



ICOPHAS

International Conference
of Pharmaceutical, Health,
and Sciences



ABSTRACT BOOK



International Conference of
Pharmaceutical, Health, and Sciences (ICoPHAS)
“New Horizon in Pharmaceutical and Therapy”

Oct, 4th 2023

Susiana Tabrani Convention Hall
Pekanbaru, Riau, Indonesia

Organized by:

Program Studi Farmasi, Fakultas Farmasi dan Ilmu Kesehatan
Universitas Abdurrahman Wahid

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International Conference of
Pharmaceutical, Health, and Sciences (**ICoPHAS**)

“New Horizon in Pharmaceutical and Therapy”

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يُونَيْتِي بُرْسِيْتِي: اِسْلَامُهُ اِنْتَارَا اِبْعَسَا مِلْدِيْسِيَا



اَوْبُوْرُ مَرْسِيِيُوْرُ تِيْكُوْرُوْجِيْنُ مَرْاَبَا
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apt. Muslim Suardi, M.Si., Ph.D

Assalamu'alaikum Wa Rahmatullahi Wa Barakatuh,

Honorable the top leader of the Abdurrab Foundation, Mrs. Dr. dr. Suasiana Tabrani, MPd., and the Leader of Abdurrab Foundation Mr Ivan Tabrani, M.Kes and staff.

Honorable the Rector of Universitas Abdurrab, Prof. Susi Endrini, S.Si., MSc., PhD, and staff

The Dean and all of the management of Universitas Abdurrab.

The leader of the health organization, School of Pharmacy UMRI, STIFAR, SMA Abdurrab, SMF Ikasari.

Keynote speakers, invited speakers, scientific committee, and participants of The International Conference of Pharmaceutical, Health, and Sciences (ICOPHAS 2023), especially beloved students of Universitas Abdurrab. We are proud of and love you all.

I would like to welcome all of you to The International Conference of Pharmaceutical and Sciences (ICOPHAS) 2023. It is such an honor for me to speak on behalf of the organizer. ICOPHAS is an international conference performed by the Faculty of Pharmacy and Health Sciences Universitas Abdurrab Pekanbaru, Indonesia, in conjunction of 18th Anniversary of Universitas Abdurrab. Appreciate for School of Pharmacy FPHS Univrab that has initiated this international conference although just 4 years old. Under the theme of the conference "New Horizon in Pharmaceutical and Therapy", the conference was aimed to invite scholars, researchers, and students to discuss the subject related to the development of pharmaceutical studies and strengthen drug therapy.

On this occasion, I would like to express my huge appreciation to keynote speakers Prof. Dr. Taifo Mahmud Ph.D., from Oregon State University, USA; Prof. Dr. Paul WS Heng PhD., consultant for the National University of Singapore; Assoc. Prof. Dhananjaya Rao Pasupuleti from REVA University, India; Prof. Dr. apt. Yandi Syukri, M.Si., from Universitas Islam Indonesia; Dr. Muhamad Rusdi bin Ahmad Rusmili and Dr. Kamal Rullah from International Islamic University of Malaysia. I also would like to appreciate invited speakers Prof. apt. Zulies Ikawati, Ph.D., from Universitas Gadjah Mada; Prof. apt. Marlina, Ph.D., from Universitas Andalas; Dr. Hanis Hanum bt Zulkifly from University Technology Mara; and apt. Muslim Suardi, M.Si., Ph.D. from Universitas Abdurrab.

Total participants is 801, while oral and poster are 36 and 20 presenters, respectively. Participants come from America, India, Indonesia, Malaysia, and Singapore. The oral presentation will be divided into two parallel sessions performed in Hall 1 and Hall 2, while the poster presentation will be conducted in SETH Lobby. Presentations will be arranged off-line and on-line as well. We would like to thank and express our appreciation for all of the scientific members, the organizing committees, and all of supporting. We look forward to having a successful conference, and we hope that all the participants enjoy and get benefit from the conference.

For the keynote and invited speakers, you all make us happy and really make the dream come true.

Best regards,

apt. Muslim Suardi, M.Si., Ph.D
The chairman of ICOPHAS 2023.

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OR – Oral Percentation
PO – Poster

SPEAKERS ABSTRACT

KEYNOTE SPEAKER 1

Insights to Pellet Formation

Paul WS Heng

Consultant to National Singapore University

ABSTRACT

The presentation will explore the technique of pellet making by extrusion spheronization and discuss the pellet formation process. With deeper understanding of the factors associated with the pellet forming process, better quality pellets can be produced. A discussion on steps to mitigate issues faced during pellet making will be presented.

Keywords: Pellet, spheronization, quality.

KEYNOTE SPEAKER 2

Biotechnology in Pharmaceutical Research

Taifo Mahmud

Department of Pharmaceutical Sciences, Oregon State University, Corvallis, OR 97331,
U.S.A.

ABSTRACT

About two-thirds of approved pharmaceuticals are natural products, botanicals, natural product-derivatives, or natural product-inspired synthetic compounds. Plants, marine animals, algae, and microorganisms are known to be prolific sources of bioactive natural products. Despite their enormous potential, the number of new natural products identified in recent years has significantly declined. This trend has called for alternative approaches to drug discovery and development. Among them are the applications of state-of-the-art analytical methodologies, modelling and artificial intelligence, and biotechnology to identify, characterize, and/or generate novel bioactive natural products and their derivatives. Examples of biotechnological tools available for natural product-based discovery include genome mining, biosynthetic pathway engineering, biotransformation, and synthetic biology. Combinations of these cutting-edge technologies and state-of-the-art instrumentations may accelerate the discovery of new pharmaceuticals.

KEYNOTE SPEAKER 3

Snake Venom: Drops of Death and Potential Cure

Dr. Muhammad Rusdi bin Ahmad Rusmili
Internasional Islamic University of Malaysia

ABSTRACT

Snake venom is a secretion from venom gland in venomous snake. It contains myriad of protein and peptide-based biomolecules that exert various effects to different body systems, individually or synergistically. It is a product of evolution where venomous snake species are continuously adapting to produce an efficient venom to subdue prey and deter predator. Adaptation of snake venom creates variation in the composition of biomolecules in the venom, which may have significant detrimental clinical effects during snake bite envenoming. Variation in biomolecules composition of snake venom reduces the efficacy of the only reliable antidote for snake bite envenoming, the antivenom. Due to the adaptation and variation of composition of snake venom, snake venom is one of important source of novel biomolecules which can be developed as potential diagnostic and research tools and pharmaceuticals. Although there are many venom proteins families that have been detected from the venom using various 'omics' techniques, not many of these proteins have been isolated or synthesized for activity characterization. Therefore, characterization of endemic venomous snakes' venom is essential to determine and ensure antivenom produced in national organization or purchased by health care providers are effective to be used, especially in countries with significant differences in the climate and endemic fauna between regions. It is also an important step for identifying biomolecules from snake venom with development potential. In addition, customized-region specific community education for prevention of snake bite is important to reduce snake bite envenoming incidence, particularly in regions with high venom/species variation.

KEYNOTE SPEAKER 4

Chromones: Privileged Scaffold in Anti-Inflammatory and Anticancer Drug Discovery

Kamal Rullah

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ABSTRACT

Chromone, a class of heterocyclic compounds, is widely acknowledged as a privileged structure for advancing drug discovery and development. These molecular scaffolds have garnered considerable attention due to their drug-like characteristics and versatile binding properties. Notably, within the realm of approved anti-inflammatory and anticancer drugs, chromone-based structures exhibit remarkable selectivity toward specific targets. Consequently, an increasing number of research teams are keenly interested in devising novel synthetic methods and assessing the biological attributes of these compounds.

In this context, we will delve into significant breakthroughs involving chromone-based compounds functioning as anti-inflammatory and anticancer agents. For instance, we have explored the potential of compounds like 2-(3,4-dimethoxyphenyl)-3-(4-fluorophenyl)-6-methoxy-4H-chromen-4-one (KR-1401-KW), which has demonstrated notable efficacy in suppressing inflammatory responses associated with PGE₂. Additionally, we have discussed 3-(4-(chloromethyl)phenyl)-2-(3,4-dimethoxyphenyl)-7-methoxy-4H-chromen-4-one, a compound (KR-2201-NF) exhibiting promise as an inhibitor of UNC-51-like kinase 1 (ULK1), thereby modulating autophagy and inducing apoptosis in colon cancer.

Furthermore, computational evidence, including molecular docking and molecular dynamics (MD) simulations, underscores the potential of these compounds as promising candidates for the development of novel anti-inflammatory and anticancer drugs.

Keywords: Chromone, anti-inflammation, anticancer, docking study, molecular dynamics (MD) simulations

Supporting Agencies: Source of research funding by the Ministry of Education (MOE) through the Fundamental Research Grant Scheme (FRGS/1/2022/STG04/UIAM/02/2) and the International Islamic University of Malaysia-IIUM through Research Management Centre Grant 2020 (RMCG20-008-0008).

KEYNOTE SPEAKER 5

Medicinal Plants and Metabolic Diseases

Prof Dr Pasupuleti Visweswara Rao, FAPAS, FMSA
Professor of Biotechnology, Director – International Relations and Research Collaborations,
REVA University, Srinivasa Nagar, Bangalore, India

ABSTRACT

Medicinal plants and herbs play an important role in human life and diseases. Medicinal plants with potential polyphenols and flavonoids are being used for numerous communicable and non-communicable diseases. The isolated bioactive compounds with protecting capacity play an important role in preventing and treating certain types of diseases including microbial diseases, inflammatory diseases, metabolic disorders, skin diseases, etc. The biopharmaceutical industries and natural products development research institutes are focusing more on natural products research due to their minimal or no side effects. Various new technologies including nanotechnology focus on synthesizing nanoparticles biologically and using them for various biological activities. Natural products are preferable since they possess very little or no toxic compounds.

Keywords: Medicinal plants, Metabolic diseases, herbal medicine, diabetes, oxidative stress, nanoparticles.

KEYNOTE SPEAKER 6

Preparation of Nanoparticle-Based to the Solubility of Plant Extract

Yandi Syukri

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ABSTRACT

The water solubility of a drug, especially of plant extract, is a fundamental property that plays a vital role in the absorption of the drug after oral administration. Self-nano emulsifying (SNE) has recently been reported to enhance the solubility of poorly water-soluble plant extracts such as propolis, *Phyllanthus niruri*, *Curcuma zanthorrhiza*, and *Zingiber officinale*. SNE is an isotropic mixture of oil, surfactant, co-surfactant, and drug that form fine oil-in-water nanoemulsions when introduced into aqueous phases under gentle agitation. A solubility study of the drug in various vehicles determined the selection of oil, surfactant, and co-surfactant components for preliminary screening of SNE formulation. Ternary phase diagrams were constructed to identify the nano-emulsification area of the selected systems. The transmittance, droplet size, zeta potential, thermodynamic stability, and robustness to dilution of chosen formulations were investigated. This paper summarized recent progress on propolis, *Phyllanthus niruri*, *Curcuma zanthorrhiza*, and *Zingiber officinale*. The steps for developing L-SNE into a Solid SNE Platform have also been discussed. Currently, a novel technique is being developed in the form of solid SNEDDS. It is when adsorbents adsorb a liquid SNEDDS to become more stable and offer better patient compliance.

