ABSTRACT BOOK 2021

International Graduate Student Coference on Pharmaceutical Sciences (IGSCPS) 2021

Recent Update in Pharmaceutical Research for Transforming Global Health and Medicine

Faculty of Pharmacy Universitas Airlangga

Surabaya, October 05, 2021

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Rector's Remarks
IGSCPS 2021
Faculty of Pharmacy

A very warm greeting from Universitas Airlangga, Surabaya – Indonesia

Praise gratitude to Allah SWT, because of His permission the International Graduate Student Conference on Pharmaceutical Sciences (IGSCPS) 2021 abstract book can be well compiled. Under the Postgraduate Program of the Faculty of Pharmacy, it is a great honor for Universitas Airlangga to host the International Graduate Student Conference on Pharmaceutical Sciences (IGSCPS) 2021. With the theme on the recent updates in pharmacy and pharmaceutical sciences for transforming global health and medicine, this international conference aims to accommodate and facilitate postgraduate students to share their experience, knowledge, ideas and to publish their research results in indexed proceedings or Scopus indexed journals particularly but not limited to pharmaceutical and health sciences.

As higher education Institutions, we hold the responsibility to be perpetually adaptive to cater to everyone's needs. We need to promote cooperation within interdisciplinary research that can enhance productivity and sustainability that can benefit society. We believe that together with an inter- or multi-disciplinary approach, we constantly reinforce the idea of research and inspiring researchers to produce reports of their study and publish them as articles in scholarly periodicals or scientific publication journals.

To conclude, let us express our sincere appreciation to the IGSCPS of 2021 organizing Committee for the tremendous effort in making all of this possible. Congratulations on the tireless effort and hard work in ensuring that the international conference was conducted smoothly and successfully.

Yours Sincerely,

Prof. Dr. Mohammad Nasih, SE., MT., Ak
Rector

Dean's Remarks
IGSCPS 2021
Faculty of Pharmacy

Assalamu'alaikum warahmatullah wabarakatuh,

Welcome to Surabaya,

It is a great pleasure to welcome all distinguished speakers and all participants to Surabaya in International Graduate Student Conference on Pharmaceutical Sciences (IGSCPS) 2021on October 5, 2021, via virtual conference. This conference is an international conference in the field of pharmacy and health which was initiated by the Postgraduate Program of the Faculty of Pharmacy, Universitas Airlangga. This conference has a big theme **"Recent updates in pharmacy and pharmaceutical sciences for transforming global health and medicine"**.

Due to the coronavirus (COVID-19) being a Global Pandemic and your safety is our priority, the conference will be held through Video Conference (VICON). This conference will involve expert speakers in the fields of pharmaceutical analysis, pharmaceutical technology, clinical and community pharmacy, cosmetics, pharmacology and biomedical sciences, natural products, drug discovery, and complementary and alternative medicine. Furthermore, the conference, which is a meeting place for various parties, on a national and international scale is designed to make it easier for scientists and professionals, as well as students, to share their research experiences and discuss their research in the international arena.

This periodic conference, which was first held in 2018, aims to accommodate and facilitate postgraduate students to publish research results in indexed proceedings or Scopus indexed journals. This international conference is one way to maintain our academic reputation and research reputation and the University will be highly recognized and perhaps highly cited.

We hope we can expand our international research collaborations especially in building research capacity in terms of talents of researchers, the abundance of resources or research facilities, and management of research. This is the best way to work hand in hand to solve some global health issues especially in the pharmaceutical and healthcare field and to achieve a healthy and better quality of life.

I would like to extend my deeply gratitude to the organizing committee for their hard work in making this a successful event. Finally, I wish all of you will gain many

advantages from this event and enjoy your virtual meeting in Surabaya. May this event be memorable and fruitful for all of us.

Wassalamualaikum warahmatullahi wabarakatuh.

Prof. Junaidi Khotib, M.Kes., Ph.D., Apt.
Dean
Faculty of Pharmacy, Universitas Airlangga

Chairman's Remarks
IGSCPS 2021
Faculty of Pharmacy

Assalamu'alaikum warrohmatullahi wabarokatuh

Distinguished guests, Ladies, and Gentlemen.

It is my great pleasure to welcome you to the International Graduate Students Conference on Pharmaceutical Sciences (IGSCPS), 2021 in Surabaya, which will take the theme "Recent Update in Pharmaceutical Research for Transforming Global Health and Medicine". This international conference is held with the aim to facilitate students to be able to publish their research, as nowadays scientific publications become a requirement for graduation both the master and doctoral degrees. Because of that reason, the committee has collaborated with several scientific journals to publish selected papers from the presenters as regular issues.

On this occasion, I am Djoko Agus Purwanto, Professor in the Department of Pharmaceutical Sciences, Faculty of Pharmacy, Universitas Airlangga, as Chairman of the conference committee allow me to thank the speakers today, on Plenary Session I, Assoc. Prof. Amirali Popat, Ph.D from School of Pharmacy, The University of Queensland Australia, Prof. Fumitaka Fujita from the Graduate School of Pharmaceutical Sciences, Osaka University, Japan and Prof. Dr. apt., Siswandono, MS. from Faculty of Pharmacy, Universitas Airlangga, Indonesia. The Speakers on Plenary Session 2, Assoc. Prof. Dr. Najihah binti Mohd Hashim from Faculty of Pharmacy, Universiti Malaya, Malaysia, Assoc. Prof. Surakit Nathisuwan, Pharm.D, BCPS from Faculty of Pharmacy, Mahidol University, Thailand, and Prof. Dr. rer nat. apt. Mochamad Yuwono, MS. from Faculty of Pharmacy, Universitas Airlangga, Indonesia.

We also extend our deepest gratitude to the Rector of Universitas Airlangga who has facilitated the implementation of this international conference. Likewise, the Dean of the Faculty of Pharmacy, Universitas Airlangga who also enthusiastically encourage this conference to be held.

To all participants, and presenters, both oral and posters, I would like to express my highest appreciation for your participation and strong support so that this conference can run well. As the chair of the committee, I will not be able to stand here, in front of all of you today, if not because twenty-eight amazing people in the organizing committee who have been with me since the very beginning.

