, N3 from pineapple isolated from pineapple, while mango has no result. Test results on resistance to glucose and ethanol selected 3 isolates with codes A1, NG1 and NG2. The results of the fermentation test for bioethanol production using Saccharomyces cerevisiae obtained 6.60%, yeast species coded A1 is 3.30%, yeast species coded NG1 is 4.5%, yeast species coded NG2 is .4.85%. of ethanol. The conclusion of this study is that yeast with the NG2 code has the potential for the bioethanol fermentation process.

Keyword: bioethanol, yeast, tropical fruits

Endophytic Fungi: Isolated from *Cosmos caudatus* Kunth and *Cosmos sulphureus* Cav.: A Histologic Observation, Identification, and Secondary Metabolites Chemical Analysis

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Abstract. *Cosmos caudatus* and *Cosmos sulphureus* are sorts of plant commonly use for side dish vegetables. Some plant live in mutualism symbiotic interaction with some endophytic fungi that protect the host plant. This research is done to: 1) determine the endophytic fungi colonization in the *Cosmos* plant tissues by histologic observation, 2) isolate and identify the endophytic fungi species from *Cosmos* leaf, branch bark and flower petal tissues, 3) analyze alkaloid, flavonoid, tannin, saponin, and fenolic contents produced by the each endophytic fungi species. The endophytic fungi culture on PDA medium were cut into 5x1 cm in size and inoculated in PDB medium, then shake in the rate of 120 rpm for 7x24 hours. Afterwards the liquid centrifugated. The secondary metabolites contents were analyzed by using spectrophotometric method. This research result showed that: 1) the endophytic fungi position was found on the leaf palisade cell wall, epidermal cell wall, sponsa cell wall, neighbour cell wall; on the branch bark parenchyme cell wall; on the flower petal epidermis cell wall; 2) eleven endophytic fungi have been identified; 3) There are variation in the secondary metabolites contents produced by each endophytic fungi.

Keywords: *Cosmos* sp., endophytic fungi, histologic observation, identification, secondary metabolites

The influence of anticancer amla fruit extract (*Phyllanthus emblica*) against rat liver cells (*Rattus Norvegicus*) induced *7,12-Dimethylbenz(α)antrasena* (DMBA) through in vitro

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Abstract. Pharmacological research of amla fruits is known to have activity as an antioxidant, mutagenic activity and anticancer. *Purpose* This study aims to determine the effect of Amla (*Phyllanthus emblica*) fruits extract on the confluence, viability, and LC_{50} of rat's liver cells (*Rattus novergicus*) in vitro induced *7,12-Dimethilbenz(α)antrasena* (DMBA). *Methods* In this study we used a Completely Randomized Design (CRD experimental were divided into seven groups of four repetition each. The treatments consist Group K(-) as control, K(+), P1 (200 µg/ml), P2 (400 µg/ml), P3 (600 µg/ml), P4 (800 µg/ml), and P5 (1000 µg/ml). *Results* The samples were rat liver cells aged 3-4 days which were cultured on DMEM media with 10% FBS and incubated in an incubator at 37°C with 5% CO_2 for four days. The percentage of confluence and viability were analyzed using ANOVA one way ($\alpha = 0.05$). The administration of amla extract has effect on confluence and viability of rat's liver cell ($p>0.05$). The value of LC_{50} is 161.11 µg/ml, it's mean < 1000 µg/ml, Based on the results we conclude the administration of amla fruits extraction influenced against DMBA oxidative stress in liver cancer. Amla ftruits has potential as anticancer and candidate effective against cancer treatment.

Keywords: *Phyllanthus emblica,* Anticancer, DMBA, In Vitro

Chitosan nanoparticle-loaded edible films and coatings for food preservation: A review of barrier and antimicrobial properties

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Chitosan nanoparticle (CNP)-loaded edible films and coatings are innovative approaches used in the food industry for food preservation. This review article aimed to explore the potential of utilizing chitosan nanoparticles, a derivative of chitin found in the exoskeletons of crustaceans, to enhance the properties of edible films and coatings. CNP could form a thin, transparent, and flexible film that provides improved barrier properties against moisture, gases, and lipids. This helped in extending the shelf life of food products by reducing their susceptibility to spoilage and maintaining their freshness for a longer period. CNP exhibited antimicrobial activity against a wide range of microorganisms, including bacteria and fungi. When incorporated into edible films or coatings, it inhibited the growth of spoilage and pathogenic microorganisms, thereby enhancing the safety and quality of the food product. Overall, incorporating CNP into edible films/coatings offers a promising solution for improving food packaging and enhancing the safety and quality of various food products. However, the development and commercialization of nano chitosan-based materials required further research to address any potential concerns regarding its long-term effects and to ensure regulatory compliance.

Keywords: Packaging, green, environment, contamination, pathogen

Evaluation of the efficacy of a green-based palm oil method for chlorophyll removal and anti-aging activity on *Centella asiatica* ethanolic extract

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Centella asiatica is an essential medicinal herb in numerous traditions. The high chlorophyll concentration of *C. asiatica* makes dosage form formulation challenging. On the other hand, palm oil is feasible to eliminate the chlorophyll from plant-based products. *C. asiatica* was extracted to study its phytochemical composition and in-vitro anti-aging effects on chlorophyll elimination. The extract was soxhletated in 70% ethanol. The extract was partitioned with 50% ethanol and palm oil to create a dechlorophyllation extract. Asiaticoside was analyzed using TLC-densitometry. The cytoprotective effect of H_2O_2-induced oxidative stress in Vero cells was assessed using MTT assays. A flow cytometer is used for quantifying the intracellular ROS. The senescence-associated-β-galactosidase assay was used to identify senescent cells. Palm oil removed chlorophyll 90.94±0.62%. The dechlorophyllation extract (DE) showed a concentration of 1.58±0.02% for asiaticoside, but it was not found in the original extract (OE). The experimental group (DE) better protected Vero cells from H_2O_2-induced cytotoxicity than the control group (OE). Both DE and OE reduced intracellular ROS and senescent cells. Palm oil-based chlorophyll removal improved the phytochemical content and anti-aging effects of *C. asiatica* in ethanolic extract.

Keywords: aging, asiaticoside, *C. asiatica*, chlorophyll-removal, palm oil, senescent

Biopriming of cayenne SEED (*Capsicum frutescens* L.) using indole acetic acid (IAA)-producing fluorescent pseudomonads to increase germination and growth of seeds

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Capsicum frutescens L. is one of the horticultural commodities that plays an important role as food and industrial raw materials. The amount of chili consumption continues to increase, so its production requires quality seeds. The physiological quality of seeds can be improved, one of which is by using fluorescent pseudomonads as biopriming. The fluorescent pseudomonads LAHLS1, LAHT1, LAHCS2, and PfPb3 produced Indole Acetic Acid (IAA) with concentrations between 5.37 to 20.31 ppm, and were significantly different. Biopriming of *C. frutescens* L. seeds using different fluorescent pseudomonad isolates affected the percentage of germination, wet weight and dry weight of *C. frutescens* L. seedlings. Fluorescent pseudomonads LAHLS1, LAHT1, LAHCS2, and PfPb3 can increase the percentage of *C. frutescens* L. seed germination up to 100%. The highest seedling wet weight (43.52 mg) was found in seed biopriming using fluorescent pseudomonad LAHLS1 and the lowest was control (12.33 mg). The highest seedling dry weight (4.40 mg) was found in seed biopriming using fluorescent pseudomonad LAHLS1, and the lowest was control (0.93 mg). The results showed the potential use of IAA-producing fluorescent pseudomonads in increasing the percentage of seed germination and influencing the growth of *C. frutescens* L. seedlings based on observations of wet weight and dry weight of seeds.

Keywords: biopriming, *Indole Acetic Acid* (IAA), fluorescent pseudomonads

The Effect of UV Radiation on The Frequency of Crossing Over in Drosophila Melanogaster

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Abstract. The ever-increasing depletion of the ozone layer due to exposure to high environmental pollutants may contribute to the high probability of cells being exposed to UV radiation and causing various cellular responses such as genomic instability. This study aims to determine the effect of UV light exposure on the frequency of crossing over in a cross between the wild-type strain and the black vestigial strain of Drosophila melanogaster. The method used in this study is an experimental method using four variations of UV irradiation, 0', 3', 6', and 9'. The frequency of crossing over was calculated by the frequency of recombinant progeny from crossing over of the two strains of D. melanogaster. The data obtained were then analyzed using Single Factor Anova. The results of the data analysis showed that the p-value of 0.456 was greater than the alpha value (0.05), which means that the length of UV radiation did not affect the frequency of crossing over between the two strains. However, it was found that the body size of the D.melanogaster's progeny was more petite and their movements were slower than those that did not get UV light exposure. Further research is needed to examine this phenomenon.

Keywords: crossing over, Drosophila melanogaster, genetic, UV radiation

Effect of pH variation on chemical components and antifungal activity of ethanol extract of ketepeng cina (*Cassia alata* L.) Leaves

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Abstract. Ketepeng cina (*Cassia alata*, L.) has been widely used as a traditional medicine, one of which is as an antifungal. Previous research showed problems in storage, ethanol extract of ketepeng cina leaves which reported changes in pH and colour over time. This study explored main chemical components and antifungal activity under varying pH. Antifungal activity against *Candida albicans* was tested using microdilution and well diffusion methods. The chemical components of the extract represented by aloe-emodin and kaempferol were measured by HPTLC with eluent *n*-hexane: ethyl acetate = 1: 1. The extract with pH 4.5 had the highest aloe-emodin content and antifungal activity. Statistical tests were conducted using ANOVA and Kruskal-Wallis. The ANOVA test results showed that between groups had significant differences ($p=0.000$). The Kruskal-Wallis test results showed a value of $p=0.003$ ($p<0.05$) which stated that there were significant differences between treatment groups except in the negative control group and solvent control as well as the pH control and pH 5.5 extract groups. It can be concluded that pH can affect the levels of the main chemical components and antifungal activity in ethanol extracts of ketepeng cina leaves (*Cassia alata*, L.).

Keyword : *Cassia alata*, *Candida albicans, Aloe-emodin, kaempferol, pH variation*

Synthesis and antimicrobial activity test of silver nanoparticles using combination of *Bifidobacterium* sp. and *Lactobacillus plantarum*

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Antibiotic resistance can reduce the effectiveness of antibiotics in overcoming pathogenic bacteria, so exploration is needed related to alternative antibacterial therapies. Silver nanoparticles (AgNPs) are one of the results of nanotechnology that synthesizes silver metal and converts it into sizes with a scale of <1000 nm. AgNPs is one type of nanoparticle that has a broad spectrum of antimicrobial activity against bacteria that are resistant to various drugs. AgNPs can be synthesized biologically using Lactobacillus plantarum and Bifidobacterium sp. This study aims to find out the characteristics and know the antibacterial activity of AgNPs synthesis with a combination bioreducing agent of Bifidobacterium sp. and L. plantarum. Synthesis is carried out by mixing a solution of AgNO3 and the supernatant of both bacteria in a ratio of 9:1. AgNPs were characteristized, and antimicrobial activity was tested based on the inhibition zone, Minimum Inhibition Concentration (MIC) and Minimum Bactericidal Concentration (MBC). The combination of bacteria supernatants was able to produce AgNPs with spherical shape and 310.5 nm size. The functional groups involved include O-H, C=C, and C=C and N-H groups. AgNPs has the most optimal antimicrobial activity against S. aureus and E. coli, but has no significant effect on C. albicans.

Keywords: AgNPs, Antimicrobial, Bifidobacterium sp., Characteristic, Lactobacillus plantarum

The Improvement of Phycocyanin Stability at High Temperatures by Microencapsulation Using Whey Protein Isolate

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Abstract. Phycocyanin is a blue pigment in cyanobacteria known for its antioxidant activity and can be applied as natural food colorant. However, one drawback to applying phycocyanin in food products is their high-temperature instability. In this research, we investigated the effect of encapsulation of phycocyanin using whey protein isolate (WPI) as the wall material to improve high-temperature stability. The study also assessed the physiochemical properties of microencapsulated phycocyanin. Phycocyanin was extracted from dry biomass Spirulina using a cold maceration method. Then, phycocyanin extract was encapsulated with prepared emulsions containing 0.25%, 0.50%, 0.75%, and 1.00% WPI as wall materials. The result showed all microencapsulated phycocyanin, regarding various concentrations of WPI, showed lower phycocyanin degradation at 60°C and 70°C at various heating times compared to control, suggesting higher stability. The control sample had 35.55±0.33% and 62.61±0.55% concentration degradation at 60°C and 70°C after 10 min heating. The microencapsulated phycocyanin with 0.5% WPI had 12.67±2.08% and 19.95±2.02% at 60°C and 70°C after 10 min heating. The encapsulation efficiency achieved 98-99% regarding various concentrations of WPI. There was no significant difference in solubility between the control and microencapsulated phycocyanin. Our result concluded that microencapsulation, using WPI as wall material, improved the high-temperature stability of phycocyanin.