Keywords: SNE, Solid-SNE, plant extract, drug solubility

INVITED SPEAKER 1

Treatment of Osteoarthritis

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ABSTRACT

Stem cells are cells that have not yet differentiated into other forms, thus having the potential to differentiate into various tissues in the body. Their ability to regenerate themselves and differentiate into other cells is of great interest, especially in regenerative medicine.

There are various studies on using stem cells from different sources as alternative treatments. For example, stem cells from bone marrow can be used as therapy for orthopedic, cardiovascular, and peripheral vascular diseases. In contrast, umbilical cord-derived mesenchymal stem cells can be used as therapy for stroke, among others. What particularly catches our attention is how mesenchymal stem cells can help with osteoarthritis problems and their role in wound healing. Our research shows mesenchymal stem cells derived from synovial membranes can help with osteoarthritis.

Interestingly, these stem cells can be obtained from the tissue of patients undergoing total knee replacement surgery for grade IV osteoarthritis. However, further investigation is still needed. Additionally, mesenchymal stem cells also have antibacterial properties towards open wounds in patients with diabetic foot ulcers, with various mechanisms of action.

Keywords: Mesenchymal stem cell, osteoarthritis, synovial membrane, grade IV osteoarthritis, regenerate.

INVITED SPEAKER 2

Clinical Pharmacy Practice in Digital Era

Prof. apt. Zullies Ikawati, PhD
Faculty Pharmacy, Universitas Gajah Mada

ABSTRACT

Digital health has become increasingly common practice in pharmacy practice, which was accelerated by the COVID-19 pandemic. The pharmacist should continue to utilise technology to improve access, choice and affordability for consumers and to empower pharmacists to manage medicine risks for consumers and be more accountable and responsible for medicine safety, efficacy and overall value. The use of electronic health records, electronic prescriptions (e-prescriptions) and real-time prescription monitoring also provide opportunities for pharmacists to ensure quality and safe use of medicines. Besides, other digital health tools can be used to assist the medicine dispensing and administration, like robotic IV admixture, barcode labeling, etc. Pharmacists as a profession who have a history related to information technology should have the ideal predisposition and competence to provide increasingly digital health services to patients. Digital health is largely shaped by experts outside of health care, therefore opens an opportunity to collaborate in an interdisciplinary manner to develop a digital health care practice.

INVITED SPEAKER 3

New Horizon in Implementation of Pharmaceutical Technology in Several Fields of Study: A long-lasting Release of Urea From PL-PCL Briquettes

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ABSTRACT

The technology had been developed day by day. It is very important to manage specific tasks in our lives. The advancement of pharmaceutical technology is also very fast. The related technology, especially the slow-release dosage form, has been developed in several fields of study and for various purposes. Formulations of slow-release dosage forms were applied to a variety of active ingredients. The study above will be discussed briefly, and on the other hand, the formulation of the urea PS-PCL molding briquettes will be a focus. In addition, there are various opportunities for collaboration among investigators from various fields of study.

To briefly discuss the implementation of pharmaceutical technology in several fields of study, especially slow-release products in terms of herbicides, insecticides, insect repellents, feed additives for ruminants, and fertilizers. To discuss the formulation of urea slow-release briquettes using PS and PCL bio-blend.

A short review of the article related to the implementation of slow-release technology in the formulation of several active ingredients and purposes. The urea slow-release fertilizer (SRF) in briquette form was produced using the molding method using Polystyrene (PS) and starch (ST) in six formulas at different ratios of bioblend:urea. Urea levels in the bracket and in the dissolution medium were measured using a visible spectrophotometer.

The release kinetics of urea from PS-PCL briquettes occurred following zero-order kinetics. The T90 from F1, F2, F3, F4, F5, and F6 were 2.2 ± 19.97 , 7.6 ± 151.42 , 14.4 ± 90.31 , 2.9 ± 89.43 , 6.3 ± 150.38 , and 22.1 ± 197.41 months ($p < 0.05$). The dissolution efficiency of urea from F1, F2, F3, F4, F5, and F6 was 64.14 ± 6.57 to $30.27 \pm 6.76\%$ ($p < 0.05$), respectively. The slow-release urea briquettes could be prepared using PS-PCL bio-blend with a value of T90 between 2.9 and 22.1 months, a long-lasting urea release.

The slow-release technology had been developed and implemented in several fields of study. An extraordinary release of urea from briquettes had been obtained using the PS-PCL bio-blend. The release of urea from the briquettes followed zero-order release kinetics.

Keywords: urea, bio-blend, briquettes, release, kinetics.

INVITED SPEAKER 4

Medication at Transition of Care and Medication Reconciliation

Hanis Hanum binti Zulkifly

Universiti Teknologi Mara (UiTM) Shah Alam

ABSTRACT

Effective management of medications during care transitions is a critical aspect of healthcare delivery, impacting patient safety, outcomes, and healthcare costs. Medication reconciliation, the process of comparing and reconciling a patient's medication regimen during transitions of care, plays a pivotal role in mitigating medication-related errors and adverse events. This talk explores the key steps for ensuring medication safety, transition of care, medication reconciliation and medication related harm during the transitions of care. Furthermore, it explores the significance of medication management at transition points, emphasizing the challenges and opportunities for improvement in healthcare systems. It highlights the importance of interprofessional collaboration, patient engagement, and the use of technology in facilitating accurate and comprehensive medication reconciliation

Apart from that, the potential benefits of a standardized approach to medication reconciliation, such as reducing medication discrepancies, preventing adverse drug events, and enhancing continuity of care will also be covered. Ultimately, addressing medication-related issues during transitions of care through effective reconciliation processes is imperative for optimizing patient care and promoting healthcare quality.

PARTICIPANT ABSTRACT of ICoPHAS

Discovery of a Novel Chromone-Based Potential Inhibitor of ULK1 That Modulates Autophagy and Induces Apoptosis in Colon Cancer

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ABSTRACT

The present research delves deeply into investigating the pivotal roles of autophagy and apoptosis in the regulation of tumorigenesis and inhibition of tumour growth by eliminating damaged cells, proteins, and organelles. In the quest for potential candidates for anti-cancer therapy, a series of twelve compounds based on chromone were synthesized and subjected to thorough characterization. Their cytotoxicity was meticulously evaluated across a spectrum of human cancer cell lines, encompassing kidney, breast, colorectal, and bladder cancers. 5-fluorouracil (5-FU) was utilized as a positive control for comparative analysis. Remarkably, a specific derivative containing a chlorine atom exhibited excellent cytotoxic activity (LC₅₀: 3.2 µM), surpassing 5-FU (LC₅₀: 4.2 µM), especially in SW620 colorectal carcinoma cells. Moreover, the compound demonstrated its potential to inhibit colony formation, induce cell cycle arrests, and initiate apoptotic cell death, as validated by propidium iodide/annexin V staining and analysis of apoptosis markers (e.g., c-PARP, BAD, BAK, and BCL-2). The observed cell death was associated with an augmented generation of reactive oxygen species (ROS) and modulation of crucial elements in the autophagic machinery (e.g., LC3B, AMPK, AKT, ULK1, and ULK2). Molecular docking and molecular dynamics (MD) simulations strongly suggested a potential direct interaction between the mentioned compound and ULK1, implying its significance in autophagy regulation. In conclusion, these findings shed light on the promising potential of the chromone derivative as a lead compound for the development of a new class of anti-colon cancer drugs that modulate autophagy.

Keywords: Chromone, autophagy, apoptosis, ULK1 inhibitor, colon cancer

Intermediates to Nitroflavones - Discovery of New Anticancer Agents

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ABSTRACT

In the pursuit of discovering new anti-cancer agents, the study explored intermediates to nitroflavones, with a focus on nitroacetophenone. The findings highlight the immense potential of nitroflavones and their intermediate, nitroacetophenone, in drug discovery. A cost-effective, in-house synthesis method for nitroacetophenone enables precise cost control while leveraging this potential. These compounds exhibit diverse pharmacological activities and offer opportunities for fine-tuning their chemical structure, positioning them as valuable assets in the quest for novel pharmaceuticals. Molecular docking, exemplified in our case study, emerges as a pivotal tool for the early evaluation of these compounds. Encouraging the development of scaffolds from the nitro substituent on flavones appears promising for enhancing interactions and, consequently, improving their activity.

Keywords: Nitroflavones, anti-cancer, docking study

Effectiveness of Giving Papaya Fruit Juice to Reduce Gastritis Pain in Communities in Pinang Sebatang Timur Village, Tualang District, Siak District

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ABSTRACT

Gastritis or commonly known as "heartburn" is a disease that can attack all levels of society from all levels of age and gender. Gastritis usually begins with an unhealthy and irregular diet so that the stomach becomes sensitive when stomach acid increases. The signs and symptoms of gastritis include abdominal pain and dyspepsia. The purpose of writing scientific papers is to be able to reduce pain in the community with "Effectiveness of Giving Papaya Fruit Juice on Reducing Gastritis Pain in Communities in Pinang Sebatang Timur Village, Tualang District, Siak Regency". From this research, papaya fruit has a weak acid-base mineral content that can be used to neutralize stomach acid, so that the pain felt due to increased stomach acid can be reduced. This research used the Quasy Experiment method with control group pretest-posttest. The sample is 60 people. The p action of giving papaya fruit juice is 7.37 while the mean after the action of giving papaya fruit juice is 3.57 with a p value = $0.000 < \alpha (0.00)$, which means there is an effect of giving papaya fruit juice on the community in Pinang Sebatang Timur. The largest number were women, 34 respondents (56.6%). Based on the characteristics, it can be described that the distribution of respondents was according to the age of early adulthood (20-35) with a total of 48 respondents (80%) in the village of Pinang Sebatang Timur, Tualang District. So that people are diligent in consuming papaya fruit juice to reduce gastritis pain because papaya fruit is easy to find in the market.

Keywords: gastritis, pain, papaya fruit juice

Description of Characteristics of Adverse Event Following Immunization after Covid-19 Vaccination in Sidomulyo Health Center Pekanbaru City 2021

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ABSTRACT

Coronavirus Disease-2019 (COVID-19) is an infectious disease caused by SARS-COV-2. There was an addition of 133 new confirmed cases of COVID-19 in the Sidomulyo Health Center area in June 2021, resulting in a total of 2,111 cases, making the Tampan District the area with the highest spread of COVID-19 cases in Pekanbaru City. Cases of COVID-19 have resulted in an increase in mortality and morbidity, so it needs to be prevented and controlled by breaking the chain of transmission through the administration of vaccines. The use of the COVID-19 vaccine in Indonesia coincided with the emergence of Adverse Event Following Immunization. The objective of this study was to describe the characteristics of Adverse Event Following Immunization after COVID-19 vaccination in Sidomulyo Health Center for the period July to August 2021.

This research was an analytic observational study with a cross sectional study design. The sample of this research were the community who live in the working area of Sidomulyo Health Center in Pekanbaru City who have received 2 complete doses of the COVID-19 vaccine for the period July to August 2021. The sampling technique used was Simple Random Sampling with a sample size of 227 people. The data analysis used was univariate analysis.

Respondents who receive the most vaccinations were 36-45 years old (28,7%) with the most gender, namely women, with 117 respondents (51,5%) and the occupation of respondents who received the most COVID-19 vaccinations were housewives with 69 respondents (30,4%). There was a picture of respondents with the date of the first dose of vaccine 28 days before the second dose (95.2%). Sinovac vaccine (100%), with a confirmed history of COVID-19 (7.0%). Adverse Events Following Immunization in the form of sore pain at the injection site (55.9%), no symptoms (17.6%), fever (13.7%), swelling at the injection site (7.0%), headache (4,4%), easily tired (1.3%), and mouth symptoms (0%). The majority of respondents felt the symptoms of Adverse Events Following Immunization for 1 day (49.8%).