Ladies and gentlemen

We hope that this conference can provide great benefit to everyone with an interest in health and medicine. Thank you for your participation and enjoy the conference.

Wassalamu'alaikum warrohmatullahi wabarokatuh

Prof. Dr. apt. Djoko Agus Purwanto, M.Si
Conference Chairman

Overcoming Biological Barriers using Mesoporous Silica Nanoparticles for Effective Drug Delivery

Amirali Popat

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Abstract

Mesoporous silica nanoparticles (MSNs) have attended frenzy of attention in past 20 years as an emerging biocompatible drug delivery and diagnostic system. Lot of these formulations based on MSNs are now in Phase I and II clinical trials. However, despite use of colloidal silica (aerosil) as common tablet excipients since past 50 years, the full translational potential of MSNs as oral drug delivery agents is not realised. Our group focuses on use of MSNs nanocomposites to overcome multiple biological barriers (Mucus, Gut, Tumour, and Blood Brain Barrier). We are particularly interested in effective oral delivery of hydrophobic drugs and macromolecules. For instance, by harnessing the high surface functionality of MSN we have prepared various pH and enzyme responsive drug delivery systems based on MSNs for targeting small intestine and inflamed gut. Additionally, we have evaluated the potential of library of silica particles in delivery of variety of small and macromolecules for the treatment of IBD, Diabetes, TB, and Cancer. MSNs has the potential to become all in one excipient/carrier for overcoming multiple biological barriers and has the potential to be translated into practice in the future.

Influences of Environmental Changes on Nociceptors on Skin Surface

Fumitaka Fujita

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Abstract

Epithelial tissue, especially the skin, is constantly exposed to major environmental changes, pathogens and chemicals, but it has an elaborate mechanism for maintaining tissue through a flexible cell response and control system. Twenty years ago, we never imagined that one molecule could sense temperature and sensory irritations on the skin surface. In 1997, it was discovered that an ion channel called TRPV1 responded to not only high temperature but also capsaicin, which dramatically changed understanding of sensory perception on skin. We have clarified that TRPA1, which was found in 2003, is related to sensory irritation by various chemicals and environmental changes, such as anti-bacterial agents, alkali solution, hypotonic solution and fragrance chemicals. In addition, I mention examples of applications to cosmetics.

The Role of *In Silico* Approach for Drug Development (Novel 5-*O*-benzoylpinostrobin Derivatives as SARS-CoV-2 Main Protease Inhibitors)

Siswandono

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Abstract

Attempts to design new drugs can be done through structural modification. Structural changes are made by altering substituted groups, which will cause changes in the physicochemical properties, and this may affect the pharmacokinetics, toxicity, and activity of the compound. Changes in the physicochemical properties, toxicity, and activity can be predicted by molecular modeling called *in silico* approach. COVID-19, a global pandemic caused by SARS-CoV-2 infection, has led researchers around the world to search for therapeutic agents for the treatment of the disease. The main protease (M^{Pro}) of SARS-CoV-2 is one of the potential targets in the development of new drug compounds for the disease. Some known drugs such as chloroquine and remdesivir have been repurposed for the treatment of COVID-19, although the mechanism of action of these compounds is still unknown. In addition to these known drugs, new drug compounds such as 5-*O*-benzoylpinostrobin derivatives are also potentially used as SARS-CoV-2 M^{Pro} inhibitors. This study aims to predict the physicochemical properties, ADME, toxicity, and antivirus activity of 17 compounds of 5-*O*-benzoylpinostrobin derivatives as potential SARS-CoV-2 Main Protease Inhibitors compared with several other compounds used in COVID-19 therapy. The *in silico* test is performed by an online program (pkCSM and SwissADME) to predict the physicochemical properties, ADME, and toxicity. Docking a compound that will predict its activity with the target receptor, SARS-CoV-2 Main Protease PDB ID. 5R84, using the MVD (Molegro Virtual Docker) program. The results of the docking of the ligand-receptor are described by the value of Rerank Score (RS). Compounds that have small RS values are predicted to have a great activity. From the results of this in silico test, it can predict 5-*O*-benzoylpinostrobin derivatives having higher anti-Covid-19 (SARS-CoV-2) activity, better on ADME properties, and lower toxicity than 5 anti-virus drugs (acyclovir, favipiravir, remdesivir, oseltamivir, umifenovir), and potential compounds to combat Covid-19.

Keywords: Drug development, *in silico* approach, 5-*O*-benzoylpinostrobin derivatives, SARS-CoV-2 Main Protease Inhibitors

Scientific Research on Medicinal Plants to High-Value Health Products: Potentials and Challenges from Malaysian Perspectives

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Abstract

Malaysia is tremendously endowed with multi-ethnic cultures and a unique combination of folk and traditional medicines. Many cultures from within the country and from surrounding regions have greatly influenced not only the cuisine but also the traditional medicine. The availability of the Malay Traditional Medicine, Ayurveda, the Traditional Chinese Medicine (TCM), Kampo and Jamu in Malaysia as well as in this region which could be using over 3000 species of medicinal plants which makes Malaysia one of the 12 most diverse mega-biodiversity countries with its rainforest ranked 4th on the list of biodiversity hotspots in Asia after India, China, and Indonesia. The Malaysian herbal industry is also fully supported by the government and adopted as part of the national key economic areas (NKEA) under the Government's Economic Transformation Plan, thus enjoying rapid development in line with the growing global herbal industry. The use of Complementary and Alternative Medicines (CAM) to support or as adjunctive therapies in medical treatment, as to prevent relapses in cancer, reinforce the immunity system, reduce disease symptoms, and maintain health is also gaining more traction worldwide. Natural products are usually characterized with identified potential antioxidant, antimicrobial, anti-inflammatory and anti-cancer compounds. The high-cost implication and side effects of conventional medical and pharmaceutical interventions, most synthetic drugs and materials have also made natural products more attractive. Nevertheless, the heterogeneity of regulatory standards, efficacy, quality and safety of herbal products require global and international standardization. Herbal products should, however, be made accessible to low-income and rural communities across the globe. The proper preservation, cultivation, and documentation of the ethnopharmacological important plants would enhance the sustainable use of the various indigenous plants.