Bioactivity of *Chisocheton pentandrus* leaf extract and its potential as antioxidant and inhibitor of α-glucosidase

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Abstract. Indonesia is one of the countries with the highest plant diversity in the world, including the *Chisocheton* genus, they use the plants in this genus as traditional medicine. The genus *Chisocheton* has a wide variety of compounds with different activities, such as antiplasmodial, antiviral, and anti-inflammatory. The focus of this research is to find out about the anti-oxidant, anti-diabetic, and anti-bacterial activities of *Chisocheton pentandrus* leaf extract from the Bali Botanical Garden plant collection. The antioxidant activity assay was carried out by scavenging the free radical DPPH. The antidiabetic assay was carried out by inhibiting the activity of the α-glucosidase enzyme, while the antibacterial test was carried out by the agar diffusion method. Based on the data generated in this study, the active ingredients of *C. pentandrus* leaf extracts have high potency as antioxidants and α-glucosidase enzyme inhibitors, but the extract was not effective in inhibiting bacterial growth.

Keywords: anti-oxidant, anti-diabetic,anti-bacterial, α-glucosidase

The Phytochemical Composition of Medicinal Plants in Indonesia and Their Potential as Antibacterial Agents Against *Salmonella typhi* ATCC 13311

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Salmonella typhi is a bacterial pathogen responsible for the onset of typhoid fever. Several Indonesian medicinal plants are commonly utilized as antibacterial agents, namely moringa (*Moringa oleifera* Lamk.), green tea (*Camellia sinensis*), binahong (*Anredera cordifolia* (Ten.) Steenis), and green meniran (*Phyllanthus niruri* L.). This investigation aimed to identify the chemical compounds found in plants and their antibacterial activity against *Salmonella typhi*. The simplicia was extracted by the maceration technique with a solvent of 70% ethanol. Chemical compounds are identified using various chemical reagents. The antibacterial activity test was conducted using the diffusion method. The data were analyzed using a one-way analysis of variance (ANOVA) test. The phytochemical analysis of plant samples revealed the presence of many bioactive compounds such as flavonoids, saponins, tannins, alkaloids, steroids, and phenolics. The antibacterial activity of plant samples against *Salmonella typhi* has been shown. The average values of the inhibition zones for moringa leaf extract, green tea, binahong, and green meniran were determined to be 20.33 mm, 18.33 mm, 22.67 mm, and 27.00 mm, respectively. The antibacterial activity of green meniran leaf extract is significantly more potent against *Salmonella typhi* than other plant.

Keywords: Phytochemicals, Medicinal Plants, Antibacterial, *Salmonella typhi*

Seed kernel extracts of 7 Mangifera indica Indonesian cultivars: in vitro Anti-Multi-Drug resistance Escherichia coli isolate from wound infections

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Introduction: *MDR E.coli* is one of the most common gram negative bacteria that causes wound infections. Therefore, antibacterial agents of natural origin are needed. This study aims to determine the antibacterial activity of seed kernel extracts of 7 mango cultivars *(Mangifera indica L.)* against *MDR E. coli.* **Method:** The dilution method is used to determine the values of the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). **Result:** it was found that mango seed extract (*Mangifera indica L.)* has potential as an antibacterial agent against MDR-E. *coli.* Mango seed extract showed the widest inhibitory zone in the range of 6.25-23.25 mm, the MIC value of mango seed ethanol extract ranged from 0.078-0.625 mg/mL, and the MBC value ranged from 1.25-10 mg/mL. **Conclusion: Mango** seed extract (*Mangifera indica L.)* potential to be developed as an antibacterial agent against MDR-E. *coli.*

Keywords: *antibacterial activity, E. coli, Mangifera indica L., wound infection*

The technology of using chayote (*Sechium edule*) and modified cassava flour (Mocaf) in the production of sticks

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Abstrack. Sticks are a snack food made from wheat flour. Efforts continue to reduce the use of and dependence on wheat flour. The substitution of mocaf to reduce the use of wheat flour and the addition of chayote in the processing of sticks has an influence on the characteristics of the sticks produced. The aim of this study was to analyze the effect of the addition of chayote and mocaf on the physical, chemical and organoleptic properties of the sticks. The research used a factorial randomized block design with treatment; C:chayote (5%, 10%, 15% and 20%) and F:wheat flour: mocaf ratio (1:1; 1:2; 1:3) for 3 replicates. The results showed that the addition of chayote and mocaf affected the characteristics of the sticks produced. The most preferred treatment by the panelists was C3F1 with values for water content, ash, fat, protein, carbohydrate, a-value, b-value, L-value, and yield of 5.307; 1.847; 29.753; 7.330; 55.763; 3.667; 60.000; 79.667 and 98.936, respectively. Increasing the amount of chayote makes the stick dough more difficult to shape. The more the addition of mocaf makes the texture of the stick more crumbly and easily crushable, the more the aroma and distinctive taste of mocaf become stronger, so the stick was less preferred.

Keywords: Chayote, Mocaf, Stick

The Effect Of Magnetic Field Exposure On Productivity And Vitamin C, Chlorophyll, And Flavonoids Content Of Lettuce Plants (*Lactusa sativa. L*)

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Abstract. This study was conducted to determine the productivity of lettuce plants (Lactuca Sativa. L) and the content of vitamin C, chlorophyll, and flavonoids given magnetic field treatment with a constant exposure time of 15 minutes. The average fresh weight of lettuce plants obtained was 23,234 grams with the average fresh weight in the control group was 7,988 grams. The average vitamin C content of lettuce plants obtained was 10.262 mg/ml with the average vitamin C content in the control group was 6.986 mg/ml. The average chlorophyll content of lettuce plants obtained was 3.472 mg/ml with the average chlorophyll content in the control group being 3.084 mg/ml. The average flavonoid content of lettuce plants obtained was 10.599 mg/ml with the average flavonoid content in the control group was 7.999 mg/ml. From the results of these data, it can be stated that exposure to magnetic fields has a significant impact on the productivity of lettuce plants (Lactuca Sativa. L) and the content of vitamin C, chlorophyll, and plant flavonoids.

Effectiveness of NPK (11-11-28) fertilizer on the growth and yield of shallot

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This study aims to determine the effectiveness of NPK (11-11-28) fertilizer on the growth and yield of shallot. This research was carried out in Malang Regency on DS 2019, using of plot 3,5 m x 5 m with 9 treatments, using RBD, repeated 3 times. The treatment includes: A. 0 kg.ha-1 Urea+0 kg.ha-1 ZA+0 kg.ha-1 SP-36+0 kg.ha-1 KCl+0 g.l-1 water NPK, B. 150 kg.ha-1 Urea+250 kg.ha-1 ZA+100 kg.ha-1 SP-36+100 kg.ha-1 KCl+0 g.l-1 water NPK, C. 150 kg.ha-1 Urea+250 kg.ha-1 ZA+100 kg.ha-1 SP-36+100 kg.ha-1 KCl+2 g.l-1 water NPK, D. 150 kg.ha-1 Urea+250 kg.ha-1 ZA+100 kg.ha-1 SP-36+100 kg.ha-1 KCl+4 g.l-1 water NPK, E. 150 kg.ha-1 Urea+250 kg.ha-1+ZA+100 kg.ha-1 SP-36+100 kg.ha-1 KCl+6 g.l-1 water NPK, F. 250 kg.ha-1 Urea+500 kg.ha-1 ZA+200 kg.ha-1 SP-36+200 kg.ha-1 KCl+0 g.l-1 water NPK, G. 250 kg.ha-1 Urea+500 kg.ha-1 ZA+200 kg.ha-1 SP-36+200 kg.ha-1 KCl+2 g.l-1 water NPK, H. 250 kg.ha-1 Urea+500 kg.ha-1 ZA+200 kg.ha-1 SP-36+200 kg.ha-1 KCl+4 g.l-1 water NPK, I 250 kg.ha-1 Urea+500 kg.ha-1 ZA+200 kg.ha-1 SP-36+200 kg.ha-1 KCl+6 g.l-1 water NPK. The results showed the application of NPK (11-11-28) fertilizer as much as 6 g.l-1 water combined with 150 kg.ha-1 Urea+250 kg.ha-1 ZA+100 kg.ha-1 SP-36+100 kg.ha-1 KCl (treatment E) obtained of dry tuber weight of 14.28 t.ha-1 with an R/C ratio of 4.10.

Keyword : NPK fertilizer, growth, yield, R/C ratio, shallot

EMPLOYEE PERFORMANCE ASSESSMENT USING THE BACKPROPAGATION NEURAL NETWORK METHOD

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Abstract- Industry 4.0 and e-government play significant roles in reshaping organizational and public administration landscapes, driving the need for effective employee performance evaluation. The objective of this research is to classify employee performance into different categories, namely “sangat baik”, “baik”, “cukup”, “sangat buruk”, “buruk”, utilizing the Neural Network Backpropagation method. The employed methodology involves several stages. First, preprocessing is carried out to group assessment criteria into qualifications, competencies, performance, and discipline. Subsequently, feature selection is conducted to group data features according to the established criteria. The processed data is then fed into the Backpropagation Neural Network model. This process involves initializing weights and parameters such as a learning rate of 0.1, 2000 epochs, and 4 hidden layers. after the initialization process enters the calculation process, then continues with calculating the Mean Squared Error (MSE) until converged, Otherwise, iterations continue. The results demonstrate a reasonably accurate outcome, with a Loss: 0.027, MSE: 0.027, MAE: 0.164. It can be inferred that the Backpropagation Neural Network method is highly suitable for addressing employee performance assessment challenges, yielding reasonably optimal results.

Keywords—backpropagation neural network, assessment, performance, employee, e-government

In silico study of *Allium sativum, Curcuma manga,* and *Acorus calamus* nanoparticles as anti-inflammatory

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Abstract. Nanoparticles extracts of *A. sativum, C. mangga*, and *A. calamus* contain several active compounds that have potential as anti-inflammatories. This study aims to analyze the in-silico anti-inflammatory potential of nanoparticle extracts of *A. sativum*, *C. mangga,* and *A. calamus*. In-silico anti-inflammatory analysis was performed by screening for anti-inflammatory activity, analysis of druglikeness properties and ADME, as well as molecular docking of NFkB and COX-2 proteins. The results of this study indicated that the nanoparticles of *A. sativum, C. mangga*, and *A. calamus* contain 123 bioactive compounds with 72 compounds having high activity as anti-inflammatories based on screening from PASS Online and as many as 41 compounds comply with the lipimski rule of five followed by ADMET predictions and molecular docking. The compounds had potential as anti-inflammatories seen from the free energy value of molecular docking for NFkB protein are Lupiwighteone with a value of -9.3 kcal/mol and for COX-2 protein are Apigenin, Fisetin, and Catechin with a value of -9.8 kcal/mol.

Keywords: *Acorus calamus, Allium sativum, Curcuma mangga,* Molecular docking, Nanoparticles

Contribution of Drosophila Climbing Assay in Studying Biology and Diseases

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Abstract. The Drosophila Climbing Assay (DCA) is an important assay in studying disease and other biological studies. The aim of this systematic literature review (SLR) is to analyze the distribution, treatment, and contribution of DCA during the 21st Century. World counter, world cloud, and VosViewer were also involved to analyze the words frequency in related studies, bibliometric, and gap analysis. By using the Scopus database and limiting document types to journal articles, a total of 183 documents have been successfully collected and analyzed in this SLR. Behavior, model, activity, expression, lifespan, and disease are terms that often equate to studies involving the DCA procedure. US, China, and India are the 3 countries that most frequently reporting DCA. DCA has been involved intensively in behavior, Parkinson's, and nervous system research. The co-occurrence analysis resulted in 4 clusters where the DCA procedure to study the impact of nutrient stress and nanoparticles was the result of the identified gap analysis.

Keyword. Drosophila, Climbing, Biology, Disease.

VIABILITY TEST OF YEAST ENCAPSULATION (*Candida tropicalis)* USING SODIUM ALGINATE POLYMER IN BREAD PRODUCTION

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Abstract. Improper yeast treatment can harm its growth. Encapsulation, protecting yeast cells from harsh conditions, can prevent damage. This study aims to assess sodium alginate's impact on *Candida tropicalis* yeast encapsulation viability and its effect on yeast in bread making. *Candida tropicalis* capsules used 10% and 15% sodium alginate concentrations for 2 isolates and 1 control. Data analysis involved Kruskal-Wallis and Mann-Whitney tests. Encapsulation with sodium alginate affected *Candida tropicalis* yeast cell viability. Bread volume percentage tests with 15% sodium alginate additions showed significant increases, especially at 15% concentration. Organoleptic tests indicated panelists preferred fermented bread from *Candida tropicalis* 2 with 15% sodium alginate for color, taste, and texture attributes. For aroma, panelists preferred *Candida tropicalis* 1 with 15% sodium alginate. This study provides insights into encapsulation's influence on yeast viability and its role in improving bread attributes using sodium alginate.