There was a picture of the COVID-19 Adverse Events Following Immunization in Sidomulyo Health Center in Pekanbaru City for the period July to August 2021.

Keywords: Adverse event following immunization, COVID-19, vaccination

Determination of Protein Biomarker for Early Cancer Detection via Aptamer-Antibody Sandwich Assay

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ABSTRACT

The development of rapid and cost-effective electrochemical sensor for the detection of cancer biomarker would enhance the methods currently used to detect cancer in its early stage. An aptamer-antibody sandwich assay for the voltammetric determination of protein biomarker was developed.

The DNA aptamer was immobilized onto gold nanoparticle modified carbon electrode followed by sequent adsorption of target protein and enzyme conjugated antibody onto aptamer surface formed a sandwich complex. The electrocatalytic reaction of surface bound enzyme and substrate was monitored generated voltammetric detection signals that linearly increased as a function of target protein concentration. As a final demonstration, the aptamer-antibody sandwich assay platform was applied to the analysis of target protein in human serum solutions and the results were validated using a commercially available ELISA test.

The voltammetric responses linearly increased as a function of the target protein concentration with a detectable concentration.

A selective and sensitive portable biosensing platform for the determination of target protein implies that the proposed sandwich method is a promising analytical tool for the analysis of protein biomarker in real samples.

Keywords: Aptamer, surface sandwich assay, electrochemical sensing

Effect of High Intensity Interval Training Versus Moderate Intensity Continuous Training on Cardiorespiratory Fitness and Body Fat Percentage in Overweight Adolescents

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ABSTRACT

Overweight during adolescence has been identified as a major health problem throughout the world. It has been associated with a reduced exercise tolerance and a decrease of cardiopulmonary function. Low cardiorespiratory fitness is considered as an established risk factor for cardiovascular and metabolic disorders. Decreased physical activities and sedentary life style were the most important factors contributing in the development of obesity in adolescence. Consequently, exercise training was often included in weight-loss programs with energy restriction. High Intensity Interval Training (HIIT) has become a strategy to improve cardiorespiratory fitness. However, the effectiveness of high-intensity interval training (HIIT) versus moderate-intensity continuous training (MICT) in overweight adolescents remained uncertain. The aim of this study was to investigate the effects of high intensity interval training (HIIT) versus moderate intensity continuous training on cardiorespiratory fitness in overweight adolescents.

Twenty overweight adolescents were randomly assigned to control, high intensity interval training (HIIT) and moderate intensity continuous training (MICT) groups. The HIIT groups exercised by Tabata Workout is carried out for seven minutes with 20 seconds of exercise interspersed with 10 seconds of rest. The MICT group ran continuously for 30 minutes at 65-70% HRmax. Exercise was performed three times per week in four weeks. VO₂max capacity was measured using a multi-stage fitness test by running back and forth with a 20-meter track.

The results showed that there were significant differences on VO₂max between pre and post in both groups ($P < 0,05$). But There were no significant difference in VO₂max between HIIT and MICT group ($P > 0,05$).

We found that HIIT and MICT were effective to increase cardiorespiratory fitness in overweight adolescents

Keywords: High-intensity interval training, moderate-intensity continuous training, cardiorespiratory fitness, body fat, overweight

Antipyretic Effects of Pineapple Juice (*Ananas comosus* L. Merr) Against Male White Rat Wistar Strain (*Rattus norvegicus*) DPT Vaccine Induced

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ABSTRACT

Fever or febrile is a characteristic of a disease characterized by increase in body temperature above normal. Fever can be caused by toxic materials that affect the temperature regulation center. Causes of fever include diseases caused by bacteria, brain tumors and environmental conditions that it can end in heatstroke. According to World Health Organization (WHO) the number of fever cases in the world reaches 16-33 million with 500-600 thousand deaths each year. Generally fever can be overcome by using antipyretic preparations. However, the use of this antipyretic class of drugs should not be used routinely because it is hepatotoxic when using more than 4 grams. Indonesia is a country in the tropics that has great biodiversity, rich in medicinal raw materials. One of the plant species in Indonesia that has antipyretic properties is the pineapple plant. Pineapple contains the enzyme bromelain which can downregulate the expression level of Cyclooxygenase-2 (COX-2) and prostaglandin E2 (PGE-2) which can reduce fever. The purpose of this study was to determine the antipyretic effect of pineapple juice against male white rats wistar strain (*Rattus norvegicus*). This study uses an experimental method that uses design pre and post test control group design. Based on test post hoc the results showed a significant difference between the negative control group and the dose 1 group or concentration 100% ($p < 0.05$) which indicated that the dose 1 group had an antipyretic effect.

Keywords: Pineapple, juice, antipyretic, DPT, vaccine

Adding the Application of Neuromuscular Taping to Nerve Mobilization Interventions to Reduce Pain in Carpal Tunnel Syndrom

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ABSTRACT

Carpal tunnel syndrome (CTS) is a collection of symptoms and signs of disease caused by squeezing of the median nerve in the carpal tunnel in the wrist. This CTS condition is one of the most common types of neuropathy. This syndrome arises with symptoms of pain, numbness, and weakness in the hands due to compression of the median nerve. Carpal tunnel syndrome is a syndrome associated with repetitive motion and a fixed position for a long duration so that it affects the blood supply to the hands and causes pain. The aim of this study was to determine the effectiveness of adding neuromuscular taping intervention to the nerve mobilization which was previously usually given to reduce pain in carpal tunnel syndrome.

Case study with pre and post test research a design that compares the level of pain values before and after being measured with a measuring instrument Visual Analog Scale (VAS) to provide additional Neuromuscular Taping intervention in conditions carpal tunnel syndrome for 3 weeks.

Analysis of differences in pain test scores with VAS in sample group with a significance value of 0.006 which shows <0.05 , which means there is an effect of giving additions Neruomuscular Taping Intervention in Nerve Mobilization noted changes in pain levels in Carpal Tunnel Syndrome patients.

The addition of Neuromuscular Taping to nerve mobilization interventions shows more effective clinical findings. Therefore, this combination may be a supportive intervention option for an effective nerve mobilization program in carpal tunnel syndrome.

Keywords: Carpal tunnel syndrome, physiotherapy, neuromuscular taping, visual analogue scale

Determination of The Minimum Inhibitory Concentration and The Minimum Killing Concentration of Bajakah Root (*Spatholobus littoralis* Hassk) Infusion on *Staphylococcus aureus*

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ABSTRACT

Bajakah root (*Spatholobus littoralis* Hassk) is a compound that can inhibit the growth of bacteria *Staphylococcus aureus*. *Staphylococcus aureus* are gram-positive bacteria that are facultative aerobes and are pathogenic bacteria for human. The purpose of this research is to find out how much potential is produced by the root of the bajakah on bacterial growth. The type of research used is laboratory experimental research with a research design that is "Post Test Only Control Group Design". This study was to find out how much MIC and MBC infusion of bajakah roots had on the growth of *Staphylococcus aureus* bacteria. Bajakah root powder is made with a concentration of 10 g/100 ml, 5 g/100 ml, 2.5 g/100 ml, 1.25 g/100 ml, 0.625 g/100 ml, 0.3125 g/100 ml, 0.15625 g/100 ml. Based on the results of the study, turbidity occurs of MIC due to the color of sample and opinion so that it cannot be confirmed for MIC. However, in MBC there was colony growth in each test medium, but the higher the gram concentration the less growth. These results prove that 100 grams of sample powder has not been declared to kill bacterial growth, if it is possible to inhibit it.

Keywords : *Spatholobus littoralis* Hassk, root powder, *Staphylococcus aureus*

Analysis of Differences in Total Antioxidant and Phenolic Content of Senggani Leaf Extract (*Melastoma malabathricum* L.) Rokan Hulu and Kampar Kiri Regions Using Uv-Vis Spectrophotometry

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ABSTRACT

Senggani plant (*Melastoma malabathricum* L.) is a plant that is commonly found in Southeast Asia. The efficacy of this plant is traditionally used by the Senggani community as a wound medicine, and is also used to treat ulcers, diarrhea and dysentery. According to previous research conducted, the young leaves of senggani can be boiled for the treatment of rheumatism, arthritis (arthritis), relaxing the feet and gargling-gargling to treat teeth. Parts of the leaves, fruit and roots can be used to neutralize toxins by boiling and drinking the water. The extraction process was carried out using a multilevel maceration method. The purpose of this study was to determine the content of secondary metabolites from Senggani leaves and to measure the total phenolic content and test the antioxidant activity using the UV-Vis Spectrophotometry method. Furthermore, phytochemical screening showed the presence of secondary metabolites of alkaloids, flavonoids, phenolics, saponins, terpenoids and tannins. The results showed that the ethanol extract of Senggani leaves in the Kampar Kiri and Rokan Hulu areas contained alkaloids, flavonoids, phenolics and saponins. The results of determining the total phenolic content of the ethanol extract of senggani leaves in the Kampar Kiri area were 5171.2 GAE/g and Rokan Hulu 3237.2 GAE/g. Comparison of the antioxidant activity of ethanol extract of senggani leaves in the Kampar Kiri area 35.8146 mM and Rokan Hulu 35.9545 mM. The highest antioxidant compounds are found in the upstream Rokan area and the most lowest compounds are in the left Kampar area.

Keywords : Senggani leaf, phytochemical screening, extraction, phenolic total, antioxidant

LC-MS Screening and Blood Glucose Levels of Diabetic Mice Given by *Curcuma caesia* Extract

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ABSTRACT

Diabetes mellitus is a metabolic disorder characterized by distinctive hyperglycemia resulting from irregularities in insulin secretion, insulin action, or a combination of both. The utilization of natural ingredients presents an alternative approach to managing diabetes. Among these alternatives is black turmeric (*Curcuma caesia*), which harbors anti-diabetic properties. This study seeks to assess the compound composition and blood glucose reduction in alloxan-induced mice following the administration of a 70% ethanol extract of *Curcuma caesia* at doses of 10, 25, and 40 mg per 20 grams of body weight, alongside negative control (Na CMC) and positive control (Glibenclamide at 0.013 mg per 20 grams of body weight). The analysis of compound content was conducted using LC-MS. Blood glucose levels were monitored on days 0, 5, 10, and 15 using a glycometer. Data were subjected to one-way ANOVA for statistical analysis. The research findings revealed that major components eluted at retention times of 16.69 (6 compounds), 16.70 (6 compounds), 16.72 (10 compounds), 16.74 (13 compounds), and 18.87 (5 compounds), predominantly belonging to the Flavonoid, Alkaloid, and Terpenoid groups. The Blood glucose levels in mice showed a decrease in blood sugar. ANOVA test showed no significant differences between various groups ($p > 0.05$).