Keywords: Medicinal plants; high-value products; herbal products; Malaysia; standardization

Clinical Pharmacy Research as a Key to Create Local Evidences & Guide National Health Policies: Thailand's Experience

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Abstract

Clinical pharmacy has been defined as a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, and disease prevention. Based on the philosophy of pharmaceutical care, clinical pharmacists blend a caring orientation with specialized therapeutic knowledge, experience, and judgment to ensure optimal patient outcomes. In addition, one important element of clinical pharmacy is the obligation to generate new knowledge that advances health outcomes. Research in the area of pharmacy practice has constantly evolved based on the evolving practice standard and the role of pharmacists in a healthcare system. For Thailand, the country has adopted and adapted the concept of clinical pharmacy, and later, pharmaceutical care to guide the change in both pharmacy education and practice. Throughout over four decades of clinical pharmacy implementation in Thailand, significant progress has been made in all fronts. Throughout this practice development, research works conducted to formally evaluate pharmacist interventions in Thailand's context started to flourish. Increasing number of high-quality experimental studies show clear or potential benefit of pharmacist participation in Thai healthcare system. Pharmacy outcome researchers play a prominent role in publishing these studies in collaboration with clinical pharmacists in both local and international journals leading to improved visibility and knowledge sharing. Certain key information generated from these data were later used to support policy movement toward promoting pharmacy agenda at a national level and guiding national drug policy/health policy. In addition, these researchers are now increasing successful in producing research works that are beneficial and relevant to guide drug/health policy on a regional and global scale. With this advancement, pharmacy practice researchers have become important contributors toward national research performance. Their research works can also have direct social impact through changes in drug/health policy at a national and international level.

Keywords: Clinical pharmacy, health policy

Advances in Instrumentation and Applications of HPLC and LC-MS/MS for Pharmaceutical Analysis

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Abstract

High performance liquid chromatography (HPLC) has been widely used for years as a key analytical method in pharmaceutical industries worldwide. The method has gained its popularity mainly for the quality control of drug products specified in monographs of the pharmacopeias. Continued improvements of the HPLC instrumentation including column technologies and the use of various separation modes with different detectors such as ultraviolet-visible, photodiode array, pulsed amperometry, conductivity, fluorescence, refractive index, and evaporative light scattering detection have resulted in a wider scope of applications in the pharmaceutical field. Currently, there is a growing demand for highly sensitive and specific detection to cope with samples containing either incredibly low-level analytes such as pharmaceutical impurities or large molecules drugs including protein-based biopharmaceuticals. For such cases, liquid chromatography coupled to tandem mass spectrometry (LC–MS/MS) has recently become more and more popular as analytical tools, offering the possibility to take advantages of HPLC or UHPLC as a powerful separation technique and MS/MS as an extremely sensitive and specific detection technique. LC-MS/MS has been recently developed for the identification and quantitation of low-level genotoxic and carcinogenic nitrosamine impurities in drug substances and drug products. Meanwhile, the use of LC-MS/MS is continuously evolving to accomplish better specificity and convenience for detection, structure elucidation and quantitation of large molecules in biopharmaceuticals products. This presentation will highlight the recent advances of HPLC and LC-MS/MS instrumentation to solve the challenges in the method development, validation and applications for the control of active pharmaceutical ingredients and organic impurities in complex samples of finished pharmaceutical products.

Keywords: HPLC, LC-MS-MS, method development, quality control, organic impurities

SPEAKER SCHEDULE
INTERNATIONAL GRADUATE STUDENTS CONFERENCE ON PHARMACEUTICAL SCIENCES (IGSCPS)
October 5th, 2021

Time (UTC+7)	Event
07.30 – 07.45	Join Zoom Link
07.45 – 08.10	Opening and Welcome speech by 1. Chairman Faculty of Pharmacy Airlangga University (Prof. Dr. apt. Djoko Agus P., M.Si) 2. Dean Faculty of Pharmacy Airlangga University (Prof. apt. Junaidi Khotib, S.Si., M.Kes., Ph.D) 3. Rector of Airlangga University (Prof. Dr. Moh. Nasih SE., MT., Ak)
Plenary session I	
08.10 – 10.15	1. Prof. Amirali Popat (University of Queensland, Australia) "Overcoming Biological Barriers using Mesoporous Silica Nanoparticles for Effective Drug Delivery" 2. Prof. Fumitaka Fujita (Osaka University Japan) "Influences of environmental changes on nociceptors on skin surface" 3. Prof. Dr. apt. Siswandono, MS (Faculty of Pharmacy Airlangga University) "The Role of In Silico Approach for Drug Development (Novel 5-O-benzoylpinostrobin Derivatives as SARS-CoV-2 Main Protease Inhibitors)" Discussion for Plenary session I
10.15 – 10.25	Closing Plenary session I
10.25 – 12.00	Oral Presentation
12.00 – 12.45	Break
12.45 – 14.30	Poster Presentation
Plenary session II	
14.30 – 16.40	1. Prof. Dr. Najihah Mohd Hashim (University of Malaya) "Scientific Research on Medicinal Plants to High-Value Health Products: Potentials and Challenges from Malaysian Perspectives" 2. Prof. Surakit Nathisuwan (Mahidol Universitu, Thailand) "Clinical and Community Pharmacy" 3. Prof. Dr. apt. M. Yuwono, MS (Faculty of Pharmacy, Airlangga University) "Pharmaceutical Analysis" Discussion for Plennary Session II
16.40 – 16.45	Closing Plennary Session II
16.45 – 17.00	Best Poster and Best Presentation Announcement Closing Ceremony

ROOM 1	
Meeting ID	971 4996 5815
Passcode	igscps01
Link	https://zoom.us/j/97149965815?pwd=NHB6Z1VGRGgzWVJQS3pKQVRsSE1XUT09

Session 1   : **10.25 – 12.10** (Western Indonesia Time, UTC+7)
Scope   : **Pharmacology and biomedical sciences (oral)**