Keywords: *Bread quality, Candida tropicalis, endophytic yeast , encapsulation,* fermentation, *viability*

Effect of *Allium sativum*, *Curcuma mangga* and *Acorus calamus* nanoparticles on mice (*Mus musculus*) hepatic levels (GPT & GOT) in cisplatin induced

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Abstract. The liver plays an important role in the detoxification process, this process requires several enzymes including aminotransferase enzymes (GPT and GOT). GPT and GOT levels are used as indicators to measure the occurrence of impaired hepatic cell wall permeability. This study aims to determine the effect combination nanoparticles of *A. sativum, C. mangga* and *A. calamus* on cisplatin-induced hepatic transaminases (GOT&GPT) levels of mice. This type of research was experimental using a completely randomized design (RAL) with 6 treatments and 6 replications, namely P1 (cis + nano 0 mg/kgBB), P2 (cis + nano 25 mg/kgBB), P3 (cis + nano 50 mg/kgBB), P4 (cis + herbs 75 mg/kgBB), P5 (cis + clomiphene 0.9 mg/kgBB), and K- (aquades). First, data was tested using Kolmogorov Smirnov test (normality) and Levene test (homogeneity). Normal and homogeneous data then tested for diversity one-way Anova (a 5%) and DMRT follow-up test (a 5%). The results showed that mice induced by cisplatin and given nanoparticles at a dose of 50 mg/kg BW had the most optimal levels of GPT (210.89 U/L) and GOT (190.41 U/L). Conclusion this study that was an effect from three plant nanoparticles on mice hepatic (GPT and GOT) levels in cisplatin induced.
Keywords : Cisplatin, Nanoparticles, Levels of transaminase enzymes (GPT&GOT)

Molecular Docking Exploration of Flavonoid Compounds from *Orthosiphon stamineus* B. as Cyclooxygenase-2 (COX-2) Inhibitors for Potential Anti-inflammatory Drug Candidates.

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Abstract. The cat's whiskers plant (*Orthosiphon stamineus* Benth.) is a herbal plant native to the Nusantara region that has properties as an antioxidant, antidiabetic, and anti-inflammatory agent. This plant contains unique flavonoid compounds such as eupatorine and sinensetin, which act as anti-inflammatory agents. These compounds play a role as protease inhibitors, including Cyclooxygenase-2 (COX-2) as an anti-inflammatory inhibitor. This research aims to explore the flavonoid compounds of *Orthosiphon stamineus* as anti-inflammatory agents through the natural ligand HEM by inhibiting the COX-2 mechanism. The research was conducted using in silico methods through molecular docking processes, using software such as SWISSADME, rscb, Discovery Studio Visualizer, Autodockvina, PyRx, and Pymol to explore the potential of flavonoid compounds in cat's whiskers as potential anti-inflammatory drugs with COX-2 inhibitors. The parameters used included Binding Affinity, hydrogen and hydrophobic bonds, amino acid residues, and RMSD (Root Mean Square Deviation). The results showed that the flavonoid compounds all have potential as anti-inflammatory drugs, especially eupatorine with a Binding Affinity value of -8.3 kcal/mol. In conclusion, there are derivative flavonoid compounds consisting of eupatorine, sinensetin, and 5-Hydroxy-3',4',6,7-tetramethoxyflavone that have anti-inflammatory inhibitor activity through the COX-2 inhibition mechanism.

Keywords: anti-inflammatory, in silico, molecular docking, *Orthosiphon stamineus*

The immunomodulatory effect of juwet fruit extract (*Syzygium cumini*) on antibody titer values in male rats (*Rattus norvegicus*)

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Abstract. The immune system plays a crucial role in safeguarding the body against harmful pathogens. Juwet fruit (*Syzygium cumini*) contains bioactive compounds, but specific effects on the immune system remains largely unexplored. Hence, this study aimed to assess the immunomodulatory effect of juwet fruit extract on antibody titers in male rats (*Rattus norvegicus*). The research employed an experimental design using a completely randomized pattern (CRD) with four treatments (K-, P1, P2, and P3) and six replications. The rats were administered juwet fruit extract at doses of 50 mg/kgBW, 100 mg/kgBW, 150 mg/kgBW, and NaCMC (control group) for 21 days. On the 15th day, bovine red blood cells (BRBC) were given to stimulate the immune response. Data analysis involved one-way ANOVA and DMRT (α=5%). The findings demonstrated that juwet fruit extract significantly increased antibody titers ($p<0.05$), with the 150 mg/kgBW dosage displaying the highest antibody titer. Consequently, this research concludes that juwet fruit can enhance antibody production in male rats, making it a promising natural immunomodulatory agent. Furthermore, it is suggested that future investigations explore the effects of juwet fruit compounds on immunity disease models to gain insights into their potential application for specific medical conditions.

Keywords: titer antibody, immunomodulator, *Syzygium cumini*

Behavior Analysis of Mathematical Models of String Vibration with Rolling Mass

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Abstract. This research focuses on the analysis of the deflection $y(t)$ and the deflection angle $\theta(t)$ in the system equation of string vibration with rolling mass. In this study, the deflection behavior is analyzed to test the reliability of the model and the influence of parameter value. The analysis is based on the interpretation of the graph and phase portrait of the model. Furthermore, the effect of object mass (m_b) on the string deflection $y(t)$ is carried out by comparing the graphs of $y_1(t)$ and $y_2(t)$ with $m_b = 10$ dan $m_b = 50$, respectively. The comparison of the graphs of $y_1(t)$ and $y_2(t)$ shows that the rolling mass (m_b) affects the amplitude of the string deflection. Thus, the larger value of m_b, the greater the amplitude of the string deflection. The analysis results show that the mathematical model of string vibration with rolling mass is practical and approximates the actual conditions. Additionally, the weight of the rolling mass also influences the amplitude of string deflection.

Keywords: Amplitude, Deflection Angle, ODE, Rolling Mass, String, String Vibration, String Deflection, Vibration.

Comparison of interaction value of zerumbone compound from lempuyang wangi (*Zingiber zerumbet*) with zopolrestat against aldose reductase in silico

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Abstract. Aldose reductase is an enzyme that plays a role in glucose metabolism. An increase in aldose reductase will trigger an increase in blood sugar concentration by converting glucose to sorbitol. Increased sorbitol conditions will result in diabetes complications such as diabetic cataracts. So we need an inhibitor that can inhibit the working system of the aldose reductase enzyme. One of the medicinal plants that has anti-diabetic properties is Lempuyang Wangi. Lempuyang Wangi has a zerumbone isolate compound which has the potential as an anti-diabetic herbal compound. The purpose of this study was to examine the anti-diabetic properties of Lempuyang Wangi using the in silico method. In this research, docking was carried out with Pymol and Pyrx software, and visualization using Biovia Discovery Studio to see the interaction between zerumbone compounds and aldose reductase and compared with zopolrestat compounds. The docking result of zopolrestat as a comparison compound is -9 kcal/mol, while zerumbone has a binding affinity value of -6 kcal/mol and has the same amino acid bonds with zopolrestat, making it a potential candidate as an antidiabetic herbal drug in inhibiting the working system of the aldose reductase enzyme.

Keywords: Enzyme aldose reductase, Lempuyang wangi, Zerumbone, Zopolrestat

Effectiveness Test of Lampeni Leaf (Ardisia elliptica) as Anti-allergy to Mice (Mus musculus) Induced by Ovalbumin

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Abstract. Hypersensitivity reactions are allergic reactions induced by immunological mechanisms involving IgE antibodies called allergens. One of the most common sources of allergens found in food is the allergen found in egg whites, namely ovalbumin. The lampeni plant (*Ardisia elliptica*) has been considered to have potential anti-allergic effects. The purpose of this study was to evaluate the antiallergic effect of *Ardisia elliptica* leaf extract in ovalbumin-induced mice. Mice were induced by ovalbumin allergen on days 0, 7, and 14. On day 15, mice were given anti-allergic treatment orally. Measuring and observing the diameter of the mice's femurs were carried out 5 hours after treatment. The results showed that the extract with a concentration of 20% was the best treatment for reducing the size of the femur diameter after swelling. 20% extract can reduce swelling by 23.35%. The quercetin compound found in leaf extract can help reduce inflammation and tissue damage due to histamine release, by inhibiting the production of inflammatory mediators such as prostaglandins, leukotrienes, and cytokines. *Ardisia elliptica* leaf extract has been shown to be a potential natural anti-allergic agent against allergies caused by egg white ovalbumin.

Keywords: *Ardisia elliptica*, ovalbumin, mice, antiallergic

Phylogenetic Analysis of the Genus *Bifidobacterium* sp. and *Lactobacillus* sp. Based on the 23S rRNA Gen

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Abstract. Bifidobacterium bacteria are relatives of the Lactobacillus group of bacteria. However, recent studies have shown that the Bifidobacterium species are more closely related to the bacteria of the Actinomyces group which has been confirmed by analysis of the 16S rRNA sequence. The 23S rRNA gene sequence was from the NCBI Gen Bank. Sequence alignment using the ClustalW program on MEGA Version 11.0. A phylogenetic tree was created using the Maximum Parsimony model Subtree-Pruning-Regrafting (SPR) method with 1000 bootstrap to construct evolutionary distances. Haplotype checking using DNAsp 5.10. Haplotypes were developed using Network version 10.2.0 to determine gene flow between species of *Bifidobacterium* sp., *Lactobacillus* sp., *Mobiluncus* sp., and *Alloscardovia* sp. Analysis of nucleotide content using the Oligo Analyzer. The construction of the phylogenetic tree shows that Bifidobacterium is separate from Lactobacillus. The haplotype network shows that Bifidobacterium and Lactobacillus undergo speciation especially in *B. asteroides* and *L. paracasei*. Moreover, the higher Bifidobacterium GC content makes Bifidobacterium more primitive compared to Lactobacillus. In conclusion, the phylogenetic analysis of the 23S rRNA gene shows that the Bifidobacterium genus is distinct from Lactobacillus.

Keyword: 23S RRNA, Bifidobacterium, Lactobacillus, Phylogenetics

Analysis of active compounds *piperlongumine* and *piperine* in *battle* leaf plants (*Piper battle* L.) as anti-cancer drug candidates in silico studies

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Abstract. Betel leaf plants are one of the biodiversity that is often used by the community for generations. Betel leaf contains chemical compounds such as alkaloids, flavonoids, tannins and essential oils with activity as antioxidants. Flavonoid compounds are antioxidant, antidiabetic, anticancer, antiseptic, and anti-inflammatory. The anti-inflammatory active components of Piper extract include piperlungomine and piperine. This study aims to determine the active compounds of piperlongumine and piperine in betel leaves which have the potential as candidates for anti-cancer drugs. The chemical drug used as a comparison of test compounds is vincristine. This study is based on in silico method with compound screening procedures using Kanaya Knapsack, NCBI, Pass Prediction, and SwissAdme websites. The result of this study is that piperlongumine and piperine test compounds have the potential as anti-cancer drugs as antagonists of membrane integrity. Piperlongumine and piperine have qualified Lipinski, while the chemical drug vincristine as a control drug has a lower potency than the two compounds tested.

Keywords: Piperlongumine, piperine, anti-inflammatory, anti-cancer

The immunomodulatory activity of aquades extract robusta green coffee on phagocytosis macrophages Cell *Mus musculus* In Vitro

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Abstract. Robusta green coffee (*Coffea canephora*) contains higher antioxidant and anti-inflammatory compounds compared to black coffee. The chlorogenic acid, caffeine, and flavonoids contened in green coffee has properties as an immunomodulator activity. This study aims to determine the immunomodulatory effect of Robusta green coffee extract on the phagocytic activity of mice peritoneal macrophages in vitro. Macrophages cell were isolated from the peritoneal cavity of a Mus musculus and cultured with different doses of green coffe extract (0, 25, 50, 75 µg/ml) in 10% FBS RPMI medium, then incubated in 5% CO2 at 370C. The immunomodulatory activity on macrophages was evaluated based of phagocytosis activity then analysed using ANOVA (α=0.05). Immunomodulatory activity of Robusta green coffee extract significantly affects on macrophage phagocytosis in vitro. In the concentration of 50 µg/ml was the most effective treatment in increasing the phagocytosis activity of macrophages peritoneal, which phagocytosis persentation was equal to 61.70 ± 4.738% and phagocytosis capacity was equal 188 ± 12.124 latex bead/ml. Therefore, green coffee extract shows potential as an immunomodulatory agent.

Keywords: Immunomodulatory, In vitro, Macrophage phagocytosis**,** Robusta green coffee

Sensitivity, quality factor, and reflection spectra of graphene-based spr biosensors with coating adhesive layer (Cr, Ti, Ta, and TiN): an FDTD simulation study

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Abstract- One of the challenges in constructing an SPR sensor system is coating the plasmonic thin film onto a substrate (in a prism-based configuration) that can adhere robustly. The weak adhesion between the plasmonic thin film and the substrate has been overcome experimentally by adding an intermediate adhesion layer. However, deposition of the adhesion layer onto the SPR sensor chip will cause the chip has multilayer system, in which the sensor performance must be investigated to maintain sensor quality. Here, we conducted finite-difference time-domain (FDTD) simulations to investigate the influence of adhesion layer materials (e.g., Cr, Ti, Ta, and TiN) with thickness variation (5, 10, and 15 nm). We found that the material type and the thickness variation of the adhesion layer affect the shape of the reflection spectrum where the thicker the adhesion layer, the shallower the height of the resonance dip in the spectral curve and also it causes the FWHM be a slightly wider. In addition, the material and thickness of the adhesion layer do not affect the sensitivity factor and quality factor. Then, an adhesion layer with optimal thickness was applied to the graphene based SPR biosensor.