Key words: *Curcuma caesia*, LC-MS, blood glucose

Edible Film from Pangasius Catfish (*Pangasius hypophthalmus*) Gelatin and Antibacterial Activity against *Streptococcus mutans*

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ABSTRACT

Edible films are thin, biodegradable, transparent, and ingestible layers. The materials used to make these edible films can include gelatin. One source of raw material for gelatin production is the skin of pangasius catfish (*Pangasius hypophthalmus*). In the production of edible films, ginger oil, which contains antibacterial properties due to its essential oil content, can be added. Compounds in essential oils actively work to disrupt the outer membrane and cytoplasmic membrane of bacterial cell walls. This research aims to understand the characteristics of edible films made from pangasius catfish gelatin in comparison to bovine gelatin and to determine the antibacterial activity of edible films made from pangasius catfish gelatin with the addition of ginger oil (*Zingiber officinale*) against *Streptococcus mutans*. The characterization of the edible film includes film thickness, light transmission, transparency, water vapor transmission rate, tensile strength, and elongation at break. Furthermore, the antibacterial activity of the edible film with ginger oil added is assessed using the disc diffusion method with chloramphenicol as a positive control. The research results indicate that edible films made from pangasius catfish skin gelatin have an average thickness 0.105 mm, transparency 0.87337, water vapor transmission rate 105.3 g/m².hour, tensile strength of 20.791 kg/cm², and an elongation percentage 120%. The average inhibition zones of the edible film against *Streptococcus mutans* with the addition of ginger oil at concentrations of 1%, 2%, and 3% are 5.49 mm, 6.92 mm, and 7.62 mm, respectively. From the conducted research, it can be concluded that edible films made from pangasius catfish skin gelatin exhibit varying characteristics when compared to bovine gelatin-based films, and the combination of edible film with ginger oil can inhibit the growth of *Streptococcus mutans*, with the highest average inhibition zone being 7.62 mm at a 3% ginger oil concentration

Keywords: *Pangasius hypophthalmus*, gelatin, edible film, *Streptococcus mutans*

Diuretic Activity Assay of Ethyl Acetate Fraction of Star Fruit Wuluh Extract (*Averrhoa bilimbi* L.) against Male White Rat (*Rattus norvegicus*)

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ABSTRACT

Diuretics are compounds that can increase urine output. Empirically, people have used star fruit (*Averrhoa bilimbi* L.) as a diuretic. This study aims to determine the diuretic activity of ethyl acetate fraction of star fruit wuluh to the urine volume of rats. A total of 25 male white rats were divided into 5 treatment groups, with each group containing 5 test animals. The first group was given 1% Na CMC suspension as a negative control, the second group was given a furosemide suspension dose of 3.6 mg/kg body weight as a positive control, the third group was given an ethyl acetate fraction dose of 0.44 g/kg body weight, the fourth group was given an ethyl acetate fraction dose of 0.88 g/kg body weight and the fifth group was given an ethyl acetate fraction dose of 1.76 g/kg body weight. All treatment is given orally. Diuretic activity test was conducted using the Lipschitz method, where 30 minutes before the test rats were induced with warm water as much as 1 mL/100 g body weight and urine volume measurements were taken every hour for 6 hours of observation the parameters observed were urine volume, percentage of urine excretion, diuretic action and diuretic activity. The results showed that the ethyl acetate fraction of carambola fruit at a dose of 1.76 g/kg body weight has a strong diuretic activity. The data obtained were also analyzed using two-way ANOVA test and followed by Tukey Post Hoc test. Based on the *Tukey Post Hoc* test results obtained the results obtained showed that the test preparation that has an effective dose is the ethyl acetate fraction group dose of 1.76 g/kg body weight and which shows that the time that gives the best diuretic effect is at 4 hours.

Keyword : Diuretic, *Averrhoa bilimbi* L., extract, furosemide

Antimicrobial Assay of Ethyl Acetate Fraction of Betadin Leaves (*Jatropha multifida* L.) Towards Bacteria *Propionibacterium acnes*, *Staphylococcus epidermidis*, *Corynebacterium diphtheriae*, *Microsporium canis* and *Epidermophyton floccosum*

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ABSTRACT

Indonesia has many plants that must be preserved and put to good use, most of these plants can be used as traditional medicine, one of which is betadine leaf (*Jatropha multifida* L.) which is commonly used as an ornamental plant. This plant is known contain secondary metabolites such as alkaloids and flavonoids which have the ability to inhibit the mechanism of action of bacteria.

The extraction method was carried out by maceration using 96% ethanol and fractionation. Antibacterial assasy using with concentration of 80%; 40%; 20%; and 10% disc diffusion method towards *Propionibacterium acnes*, *Staphylococcus epidermidis*, *Corynebacterium diphtheriae*, *Microsporium canis* and *Epidermophyton floccosum*.

Test results on *Propionibacterium acnes* showed that the ethanol extract of betadine leaves had an inhibition zone diameter of 7.13 mm (10%) and the ethyl acetate fraction had an inhibition zone diameter of 8.5 mm (10%), on *Staphylococcus epidermidis* showed that the ethanol extract of betadin leaves has an inhibition zone diameter of 6.43 mm (10%) and the ethyl acetate fraction has an inhibition zone diameter of 7.2 mm (10%), on *Corynebacterium diphtheriae* showed that the ethanol extract of betadin leaves has an inhibition zone diameter of 7.9 mm (10%) and the ethyl acetate fraction has an inhibition zone diameter of 6.9 mm (10%). *Microsporium canis* test showed that the ethanol extract of Betadine leaves had an inhibition zone diameter of 10.37 mm (10%), and the results of *Epidermophyton floccosum* tests found that the ethanol extract of Betadine leaves had an inhibition zone diameter of 15.26 mm (10%).

Based on the results of this study can be concluded that both the ethanol extract and the ethyl acetate fraction of betadine leaves (*Jatropha multifida* L.) have the ability to inhibit the growth of *Propionibacterium acnes*, *Staphylococcus epidermidis*, *Corynebacterium diphtheriae*, *Microsporium canis* and *Epidermophyton floccosum* fungi.

Keywords: *Jatropha multifida* L., fraction, ethyl acetate, antimicrobial

Serum Preparation Using Pineapple Fruit Extract (*Ananas comosus* L. Merr.): Formulation and Physical Evaluation

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ABSTRACT

The development of a serum using pineapple fruit extract (*Ananas comosus* L. Merr.) has piqued the interest of researchers due to its ability to protect cells against free radicals. Pineapple fruit is high in antioxidants, with bromelain, phenolic compounds, flavonoids, vitamin C, and carotenoids all playing a role. The serum was chosen as the formulation vehicle due to its ability to improve skin hydration, elasticity, and texture.

This research employed an experimental methodology, where the serum formulations were prepared using ethanol extract of pineapple fruit at concentrations of 1%, 3%, and 5%. Subsequently, a comprehensive assessment of the physical and stability aspects of the serum formulations was conducted.

The serum seemed fairly sticky yet liquid, had the strong flavor of pineapple extract, and was pale to medium yellow in the organoleptic assessment. Homogeneity tests (F0, F1, F2, and F3) revealed that all formulations were homogeneous. F0, F1, F2, and F3 pH values ranged from 4.5 to 5.3. The serum formulations' viscosities (F0, F1, F2, and F3) ranged from 345.7 to 2624.5 cPs.

The antioxidant activity was measured using UV-Vis spectrophotometry at a wavelength of 514.6 nm. Formula 1 (1% extract concentration) had an IC₅₀ value of 74.57, Formula 2 (3% concentration) had an IC₅₀ value of 41.29, and Formula 3 (5% concentration) had an IC₅₀ value of 45.98. The antioxidant concentration in Formulas 2 and 3 suggested a high level of antioxidant activity, whereas the antioxidant activity in Formula 1 was rated adequate.

This study successfully developed a serum formulation with varying concentrations of pineapple fruit extract. Physically, the serum exhibited characteristics aligning with established standards. Particularly, formulations with 3% and 5% extract concentrations displayed potent antioxidant activity, suggesting potential applications in skincare with significant protective effects against free radicals.

Keywords: Serum, pineapple, formulation, evaluation, extract

Phytochemical Screening and Antioxidant Assay of Ethanol Extract of Lidah Mertua's Leaves (*Sansevieria trifasciata* Prain)

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ABSTRACT

Lidah mertua's leaves (*Sansevieria trifasciata* Prain.) is traditionally used to treat various diseases. The purpose of this study was to determine the compound content of the Lidah mertua's leaves and to measure the antioxidant activity of ethanol extracts of the Lidah mertua's leaves. Extraction was carried out using a multilevel maceration method. This study tested the antioxidant activity using the 1,1-diphenyl-2-picrylhydrazil (DPPH) method using a microplate reader. Furthermore, phytochemical screening of secondary metabolites to determine the content of compounds contained in the Lidah mertua's by testing alkaloids, phenolics, flavonoids, terpenoids, steroids, and tannins. The results of phytochemical screening of ethanol extract contains alkaloid secondary metabolites (dragendroof), flavonoids, terpenoids, and tannins. The results showed that the ethanol extract of Lidah mertua's leaves contained compounds and showed strong antioxidant activity with IC₅₀ = 89.316 µg/m.

Keywords: : Lidah mertua leaves, screening, DPPH, antioxidants

Determination of Anthocyanin Levels by Differential pH and Antioxidant Assay of Ethanol Extract of Telang Flowers (*Clitoria Ternatea* L.) Using DPPH Method

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ABSTRACT

Butterfly pea flowers (*Clitoria ternatea* L.) contain anthocyanin compounds, which give color to the flower petals. Anthocyanins are part of the flavonoids which have antioxidant properties. Antioxidants sourced from anthocyanins work as free radicals neutralizer. The aim of this research was to determine the anthocyanin levels and antioxidant activity of ethanol extract of butterfly pea flowers.

Determination of anthocyanin content of butterfly pea flower ethanol extract using the Differential pH method and antioxidant testing using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method.

The results of the study showed that the anthocyanin content obtained was 143,157 TAC (Total Anthocyanin Content) mg/kg, while the antioxidant activity with the IC50 value of the ethanol extract of butterfly pea flower was 2.32 ppm, with a total phenolic content of 49,7478 mgGAE/g and flavonoids of 75.192 mgQE/g.

Based on the results above, it can be concluded that the ethanol extract of butterfly pea flowers has antioxidant activity in the very strong category, namely <math><50\mu\text{g/mL}</math>.

Keywords: Butterfly pea flower, anthocyanin, antioxidant, phenolic, flavonoid

Antibacterial Activity Against *Propionibacterium Acnes* From 96% Ethanol of Avocado Peel Extract (*Persea americana* Mill.)

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ABSTRACT

Acne is a skin disorder that usually occurs in adolescence. The formation of acne occurs due to blockage of the follicles by dead skin cells which can be caused by several things, including hormonal activity, genetic factors (heredity) and infection by the bacteria *Propionibacterium acnes*.

The design of this research is quantitative experimental. This research uses a maceration extraction method. Avocado peel (*Persea americana* Mill.) was extracted using the maceration method with 96% ethanol solvent. The extract results obtained were subjected to phytochemical screening, and antibacterial activity tested against *Propionibacterium acnes*.

The results of the antibacterial activity test have an average diameter of the inhibition zone at 100% concentration, namely 15.33 mm, 80% concentration, namely 14.1 mm, 60% concentration, namely 13 nm, 18%, 40% concentration, namely 12.13 mm. The average inhibition zone with a concentration of 100% has the highest average, namely 15.33 mm. The secondary metabolite groups contained in avocado skin are flavonoids, saponins, tannins, polyphenols and alkaloids.

Based on the results above, it can be concluded that the ethanol extract of avocado peel has antibacterial activity.