Abstract ID	Name	Title
OP005	Yuliet	Immunomodulatory Potential of Ethanol Extract of Banggai yam tuber (*Dioscorea alata* L.) Pau ateno variety on the phagocytic activity of macrophage cells in male mice Balb/C
OP014	Arsyik Ibrahim	Anti-Cancer Activity of *Peronema canescens* Jack Leaves Extracts against In vitro Cancer Cells
OP020	Ahmad Dzulfikri Nurhan	Effect of andrographolide and epigallocatechin gallate (EGCG) on the risk of addiction induced by nicotine and cigarette smoke extract (CSE) in mice
OP024	Fifteen Aprila Fajrin	The Ethanol Extract Activities of Red Ginger (*Zingiber Officinale* var. *Rubrum*) In Completed Freund's Adjuvant-induced-Induced Chronic Pain in Mice
OP026	Edward Ciputra	A systematic review on the effect of bisphenol A and bisphenol S towards neurodevelopment: an *in vivo* and *in vitro* perspective
OP036	Iif Hanifa Nurrosyidah	Antibacterial Activity of Cell-Free Fermentation Probiotic Filtrate from Red Passion Fruit (*Passiflora edulis* Sims.) in de Man Rogosa Sharpe Broth Media againts *Mycobacterium tuberculosis*, *Escherichia coli* Extended Spectrum Beta-Lactamase and Methycillin

Session 2   : **13.00 – 14.50** (Western Indonesia Time, UTC+7)
Scope   : **Pharmacology and biomedical sciences (oral) & pharmaceutical sciences (poster)**

Abstract ID	Name	Title
OP001	Dwi Hartanti	Pharmacognostic, physicochemical, and antioxidant specifications of *Curcuma comosa* Roxb. crude drugs
OP003	Lukman Muslimin	Solvent Effects on Phytochemical Constituent, Antioxidant Activity and Dermatological Potential of *Cayratia trivolia* (L.) Domin
OP033	Melati Yulia Kusumastuti	Antimicrobial activity of Tekelan's (*Chromolaena odorata* L.) leaves extract
OP054	Sri Rahayu Dwi Purnaningtyas	Systematic Review: Potential Epigallocatechin -3- Gallate (EGCG) Phytochemical Compound of *Camelia sinensis* As Antibacterial
PP001	Octaviana Galuh Pratiwi	NOD3 expression on green tea with EGCG intervention in rat middle cerebral artery occlusion model
PP004	Dinda Divamillenia	The effect of green tea with EGCG active compound in enhancing the expression of M2 microglia marker (CD206)
PP006	Tina Rostinawati	Construction of Gene Encoding LL37 (pJ411_LL37) and Its Expression in *Escherichia coli* BL21(DE3)

PP009	Dony Chrismanto	First Report of *Entamoeba spp.* in Long Tailed Macaque (*Macaque fascicularis*) in Baluran National Park, Indonesia
PP011	Lusi Nurdianti	Anti-diarrheal activity of guava leaf ethanol extract (*Psidium guajava* L.) nanosuspension against *Escherichia coli* bacteria
PP015	Lucia Hendriati	Diabetic Gangrene Healing by *Stichopus variegatus* and *Allium sativum* Extract Combination in Emulgel in White Rats

ROOM 2	
Meeting ID	971 4996 5815
Passcode	igscps01
Link	https://zoom.us/j/97149965815?pwd=NHB6Z1VGRGgzWVJQS3pKQVRsSE1XUT09

Session 1 : **10.25 – 12.10** (Western Indonesia Time, UTC+7)
Scope : **Pharmacology and Biomedical Sciences (oral)**

Abstract ID	Name	Title
OP043	Tri Wahyudi	Lactobacillus and Bifidobacterium Bacteria Potential as Psychobiotic for Depression and Anxiety Disorder
OP044	Abraham Simatupang	Comparison of Adverse Event Following Immunization of Sinovac and Astra Zeneca. An Interim Report
OP045	Yusuf Alif Pratama	Acute and subchronic toxicity tests of Indonesian House Dust Mites (IHDM) allergenic extract for asthma allergy immunotherapy
OP046	Fakhriyah Dinina	Effectiveness of Indonesian House Dust Mite (IHDM) allergenic extract in triggering allergic rhinitis sensitivity in a mouse model
OP047	M. Shofwan Haris	Role of 5-HT1A receptor on fluvoxamine induced gastrointestinal mucosa protection and healing in animal with stress-induced gastric ulcer
OP076	Susiani Dian Novianty	Potential of Kombucha leaves *Annona muricata* L. and flower *Clitoria ternatea* as amylase enzyme inhibitors and total sugar levels analysis
OP048	**Zuhaela Iqbal**	**PEG-4000 ameliorates morphine-induced constipation in mice through inhibition of AQP-3 mRNA expression**

Session 2 : **13.00 – 14.50** (Western Indonesia Time, UTC+7)
Scope : **Clinical and community pharmacy (oral) & pharmaceutical sciences (poster)**

Abstract ID	Name	Title
OP016	Maria Philomena Erika Rengga	The Effect of Writing Gratitude in Buku Syukur Beta (BSB) on HbA1c in Type-2 Diabetes Mellitus
OP025	Risa Septinia	Study of lopinavir/ritonavir in severe COVID-19 patients with comorbid hypertension and diabetes mellitus
OP068	Fatimatuz Zahra Oviary Satryo	Mental Health During Covid-19 Pandemic, Impact Patient Characteristic: A Cross-Sectional Study in Indonesia
OP069	Fauzul Meiliani	Increased knowledge through counseling and training regarding physical and mental health during the COVID-19 pandemic
PP017	Yudi Purnomo	Comparative analysis of nitric oxide production of Pulutan (*Urena lobata*) leaf fraction with the removal of chlorophyll on rat hepatocyte culture
PP029	Ilham Bagus Sagitaras	Effectiveness of Shrimp Allergenic Extract as an Immunotherapy Agent in Mice Model of Gastrointestinal Allergy
PP034	Dian Suasana	The effect of physical exercise during chronic nicotine exposure on somatic nicotine withdrawal signs in mice
PP038	Dewi Lestari	The effect of quercetin on expression of NMDA subtype glutamate receptor, MC4 receptor, POMC, and Nrf2 mRNA in the hippocampus area of mice induced ischemic stroke
PP039	Ardian Lestari Judoko	Effect of andrographolide and resveratrol on OX1R and prepro-orexin mRNA expression in CIPN-induced hypothalamus of mice with oxaliplatin
PP020	Yudi Purnomo	Anti-inflammatory activity of Pulutan (*Urena lobata*) leaf extract and its fraction by protein denaturation inhibition test