Keywords—SPR Biosensors; Thin Film Coating; Adhesive Layer; Simulation; FDTD

Genes Expression Level Associated with Phosphate Uptake Efficient in Oil Palm (*Elaeis guineensis* Jacq.)

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Abstract. Oil palm (*Elaeis guineensis* Jacq.) is the top contributor for Indonesia's economic growth. The effectiveness and efficiency of fertilization are important in order to sustain of oil palm cultivation. Phosphate absorption efficiency has complex molecular and physiological responses, so that appropriate method to identify the involving genes was needed. Elite palms with nutrient efficiency can be selected from germplasm using molecular markers. *In silico* selection to obtain specific gene marker in phosphate absorption has been done in a previous research. The ten genes candidates were selected based on *SSH library* database. The objective of this research was to get the transcription level of 10 genes in the roots and leaves of commercial progeny treated with deficient dosage of phosphate fertilizer. This research conducted analysis of 10 genes target from leaf and root which associated with phosphate uptake using RT-qPCR methods. Analysis of 10 gene using real time PCR in root samples showed that *histone-lysine n-methyltransferase* (*EZ1*) and *Mitochondrial 2-oxoglutarate malate* (*M2OM*) was differed significantly compared with other genes in root. Positive correlation between *histone-lysine n-methyltransferase* (*EZ1*) and Mitochondrial 2-oxoglutarate malate (*M2OM*) towards phosphate uptake efficiency. Furthermore, in leaves showed that *pto-interaction* (*PTI1*) and *Peroxidase 3* (*Per3*) gene has differed significantly compared with other genes. Positive correlation between *pto-interaction* (*PTI1*) and *Peroxidase 3* (*Per3*) towards phosphate uptake efficiency.

Key words: *gene expression, oil palm, phosphate uptake, RT-qPCR*

Analysis of Areas and Accident-Prone Point on the Malang-Pandaan Toll Road Using DBSCAN Clustering Method

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Abstract. One of the biggest causes of death in Indonesia is traffic accidents. Traffic accidents along the Malang-Pandaan toll road have significantly increased during the years 2018-2022. One of the methods used to analyze accident data is the cluster analysis method, which aims to cluster high proximity and similarity levels. Through the analysis on the Malang-Pandaan toll road, it is hoped that the causes of traffic accidents and the accident rates on that road segment can gradually decrease. This study employs the DBSCAN Clustering method. The grouping is conducted by determining the values of epsilon, minpts, and silhouette. This is followed by finding the distances between clusters with core points. The results of clustering in this study are divided into three cluster groups: cluster 0 located between kilometers 85 - 88 KM, cluster 1 located between kilometers 60 - 72 KM, and cluster 2 located between kilometers 75 - 82 KM on the Malang-Pandaan toll road. Therefore, the kilometers with the highest accident rates are within the range of 60-72 KM, with the main causes being human factors such as drowsiness, lack of anticipation, lack of focus while driving, and exceeding the speed limit.

Keywords: Cluster, accident, toll road, DBSCAN Clustering

In Silico and In Vitro Immunomodulatory Activity of Robusta Green Coffee Extract Against Phagocytosis Macrophages and Lymphocyte Proliferation

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Abstract. Robusta Green coffee is rich in compounds such as chlorogenic acid, caffeine, kahweol, and trigonelline, which are known to have immunomodulatory activity. This research aims to investigate the immunomodulatory activity of green coffee extract on macrophage phagocytosis and lymphocyte proliferation. The interaction of green coffee compounds with the target protein was identified in silico using molecular docking methods, employing software such as Discovery Studio Visualizer, Autodock-vina, PyRx, and Pymol. Macrophages from the peritoneum stimulated inflammation with lipopolysaccharide (10µg/ml), incubated with different doses of extract (30, 40, 50, 60 and 70 µg/ml) in RPMI medium. Lymphocytes were isolated from lymph organs, also incubated with the same doses. The immunomodulatory activity on macrophages was evaluated based of phagocytosis activity. The proliferation of lymphocytes was evaluated by MTT Assay. Parameters were analyzed using ANOVA (α=0.05). The extract significantly affects macrophage phagocytosis and lymphocyte proliferation. In the concentration range of 40-50 µg/ml, it can decrease the percentage of phagocytosis, and increase the phagocytic capacity of macrophages and lymphocyte proliferation. Associated with molecular docking results, showing that chlorogenic acid and kahweol have the potential as immunomodulatory agents, with the highest binding affinity values for inflammatory cytokine (TNF-α, IL1β, IL2) and the NF-kB pathway. Therefore, green coffee extract shows potential as an immunomodulatory agent.

Keywords: Immunomodulator, Lymphocyte proliferation, Macrophage phagocytosis, Robusta green coffee

Effects of gamma irradiation on morphological and anatomical changes in Porang (*Amorphophallus muelleri* Blume)

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Abstract. Porang is agricultural plant that become important in the recent years. However, harnessing them through traditional genetic breeding is time-consuming and expensive. Inducing mutagenesis may be a short-time option for its genetic improvement. Therefore, the aim of this research is to determine the effect of gamma irradiation in the morphological and anatomical changes of Porang. This research used completely randomized design (CRD) consisted of 6 levels of radiation including 0 Gray, 2 Gray, 4 Gray, 6 Gray, 8 Gray and 10 Gray. Porang height, total shoot and leaves, width and length of leaves, stomatal and calcium oxalate density were characterized after irradiation. Quantitative data were analyzed by using Anova one way and duncan on 5% significance level. Level irradiation of 2 Gray affected the number of shoots and leaves, plant height, width and length of leaves, while level irradiation of 6 Gray increased the number and density of stomata, and decreased the density of calcium oxalate. Gamma radiation has succeeded in increasing the agricultural value of porang and producing porang with higher genetic diversity than wildtypes

The Influence of Anticancer Amla Fruit Extract (*Phyllanthus emblica*) Against Rat Liver Cells (*Rattus Norvegicus*) Induced *7,12-Dimethylbenz(α)antrasena* (DMBA) Through In Vitro

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Abstract. Pharmacological research of amla fruits is known to have activity as an antioxidant, mutagenic activity and anticancer. Purpose This study aims to determine the effect of Amla (*Phyllanthus emblica*) fruits extract on the confluence, viability, and LC_{50} of rat's liver cells (*Rattus novergicus*) in vitro induced *7,12-Dimethilbenz(α)antrasena* (DMBA). Methods In this study we used a Completely Randomized Design (CRD experimental were divided into seven groups of four repetition each. The treatments consist Group K(-) as control, K(+), P1 (200 µg/ml), P2 (400 µg/ml), P3 (600 µg/ml), P4 (800 µg/ml), and P5 (1000 µg/ml). Results The samples were rat liver cells aged 3-4 days which were cultured on DMEM media with 10% FBS and incubated in an incubator at 37°C with 5% CO^2 for four days. The percentage of confluence and viability were analyzed using ANOVA one way ($\alpha = 0.05$). The administration of amla extract has effect on confluence and viability of rat's liver cell ($p>0.05$). The value of LC_{50} is 161.11 µg/ml, it's mean < 1000 µg/ml, Based on the results we conclude the administration of amla fruits extraction influenced against DMBA oxidative stress in liver cancer. Amla ftruits has potential as anticancer and candidate effective against cancer treatment.
Keywords: *Phyllanthus emblica,* Anticancer, DMBA, In Vitro

MAPPING OF POTENTIAL LAVA FLOW PATHS IN THE AFFECTED AREA OF MOUNT SEMERU ERUPTION USING ASTER GDEM IMAGE DATA

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Mount Semeru erupted on December 4, 2021 and experienced another eruption one year later on December 4, 2022. Research can be conducted with the aim of creating a map of potential lava flow paths in the Mount Semeru area to support early warning systems for natural disasters as a mitigation effort and to minimize casualties and losses due to eruptions. This study was carried out using ASTER GDEM image data, applying hydrological flow principles in ArcGIS software. It was then overlaid with the river network in the Mount Semeru area as potential paths for lava flow. Lava flow analysis was performed using multi-buffering at distances of 100 m, 200 m and 300 m, showing that the tropical forest and shrubs in Parujambe Village were most affected by the largest lava flow impacts compared to other villages. In the Disaster-Prone Area the total area is 20105.85 ha, with Zone I covering 2827.30 ha, Zone II covering 5026.46 ha, and Zone III covering 12252.08 ha, with the largest land cover being tropical forest. Risk analysis revealed that the Pronojiwo Subdistrict in Lumajang Regency falls within Zone III and has the highest population density, making it the village with the highest risk.

Keywords: DEM; Lava Flow; Disaster Prone Area; Mount Semeru.

Baire's Category Theorem in Cone Metric Space

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Abstract. This research focuses on proving the application of Baire's category theorem in a cone metric space. The Baire's category theorem is a principle in mathematical analysis that describes the convergence and distribution properties of functions in a given space. This research presents the Baire's category theorem in a complete metric spaces along with the conditions that must be satisfied and then applies it to complete cone metric spaces. Theorems on cone metric spaces are also explained to support the research. The result shows that in cone metric spaces satisfying the completeness property, the intersection of the counted dense sets is also dense because the cone metric space satisfies the conditions of Baire's category theorem. The example of the Baire's category theorem in cone metric spaces is also given to reinforce the proof of this research. This research is expected to provide a better understanding of Baire's category theorem, cone metric space and the application of Baire's category theorem in a cone metric space.

Keywords: Baire's category theorem, cone metric space, metric space

The Effect Soaking Time and Concentration of EMS (*Ethyl Methanesulphonate*) to Germination and Growth in Soybean (*Glycine max* L.) Grobogan Variety to Dryness Condition

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Abstract. Soybean (*Glycine max* L.) is an important commodity in Indonesia because it is the cheapest source of protein for the community. However, soybean production is unstable, so new varieties with high availability of genetic resources are needed. One way to expand genetic diversity is through mutagenesis using chemical compounds, to produce soybean varieties with high productivity and drought resistance. This study aims to determine the effect of EMS concentration and soaking time on the germination and growth of the Grobogan soybean variety. The method used was mutation induction with EMS, germination testing with the UKDdp method, and planting plants in polybags. Data were analyzed using two-way ANAVA and further tested using DMRT (α=5%). The results showed that the best treatment combination was obtained at a concentration of 0.03% with a soaking time of 4 hours. The germination variable is the germination percentage of 48.67%; abnormal sprouts of 51.33%; hypocotyl length of 6.28 cm; sprout root length of 5.38 cm; the dry weight of the sprouts was 4.64 gr and the growth was the number of leaves of 12.00 ; and total plant dry weight of 5.08 gr. The conclusion of this study is the best results were obtained from the treatment with the lowest EMS concentration and soaking time.

Keywords: EMS, Germination, Growth, Grobogan Variety Soybean, Drought

ANTHRAQUINONE CONTENT OF KELEMBAK ROOT COLLECTED FROM SEVERAL REGIONS IN CENTRAL JAVA AND FROM CULTIVATION IN TAWANGMANGU

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Nine samples of kelembak (*Rheum officinale* Baill.) were collected from several regions in Central Java consisting of 2 groups, namely kelembak jamu and kelembak jawa. Anthraquinone content were determined by TLC densitometry with silica GF254 stationary phase and toluene: dichloromethane: acetic acid (6: 3: 1) mobile phase. The nine samples had large anthraquinone variations ranging from 0.06 + 0.00% (klembak jamu from B2P2TO-OT) to 0.32 + 0.01% (Kelembak Jawa from).The sample in characterization obtained 4 accessions of kelembak jawa, 3 accessions of kelembak jamu and 1 accession which has a combined character of kelembak jawa and kelembak jamu. The eight accessions were planted in B2P2TO-OT gardens and harvested at the age of 6 months. Kelembak jawa has an average anthraquinone content of 0.28 + 0.07%, kelembak jamu 0.18 + 0.03% and 0.33 + 0.01% for kelembak which has a combined character.

Key words: anthraquinone, Central Java, kelembak, *Rheum officinale*

Hystopatology Of Hepar In Hypetensive Rats (Doca-Salt) Exposed To Mango Mistletoe Methanolic Extract

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Abstract, Hypertensive disease is one of the non-communicable diseases (NCDs) that Its prevalence is high and it is a major risk factor for cardiovascular disease. Severe and long-lasting hypertension can affect the liver, given the liver is an organ that produces angiotensinogen protein, which is influential against increases in blood pressure through the Renin-Angiotensin-Aldosterone system (RAAS). Eating foods rich in antioxidants is an alternative for prevention hypertension, one source of antioxidants is mango mistletoe plant (Dendrophthoe pentandra). This study aims is a true experimental design using a Random Design research design Complete (RAL) using rats divided into five groups, namely negative control (normotensive), positive control (hypertension), and treatment group with administration of mango benalu at doses of 50 mg / kg BB, 100 mg / kg BB, and 200 mg / kg BB. Data were analyzed using JAMOVI 1.1.9.0. Based on the results of the study showed That the significant difference in values between all groups was $P<0.05$. So that administration of mango mistletoe methanolic extract (EMBM) can reduce cell necrosis hepatocytes in hypertensive male rats, with an optimal dose of 50mg/KgBB.