Keywords: Acne, avocado peel, extract, *Propionibacterium acnes*

Impact of Compaction Parameters on MUPS Tablets

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ABSTRACT

Multi-unit pellet system (MUPS) tablets provide a multitude of advantages for sustained release dosage forms. However, with the need to be tableted, one major challenge is compaction-induced pellet coat damage which undermines the desired sustained release function. To date, the impact of compaction parameters such as precompression and tableting rate on sustained release MUPS tablets remain not well explored. In this presentation, the impact of altering how the MUPS tablets was produced was evaluated, and various benefits could be demonstrated.

Keywords: Pellet, compaction, released, benefits.

Moisture-excipient Interactions: Insights and Implications

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ABSTRACT

Moisture-related stability issues present a challenge to formulators in the development of moisture-sensitive products. As moisture is widely found in the atmosphere, it is impractical to remove moisture entirely, hence various approaches have been devised for managing moisture in moisture-sensitive products. One such approach is through a judicious selection of excipients. In this presentation, the interaction between moisture and excipients, and its impact on the stability of moisture-sensitive products will be critically discussed. With a good understanding of moisture-excipient interactions, moisture-related stability issues can be better managed.

Keywords: Moisture, excipients, stability

Phytochemical Screening, Total Flavonoid Content and Antioxidant Activity of Ethanol Extract from *Melastoma malabathricum* L. Flower

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ABSTRACT

Melastoma malabathricum L. as known as local name "Senduduk" belongs to Melastomaceae family that is widely distributed in tropical regions including Indonesia. This plant is widely used in traditional herbal medicine to cure several ailments such as accelerating wound healing, treating diarrhoea, dysentery, stomachache, and diabetes. This study aimed to determine the secondary metabolite compounds through phytochemical screening method, total flavonoid content and antioxidant activity. The extraction of *M. malabathricum* flower was carried out using 96% ethanol solvent with maceration technique. Determination secondary metabolite using the phytochemical screening method was carried out qualitatively according to the standard method. Determination of total flavonoid content was determined using $AlCl_3$ through Spectrophotometric UV-Vis and the antioxidant activity test using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method. The result of the phytochemical screening test revealed the ethanol extract of *M. malabathricum* flower contained flavonoids, saponins, tannin and terpenoids. Total flavonoid content of ethanol extract from *M. malabathricum* flower was 66.057 mgQE/g. The results of the antioxidant activity test of the ethanol extract was 4,233 ppm compared to positive control ascorbic acid with IC_{50} value of 4.876 ppm. The result of this study indicate that ethanol extract of *M. malabathricum* flower has excellent antioxidant activity with IC_{50} less than 50 ppm and has potential to be further develop as antioxidant agent. Moreover, the highest DPPH free radical scavenging activity could be related to the its higher flavonoid content and contained several secondary metabolites on ethanol extract of *M. malabathricum* flower.

Keywords: *Melastoma malabathricum*, flavonoid, antioxidant, IC_{50} value

Antioxidant Activity on Combination Robusta Coffee (*Coffea canephora*), Peach (*Prunus persica* (L.)) and Stevia Leaf (*Stevia rebaudiana*) Natural Sweetener with Various Solvents

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ABSTRACT

Antioxidant-rich foods and drinks are recommended to help relieve oxidative stress caused by increased free radical synthesis. Arabica, Robusta coffee has a distinctive dark color and slightly bitter taste. Because of this, the fruit is often added to Robusta coffee to create a variety of flavors. Alkaloids, flavonoids, saponins, tannins and phenols are also found in Robusta coffee. Apart from its caffeine-containing qualities, coffee contains phenolic chemicals which function as antioxidants. Nowadays, many coffee drinkers, especially young people, choose to add herbal plants which have antioxidant properties, and also add natural sweeteners as a substitute for sugar in their coffee drinks.

This research aims to study the antioxidant activity of a combination of Robusta coffee (*Coffea canephora*), peach fruit (*Prunus persica* (L.)), and stevia leaves (*Stevia rebaudiana*) with a variety of solvents, using the DPPH method (1,1-Diphenyl-2-picrylhydrazyl).

The research results showed that the antioxidant activity value of the combination of Robusta coffee, peaches and stevia leaves with a ratio of (4:4:2), had an IC₅₀ value of 33.38 ppm with ethyl acetate extract included in the strong category, which can be used as an antioxidant to help improve Overall health and prevents the development of age-related diseases.

Robusta coffee drink with a combination of peaches and stevia leaves is a processed beverage product that has strong antioxidant activity. The results of the ANOVA test on the various solvents used and samples showed a value ($p < 0.01$) which indicated a significant difference.

Keywords: Antioxidant, coffee, natural, sweetener

Formulation of Deodorant Stick Product with Ethanol Extract Ketapang Leaf (*Terminalia catappa* L) as Antibacterial against *Staphylococcus epidermidis*

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ABSTRACT

Ketapang leaves (*Terminalia catappa* L.) are one of the plants that have antimicrobial potential because they contain secondary metabolite chemical compounds in the form of flavonoids and tannins. Body odor occurs due to lack of maintaining body hygiene and the presence of bacteria which can cause unpleasant body odor. One of the triggers for body odor is a bacterial infection, namely the *Staphylococcus epidermidis* bacteria. The aim of this research is to determine the formula of ketapang leaf extract (*Terminalia catappa* L.) which is made in stick dosage form with good characteristics and to determine the concentration of the stick deodorant preparation in inhibiting the gram positive bacteria *Staphylococcus epidermidis*.

The research carried out included collecting samples of Ketapang leaves which were taken purposively, made into simplicia and extracted using the maceration method using 96% ethanol solvent and concentrated using a rotary evaporator. Simplisia was screened to see the content of secondary metabolite compounds in ketapang leaves. The concentrations of ketapang leaf ethanol extract used were 1%, 2%, and 4% then compared with blanks and market deodorant preparations. Evaluation tests carried out on stick deodorant preparations include organoleptic tests, homogeneity tests, pH tests, melting time tests, melting point tests and *Staphylococcus epidermidis* bacteria inhibition tests.

The results of simplicia characterization are water content 6.00%, water soluble essence content 18.33%, ethanol soluble essence content 33.33%, total ash content 2.33%, acid insoluble ash content 1.00%. The results of the phytochemical screening of Ketapang leaves show that there are flavonoids, tannins, saponins and steroids so that simplicia has the potential to inhibit bacteria. Ketapang leaf ethanol extract can be formulated into a deodorant stick preparation that meets the requirements for a good preparation with stearic acid as the base and has bacterial inhibitory activity where at a concentration of 4% it has the highest inhibitory activity of concentrations of 1% and 2%, namely with an average of 8.0 mm in the medium category.

The deodorant stick preparation of ethanol extract of ketapang leaves (*Terminalia catappa* L.) has antibacterial activity as indicated by the inhibitory value against *Staphylococcus epidermidis* bacteria.

Keywords: Ketapang leaf, *Terminalia catappa* L., deodorant stick, *Staphylococcus epidermidis*

Phytochemicals Analysis and Antibacterial Activity of Nanoparticles Ethanol Extract Pala Leaves (*Myristica fragrans* Houtt) against *Staphylococcus Aureus* and *Escherichia Coli*

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ABSTRACT

Pala leaves (*Myristica fragrans* Houtt) contain secondary metabolites, flavonoids, terpenoids and alkaloids as antibacterials. In the nano size, the surface contact area of the particles becomes larger, which can increase the amount and solubility of the active substance more so that the antibacterial activity is stronger. This research aims to determine the effect of chitosan variations on particle size, antibacterial activity, and pala leaf ethanol extract nanoparticle shape.

Determination of the total flavonoid content of ethanol extract using the UV-Vis spectrophotometric method. Using the ionic gelation method, nanoparticles were made with chitosan and sodium tripolyphosphate variations, with the formulas 8:1, 10:1, and 12:1. The nanoparticles formed were characterized using a Particle Size Analyzer and Scanning Electron Microscopy. Antibacterial test against *S. aureus* and *E. coli* bacteria using the agar diffusion method using a paper backer. The concentration of ethanol extract from pala leaves for testing was 50%, 40%, and 30%, while the concentration of nanoparticle extract was 5%, 4%, and 3%.

The results of the total flavonoid content in the QE/ethanol extract were 39.73 ± 1.96 mg. The results of the antibacterial test against *Staphylococcus aureus* and *Escherichia coli* bacteria and pala leaf extract provide limits to the inhibition area for both bacteria at concentrations of 30% (13.35 mm), 40% (13.68 mm) and 50% (13.93 mm) for *S. aureus* and 30% (13.28 mm), 40% (13.45 mm) and 50% (13.81 mm) for *E. coli*. In the chitosan nanoparticles of pala leaf extract, the concentrations were 3% (14.70 mm), 4% (15.30 mm) and 5% (15.56 mm) for *S. aureus* and 3% (14.60 mm), 4% (14.65 mm) and 5% (15.05 mm) for *E. Coli*.

Ethanol extract of pala leaves can be made in nanoparticles with chitosan and sodium tripolyphosphate variations using the ionic gelation method. The particle size increased with increasing chitosan concentration. Ethanol extract in the form of pala leaf nanoparticles has greater antibacterial activity than the antibacterial activity of ethanol extract of pala leaves.

Keywords: Pala leaves, chitosan, nanoparticle, antibacterial

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Antioxidant Activity of Gotu Kola Herbal Tea (*Centella asiatica* (L.) Urb.)

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ABSTRACT

Gotu kola (*Centella asiatica* (L.) Urb.) is a herbaceous plant that contains chemicals in the form of glycosides, saponins, asiaticoside, madecoside, asiatic acid and madexatic acid. Apart from that, it also contains valerian and element K in the form of potassium salt. This relatively high potassium content gives pegagan leaves the distinctive properties of having a diuretic effect. This effect is good for people with diabetes, hypertension, cholesterol, and gout. The gotu kola herb also has antioxidant properties. Antioxidants are compounds that can ward off the bad effects of free radicals which can damage cells in the body and can trigger disease. Tea is a safe product because it does not contain preservatives, is easy to prepare, and is popular with Indonesians. The use of the gotu kola herb as an herbal tea drink is expected to have antioxidant activity that can maintain health.

Gotu kola herbal tea is made by drying it at a temperature below 60°C in a drying cupboard, then grinding it and putting it in a tea bag. Determination of antioxidant activity was carried out at concentrations of 100, 150, 200, 250, and 300 µg/mL using the DPPH method, and absorbance was measured using a UV-visible spectrophotometer. The absorbance value is used to determine the percent damping, which is then used to create a linear equation. The IC₅₀ value is calculated using the regression equation.

From the results of the experiments carried out, it was obtained that the reduction percentage was 33.87% at a concentration of 100 µg/mL, 48.86%, at a concentration of 150 µg/mL, 54.10%, at a concentration of 200 µg/mL, 65.20% at a concentration of 250 µg/mL and 79.20% at a concentration of 300 µg/mL, from this data it can be seen that the greater the concentration, the greater the reduction percentage, this shows that gotu kola herbal tea can reduce/ward off free radicals and this ability is in the medium activity category because the IC₅₀ value is 187.55 µg/mL

Gotu kola herbal tea has antioxidant activity with an IC₅₀ value of 187.55 µg/mL in the medium activity category.

Keywords: Herbal tea, *Centella asiatica*, antioxidant, DPPH, spectrophotometer

Formulation and Characterization of Body Scrub Using Cocoa Beans (*Theobroma cacao* L.) as an Exfoliator

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ABSTRACT

Cocoa plants are plants that are rich in flavonoid compounds, which can be used as scrubs or exfoliators. The use of synthetic scrubs can damage the skin, so it needs to be modified by making scrubs from natural ingredients, namely cocoa beans, which have the advantage of being more stable so that they can clean the skin mechanically by removing dead skin cells, and formulating cocoa beans into body scrub cream preparations to provide comfort when applied to the skin. The objective of this research was to determine whether cocoa bean (*Theobroma cacao* L.) body scrub cream has good physical quality and whether it can be used as an exfoliator.