ROOM 3	
Meeting ID	971 4996 5815
Passcode	igscps01
Link	https://zoom.us/j/97149965815?pwd=NHB6Z1VGRGgzWVJQS3pKQVRsSE1XUT09

Session 1 : 10.25 – 12.10 (Western Indonesia Time, UTC+7)
Scope : **Pharmaceutical technology (oral)**

Abstract ID	Name	Title
OP008	Fitria Wulandari	The effect of various concentrations of the addition of emulsifier tween 80 and span 80 on the stability of cream formulation containing ethanolic extract of basil leaves (*Ocimum americanum* L)
OP018	Indra	The influence of cocrystallization approaches on the compressional characteristics of ramipril/vanillin 1:1 cocrystals
OP019	Ade Yeni Aprillia	Formulation development and evaluation of itraconazole emulgel as antifungal activity
OP034	Tekla Kalalo	Effect of Sodium Alginate Concentration on Physical Characteristics of Inhalation Quercetin Microspheres
OP038	Benni Iskandar	Characterization of Physical Properties and Stability Test of Microemulsion Spray Preparations from Ethanol Extract of *Moringa oleifera* L
OP052	Wirda Anggraini	Systematic Review: Potential Phytochemical Compound Bark of *Parameria laevigata* on Biofilm Formation

Session 2 : 13.00 – 14.50 (Western Indonesia Time, UTC+7)
Scope : **Pharmaceutical analysis & Natural products (oral) & pharmaceutical sciences (poster)**

Abstract ID	Name	Title
OP028	Ghina Rofifah Zhani	*In silico* and *in vitro* analysis of anticholesterol extract of tempe peanut (*Arachis hypogaea*)
OP029	Fatwa Zulva Vastiani	Effect of boiling time soursop leaves (*Annona muricata* L.) and telang flower (*Clitoria ternatea*) kombucha on the differences of tannin levels and cholesterol levels
OP030	Sentot Purwandi	Isolation and characterization of cellulose from fruit peel fiber *Borassus flabellifer* L from Semanding - Tuban compared with standard
OP051	Fernando Susanto	Microwave-assisted synthesis of 3,4-dimethoxycinnamic acid and evaluation of its anti-blood clotting activity
PP007	Septia Andini	Dissolution Profile of Fast Disintegrating Tablet (FDT) Graptophyllum Leaf Extract (*Graptophyllum pictum* (L.) Griff) with Ac-Di-Sol as Superdisintegrant
PP012	Muh Agus Syamsur Rijal	The effect of hesperetin concentration on physical characteristics of TPGS poloxamer P84 mixed micelles and release profile of hesperetin
PP014	Andhika Dwi Aristyawan	Isolation and identification of a diterpene alkaloid from a marine sponge *Agelas nakamurai* and its bioactivity against acetylcholinesterase enzyme
PP025	Wahyudin Bin Jamaludin	Transdermal Patches Development of 96% Ethanol Extract of Dayak Onion Bulbs (*Eleutherine Bulbosa* Urb.) with Plasticizer Variation
PP036	Firman Gustaman	Formulation and Optimization of Pining Fruit Extract Gel Based on Various Concentrations of Na-CMC as a Burn Healing Gel in Wistar Rats
PP045	Andang Miatmoko	The effect of 1,2-dioleoyl-3-trimethylammonium propane (DOTAP) addition on the physicochemical characteristics of b-ionone liposomes

PP046	Ester Adelia Mianing	The use of nanoparticles for delivering ursolic acid in cancer therapy: a scoping review

ROOM 4	
Meeting ID	971 4996 5815
Passcode	igscps01
Link	https://zoom.us/j/97149965815?pwd=NHB6Z1VGRGgzWVJQS3pKQVRsSE1XUT09

Session 1 : 10.25 – 12.10 (Western Indonesia Time, UTC+7)
Scope : **Pharmaceutical technology and analysis (oral)**

Abstract ID	Name	Title
OP010	Aditya Fridayanti	Ethanolic extract of bulbs of *Eleutherine sp*. phytochemical screening and GC-MS analysis
OP011	Nimas Rizqi Firdausy Haq	Dose Evaluation of Marketed Ophthalmic Preparations of Several Therapeutics Classes
OP041	Dewi Isadiartuti	Characteristics and dissolution of the inclusion complex p-methoxycinnamic acid hydroxypropyl-β-cyclodextrin made with milling method
OP050	Dyera Forestryana	Development Liquid Crystal Nanoparticles Formula of Binjai Leaves Methanol Extract for Topical Use
OP073	Dini Retnowati	Laboratory Scale Up of Chitosan-Aloe Vera Hydrogel Spray: Geometrical and Mechanical Approach
OP075	Tamara Aurel Aldama	Formulation of spray gel oleum citri with combination of edible bird's nest as wound healing

Session 2 : 13.00 – 14.50 (Western Indonesia Time, UTC+7)
Scope : **Natural products (oral) & pharmaceutical sciences (poster)**