Keywords: Mango Benalu, Hypertension, Hepar, Hepatocytes

Histopatologi hepar pada tikus hipertensi (Doca-Garam) yang dipapar ekstrak metanol mangga mistletoe

Abstrak, Penyakit hipertensi menjadi salah satu penyakit tidak menular (PTM) yang prevalensinya tinggi dan menjadi faktor risiko utama untuk penyakit kardiovaskular. Hipertensi berat dan berlangsung lama dapat berpengaruh terhadap hepar, mengingat hepar merupakan organ yang menghasilkan protein angiotensinogen, yang berpengaruh terhadap kenaikan tekanan darah melalui sistem Renin-Angiotensin-Aldosterone (RAAS). Mengonsumsi makakan yang kaya antioksidan menjadi alternatif untuk pencegahan hipertensi, salah satu sumber antioksidan adalah tumbuhan benalu mangga (Dendrophthoe pentandra). Penelitian ini bertujuan untuk mengetahui histopatologi hepar pada tikus hipertensi yang dipapar ekstrak metanolik Dendrophthoe pentandra L. Miq. Penelitian ini merupakan true experimental design menggunakan desain penelitian Rancangan Acak Lengkap (RAL) dengan menggunakan tikus yang dibagi menjadi lima kelompok, yaitu kontrol negatif (normotensi), kontrol positif (hipertensi), dan kelompok perlakuan dengan pemberian benalu mangga dengan dosis 50 mg/kgBB, 100 mg/kgBB, dan 200 mg/kgBB. Data dianalisis menggunakan JAMOVI 1.1.9.0. Berdasarkan hasil penelitian menunjukan bahwa perbedaan nilai signifikan antara semua kelompok adalah $p<0.05$. sehingga pemberian ekstrak metanolik benalu mangga (EMBM) mampu menurunkan nekrosis sel hepatosit pada hepar tikus Jantan yang mengalami hipertensi, dengan dosis optimumnya yaitu 50 mb/kg BB.

Kata kunci: Benalu mangga, Hipertensi, Hepar, Hepatosit

Study of the halality of the fermentation process in tape by khamir *Saccharomyces cerevisiae*

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Indonesia is an archipelagic country with the largest Muslim population in the world. As a country with a majority Muslim population, in the supply of food products it pays close attention to the halal aspect. Food products resulting from biotechnology that use many microorganisms (*saccharomyces cerevisiae*) must pay attention to the halal aspect. This must be considered so that every production process or in the manufacturing process is ensured to avoid contamination of non-halal materials. Among the food products that need to pay attention to their halal status which utilizes the role of microorganisms is tape. Fermentation 1 day tape alcohol content reaches 1.76%, whereas after 2.5 days the level becomes 3.3%. Based on the MUI fatwa number 4 of 2003 which states that tape and water tape are not included in khamr, unless they are intoxicating. This research uses analysis of literature reviews from related research journals. The results showed that the process of making tape uses a non-alcoholic fermentation system, namely fermentation that does not aim to form high levels of alcohol using certain alcohols so that the elements of haram are not found in the manufacturing process.

Keywords: fermentation, halal, *saccharomyces cerevisiae*, tape, yeast

Computer-aided identification of putative human estrogen receptor-binding phytochemicals: An in-silico-based rationalization pipeline for the use of rosella flower extract in breast cancer

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Breast cancer (BC) is one of the most frequent malignant diseases in women. Rosella (Hibiscus sabdariffa L.) flower extract (RFE) has emerged as an attractive alternative to traditionally treating BC in an estrogen receptor (ER)-dependent manner. This study aimed to (1) identify putative ER-binding phytochemicals of RFE in regulating ER activity and (2) subsequently use the in silico pipeline from this study to develop such a tutorial for the readers to further rationalize the use of particular herb formulae in the BC field. First, a list of phytochemicals found in RFE was obtained from Dr. Duke's Phytochemical and Ethnobotanical Databases. Second, both canonical SMILES and two-dimensional (2D) structures of each phytochemical were collected from PubChem. Third, the protein target and bioactivity of phytochemicals were predicted using the Similarity Ensemble Approach (SEA) and PASS online, respectively. Fourth, the network of putative protein targets related to the ER-dependent pathway was modeled using STRING. Fifth, complexes of ER with putative ER-binding phytochemicals identified in this study were modeled using PyRx 0.8 and visualized using PyMol and ProteinPlus. This study successfully identified subsets of phytochemicals as hits with similar putative binding patterns as several ER-binding drugs, indicating the reliability of the pipeline used here.

Keywords: breast cancer, estrogen receptor, in silico-based rationalization pipeline, phytochemicals, rosella flower extract

Reconstruction Of Phylogenetic Trees And Haplotype Networks (*Andrographis paniculate*) From Indonesia Based On Chloroplast DNA (matK) Sequence

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Abstract. Sambiloto (*Andrographis paniculate*) is a plant that grows a lot in Indonesia. The very wide distribution in various regions makes it necessary to study the kinship of the plant Sambiloto, which includes identification of characters and morphology. However, the lack of available molecular data to support identification of characters and morphology hinders accurate identification of species. So this study aims to determine the kinship of Sambiloto plants in various regions using a phylogenetic approach obtained from the DNA of Sambiloto plants. The DNA taken was from chloroplast DNA (matK). Sambiloto chloroplast DNA was taken from various regions including Sumatra, Java, Sulawesi, Nusa Tenggara and Papua. This study also used a comparison species, *A. nalamayana*. *A. alata*, *A. glandulosa*, *A. echiodes*, *A. lineata*. In mapping the researchers used the neighbor joining, maximum persimony, Bayesian, and haplotype phylogenetic tree approaches. From the results of the approach it is known that all Andrographis paniculate species from various regions have a close kinship and have a common ancestor.

Keyword: *Andrographis paniculate*, Chloroplast DNA (matK), And Phylogenetic tree.

Antibacterial potential of kombucha from apple peel against methicillin resistant *Staphylococcus aureus*

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Abstract. Making kombucha by utilizing local apple peels is expected to reduce the production of apple peel waste while increasing the nutritional value and functional value of kombucha products. This study was aimed to determine the active compound content of kombucha apple peel and its antibacterial activity against MRSA (*Methicillin Resistant Staphylococcus aureus*). This research was experimental in a completely randomized design with two factors: apple varieties (Anna, Manalagi, and Romebeauty) and the proportion of adding apple peel (2.5%, 7.5%, and 12.5%). The analyses included phytochemical screening and antibacterial activity tests using the well-diffusion and dilution methods. The results showed that kombucha apple peel contains tannins, saponins, flavonoids, polyphenols, and organic acids. The varietal treatment factor and the proportion of the addition of raw materials had a significantly different effect ($\alpha \leq 0.05$) on the average total phenol, total acid, and antibacterial activity of kombucha apple peel. Antibacterial activity against MRSA showed a range of weak to moderate inhibition, with the highest inhibition zone diameter value of 6.58±0.52 mm in the Anna variety treatment with a proportion of 12.5%. The MIC value of the best-treated kombucha was at a concentration of 85%, while the MIC value could not be determined.

Keywords: bacterial infection, kombucha, phytochemical, *Malus sylvestris*, *Staphylococcus aureus*

Tuber yield and starch qualities variation of cassava clones

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Abstract. Cassava is important crops, both for food and industries. Beside tuber yield, physico-chemical properties of tubers are very important to determine the tuber quality. The research was conducted at farmer's field and the ILETRI's Laboratory, Malang, East Java, Indonesia. The research aims were to assess agronomic characters, physico-chemical properties of tubers, and starch qualities of 13 cassava clones. The results showed that tuber yield and physico-chemical properties of tubers varied among clones tested. Clone CMM 02040-1 had starch content, starch yield, sugar content, dry matter content, and water content better than check. Clone CMM 03038-7, although the starch content is lower than clone CMM 02040-1, but with high yield potential, clone CMM 03038-7 had high starch yield potential. The results of the analysis of functional properties of starch, both clones (clone CMM 02040-1 and clone CMM 03038-7) showed good functional properties, so suitable for raw material of industries. That two clones had been released as new superior cassava varieties.

Keywords: Manihot esculenta, physico-chemical properties, starch

Memetic algorithm small survey for 2019 published papers

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Abstract. This paper was created as a plan for selecting the implementation of the Memetic Algorithm (MA) as an algorithm optimisation to be applied to the large research we are conducting, namely the Automatic Identification System (AIS) research. Memetic Algorithm (MA), which is known by other terms such as Memetic Computing or Memetic Computation, Genetic Local Searchers, Lamarckian Genetic Algorithm (GA), or Baldwinian GA, is still interesting to study. In this paper, we try to accommodate the glory of MA based on research papers in 2019 where we surveyed the 2019 memetic algorithm (MA) papers by searching for these articles using Google Scholar and only for 2019 published papers, and we found there were 2,850 result papers. We randomly limited the 75 documents distributed into five types of articles: problem content of 40 papers, image content of ten papers, parallel content of five papers, gene or DNA content of four reports, and other content of 16 papers. Hopefully this small survey paper can help those who are interested in this MA algorithm, especially researchers in Indonesia, because we can find papers in Indonesian using MA.

Keywords— Genetic Local Searchers; Memetic Algorithm; Memetic algorithm Survey; Optimisation; Small Survey

Searching routing using A-Star (A*) search algorithm

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Abstract—This paper was created as a plan for selecting the implementation of the algorithm for implementing the A-Star (A*) Search algorithm to implement the Automatic Identification System (AIS). A smart city must have suitable constructions to remain an efficient area, such as intelligent traffic, innovative facilities, bright public spaces, smart buildings, and, most importantly, route-finding methods as a bridge for people in the area to go. Where have you been? They want, without worry, about the selected location's time, energy, situation and condition. Indonesia has plans to move the capital to Kalimantan. It would not be wrong if the government thought of a new concept of a new capital city as Indonesia's trade centre as the first city in Indonesia to apply the Internet of Things and a routing search method that can be flexible with all Indonesian cultures such as how they drive, how they refuel, or how they spend. From the starting point to the next issue, we have to focus on how the Algorithm manages all data to create graphs or trees to help embedded systems control all public and private vehicles to run with the system or independently by reducing accidents and errors using Indonesian culture and situations.

Keywords — A-star algorithm, A* Algorithm, pathfinding Algorithm, Optimization artificial intelligence.

GREEN PREPARATION OF Cu NANOPARTICLES WITH BIOREDUCTOR OF RED DRAGON FRUIT PEEL EXTRACT: VISIBLE SPECTROSCOPY PROPERTIES

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Abstract. Copper nanoparticles have been successfully synthesized using the green synthesis method by utilizing red dragon fruit peel extract as a bioreductor. Red dragon fruit peel contains secondary metabolites that can reduce Cu^{2+} ions to Cu^{0}. Physically, the formation of copper nanoparticles is indicated by a color change from light blue to green. In addition, the success of copper nanoparticles of red dragon fruit peel extract can be analyzed using a Visible and Fourier Transform Infrared (FTIR) spectrophotometer. The measurements using a Visible spectrophotometer showed the formation of copper nanoparticles at absorption peaks in the wavelength range of 400-450 nm. The stability of copper nanoparticles can be determined through the SPR peak absorption for 30 minutes, which shows that copper nanoparticles have good stability and have an estimated particle range of 46.43-92.93 nm, with a band gap value of 2.45 eV. The results of the FTIR spectrum on copper nanoparticles-red dragon fruit peel extract show a shift in the absorption peak of the wave number 3412.07 cm^{-1} to a wave number of 3439.07 cm^{-1} indicating a reduction of Cu^{2+} to Cu^{0}.

Keywords: Copper Nanoparticles, Red Dragon Fruit Peel Extract, Visible Spectroscopy.

Research-Based Disaster Mitigation Learning with a STEM Education approach in Mapping Risk Levels of Damage Due to Earthquakes

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In order to create a competitive nation, the development of quality human resources is a necessity. Improving the culture of researching early on in students is one of the efforts that can be made. Increasing this research culture can be done by implementing Research Based Learning (RBL). In this RBL research is integrated into the learning process. One approach that can be taken in RBL is STEM education. STEM integrates the fields of science, technology, engineering, and mathematics with the aim of increasing students' abilities in declarative, procedural, schematic and strategic knowledge so that practice and content can be studied more deeply. STEM is active learning based on real problems in everyday life. The purpose of this research is to develop an RBL model with a STEM approach. In this model students will map the level of risk due to earthquakes. Students will analyze the Maximum Land Acceleration, Vulnerability and Human Development Index in an area to make a map of the level of risk of damage due to earthquakes in that area. With this learning model, students are expected to be able to conduct research to map the level of earthquake risk as a disaster mitigation effort.

Keywords: Research-Based Learning, Disaster Mitigation, STEM Education, Risk Level, Earthquake.