This research used the true experimental method. In this research, cocoa beans were formulated to become a scrub as an exfoliator in the preparation of bodyscrub cream with various concentrations of cocoa beans scrub. Characterization of body scrub cream includes evaluation of physical quality (organoleptic test, homogeneity, type of cream, pH test, spreadability, adhesion), stability and exfoliating ability.

The results of physical quality evaluation and stability test showed that the scrub cream obtained had good physical quality and stability. In the exfoliator activity test for body scrub preparations that have an effect on the skin as anti-aging is formula 3 with the concentration of 15%, both from normalizing sebum levels, decreasing the amount of pigment, increasing collagen levels, increasing elasticity, and increasing moisture levels.

This research is that the preparation of cocoa beans body scrub cream fulfills the physical quality requirements of a good body scrub cream preparation, and cocoa beans can be used as an exfoliator. The greater concentration of cocoa beans scrub that is formulated in a cream preparation, the faster it will have a very satisfactory effect on the skin.

Keywords: Cocoa, body scrub, exfoliator

Nanoemulsion Formulation of Jasmine Flower Extract (*Jaminum sambac* L.) Using Self Nanoemulsifying Drug Delivery System (SNEDDS) Technique as an Anti Acne

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ABSTRACT

Acne vulgaris or acne is a skin problem in the form of infection and inflammation caused by infection with the bacterium *Propionibacterium acne*. Jasmine flower extract is able to inhibit bacterial growth, but in cream preparations it does not show any inhibition against bacteria, so it is necessary to develop a formula in the form of nanotechnology preparations, namely nanoemulsions made in the Self-Nanoemulsifying Drug Delivery System (SNEDDS) drug delivery system. This study aims to increase the effectiveness of anti-acne and preparation stability, so that the optimal formula is obtained. The research method used was to formulate jasmine flower extract into a SNEDDS preparation. The evaluations carried out were stability, turbidity, emulsification time, nanoemulsion characterization, pH, and antibacterial activity tests. The research results obtained 5 formulations that have stable stability, evaluation of the F5 turbidity test was close to 100%, the smallest particle size was F8 and the largest was F5, the zeta potential values of F4 and F8 met the requirements, the pH test F1 met the requirements, the emulsification time test and the polydispersity index of all formulations met the requirements, as well as the formula that had the greatest inhibition power F5. Based on the results it can be concluded that formulation 5 is the optimal formulation to inhibit the growth of *P. acne* bacteria.

Keywords: Nanoemulsion, jasmine flower, SNEDDS, anti acne

Bioinformatics Analysis of Nra Proteins of *Streptococcus pyogenes* Bacteria as a Basis for the Development of Diagnostic Reagent

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ABSTRACT

Scarlet fever is disease caused *Streptococcus pyogenes* bacteria. Scarlet fever has symptom painful headache, vomiting, chills and arousal rash red. Inspection laboratory role in establishing the diagnosis of scarlet fever. The culture method is the gold standard own limitations in effectiveness time inspection so that cause lateness treatment. Researcher sued find capable protein molecules give impact big in development reagent specific and sensitive diagnostics. One factor virulence bacteria *S. pyogenes* proteins Nra. Protein Nra has 62% identity order the amino acids that make up it part of the bacterial pili. Protein Nra expected can used as a potential protein for deep biomarkers development laboratory. Research sample form Nra protein sequence bacteria *Streptococcus pyogenes* which was taken from NCBI database with accession number ABJ15818.1. Analysis physical properties of Nra protein use device bioinformatics ProtParam served in a way descriptive. Protein Nra *Streptococcus pyogenes* bacteria own heavy molecule 59988, period isoelectric 9.39, total amino acid 511 AA, atomic number 8582 Da, index stability 41.16, index aliphatic 104.91, GRAVY index -0.071. In conclusion that the Nra protein *Streptococcus pyogenes* bacteria nature basic, hydrophilic, no stable, difficult interact with other proteins. Physico-chemical properties of Nra protein *Streptococcus pyogenes* bacteria can become reference invention potency molecule diagnostic for development reagent diagnostic specific and sensitive scarlet fever.

Keyword: *Streptococcus pyogenes*; diagnostic, reagent, Nra Proteins

Fabrication Capsule Shells From Tuna Fish Bone Gelatin (*Euthynnus affinis*) by Acid Method

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ABSTRACT

Gelatin is a polypeptide extracted from animal collagen tissue found in bones, skin and connective tissue. Utilization of gelatin in the pharmaceutical industry (as a capsule maker, tablet and pastille binder, surgical powder, plasma expander and microencapsulation, etc.). Researchers are interested in creating an alternative for making gelatin from tuna bone waste which will then be made into capsule dosage form.

Research methods include sample collection and processing, the process of isolating tuna fish bones into gelatin with varying soaking times at a temperature of 80°C using the acid method (HCL 5%), quality inspection of gelatin, making capsule shells and checking the quality of capsule shells.

Making gelatin from tuna bones using the acid method. Tests were carried out on gelatin quality checks on days 3, 5 and 7 which included organoleptic examination, determining the yield, namely 20.02%; 22.02%; 25.62%. Water content testing 9.5%; 9.66% ; 9.66%. Testing for ash content 1.2%; 1.1% ; 1.2%. Viscosity testing 2-3 centipoise. Testing the pH of gelatin is pH 5. Next, the quality of the capsule shell is checked, including diameter F1 = 6.5 ml; F2 = 0.53 ml, shell fragility test, and disintegration time test, namely when F1 and F2 rupture in artificial hull medium pH 1.2.

Isolating gelatin from tuna bones using the acid method and checking the quality of capsules from tuna fish gelatin meets the preparation quality requirements according to the Indonesian Pharmacopeia.

Keywords: Gelatin, fish bones, tuna, shells, capsules

Prevalence and Identification of *Staphylococcus aureus* Pathogenic Bacterial Contamination in Krispy Chicken in Roadside Carts and Local Fast Food Around One of the Universities of Medan City Using Rabbit Plasma Coagulase

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ABSTRACT

Crispy chicken is a ready-to-eat food that is popular with all levels of society. Krispy chicken is made from raw chicken coated with seasoned flour and fried until golden brown. Processing, storing and serving crispy chicken that is less hygienic could potentially lead to contamination by the pathogenic bacteria *Staphylococcus aureus*. This bacteria is reported to be the cause of Extraordinary Events (KLB) in Indonesia as a cause of diarrhea. Food poisoning can occur due to contamination with *S. aureus* enterotoxin. The aim of this study was to analyze the prevalence and identify the presence of the pathogenic bacteria *S. aureus* in crispy fried chicken meat from roadside carts and local fast food brands at one of the Amplas regional universities in Medan city using rabbit coagulase plasma with EDTA. The research method determines the presence of *S. aureus* in samples using Baird Parker Agar Base (BPA) media containing egg yolk. Specific identification uses the gram staining test, coagulase test using rabbit coagulase plasma with EDTA, and catalase test. Calculation of the *S. aureus* contamination value using the Total Plate Number (ALT), and analyzing the prevalence value of *S. aureus* contamination. The results on roadside wholesale crispy fried chicken meat were positive for the presence of *S. aureus* with a contamination value exceeding the threshold above 1×10^2 CFU/ml so it did not meet SNI standards. Local fast food crispy fried chicken was negative for *S. aureus* pathogenic bacteria with a value that did not exceed the threshold of 1×10^2 CFU/ml so it met SNI standards. The prevalence value of *S. aureus* contamination in roadside cart krispy chicken and local fast food is 83.3% and 16.6%.

Keywords: Prevalence, krispy chicken, *Staphylococcus aureus*, rabbit plasma coagulase

Golden Apple Snail (*Pomacea canaliculata* L.) Shell-Derived Fibrous PVA Matrix Containing Strontium-Substituted Hydroxyapatite Nanoparticles for Bone Tissue Engineering

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ABSTRACT

A scaffold that mimics the physicochemical makeup of bone at the nanoscale level is a potentially effective alternative to traditional bone grafts like autograft, allograft, or xenograft. Its production is still a significant obstacle for bone tissue engineering, though. This study describes the creation of a fibrous PVA-HA/Sr matrix using hydroxyapatite that has been strontium (Sr) substituted and extracted from the shell of the golden apple snail, *Pomacea canaliculata* L. Sr substitution to Ca was used to lower crystallinity during HAp synthesis since the manufacturing of HAp from biogenic materials, to be undertaken at very high temperatures and resulting in high crystallinity HAp. After being electrospun, the resulting HAp and HA/Sr nanoparticles were mixed with PVA to form fibrous PVA-HAp or PVA-HA/Sr matrices with 2 or 4 mol% Sr ions replacement. The addition of HAp, HA/Sr 2 mol%, and HA/Sr 4 mol%, respectively, to PVA steadily enhanced the nanofiber diameter. In PVA-HA/Sr-4 mol% and its protein adsorption, the swelling ratio percentage grew and reached its highest value. The matrices that had HAp or HA/Sr inclusion also showed good bioactivity, elevated cell viability, and improved cell proliferation. As a result, the fibrous matrices produced in this study are regarded as prospective candidates for scaffolds for bone tissue engineering. It becomes urgent to translate these findings into practical clinical use through additional in vivo research.

Keywords: Bone tissue, cell viability, fibrous matrix, PVA, *Pomacea canaliculata* L, shells

Antibacterial Activity Test of Mesenchymal Stem Cell (MSC) Secretome Against *Pseudomonas aeruginosa* Isolated from Diabetic Ulcer Patients

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ABSTRACT

Mesenchymal Stem Cells (MSCs), known for their promising potential in regeneration, proliferation, and differentiation, are frequently studied stem cell types. Recent research reports indicate that MSCs exhibit antibacterial activity against several pathogenic bacteria. Furthermore, stem cell-derived products, such as the secretome, appear capable of recapitulating numerous characteristics inherent to the cells themselves. The objective of this study is to ascertain the antibacterial activity of the secretome derived from adipose tissue MSCs when tested against *P. aeruginosa* bacteria isolated from diabetic ulcer patients. This study employed test bacteria isolated from specimens obtained from diabetic ulcer patient wounds. Bacterial isolation was carried out on MacConkey and blood agar differential media, followed by further molecular identification using the Polymerase Chain Reaction (PCR) method. The confirmed *P. aeruginosa* bacteria were utilized as the test bacteria for evaluating the antibacterial activity of the MSC secretome using the Kirby-Bauer method.

The isolated bacteria grew on MacConkey media with a profile consistent with gram-negative, non-lactose-fermenting bacteria, and exhibited hemolytic capabilities on blood agar media. Bacterial identification using PCR yielded positive results for *P. aeruginosa*, as indicated by the detection of a 504 bp DNA band corresponding to the oprL gene. Regarding the antibacterial activity testing against the isolated bacteria, the MSC secretome at concentrations of 1.25%, 2.5%, 5%, and 10% demonstrated antibacterial efficacy with average inhibitory zones measuring 8.17 mm, 8.23 mm, 8.52 mm, and 9.30 mm, respectively.

The MSC secretome exhibits antibacterial activity against *P. aeruginosa* bacteria isolated from diabetic ulcer patients. According to the classification by David and Stout, the resulting inhibitory effect falls into the moderate category.