Abstract ID	Name	Title
OP009	Winda Trisna Wulandari	Antioxidant Activity of Nanochitosan from Green Mussels (*Perna viridis* L.) Shell
OP021	Kalyana Palupi	Potential Kombucha Leaf *Annona muricata* L. and *Clitoria ternatea* Flower as An Inhibitor to The Growth of *Escherichia coli* Bacteria
OP022	Ermina Pakki	Nutritional composition, mineral content, antioxidant activity and quantitative estimation of vitamin C, phenolic and flavonoid in *Eleutherine bulbosa*
OP032	Nanang Fakhrudin	Finding the scientific evidence for the antiplatelet and antithrombotic activities of the water extract of Sukun (*Artocarpus altilis*) leaves
PP005	Wahyu Hendrarti	Synergistic and efflux pump inhibitory activity of cocoa (*Theobroma cacao* L.) and antibiotics on *Salmonella enterica* serovar Typhi strains
PP008	Yunita Eliyana	Determination of Non-Specific and Specific Parameter Values of Crude Drug and 70% Ethanol Extract of *Elaeocarpus serratus* L. Leaf from Baung Forest, Pasuruan
PP010	Nindya Pramesti Wardani	Screening antimicrobial activity of randu flower honey (*Ceiba pentandra*) from Sidoarjo
PP019	Lusi Agus Setiani	Investigation of African Leaf Methanol Extract as New Anti-Inflammatory Agents
PP040	Rini Hamsidi	Heme Polymerization Inhibition of Isolates *Carthamus tinctorius* Linn) Flowers
PP048	Romandani Puspita Sari	Physical and Chemical Characterization of Granules from 70% Ethanol Extract of Ganitri Leaves (*Elaeocarpus Serratus* L.) Using Wet Granulation Method as Anti Osteoporosis

PP032	Aprelita Nurelli Dwiana	Activity Fermented Filtrate of Yellow Passion Fruit (*Passiflora edulis* var. *Flavicarpa*) in Man de Rogose Sharp Media as Anti Bacterial
ROOM 5		
Meeting ID	**949 4716 0624**	
Passcode	**igscps02**	
Link	**https://zoom.us/j/94947160624?pwd=VFdvRFUvV1FHOG5lRTFuZTFvTlZsUT09**	

Session 1 : 10.25 – 12.10 (Western Indonesia Time, UTC+7)
Scope : Clinical and community pharmacy (oral)

Abstract ID	Name	Title
OP027	Eka Putri Nurhidayah	The effectiveness and side effects remdesivir use in COVID-19 patients with pneumonia
OP031	Rezlie Bellatasie	The Effect of Atorvastatin on Lipid Profile and Inflammatory Marker in Patient with Diabetes Dyslipidemia
OP035	Charolyn Menaisa Sembiring	Drug utilization study of pulmonary hypertension on outpatients at Dr. Soetomo General Hospital Surabaya Indonesia
OP037	Khusnul Fitri Hamidah	Potentially Inappropriate Medication Use among Elderly Patients in Emergency Department Using the Beers Criteria 2019
OP040	Novitri Wulandari	Community knowledge and attitude in recognizing symptoms and medication use for diarrhea in children: a cross-sectional study
OP042	Zamrotul Izzah	Impact of pharmacist-led education on knowledge, adherence, and glycemic control of type 2 diabetic outpatients

Session 2 : 13.00 – 14.50 (Western Indonesia Time, UTC+7)
Scope : Drug discovery (oral) & pharmaceutical sciences (poster)

Abstract ID	Name	Title
OP006	Saipul Maulana	Investigation of potential compounds from Begonia Genus as 3-Chymotrypsin-Like Protease (3Cl^{pro}) SARS-CoV-2 inhibitor Based on Molecular Docking and Molecular Dynamics study
OP013	Brenda Norton Sudjaya	*In silico* Molecular docking and ADMET Study of Benzenesulfonyl Azacyclic Urea Derivatives as Antiviral Against SARS-CoV-2
OP039	Audrey Gracelia Riwu	*In Silico* Analysis of Antiviral Agent in Dengue Infection of Compounds in Faloak Stem Bark Extract (*Sterculia quadrifida* R. Br)
OP056	Amalia Tusholecha	*In-Silico* Analysis of Bioactive Compounds from Roselle's Calyx (*Hibiscus sabdariffa* L) as Antioxidant through Inhibition of Xantin Oxidase: Molecular Docking and ADMET prediction
PP002	Ghina Rosyida	*In silico* Study of Polyelectrolyte Complex Formation as an Approach to Chitosan-Alginate Microparticles Development
PP003	Salsa Lina Agustin	QSAR of acyl pinostrobin derivatives as anti-breast cancer against HER-2 receptor and their ADMET properties based on *in silico* study
PP022	Faisal Akhmal Muslikh	Metabolite profiling of the environmental-controlled growth of *Marsilea crenata* Presl. and it's *in vitro* and *in silico* antineuroinflammatory properties
PP027	Ahmad Dzulfikri Nurhan	*In silico* studies of potential drug-like compounds from various medicinal plants: the discovery of JAK1 inhibitors and JAK3 inhibitors
PP043	Norhayati	Potential Some Phenolic Acid Compounds Toward SARS-CoV-2 Main Protease (M^{pro}) and Their Physicochemical-ADMET Properties: *In Silico* Approach

ROOM 6		
Meeting ID	949 4716 0624	
Passcode	igscps02	
Link	https://zoom.us/j/94947160624?pwd=VFdvRFUvV1FHOG5lRTFuZTFvTlZsUT09	
PP044	Hanifa Rahma Putri	Cholinesterase Inhibitory Activity of the Methanolic Extract of a Marine Sponge *Aaptos suberitoides* against AchE and BuChE Enzymes
OP002	Maria Apriliani Gani	Potential anti-osteoporosis compounds from *Zingiber officinale*: a molecular docking and pharmacokinetics prediction
OP055	Mohammad Rizki Fadhil Pratama	*Arcangelisia flava* as a SARS-CoV-2 M^{Pro} inhibitor: Molecular docking, ADME studies, and toxicity prediction
OP079	Yanu Andhiarto	Molecular Docking Studies of Flavonoid Compounds from *Syzygium cumini* (L) Skeel. Var. *Album* with Target of Type 2 Diabetes
PP031	Melanny Ika Sulistyowaty	The Preparation of Cocrystal of p- Methoxycinnamic acid and Succinic acid by Solution Evaporation Technique

Session 1 : **10.25 – 12.10** (Western Indonesia Time, UTC+7)
Scope : **Clinical and community pharmacy (oral)**