Map of potential tsunami inundation hazard on the south coast of Trenggalek Regency, East Java Province

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Abstract. There were earthquakes in 1994 and 2006 which caused a tsunami on the south coast of Java Island. Tsunamis become dangerous when the waves travel inland causing a disaster. The purpose of this study was to map the potential for a tsunami hazard in Watulimo District, Trenggalek Regency. The parameters are slope, surface roughness coefficient, coastline with a tsunami height scenario ranging from 1 m, 2 m, 5 m, 15 m, 27 m and 30 m. With the help of the model builder in the ArcGis software, the area potentially affected by a tsunami is obtained. There are six villages in Watulimo District whose settlements have the potential to be affected by the tsunami. In the 1-2 m wave height scenario, no settlements will be affected. For the 5m scenario, there are three settlement villages affected by up to 20%. Nearly 82% of settlements in four villages were inundated by the tsunami in the 15 m scenario. In scenarios of 27 m and 30 m, the average settlement in six villages is inundated by 76% and 77%. Specifically for Margomulyo Village, all of its settlements were inundated by this tsunami.

Keywords: Map of Potential, Tsunami, Inundation, Trenggalek Regency.

Application of Surfer 8 Software on the Water Quality of Way Kuripan Estuary in Bandar Lampung City

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Abstract. Way Kuripan is one of the rivers that cross Bandar Lampung city. The river carries residual of activities to the river estuary in the area of Lampung bay which will influence the quality of the estuary water. The primary objective of this research is to assess the water quality of the Way Kuripan estuary by employing the Pollution Index (IP) as the evaluative criterion. Additionally, the research aims to elucidate this assessment through the graphical representation of contour maps, generated using the Surfer 8 software. By undertaking this endeavor, the study seeks to contribute to the scholarly understanding of water quality dynamics in the Way Kuripan estuarine environment. Parameters in the determination are Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved oxygen (DO), phosphate and nitrate. The outcomes of the physics parameter tests reveal that the temperature ranged from 28.6°C to 27.8°C, Dissolved Oxygen (DO) was observed within the interval of 2.79 to 3.79, Total Dissolved Solids (TDS) exhibited variations ranging from 35.5 mg/L to 1022 mg/L, and the pH values were recorded between 7.01 and 7.57. Acquired from the chemical parameter testing, the concentration range of Biological Oxygen Demand (BOD) was determined to be between 0.475 and 1.35, the concentration of Chemical Oxygen Demand (COD) was 12.25 - 24.25, the concentration of phosphate in the range 0.001 mg/L - 0.515 mg/L and nitrate concentrations is in the range of 0.188-1. The Pollution Index in the Way Kuripan estuary is in the range of 0-1 which indicates good conditions.

Keywords: Pollution Index, Quality, River, Surfer 8, Way Kuripan

Evaluation of Antidiabetic and Antioxidant Activities of Selected Ethnomedicinal Plants from East Kalimantan

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Five ethnomedicinal plant extracts from East Kalimantan flora, traditionally used to treat blood sugar levels and other diabetes-related diseases, were examined *in vitro* for their antidiabetic and free radical scavenging activities by inhibiting rat α-glucosidase and several free radicals such as DPPH and ABTS, respectively. Out of the five plant species investigated for their antidiabetic activity against maltase rat α-glucosidase, three exhibited the strongest glucosidase inhibitory activity with maltose as a substrate, namely extracts of *Garcinia nervosa*, *Syzygium caudatilimbum*, and *Shorea balangeran* with percent inhibition (PI) values of 64.11; 65.92; 67.52 %. Meanwhile, quercetin as positive control had percent inhibition (PI) value of 72.26%. Furthermore, the antioxidant test showed that the five methanol extracts of plants from East Kalimantan have an antioxidant activity indicated by percent inhibition (PI) values. The present study confirms that the ethnopharmacological use of selected plants from East Kalimantan might have potential as an antidiabetic and natural antioxidant.

Keywords: Antidiabetics, antioxidant, biodiversity, East Kalimantan

The Potency of Selected Medicinal Plants from East Kalimantan as Antidiabetic and Antioxidant Agents

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Five selected plants in this study have been used traditionally in East Kalimantan as medicinal plants. This study aimed to screen and evaluate the *in vitro* antidiabetic and antioxidant activity of methanol extracts of selected plants from East Kalimantan. The antidiabetic activity was carried out by α-glucosidase inhibitory activity with maltose as substrate while antioxidant activity was determined by free radicals scavenging activity against DPPH and ABTS The results showed that *Garcinia riedeliana* extract had strong inhibitory activity with percent inhibition (PI) value of 71.20% followed by *Shorea laevis*, *Pternandra azurea* and *Bridelia tomentosa* with percent inhibition (PI) values of 69.86; 66.69 and 65.38 % in maltose respectively, while quercetin as positive control had percent inhibition (PI) value of 72.26%. The results on antioxidant activity showed that all extracts have percent inhibition (PI) value against free radicals DPPH and ABTS. The most active extract as α-glucosidase inhibitory activity and antioxidant activity was *G. riedeliana* extract. These findings provide the scientific evidence that one species of medicinal plants from East Kalimantan might be potential as an antioxidant and α-glucosidase inhibitor.

Keywords: Antidiabetics, antioxidant, biodiversity, East Kalimantan

Synthesis of Zeolite X from Kaolin with SiO_2 Precipitation Pre-Treatment as a Catalyst Transesterification of Castor Oil

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Abstract. Zeolite X was synthesized from natural kaolin, previously pretreated SiO2 precipitation. This research was conducted to apply zeolite as a catalyst in producing castor oil-based biodiesel instead of fossil fuels. Zeolite was synthesized by hydrothermal method at 100oC temperature for 2 hours with a variation of stirrer time of 1 hour, five days, and 10 days. The synthesis results were used as a catalyst for the transesterification of castor oil for 6 hours at 65oC. X-ray diffraction (XRD) showed that the synthesis with a stirrer time of 1 hour produced amorphous material, a stirrer time of five days produced zeolite X with impurities P, and a stirrer time of 10 days produced pure P zeolite. While the BET surface area of zeolite X with impurities P was 72.423 m2/g and pure zeolite P was 82.684 m2/g. Based on the GC results, the zeolite X catalyst with P impurities within 6 hours obtained 94.13 percent oleate methyl ester. Meanwhile, the pure zeolite P catalyst produces 26.73 percent palmitate methyl ester and 72.90 percent oleate methyl ester.

Keywords– Kaolin, SiO2, Zeolite, Methyl ester

Mobius strip parametric equations on curve and survace

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Abstract- This study describes the application of geometric and algebraic concepts in the analysis of Mobius band parametric equations. The Mobius strip comes from German: [ˈmøːbi̯ʊs] which can be spelled Mobius or Moebius. The Mobius strip is an interesting mathematical object that combines elements of geometry and algebra in a parametric formulation. In this context, we apply geometrical concepts of three-dimensional space, including Cartesian coordinates and geometric relations, to describe the position of points on the Mobius strip. Through this research, we illustrate how geometric approaches to understand and analyze more complex mathematical structures such as the Mobius strip with analyzing the reduction of geometry and topology from torus to Mobius Strip . We describe the transformation steps of the geometrical concepts in the Mobius band parametric equations. This research contributes to the understanding of the relationship between these two fields of mathematics in a real applicative context, as well as broadens the view of the application of mathematical concepts in various geometric contexts.

Keywords: Mobius strip, geometry, torus, parametric equations

Potential of endophytic yeast from neera siwalan (*Borassus flabellifer* L.) as leavening agent for bread

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Abstract. Yeast is a unicellular eukaryotic microorganism from Kingdom Fungi that has an important role in the fermentation process. One of the benefits of yeast is as a leavening agent for bread. Neera siwalan is a liquid tapped from the cobs of male siwalan flowers with a high total sugar content of around 15 grams per ml. The purpose of this study was to determine the types of yeast found in neera siwalan and its potential as a leavening agent for bread. The isolation of yeast using the culture propagation method on YMEA media was then purified, followed by macroscopic and microscopic morphological identification. tests on the potency of bread leavening agent included carbohydrate fermentation tests, glucose tolerance tests, flocculation tests, and hydrogen sulfide production tests. Yeast, which has the potential to be the best leavening agent, followed by molecular identification. The results showed that there were 5 isolates that were successfully isolated from siwalan sap, including: YNS-A2. YNS-B2, YNS-B3, YNS-C2, and YNS-D4. Molecular test results of isolate YNS-C2 showed similarities with *Candida sanyaensis* (91.89%), and isolate YNS-D4 showed similarities with *Candida* sp. (82.22%).

Keyword: bread developer, endophytic yeast, fermentation, molecular, neera siwalan

SARS-COV-2's proteins based on an in silico study

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Abstract: Several proteins are crucial in spreading SARS-CoV-2, which have been modeled and used as a target to decrease the number of positive cases, such as Spike proteins, and the main protease. Herbal medicines such as Green Tea and Turmeric have pharmacological properties, such as antiviral, and antioxidant because of their bioactive compounds. So the study aimed to illustrate the interaction between Green Tea and Turmeric bioactive compounds on Spike protein and main protease through in silico analysis. The seven bioactive compounds were docked with the main protease protein, and spike proteins, using GC376 and Hydroxychloroquine as control for main protease and spike protein respectively. The results showed that Green Tea and Turmeric bioactive compounds have lower binding affinity than GC376 and Hydroxychloroquine, including Epicatechin Gallate, Epigallocatechin Gallate, and Bisdemethoxycurcumin against spike protein with binding affinity score (-9.6 kcal/mol, -9.2 kcal/mol, -7.6 kcal/mol) compared with Hydroxychloroquine (-5.6 kcal/mol). While Epicatechin Gallate showed same binding affinity score as GC376 (-7.0 kcal/mol) against main protease. In conclusion, bioactive compounds of Green Tea and Turmeric may be having ability to inhibit SARS-CoV-2 infection than antiviral drugs. Therefore, more study is needed to evaluate efficacy of Green Tea and Turmeric bioactive compounds against SARS-CoV-2.

Keywords: Anti-viral Drugs; Binding Affinity; Herbal Medicines; Molecular Docking; SARS-CoV-2

The potential and prospects for the implementation of precision farming for soybean production in Indonesia

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Abstract. Precision farming is a modern agricultural technology using various ITs. This technology is considered very potential to be applied for developing soybean production in Indonesia. This is because with the use of conventional technology it is difficult to achieve maximal productivity as expected, especially with the limited facilities and infrastructure. Based on research results, precision farming is able to increase productivity and farming efficiency, reduce negative impacts on the environment and increase farmer's income so that it can support sustainable farming management. Precision farming is very prospective to be developed in Indonesia to increase soybean productivity and production to support the achievement of soybean self-sufficiency. Support for the implementation of precision farming has been provided by the government, the private sector, and also farmers. The success of implementation of precision farming is greatly influenced by the development of IT technology, especially those related to various aspects of soybean cultivation.

Variance analysis and heritability estimation of growth and yield parameter of sweet cassava promising clone in two environments

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Abstract. Planting a good variety is important thing in increasing the productivity of cassava. Selection and evaluation are needed for development of new variety. The evaluations were done in Malang (Entisol soil) and Probolinggo (Alfisol soil). The evaluation used a RCBD with three replications. Plants were planted on rows with distance 100 cm between rows and 80 cm within rows. A total twelve clones (8 promising clones and 4 released variety) were used in this evaluation. Results can be seen that the variance of genotype was bigger than the variance of genotype x environment interaction for fresh tuber yield, starch content, long of tuber, diameter of tuber, tuber number/plant in eight months and plant height in 4 months, means genetic potency of clones tested more important compared to effect of genotype x environment interaction. This result indicated that clone tested have low chance to be a specific adaptation. The productivity of cassava clone in term of tuber yield and starch yield in Malang was higher than that in Probolinggo. The genotypic variance and the heritability for fresh tuber yield, diameter of tuber and tuber number/plant in eight months in Malang were higher than that in Probolinggo.

Keywords: Variance analysis, heritability, sweet cassava promising clones

Early Detection of Sweet Potato Weevil (*Cylas formicarius*) and Scab Diseases (*Sphaceloma batatas*) Outbreak Based On Android Application

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Abstract. Sweet potato weevil and scab disease are major pests and diseases that become obstacles for increasing sweet potato production in Indonesia. Recently, the incidence of both pest and disease attacks can be detected earlier by using an android-based mobile application. This study aims to assemble an android-based mobile application for early detection of the outbreak of sweet potato weevil and scab disease. This research was conducted in in Malang Regency, East Java, from September to December 2022. Research was carried out by observation, literature studies, and interview with the leaders of farmer association, sweet potato farmers, and local agricultural extension staff. All basic data and supporting data as a trigger for the occurrence of the weevil and scab disease have been collected from the several sample areas. The information was arranged in clusters according to the priority of each variable then was entered into the android studio. The user should entered the supporting data based on the application program to find out the percentage of sweet potato weevil and scab disease. Understanding the predictive value of the incidence of major pests and diseases is required, so farmers can anticipate earlier and prepare appropriate, effective and efficient control technology. An-android mobile application version 1 for early detection of pest and disease which was successfully assembled was expected to be greatly assist sweet potato farmers for maintain their cultivation from yield losses due to *C. formicarius* and scab which can reduce the quantity and quality by up to 100%.