Keywords: Antibacterial activity, secretome MSC, diabetic ulcer, *P.aeruginosa*

Antioxidant and Glucose Uptake Activity of *Saurauia bracteosa* Toward L6 Skeletal Muscle Cells

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ABSTRACT

Insulin resistance followed by insulin deficiency is the pathophysiology of type 2 diabetes mellitus. *Saurauia bracteosa* leaves have been used empirically as an antidiabetic, and several scientific studies have been conducted but have not touched on the mechanisms at the skeletal muscle cell level. The aims of the study were to identify the compounds in *S. bracteosa* and to evaluate its antioxidant activity, as well as to measure the glucose uptake into L6 skeletal muscle cells.

The study began with extraction using ethanol solvent with the maceration method, followed by phytochemical screening, characterization of dry leaves and extracts, examination of secondary metabolites by LC-MS/MS and GC-MS, total phenol test, total flavonoid test, as well as DPPH, ABTS, and FRAPs antioxidant test. Furthermore, the test was also conducted on glucose uptake test using L6 skeletal muscle cells.

The results of the LC-MS/MS obtained 11 compounds, the most abundant compound is quercetin. GC-MS identified 34 compounds with similarity $\geq 90\%$ and 14 compounds as potential antidiabetics. The total phenol value was $76.19 \pm 2.05 \mu\text{g GAE/mg extract}$; total flavonoids $35.54 \pm 0.80 \mu\text{g QE/mg extract}$; antioxidant activity of DPPH, ABTS, and FRAP, respectively with an IC_{50} value of 48.26; 226.88; 159.45 $\mu\text{g/mL}$. The results of the glucose absorption test after 5 hours of incubation showed that the ethanol extract of *S. bracteosa* at doses of 100 and 200 $\mu\text{g/mL}$; ursolic acid 5 and 10 μM ; quercetin 10 and 50 μM were able to significantly increase glucose uptake compared to normal controls ($p < 0.05$).

The ethanol extract of *S. bracteosa* leaves has antioxidant activity with different IC_{50} values according to the method used. The extract was able to increase glucose uptake into L6 skeletal muscle cells.

Keywords: *S. bracteosa*, glucose uptake, L6 skeletal muscle cells, total phenol, total flavonoid, antioxidant.

The Role of PARP Inhibitor for Improved Ovarian Cancer Prognosis: A Literature Review

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ABSTRACT

Due to its frequently delayed detection and few available treatment choices, ovarian cancer poses a serious health risk for people all over the world. Recent developments in targeted therapy have shown promise in terms of enhancing patient outcomes in cases of ovarian cancer. These include Poly(ADP-ribose) polymerase (PARP) inhibitors, which have the potential to be a breakthrough in the treatment of ovarian cancer by providing a better prognosis and more varied therapy alternatives. This study investigated the efficacy of PARPis for improved ovarian cancer prognosis.

Published studies on the efficacy of PARPis for improved ovarian cancer prognosis were retrieved by literature searching on the Google Scholar database to synthesize this literature review. The search strategy was based on the keywords: "PARP inhibitors" and "ovarian cancer". Through literature searching, nine journal articles were obtained.

This analysis delves into the pertinent subject of ovarian cancer and assesses the potential efficacy of olaparib, a PARP inhibitor, within the treatment framework. The discussion highlights the significance of BRCA mutations in shaping appropriate therapeutic interventions. References to clinical trials such as Solo-1 and Solo-2 shed light on the domain of post-chemotherapy maintenance therapy. Additionally, the discussion contemplates a synergistic approach, considering the amalgamation of olaparib with bevacizumab for post-chemotherapeutic maintenance. Special attention is given to understanding drug interactions to optimize treatment strategies. Ultimately, the conversation emphasizes the overarching goal of extending progression-free survival in ovarian cancer patients through meticulously tailored therapeutic modalities.

In conclusion, this study underscores the potential breakthrough of PARP inhibitors, particularly olaparib, in improving ovarian cancer prognosis. The importance of BRCA mutations and a synergistic treatment approach was highlighted, aiming to extend progression-free survival for patients.

Keywords: PARP inhibitors, ovarian cancer

The Impact of Antiviral Therapy on Clinical Outcomes in COVID-19 Patients with or Without T2DM Comorbidity at a Hospital in Bukittinggi

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ABSTRACT

Patients with comorbidities, especially comorbid type 2 diabetes mellitus (T2DM), are vulnerable to being attacked by COVID-19. Individuals with comorbid T2DM have been identified as a high-risk group for infection and the progression of severe COVID-19 disease. However, until now, no specific antiviral has been found for COVID-19, so the COVID-19 pandemic involves the rapid discovery of beneficial drug therapies.

The purposes of this research were to determine the impact of T2DM comorbidity and antiviral therapy on the clinical outcomes of COVID-19 patients.

This study was conducted using a cross-sectional design from April 2020 to March 2021 at Achmad Mochtar Hospital Bukittinggi. Data was collected retrospectively through patient medical record data. The data collected were length of stay (LoS), pulse, respiratory rate, temperature, oxygen saturation, and blood pressures of COVID-19 patients with and without hypertension comorbidity. Therapy and clinical outcomes that met the inclusion criteria were analyzed using the Mann-Whitney U Test, Kruskal-Wallis, Repeated Measured ANOVA, and Friedman Test using a computer program.

Results showed that comorbidities had a significant impact on the average respiratory rate and oxygen saturation of patients ($p < 0.05$). The antiviral therapy that is widely used for patients with confirmed COVID-19 was oseltamivir. The use of different antivirals had a significant impact on the length of stay for COVID-19 patients ($p < 0.05$). The use of favipiravir therapy tends to shorten the length of stay and the average body temperature tends to be lower, while remdesivir showed the average oxygen saturation tends to be higher and the average respiratory rate tends to be faster.

The comorbidity could impact on the physiology of patients in term of respiratory rate and oxygen saturation. Antivirals used gave different clinical outcomes.

Keywords: COVID-19, comorbidity, diabetes, antivirus, outcome

Formulation and Antibacterial Activity of Nanoemulsion Turmeric Oil against *Staphylococcus aureus* and *Escherichia coli*

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ABSTRACT

Curcuma domestica or turmeric is a popular herb in Asia. In traditional, turmeric was used for treating gastrointestinal and hepatic disorder, fever, inflammation and skin diseases. Turmeric oil is an essential oil derived from turmeric (*Curcuma domestica*). Turmeric oil has pharmacological activity such as antioxidant, anti-inflammatory, antidiabetic, anticancer, analgesic, cardiovascular, neuroprotective, nephroprotective, antibacterial, antifungal, and antiparasitic. Turmeric oil can inhibit the growth of Gram positive bacteria (*Bacillus cereus*, *B. Subtilis*, and *Staphylococcus aureus*) and Gram-negative bacteria (*E. Coli*, *Klebsiella pneumonia*, and *Pseudomonas aeruginosa*). Turmeric oil can be formulated to nanoemulsion. Nanoemulsions, which are very small droplet-sized emulsions, are nanometric drug delivery systems that are used for bioactive components due to their ease of formulation and acceptable functional properties such as physicochemical, more stability, and the potency of improving biological activity of hydrophobic compounds (increasing the surface area and interactions between active ingredients with biological membranes). The aim of present research was to determine the physical properties and antibacterial activity of nanoemulsion turmeric oil.

The nanoemulsion was made with the composition of Virgin Coconut Oil as oil phase, tween 80 and span 80 as the surfactant, and PEG 400 as the co-surfactant with constant stirring of 1000 rpm and then ultrasonication. Physical evaluation included organoleptic, pH, viscosity, centrifugation, homogeneity, droplet size and polydispersity index. Antibacterial assay by the diffusion method.

The result showed that the three formulas (F1, F2, and F3) have the same characteristic: were in the form of a thick liquid, yellow clear with turmeric aromatic. All of the formulations were homogeneous, there was no separation after centrifugation test, pH range around 6.8-7. The nanoemulsion turmeric oil has droplet size at F1, F2, F3 of 23.2 nm, 203.8 nm, and 298.7 nm, all of the formulas were physically stable by the cracking, sedimentation and turbidity.

The results of antibacterial assay found that all formulas provide the inhibition zone. All of the formulas had moderate antibacterial activity against *Staphylococcus aureus*, and *Escherichia coli* with average inhibition zone diameter of 5.0-9.8 mm.

Based on the result of this study, the formulations have good stability, and had moderate antibacterial activity against *Staphylococcus aureus*, and *Escherichia coli*.

Keywords: Nanoemulsion, turmeric oil, antibacterial

Antibacterial Activity and Time-Kill Kinetics of Ethanol Extract of Moringa Leaves (*Moringa Oleifera* Lam.) Against Pathogenic Bacteria

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ABSTRACT

Antibacterial resistance is a global health risk to people all over the world. This necessitates the search for new antibacterial agents. *Moringa oleifera* Lam. is a rich source of potential antibacterial agents. The objective of this study was to determine the antibacterial activity and time-kill kinetics of Moringa leaf ethanol extract against pathogenic bacteria such as *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, and *Escherichia coli*. According to the phytochemical screening test, the extract contains alkaloids, flavonoids, saponins, tannins, and terpenoids. Disk diffusion was used to examine antibacterial activity at extract concentrations of 2%, 4%, 6%, and 8%. All pathogenic bacteria could be inhibited by the extract with an average range of inhibition zone for *Staphylococcus aureus* 8.55±0.17 mm - 9.89±0.28 mm, *Staphylococcus epidermidis* 7.66±0.12 mm - 9.59±0.17 mm, *Pseudomonas aeruginosa* 7.35±0.27 mm - 9.21±0.12 mm and *Escherichia coli* 7.34±0.25 mm - 9.00±0.27 mm. All bacteria had a MIC of 1.25 mg/mL, and the MBC ranged from 1.25 mg/mL to 5 mg/mL. Time-Kill kinetics for *S. aureus* and *S. epidermidis* were found to be completely dead after incubation for 4 hours at a concentration of 4xMIC. However, for *P. aeruginosa* and *E. coli* bacteria, the number of colonies was decreased by > 3log₁₀ CFU/mL. The ethanol extract of Moringa leaves showed antibacterial activity, indicating that it has potential as a natural antibacterial derived from plants.

Keywords: Moringa leaf extract, antibacterial activity, time-kill kinetics, pathogenic bacteria

Effects of Yellow Pumpkin Seed Extract (*Cucurbita moschata* Duchesne) Against Cholesterol and Blood Glucose Levels in White Rats (*Mus musculus*)

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ABSTRACT

Cholesterol is a lipid fraction that originates from dietary sources and is also synthesized endogenously within the body. Diabetes mellitus (DM) is a metabolic disorder characterized by hyperglycemia. Medicinal plants serve a role in prevention and treatment as antihypercholesterolemic and antihyperglycemic agents, with pumpkin seeds being one such example. Pumpkin seeds are rich in flavonoids, alkaloids, phytosterols, tannins, and saponins, which exhibit antihypercholesterolemic and antihyperglycemic effects.

The objective of this study was to assess the reduction in cholesterol and glucose levels in white rats. This study used 35 male Wistar rats divided into 5 groups consisting of, group I (normal), group II (negative), group III (positive), group IV (extract 350 mg/kgBW), group V (extract 700 mg/kgBW) The intervention was carried out for 14 days after an acclimatization period of 7 day.