Abstract ID	Name	Title
OP004	Anisyah Achmad	What is The Pharmaceutical Clinic Care? Perceptions and Expectations of Doctors in Interprofessional Collaboration in 2 Types of Indonesia Hospitals.
OP007	Irsan Fahmi Almuhtarihan	Use of Prophylactic Antibiotics on Surgical Site Infections in Arthroplasty Patients (Scoping Review)
OP017	I Nyoman Wijaya	The pattern of drug prescribing in hypertensive patients at public health centers in Surabaya and between the suitability of antihypertensive drug prescribing with hypertension therapy algorithms
OP064	Eunice Marlene Sicilia Kundiman	Evaluation of Covid-19 effectiveness among healthcare workers using Cascade Analysis
OP066	Melinda Putri Amelia Rachman	Validity and Reliability Test of Mental Health Instruments during Covid-19 Pandemic: Case Study on Indonesian
OP067	Sri Rahayu Saleh	Quantitative and Qualitative Analysis of Antibiotics in the Intensive Care Unit (ICU): A Literature Review
OP061	Nanda Ardianto	Predictor Factor of Long COVID-19 on COVID-19 Patients: An Observational Cross-Sectional Study in Indonesia

Session 2 : **13.00 – 14.50** (Western Indonesia Time, UTC+7)
Scope : **Clinical and community pharmacy (oral & poster)**

Abstract ID	Name	Title
OP065	Bambang Subakti Zulkarnain	Effectiveness of the lowest cost options of anti VEGF therapy, bevacizumab, in patients with retinopathy of prematurity (ROP) treatment type 1 in Public Hospital Surabaya
OP070	Liana Debora	Application of ATC/DDD Methodology to Analyze Antibiotics Consumption in Internal Medicine Department: A Literature Review
OP078	Anisyah Achmad	Association between Sodium Intake and Biopsychosocial Factors with Knee Joint Pain in Osteoarthritis Patient
OP012	Elida Zairina	Community's Knowledge, Attitudes, and Practices for Using and Disposing Antibiotic : A Cross-sectional Study
PP013	Kenia Izzawa	Effect of green tea (*Camellia sinensis*) with its active compound EGCG supplementation on BDNF levels in acute thrombotic infarct stroke patients: a pilot study

ROOM 7		
Meeting ID	949 4716 0624	
Passcode	igscps02	
Link	https://zoom.us/j/94947160624?pwd=VFdvRFUvV1FHOG5lRTFuZTFvTlZsUT09	
PP016	Jamal Nasser Saleh Al-Maamari	Evaluating patients' perception and satisfaction on community pharmacists' services in Yemen
PP018	Mufarrihah	Correlation between medication adherence and quality of life of hypertensive patients
PP021	Liza Pristianty	Analysis of Collaboration Pharmacist-Doctor in Handling Diabetes Mellitus Patients at Airlangga University Hospital Surabaya Indonesia
PP023	Shah Faisal	Knowledge, awareness, and practices towards covid-19 among international students in Indonesia: a cross-sectional study
PP024	Erika Astanti	Assessment and comparison of inpatient antibiotic use on orthopedic patients using ATC/DDD methodology: a literature review
PP047	Elida Zairina	Association between barriers and medication adherence in patients with hypertension: a cross-sectional study

Session 1 : 10.25 – 12.10 (Western Indonesia Time, UTC+7)
Scope : Clinical and community pharmacy (oral)

Abstract ID	Name	Title
OP057	Ulfa Syafli Nosa	Scoping Review: Effectiveness of Vitamin C as Wound Healing in Burn Injury
OP058	Putri Ramadhani	Scoping Review: Effects of Probiotics Against the Immune System in Burn Patients
OP059	Firda Arifatu Rizkia	Pharmacist' Perceptions, Attitude, and Barriers in the Ability to Provide Service to Patients with Minor Ailments in Sidoarjo Regency
OP062	Hilda Muliana	Satisfaction self home care of Covid-19 patient using telepharmacy services
OP063	Lily Aina	Predictor Factors of COVID-19 Exposure: A Cross Sectional Study on Indonesian Communities
OP077	Anita Purnamayanti	Remdesivir therapy in severe Covid-19 with hypotension, electrolyte, and acid-base imbalance – a case report
OP060	Dinda Monika Nusantara Ratri	Evaluation of Leucovorin on 5-Mthf (5-Methyltetrahydrofolate) Levels after High-Dose Methotrexate Therapy in Pediatric Patients with Acute Lymphoblastic Leukemia (ALL)
OP074	Arina Dery Puspitasari	Strategic Treatment of Hydration in Preventing Kidney Toxicity After High Dose Methotrexate in Acute Lymphoblastic Leukemia (ALL) Patient

Session 2 : 13.00 – 14.50 (Western Indonesia Time, UTC+7)
Scope : Clinical and community pharmacy (oral & poster)

Abstract ID	Name	Title
OP023	Maria Ulfa	Hypothyroidism side effects analysis of ethionamide in MDR TB patients with short term and individual therapy
OP071	Wenny Putri Nilamsari	The consistency of algorithm-based dosing and INR monitoring as predictors of anticoagulation quality control in patients receiving warfarin

OP072	Catur Dian Setiawan	Mapping of Pharmaceutical Service Facilities (Pharmacy) Based on Geographic Information in Surabaya
PP026	Pipin Eri Agustina	Analysis of Obedience Factors of Distribution Facilities in Distributing Cosmetics in East Java
PP028	Achmad Ridwan	Cost-Effectiveness Analysis of Fentanyl Compared to Oxycodone in Post-Operative Pain
PP030	Nur Rahayuningsih	Drug related problem and cost effectiveness analysis of antihypertension in geriatrics with chronic kidney disease
PP033	Emy Oktaviani	Dose Adjustment and Clinical Outcome of Antihypertension in Patient with Hypertension and Chronic Kidney Disease
PP035	Keni Idacahyati	Effect of Psychiatry Drugs on Metabolic Profile in Patients Anxiety Depression
PP037	Yunita Nita	Factors that influence adverse drug reactions (ADRS) reporting practices by healthcare professionals in several hospitals in Surabaya
PP041	Adelia Fransiska	The Practice of Self-medication to Treat Headaches Due to Stress in the Era of the COVID-19 Pandemic
PP042	Gusti Noorrizka Veronika Achmad	Translation, validation, and reliability of the Indonesian version AQoL-4D

Pharmacognostic, physicochemical, and antioxidant specifications of *Curcuma comosa* Roxb. crude drugs

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Abstract

Objectives: *Curcuma comosa* Roxb. is popularly used to treat gynecological problems but has no official monograph in the Thai Herbal Pharmacopeia (THP). This study characterized the selected pharmacognostic and physicochemical specifications and antioxidant activities of *C. comosa* crude drugs.