MOLECULAR DOCKING OF SELECTED STEROID COMPOUNDS FROM Hydrilla verticillata ON HUMAN ROS1 KINASE RECEPTOR

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Abstract. *Hydrilla verticillata*, an aquatic plant, contains various steroids like stigmasterol, β-sitosterol, fucosterol, cholesterol, and campesterol with potential antioxidant properties. Antioxidants protect cells and tissues from Reactive Oxygen Species (ROS)-induced damage by impeding oxidation reactions and ROS elimination. This study aimed to investigate the molecular docking results of selected steroid compounds from *H. verticillata* with the human ROS1 kinase receptor. Five selected steroid compounds, collected from the PubChem database. The human ROS1 kinase receptor, PDB ID 3ZBF, was obtained from the RCSB Protein Data Bank. Molecular docking of these selected steroid compounds to human ROS1 Kinase was performed, comparing their binding affinities to crizotinib (native ligand) and ascorbic acid. The docking utilized the PyRx Virtual Screening Tool and visualization via BIOVIA Discovery Studio Visualizer. Results indicated that stigmasterol, β-sitosterol, fucosterol, cholesterol, and campesterol had binding affinities of -8.1, -8.2, -8.6, -8.4, and -8.5 kcal/mol, respectively, to the 3ZBF human ROS1 kinase receptor. In contrast, crizotinib and ascorbic acid exhibited binding affinities of -8.4 kcal/mol and -4.7 kcal/mol. Some *H. verticillata* steroid compounds displayed stronger binding affinities than crizotinib and ascorbic acid. Furthermore, these compounds complied with Lipinski's and Veber's rules and achieved bioavailability score of 0.55, suggesting their potential as antioxidants.

Keywords: Steroids, *Hydrilla verticillata*, ROS1 kinase, antioxdidant.

Study of drosophila relationships from three regions in east java, Indonesia

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Drosophila has a huge number of members and a wide range of habitats. Different natural conditions make it possible to find different Drosophila populations, although there are types of Drosophila that are cosmopolitan. Morphological variations characterize Drosophila diversity. The structural similarity of an individual can be used to determine various kinship relationships between organisms. This research aims to determine the relationship between Drosophila from three regions in East Java, Indonesia, namely Malang, Mojokerto and Pasuruan, based on similarities in morphological characteristics. Samples were taken from these three areas, and observations were carried out from January to May 2023 at the Genetics Laboratory, Biology Department, FMIPA UM. Identification of Drosophila is based on an identification key consisting of 52 traits. Drosophila was purified to the third generation (F3) to achieve a homogeneity of 87.5%. The kinship relationship is sought by calculating the association coefficient and similarity index as a reference in preparing the dendrogram. The dendrogram illustrates that Drosophila from Malang has a closer relationship with Drosophila from the Pasuruan area than from the Mojokerto area. Drosophila kinship relationships are influenced by internal and external factors, which include gene flow, mobility, distance, type of food, and natural conditions.

Keywords: dendrogram, Drosophila, kinship

Soybean growth promotion and damping-off suppression by application of *Trichoderma virens*

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Abstract. *Rhizoctonia solani* is soil borne pathogen that causes damping-off in legumes including soybean. To reduce disease infection of *R. solani* in soybean, seven isolates of *Trichoderma virens* were used as seed treatments. Soil was artificially infected using *R. solani* grown in organic media. Agronomic parameters and total phenolics were recorded at vegetative phase. Treatments with *T. virens* T.v6, T.v4, T.v7, and T.v3 showed lower disease incidence (22% to 34%) than that of the control (46%). *T. virens* T.v6 induced higher shoot and root length compared to plants grown in sterile soil. Phenolic in *T. virens* T.v7 treated plants showed the highest content (2.69 mg GAE/g) and the increase of this content was 13.7% compared to the control. Higher number of normal seedling growth and lower disease incidence than the control were observed in these treated plants. Another treatment with *T. virens* T.v6 showed lesser amount of phenolic content (2.53 mg GAE/g) and lower increase of this content (7.2%) than those of *T. virens* T.v7 treated plants. However, the *T. virens* T.v6 treated plants performed higher normal seedling growth, lower disease incidence than the control. *T. virens* T.v6 and T.v7 were promising for plant growth promotion and biological control agents which were more environmentally friendly control.

Elephantopus scaber ethanol extract suppresses inflammation via regulation of NFkB pathway in lung fibrosis mice model

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Abstract. Lung fibrosis is a chronic and progressive disease that scars and stiffens the lung, leading to organ function failure and death. There is no effective treatment to prevent and heal this condition. *Elephantopus scaber* is a traditional medicinal plant known for its anti-inflammatory activity, but its prospective role in lung fibrosis needs further investigation. This study aimed to investigate the relative number of $CD11b^{+}NFkB^{+}$ and $CD11c^{+}NFkB^{+}$ cells in the early stages of bleomycin exposure in mice after *Elephantopus scaber* ethanol extract (ESEE) treatment. Mice were grouped and received doses of ESEE or dexamethasone as positive control orally, followed by intraperitoneal injection of bleomycin (2 mg/kg) daily for 7 days. Mice were sacrificed on day 7, and the splenocytes were isolated to determine the relative number of $CD11b^{+}NFkB^{+}$ and $CD11c^{+}NFkB^{+}$ cells using flow cytometry analysis. The results showed that NFkB-expressing cells were significantly lower in all groups receiving ESEE than in groups receiving bleomycin. The group receiving ESEE at a dose of 0,1008 mg/kg represents the most optimal suppression activity, exceeding the group receiving dexamethasone. Therefore, ESEE treatment effectively suppresses inflammation by lowering the relative number of $CD11b^{+}NFkB^{+}$ and $CD11c^{+}NFkB^{+}$ in the lung fibrosis mice model.

Twitter Sentiment Analysis on Crypto Digital Currency Using LSTM and RNN

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Abstract. Cryptocurrency is an asset in the form of digital currency that uses cryptographic protocols for transaction security. The large number of digital currencies used in the process of buying and selling or a transaction makes it safe for people to feel confused about which currency to use in exchanging or buying and selling investment they are not persuaded by counterfeit currency because of the high nominal but low economic value. The purpose of the problem that has been obtained from the problem is to apply sentiment analysis using a new method, namely LSTM on sentiment analysis of cryptocurrencies. This method is used measure the level accuracy in Twitter sentiment analysis on the topic of digital currency. The results obtained by LSTM are able to overcome the vanishing gradient problem and maintain long-term information better. This allows LSTM to understand the broader context in the text. Their ability to recognize complex and dynamic patterns in text data provides better results than traditional approaches. The main advantage of RNNs and LSTMs is their ability to handle sequential data, such as text. Digital currencies are often subject to continuous market trends and changes, and this method is effective in responding to these fluctuations.

Keywords: LSTM, RNN, Crypto, Sentiment.

Detection of woven fabric motifs using the YOLOv4 method

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Abstract. Malacca is one of the districts that has a weaving culture and also produces woven fabrics in East Nusa Tenggara. The large number of types of woven cloth from each Malacca tribe means that outsiders and even native Malacca people are not familiar with typical Malacca woven cloth motifs, therefore a system is needed that can help make it easier for people to recognize the types and motifs of Malacca woven cloth. In this study, digital image processing was used to detect the types of woven fabric motifs in Malacca district using the YOLOv4 method. The results of the detection of Malacca woven fabric motifs match each woven fabric. Apart from that, the Malacca woven fabric motif detection system using YOLOv4 technology is an effective and efficient solution in recognizing typical Malacca woven fabric motifs. The woven fabric is classified into four grades with a very impressive 100% mAP score.

Keywords: Object Detection, Identifying Malacca woven fabric motifs, woven fabric, yolov4.

Synthesis and characterization of gadolinium (III) complex compounds with 1,3,5-Benzenatricarboxylate ligand (H_3 BTC) using sonochemical method

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Abstract. Gadolinium is one of the rare earth metals that is strongly paramagnetic because it has seven unpaired electrons. These paramagnetic properties are often used as a contrast agent in Magnetic Resonance Imaging (MRI). The ligand used in the synthesis is the H_3BTC which is one of the multicarboxylate ligands containing an O donor atom to form a complex with metal ions. Gd-BTC complexes were synthesized using sonochemical method with time variations of 15, 30, and 45 minutes in order to determine the relationship between synthesis time and the products formed. The design used was to dissolve $Gd(NO_3)_3.6H_2O$ and H_3BTC with DMF and distilled water solvent 20 mL. Furthermore, the sonication process was carried out with time variations of 15, 30, and 45 minutes. The synthesized product will be characterized using XRD. The results showed that the synthesis product obtained from the sonochemical method with time variations of 15, 30, and 45 minutes was in the form of white powder, where the mass of the product obtained increased with the longer the synthesis time. XRD analysis showed that the use of variations in synthesis time produced products with the same solid phase, namely crystals, but with different crystallinity and crystal size.

Keywords*: Gadolinium, H_3BTC ligand, Sonochemistry.*

The utilization of Binahong leaves as medicinal plants for livestock production and health

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Abstract. The utilization of Binahong leaves or *Anredera cordifolia* (Ten.) Stennis as medicinal plants in livestock production and health has garnered significant attention in recent years. This review paper aims to provide a comprehensive analysis of the diverse potential benefits of Binahong leaves in enhancing livestock well-being and productivity. With a focus on its applications in the livestock sector, this review encompasses multiple facets, including the phytochemical composition of Binahong leaves, their pharmacological activities, and their impact on animal health and production. The phytochemical profile of Binahong leaves is examined in detail, highlighting the presence of bioactive compounds such as flavonoids, saponins, and alkaloids, which contribute to its medicinal properties. These compounds exhibit antioxidant, anti-inflammatory, antimicrobial, and immunomodulatory activities, making Binahong leaves a promising natural remedy for addressing health challenges in livestock. Furthermore, the review explores the potential mechanisms by which Binahong leaves can improve livestock health. These mechanisms involve the enhancement of immune responses, the reduction of oxidative stress, and the mitigation of common ailments in animals. Additionally, the effects of Binahong leaves on livestock growth, reproduction, and overall production are discussed, emphasizing their role in sustainable livestock farming. In ruminants, Binahong is beneficial for therapy in Gastroenteritis caused by *Bacillus subtilis*, for the treatment of eye infections, overcoming drug resistance in *E. coli*, and for mastitis therapy in dairy cattle. This review paper suggests the potential utilization of Binahong as a herbal plant or alternative medicine for general health and, specifically, for enhancing livestock productivity.

Keywords: Binahong, herbal, medicine, livestock

Antibacterial Test of $SrBi_2Ta_2O_9$ Using Syntesis Molten Salt Method

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Abstract. Aurivillius compounds have the opportunity to be used as photocatalyst compounds so that they can kill bacteria. This study aims to determine the crystal structure, particle size, morphology, band gap energy and photocatalytic activity of $SrBi_2Ta_2O_9$ compounds against antibacterial tests synthesized using the NaCl/KCl mixed salt melt method. Precursors were weighed stoichiometrically and crushed with each salt in a ratio of 1:7 (product:salt) until homogeneous. The sample was calcined at 750 and 820 °C for 6 hours and the product in the oven at 80°C for 2 hours. Characterization of compound products was carried out using X-ray diffraction (XRD), scanning electron microscopy (SEM), and ultraviolet-visible diffuse reflectance (UV-Vis DRS) instruments. The antibacterial activity test of $SrBi_2Ta_2O_9$ compound was carried out by inhibiting the growth of Staphylococcus aureus bacteria using the plate count method.

Keywords: $SrBi_2Ta_2O_9$, antibacterial, photocatalytic activity, molten salt method

Detection of laylat al-qadr in ramadan using iqra' algorithm based on unique anomaly as luxlier data detection to proving the truth signs of Islam

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Abstract. This study is related to the importance of increasing the understanding on the use of advanced technology on the signs of truth from Allah SWT contained in the Qur'an and Hadith so that they can be easily understood by many people, especially those outside Islam, to show that Islam is a very scientific and rahmatan lil 'alamin. Therefore, in this research, a collaboration is carried out between the fields of science and technology from Data Science as the approach of identification the Laylat al-Qadr (LQ) occurrence and why it only occurs one day in the Ramadan using the iQRa' Algorithm as the main research proposal and contribution with Artificial Intelligence (AI), Machine Learning (ML) and implementation code. From the results, it was suggested that the identification of the 2022 LQ day falls on 23 Ramadan 1443 H, which have been tested from 21 cities along 29-30 days data, from the beginning to the end of Ramadan 2022.

Keywords: Detection of laylat al-qadr, iqra' algorithm, ramadan, qur'an and hadith.

Landsat 8 image analysis based on LST criteria to detect increased volcanic activity at Arjuno Welirang with the implementation of GEE programming

Daeng Achmad Suaidi

Abstract. In this paper, a study of the evolution of Arjuno Welirang volcanic activity was carried out based on Landsat 8 image analysis by determining LST values. Compared to volcanic seismic methods which are commonly used to monitor volcanic activity, this remote sensing method is technically more flexible in terms of data access. Landsat 8 satellite image data is easier to access and download. Meanwhile, volcanic seismic data is not freely available. Access to this data center requires permission from the data authority. In this study, the LST calculation algorithm is implemented with GEE (Google Earth Engine) programming. GEE is a cloud computing platform based on Java script. Using GEE with a cloud computing platform also makes it easier to process large remote sensing data because the downloaded file size is unlimited. LST analysis was carried out on Landsat 8 image data in the time period June-August 2023. This time period was adjusted to the report on the development of volcanic seismic activity released by the Magma Indonesia website. LST calculations are carried out by including surface emissivity corrections obtained based on NDVI values. The output of the running program is an LST curve against time which shows a tendency to increase the surface temperature of the Arjuno Welirang crater in July. This is similar to the trend of increasing seismic activity reported by the Magma Indonesia site. The highest temperature increase was on July 24 2023, reaching 31.78 ^{o}C.