The results of paired t-tests revealed significant differences in blood cholesterol and glucose levels before and after treatment ($p < 0.05$) in group III, IV, and V. ANOVA results indicated significant differences with $p = 0.000$ (for cholesterol) and $p = 0.002$ (for glucose). Additionally, the LSD post hoc test demonstrated significant differences between group IV and group V compared to group II, concerning both cholesterol and blood glucose levels.

In conclusion, this study demonstrates the cholesterol and blood glucose-reducing effects of pumpkin seed extract, with an effective dose observed at group V (700 mg/kg BW)

Keywords: Pumpkin seed extract, hypercholesterolemia, hyperglycemia

Antibacterial Activity Assay of Pidada Leaf Ethanol Extract against *Bacillus subtilis*

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ABSTRACT

In Indonesia, infectious diseases are still a serious problem today, and the importance of increasing other sources of antimicrobial drugs from natural materials, one of which is the pidada plant (*Sonneratia caseolaris* Engl). This plant is known to contain secondary metabolite compounds flavonoids, phenols, tannins, saponins, and triterpenoids that can inhibit bacterial growth.

This research aims to determine the inhibitory power of the ethanol extract of pidada leaves (*Sonneratia caseolaris* Engl) against *Bacillus subtilis* bacteria at varying concentrations of 80% ; 60%; 40%; and 20% used the antibiotic ciprofloxacin as a positive control and DMSO solution as a negative control.

Pidada leaves were extracted using the maceration method with 96% ethanol solvent. Antibacterial testing uses concentration variations, namely 80%; 60%; 40%; and 20%. The test results on *Bacillus subtilis* found that the ethanol extract of pidada leaves had the strongest average diameter of the inhibition zone, namely 19.13 mm at a concentration of 80%.

Based on the results of the research, it can be concluded that the ethanol extract of pidada leaves can inhibit the growth of *Bacillus subtilis* bacteria.

Keywords: Pidada leaf, *Sonneratia caseolaris* Engl, antibacterial, *Bacillus subtilis*

Effectiveness of Shallot Extract Against Thrombin in the Hemostasis Process in mice

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ABSTRACT

Blood clotting occurs due to the change in the plasma protein prothrombin to thrombin. Thrombin is an active form of prothrombin which catalyzes fibrinogen in the hemostasis process. Generally, the wound healing process uses synthetic drugs. Humans have made various efforts to heal wounds or speed up the hemostasis process using natural ingredients, one of which is shallots (*Allium ascalonicum* L.). The aim of this research was to determine the healing of cuts in mice after being given shallot juice. As positive controls in this study, betadine and distilled water were used as negative controls. This research uses a laboratory experimental research method with a pre and post test design. Based on testing garlic juice on pieces of mice carried out for 7 days with a total of 3 mice, the mean obtained in the treatment group that used shallot juice was 0.48 cm, in the group given betadine it was 0.36 cm, while in the group that received given betadine was 0.36 cm. the treatment group with distilled water was 0.19 cm. Shallots contain calcium which is needed for the activation of thromboplastin and for the conversion of prothrombin to thrombin in the wound healing process. If there are no calcium ions then blood clotting will be disrupted or even not function. Calcium is one of the compounds needed in the blood clotting process. Apart from its calcium content, the active chemical compound allicin is useful as an antibacterial and antibiotic. This statement is strengthened by research by Erlina (2013) which states that the addition of purebred chicken eggshell powder can speed up blood clotting time by looking at it microscopically. In addition, the protein content in red onions plays a role in the inflammatory process which is the first stage in the wound healing process.

Keywords: Shallot extract, thrombin, hemostasis, mice

Effects of Ultrasound, Neuromuscular Taping and Stretching Duration of 60 Seconds to Reduce Pain in Hamstring Strains Aged 18-27 Years

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ABSTRACT

The hamstring muscle is a type I (tonic) muscle or postural muscle, which functions to perform knee flexion movements, as well as assisting hip extension movements, external and internal hip rotation. In general, the hamstring is the back thigh muscle that is most often injured in the form of strains, which functions for hip and knee movements when walking, running, squatting, bending the knees and tilting the pelvis. Hamstring muscle injuries are among the most common, especially during sports, the high recurrence rate is a challenge for physiotherapy. Hamstring strains can cause significant disorders, activity limitations and participation restrictions, including loss of competitive sports time. Method: this research is quasie experimental with a pre and post test research design without control group design. The population in this research is all hamstring strain sufferers aged 18-27 years in the physiotherapy lab who received physiotherapy intervention services totaling 20 people. The research was carried out by providing ultrasound treatment, neuromuscular taping and stretching duration of 60 seconds. Results: based on the hypothesis test with paired sample test in the treatment group, it was obtained that the value of $P = 0.000$ ($P < 0.05$) with a mean value of 10.50 ± 210.00 , which means there is a significant difference in results before and after intervention by providing ultrasound, neuromuscular taping and stretching duration of 60 seconds. Conclusion: there is a decrease in pain scores by measuring the visual descriptive scale (VDS) in conditions of hamstring strains at the age of 18-27 years. This can be seen from the difference in the results before and after the intervention. This means that the intervention of ultrasound treatment, neuromuscular taping, and a stretching duration of 60 seconds significantly has a very good effect in reducing the pain value of hamstring strains.

Keywords: Physiotherapy, ultrasound, neuromuskular taping, stretching

Formulation and Antibacterial Activity of Anti Foot Odor Spray from Arabica Coffee Oil against *Staphylococcus epidermidis*

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ABSTRACT

Foot odor caused by activity of *Staphylococcus epidermidis* degrades leucine in sweat. One of the ingredients that could potentially to handle *Staphylococcus epidermidis* is coffee oil. Coffee oil contains volatile compounds such as alcohol, hydrocarbons, aldehydes, ketones, pyrazines and furans. These compounds have potential as antioxidants, antibacterial, anti-inflammatory, and emollients. The volatile oil from coffee beans is known to be very effective against *Staphylococcus aureus* and *Staphylococcus epidermidis*, reaching bacterial growth inhibition values between 85 and 100%. Preparation foot odor spray was chosen because of the great pleasant experience for the user. This study aims to make a foot odor spray and conduct an antibacterial assay by the diffusion method against *S. epidermidis* caused foot odor.

This study included foot spray preparation with 4 concentration of coffee oil (F0 0%, F1 5%, F2 10%, F3 15%); physical evaluation included organoleptic, homogeneity, pH, viscosity; and drying time, and antibacterial assay by the diffusion method.

The result showed that foot odor spray from coffee oil (F1, F2, F3) have the same characteristic: F1, F2, F3 have a slightly brown color but F0 clear but no color. F1, F2, and F3 had odor like coffee, but F0 was odorless. The degree of acidity (pH) in all of the formulas is still included in skin pH range around 4-6. The viscosity of all the formulas is still included in the viscosity for spray preparation, which is less than 150 cps, so that the preparation can be sprayed easily using a spray bottle. For drying time the observations show that foot odor spray from coffee oil has a drying time less than 5 minutes. The drying time requirement for spray is less than 5 minutes. The results of antibacterial assay found that all formulas provides the inhibition zone. F1 and F2 had moderate antibacterial activity, and F3 has strong inhibition zone with average inhibition zone diameter of 13.2 mm.

Foot odor spray from coffee oil has the potential to be used as a foot odor controller cause has strong inhibition zone in F3.

Keywords: Foot odor, spray, coffee oil, *Staphylococcus epidermidis*

Different Effect of Neuromuscular Taping (NMT) to Combination of Isometric Training with Core Stability Exercises to Decrease Pain and Increase Agility on Jumper's Knee Patients

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ABSTRACT

Jumper's knee is tear in the patellar tendon caused by repeated pressure and pulling in a jumping motion causing pathology to the knee. Unfortunately, many patients with jumper's knee complain of pain and loss of agility, leading to many therapies approach to help the disorder. The purpose of the current study was to assess the effectiveness of the Neuromuscular Taping (NMT) to a combination of isometric training and core stability exercise in reducing pain and increasing agility in the treatment of jumper's knee conditions in soccer school students.

This study included 28 active male soccer students aged 14-17 years with jumper's knee condition. Patients were divided into 2 groups: Group 1 was given isometric training and core stability exercise, and Group 2 was given isometric training and core stability exercise with the addition of the Neuromuscular Taping (NMT) application. The clinical data were collected from examination and measured with Visual Analog Scale (VAS) for pain measurement and Illinois Agility Test (IAT) for agility measurement.

Significant differences in measures of VAS ($P=0.004$) and IAT ($P=0.045$). The mean value of pain (VAS) after intervention in group 1 was 3.00 ± 0.961 and group 2 was 1.93 ± 1.072 , $p=0.004$ so ($p < 0.05$). The mean of the Illinois Agility Test to measure agility in group 1 after the intervention averaged 15.37 ± 0.780 and group 1 averaged 14.72 ± 0.766 with a value of $p=0.045$ then ($p < 0.05$).

An intervention by neuromuscular tapping to a combination of isometric training and core stability exercise improves their subjective in reducing pain and increasing agility. These finding shows the addition of the application of neuromuscular taping with isometric training and core stability exercises improves the well-being and the quality of life to jumper's knee patients.

Keywords: Neuromuscular taping, pain, agility, isometric training and core stability exercise, jumper's knee

Antibacterial Activity Assay of Ethanol Extract Matoa Leaves (*Pometia Pinnata* J.R. Forst. & G. Forst)

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ABSTRACT

Matoa leaves (*Pometia pinnata* J.R. Forst. & G. Forst) is a plant originating from Papua and has spread in several Indonesian islands. This matoa plant has green leaves and pointed tips and pinnate spines. Not many know that all parts of the matoa plant have traditional benefits as a treatment. This study was conducted to determine the antibacterial activity of ethanol extract of matoa leaves (*Pometia pinnata* J. R & G. Forst) at concentrations of 10%, 30%, 50% and 70% has antibacterial power against gram-positive bacteria *Staphylococcus aureus* and *Streptococcus mutans* as well as gram-negative bacteria *Escherichia coli* and *Klebsiella pneumonia*. Matoa leaf extract has antibacterial activity against gram-positive bacteria *Staphylococcus aureus* and *Streptococcus mutans* as well as gram-negative bacteria *Escherichia coli* and *Klebsiella pneumonia*, the best results on ethanol extract of matoa leaves at a concentration of 70% showed average results on *Staphylococcus aureus* bacteria (15.30 mm), *Streptococcus mutans* bacteria (14.63 mm), *Escherichia coli* bacteria (9.70 mm) and *Klebsiella pneumonia* bacteria (16.13 mm)

Keywords: : Matoa leaves, antibacterial activity, ethanol extract

Validation of Erythromycin Analysis with Area Under Curve by Reverse-Phase High-Performance Liquid Chromatography

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ABSTRACT

Determination of erythromycin levels with the area under the curve by reverse-phase high-performance liquid chromatography using UV detectors at wavelengths of 205 nm. The car phase used can be potassium phosphate dibase (pH 9): acetonitrile (50: 50) with a flow speed of 1 mL/minute at column temperature 50°C. The average result of recovery is 99.76% (w/w), the value of the difference in levels in various determinations is 0.2347%, the average difference is statistically - 0.1691%, precision with SD 0.6141, RSD = 6.16×10^{-3} and KV 0.6156%, and linearity $a = - 17548.6$, $b = 239.624$ and $r = 0.9993$. The experimental results show that this method is valid, selective, and sensitive.

Keywords: Erythromycin, precision, linearity