Identification of acetic acid levels in ecoenzyme from organic materials of orange peel with Acid-Base Titration Method

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Abstract. This study aimed to elucidate the comparison of the levels of acetic acid and the pH of the ecoenzymes from organic matter variations of sweet and sour orange peels. The acetic acid is an organic compound containing a carboxylic acid group which is also widely applied in the health and industrial fields. Preparation of acetic acid from substrate products containing ethanol which can be obtained from fruit ingredients including oranges. One of the uses and management of organic waste, including vegetables and fruit, is by making ecoenzymes from fruit peels with a mixture of water and sugar. Fruit peels that can be used as organic ecoenzyme ingredients vary widely, so the content in ecoenzymes becomes very diverse and tends to be unstable. This type of research is descriptive. This study consisted of three stages, namely the manufacture of ecoenzymes from pasaman orange peel, gunung omeh, kaffir lime and lime in 7 variations (for 100 days), measurement of acetic acid levels and pH in the ecoenyzme samples for 14 days and 100 days. Acetic acid levels were determined using the acid-base titration method. The results of this study showed that the highest levels of acetic acid ecoenzyme in the 100-day fermentation were 5.53% in the sour orange group, while the lowest in the mixed ecoenzyme was 3.32%. The most acidic ecoenzyme pH was at 100 days of fermentation (pH ±3.5).

Keywords: Acetic acid, Biopesticide, Ecoenzyme, Fermentation, Titration

GC-MS profile, Total Phenolic, and DPPH Radical Scavenging Activity of Saurauia actinidiifolia stembark ethyl acetate extract

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Abstract. Several species of the genus *Saurauia* have been traditionally used as remedies. However, *Saurauria actinidiifolia* is still understudied. This study aims to reveal the total phenolics and total flavonoid content. GC-MS profile and the bioactivity as DPPH free radical scavenger activity of ethyl acetate extract of *S.actinidiifolia* collected from Banggai Island, Indonesia. Determination of Total Phenolic Content (TPC) was conducted using the colorimetry method by spectrophotometer. Thin layer chromatography (TLC) and TLC-bioautography performed analysis of secondary metabolites and qualitative DPPH free radical scavenging activity, respectively. GC-MS analysis was conducted to identify and quantify the chemical of the extract. The extract's IC50 value and Antioxidant activity index (AAI) were performed by serial microdilution method on the 96-microwell plate. The results showed that TPC was 432.33 mg GAE/g extract. TLC analysis revealed several metabolites, and TLC-bioautography also revealed several compounds active as DPPH free radical scavengers. The ethyl acetate extract of *S.actinidiifolia* is categorized as a potential DPPH free radical scavenger or potent antioxidant with an IC_{50} value of 3.29 ug/ml and AAI of 9.32. GC-MS profile of ethyl acetate extract of *S.actinidiifolia* will also discussed, which might relate to its bioactivity.

Keywords: *Saurauia actinidiifolia*, TPC, IC_{50}, AAI, and GC-MS profile

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The effect of molasses and yeast extract concentration on yeast growth as leavening agent for bread

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Abstract. Yeast is a microorganism that is widely used in food and industrial products, such as a fermentation agent in the production of bread dough from yeast biomass. Formulating yeast growth media with carbon and nitrogen sources derived from natural biological materials is a strategy to improve biomass production efficiency and the number of living cells. The growth medium contains a carbon source, such as sugar cane molasses, and in addition yeast extract. Sugarcane molasses concentrations are 0.8, 0.9%, and 1%, while yeast extract concentrations are 0% and 0.75%. The ANOVA test results showed that the combination of molasses and yeast extract media had a significant effect on yeast biomass but had no effect on living cells number. The combination treatment of molasses 8% and yeast extract 0.75% resulted in the highest biomass gain of 0.47 g/50 ml. Observing the number of living cells revealed that the 0.9% molasses and 0% yeast extract treatment had the most cells, namely 12,24 x 106 cells/ml, so the isolate was used to make bread. In this study, the dough volume and organoleptic test was used to determine bread quality parameters. Organoleptic test in terms of taste, color, texture, and aroma.

Keyword: Bread quality, Candida tropicalis, molasses, yeast, yeast extract

Potential secondary metabolite compounds from beluntas (*Pluchea indica*) as probable arabinosyl transferase A (embA) inhibitors

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Abstract. Tuberculosis (TB) is an infectious disease which was the top cause of death before HIV/AIDS. The phenomenon of drug resistance from Mycobacterium tuberculosis causes major problems so that thesearch for traditional medicines is necessary by selecting secondary metabolites of medicinal plants. One of the medicinal plants that has secondary metabolite compounds is the beluntas plant (Pluchea indica) because it has benefits, one of which is as an antibacterial. The purpose of this study was to validate the efficacy of Pluchea indica's antibacterial activity through the in silico method. In this study, the process of docking was executed within PyRx software, utilizing the Probable Arabinosyl Transferase A protein sourced from bacterium Mycobacterium tuberculosis. The test compounds used were secondary metabolites from beluntas plant (Pluchea indica) and comparator drug ethambutol. Then the results of docking scores of secondary metabolites were compared with docking scores of ethambutol. The result of docking ethambutol as a comparison has a binding affinity of -4.1 kcal/mol while Plucheoside E (-7.0 kcal/mol) has binding affinity value lower than ethambutol and has the same amino acid bonds with ethambutol as a control so Plucheoside E can be considered as an effective compound in inhibiting the enzyme Arabinosyl Transferase.

Keyword: antibacterial; molecular docking; Mycobacterium tuberculosis; Pluchea indica; tuberculosis

The collapse behavior of cold-formed steel composite beam structure

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The innovation of cold-formed steel increases along with the development of sustainable development principles that prioritize eco-friendly, practical, and economical materials. This material being recyclable, practical, lightweight, and durable, also has the disadvantage of thin profile thickness so that it is prone to buckling. In this study, an experimental study was conducted related to cold-formed steel composite beams with concrete material that also contained cavities to reduce the weight of the beams. The specimens are concrete and double canal profile of C80.30.9 with a profile thickness of 0.75mm. The connections using SDS 12x20 screw connections with spacing of 300 mm. The concentrated load is applied in the middle of the beam span until the structure collapses. From this research, it was found that collapse from the flexural beam caused by crack due to bending moments or bending collapse. The depth of the crack that occurs beyond the cold-formed steel inside the concrete.

Keywords: cold-formed steel, collapse behavior, composite, concrete, flexural beam, crack

Preliminary of exfoliated graphite (EG) and EG-TiO_2 composite using electrochemical exfoliation method

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Abstract. Exfoliated Graphite (EG) is a graphene-like material that can be applied in various applications such as catalyst supports, lithium-ion battery anodes, and supercapacitors. In this research, Exfoliated Graphite (EG) materials have been synthesize using the electrochemical exfoliation method. The starting materials are Graphite Sheet and using ammonium sulfate ($(NH_4)_2SO_4$) as the solution. The obtained EG materials are then composited with TiO_2 to increase the resulting energy density of the materials. The in-situ sol-gel method was used to synthesize the EG-TiO_2 composite assisted by microwave irradiation. The resulting materials were characterized using X-ray diffraction (XRD), Fourier Transform infrared (FTIR), and UV-Vis. Based on the XRD results, the EG-TiO_2 composite showed an amorphous structure with an average crystallite size of 24.9 - 49.9 nm. It also shows that the EG-TiO_2 composite has a lower peak intensity than the EG material. The FTIR result shows that the functional group of the rGO-TiO_2 composite has a combination of Ti-O-Ti and Ti-O-C vibrations, which indicates the chemical interaction of TiO_2 with EGs. In the UV-Vis spectrophotometry result, the absorbance spectrum of the EG-TiO_2 composite shows a peak at the maximum wavelength around 269-293 nm with the smallest energy gap of 3.32 eV.

Keywords: Exfoliated Graphite (EG), EG-TiO composite, Electrochemical Exfoliation, sol-gel.

Characterization of biodiesel from Red algae gracilaria verrucosa by transesterification reaction using CaO (Calcium Oxide) catalyst with variation of reaction time

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Abstract. Biodiesel is one of the renewable energy alternatives that can be produced from various sources of raw materials, including macroalgae. One type of macroalgae that has potential as a raw material for biodiesel is Gracilaria verrucose, which has the characteristics of red color and vegetable oil content of about 80% of its dry weight. This study aims to determine the optimal reaction time (60,90, and, 120) in the transesterification process of macroalgae vegetable oil into biodiesel using CaO (calcium oxide) catalyst at temperature 65ºC. The quality of the produced biodiesel was analyzed based on the parameters of flash point, density, viscosity, acidity number, and water content. In addition, the fatty acid composition of biodiesel was characterized using GC-MS. The results showed that biodiesel from macroalgae Gracilaria verrucose has a quality that meets the standard set by SK regulation, so it can be used as an alternative fuel. The optimal reaction time that resulted in the highest biodiesel mass conversion was 90 minutes, with the parameter values of flash point, viscosity, water content, and FFA content that met the quality standard. However, the density parameter value at that reaction time still did not meet the quality standard set by SK regulation.

Keywords: *Gracilaria verrucosa*, Transesterification Reaction, Biodiesel, GC-MS.

Total phenol content of turmeric extract (*Curcuma longa* L.) in vegetable oil using the ultrasonic method

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Abstract. Turmeric extract (*Curcuma longa* L.) in vegetable oil is a herbal oil rich in antioxidants called phenolics. Turmeric extract in vegetable oil is a herbal oil rich in antioxidants called phenolics. Because it is stable, safe, and ecologically friendly, vegetable oil has the potential to be utilized as a solvent in herb extraction because it can extract bioactive components in plants. The purpose of this study is to determine the secondary metabolites and total phenolic content of turmeric extract in Extra Virgin Olive Oil (EVOO) and Virgin Coconut Oil (VCO) with the addition of a surfactant (tween 80). The extraction method utilized was ultrasonic, with variations in surfactant dosage (0 - 30 g) and extraction time (10 - 25 minutes). FTIR spectrophotometer used to identify functional groups in herbal oils. Identification of herbal oil functional groups using FTIR spectrophotometer. FTIR spectrophotometer used to identify functional groups in herbal oils. The qualitative test showed that phenolic components, flavonoids, terpenoids, and alkaloids were detected in turmeric extracts EVOO and VCO both without and with tween 80. Based on statistical study, the extraction time and the amount of surfactant used significantly affect the overall phenol content of herbal oils. The maximum total phenolic content of turmeric extract EVOO and VCO was achieved after a 25-minute extraction with 30 g surfactant, namely 44.11 0.43 mg GAE/g and 35.22 0.43 mg GAE/g. Identification of the functional groups of herbal oils with the addition of tween 80 obtained absorption patterns namely O-H, C=O, C=C aromatic, C-O-C, and C-H.

Keywords: Turmeric, EVOO, VCO, phytochemical, total phenol

Effect of welding parameters on microstructure, mechanical properties, and environment

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Abstract. Welding methods are one of the promising methods to join similar or dissimilar materials. In particular, Tungsten Inert Gas (TIG) welding is widely used in the field of industry. However, correct selected parameters and their effect on the environment are important factors in obtaining a good metal join. The aims of this study to investigate the role of the filler and heat treatment on mechanical properties improvement of the similar join Aluminum A6061, and also discuss the effect of this method on the environment based on literature review. Three different fillers consisting of ER 4043, ER 4047, ER 5556 and artificial aging with temperatures of 125oC, 155oC, 185oC respectively were conducted using TIG welding. To investigate mechanical properties, the Vickers hardness, tensile test, and also microstructure observations were carried out at room temperature. The results show the maximum 91.6HV and 180 MPa obtained by using filler ER 5556. On the other hand, artificial aging successfully enhances the mechanical properties of the aluminum 6061 welding.

Keywords: Aluminum, inert gas, filler, aging.

Effectiveness of *Salacca sumatrana* vinegar in repairing degeneration of the cardiovascular tissues (*Mus musculus L.*) male hypercholesterolemia

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Abstract. Hypercholesterolemia, a condition characterized by excess cholesterol content, can lead to coronary heart disease, atherosclerosis, and high-risk heart tissue degeneration. Current drugs, like simvastatin and pravastatin, focus on lowering cholesterol levels without addressing tissue degeneration. This study aimed to determine the effectiveness of salak vinegar in improving cardiac tissue degeneration in hypercholesterolemic mice. The experimental study involved two groups, with the control group receiving different doses of salak vinegar. Histopathological observations showed improvement in cardiac tissue degeneration in hypercholesterolemic mice, with a p value lower than the significance level (0.005). The administration of salak vinegar could serve as a reference for developing alternative hypercholesterolemic drugs that address both cholesterol levels and degeneration.

Keywords: *Salacca sumatrana*, Vinegar, Repair, Cardiovascular, Hypercholesterolemia

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