Methods: The pharmacognostic and physicochemical properties of commercial and self-prepared crude drugs were characterized according to the WHO quality control methods for herbal materials. The 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activity, ferric reducing antioxidant power (FRAP), and total phenolic content (TPC) were evaluated as per the standard method.

Results: The microscopic observation showed relatively large-sized starch granules, cortical parenchyma, vessel, and sclerenchyma fiber. The thin-layer chromatography (TLC) profile demonstrated distinct separation with two major spots. The physicochemical evaluations specified as follow: moisture (8.87±1.37%), total ash (2.35±0.12%), acid-insoluble ash (0.80±0.08%), volatile oil (1.01±0.03%), water-soluble extractable (16.01±0.95%), and ethanol-soluble extractable (17.74±1.56%). The DPPH scavenging activity, FRAP, and TPC of the crude drugs were 765.56±80.50 mM Trolox equivalent (TE)/g dry weight (DW), 505.42±22.44 mM TE/g DW, and 46.09±2.27 mg gallic acid equivalent (GAE)/g DW, respectively.

Conclusions: This study specified quality parameters of *C. comosa* crude drugs that might serve as the reference for the quality control purposes.

Keywords: antioxidant, crude drugs, *Curcuma comosa*, pharmacognostic specification, physicochemical specification.

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Potential anti-osteoporosis compounds from *Zingiber officinale*: a molecular docking and pharmacokinetics prediction

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Abstract

Objectives: Osteoporosis is a systemic skeletal disease characterized by low bone that can result in fracture when injury, for example, due to traffic accident. This study aimed to identify secondary metabolites from *Zingiber officinale* that potentially inhibit cathepsin K, a key enzyme that caused osteoporosis.

Methods: Molecular docking of 102 bioactive compounds from *Zingiber officinale* against cathepsin K (PDB ID: 4X6I) was conducted. Ligand preparation was performed using JChem and Schrödinger's software, and virtual protein elucidation was performed using AutoDockTools version 1.5.6. Cocrystal ligand was used as a positive control ligand. Pharmacokinetics of the compounds was predicted with SwissADME online tool.

Results: Nine compounds had good binding affinity against cathepsin K. The compounds were shogasulfonic acid C, (-)-beta-Sitosterol, shogasulfonic acid D, shogasulfonic acid B, shogasulfonic acid A, isogingerenone B, (S)-8-Gingerol, gingerenone A, and hexahydrocurcumin, with binding affinities of -7.2, -7.0, -6.9, -6.8, -6.8, -6.7, -6.7, -6.6, and -6.4 kcal mol^{-1}, respectively. Most compounds had good pharmacokinetic profiles and drug-likeness properties.

Conclusions: Bioactive compounds from *Zingiber officinale* is potentially used as anti-osteoporosis agent targeting cathepsin K. However, *in vitro* and *in vivo* study are needed to prove the anti-osteoporosis activity of these compounds.

Keywords: bone fracture, traffic accident, osteoporotic, *in silico* study, cathepsin K, shogasulfonic acid.

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Solvent effects on phytochemical constituent, antioxidant activity and dermatological potential of *Cayratia trivolia* (L.) Domin

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Abstract

Objectives: The present investigation evaluated four different solvent compositions (water, 50%, 70%, and pure ethanol) for their relative capacity to extract, total phenolic (TP), total flavonoid (TF) components, antioxidant activities, and dermatological potential of leaves of *Cayratia trivolia* (L.) Domin. **Methods**: The TP and TF of extract were measured using the Folin–Ciocalteau and $AlCl_3$, respectively. Antioxidant activity was evaluated using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric reducing/antioxidant power assays. While in vitro dermatological potential, tyrosinase and elastase inhibitory by colourimetric method.
Results: The extract obtained by pure ethanol presented the strongest antioxidant activity, DPPH and reducing power with IC_{50} value was 16.60±0.62 µg/mL and 27.53±0.69 µg/mL, respectively. The same extract also exhibited the highest TP (3.82±0.15 mg GAE/g) and TF (3.23±0.09 mg RE/g). Our finding additionally suggested that pure ethanol provide the highest extraction yield. However, 70% ethanol extract was a good source of tyrosinase (60.49±7.73 µg/mL) and elastase inhibitor (45.49±0.37 µg/mL).
Conclusions: Overall, the experimental results showed the powerful antioxidant and inhibitory action on skin-related tyrosinase and elastase of *C. trivolia*, supporting their further research as bioactive metabolites against skin sagging and hyperpigmentation in cosmetic and pharmaceutical formulations.

Keywords: antioxidant, *Cayratia trivolia* (L.) Domin, elastase, solvent, tyrosinase.

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What is the pharmaceutical clinic care? Perceptions and expectations of Doctors in interprofessional collaboration in 2 types of Indonesia hospitals

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Abstract

Objectives: Pharmaceutical Care Clinic (PCC) is the pharmacist's direct responsibility to patients to aim for patient safety and quality of life. To carry out a PCC requires a good collaboration between doctors and pharmacists in shaping treatment management. The aim of study that determine the correlation between doctors' perceptions and expectations of pharmacists in PCC in two types of Indonesia hospitals.

Methods: This research is descriptive quantitative observational with a cross-sectional approach. The data were collected using purposive sampling (type A) and total sampling (type C) through interviews and questionnaires. The data obtained were analyzed using Spearman, and Somers'd ($p \leq 0.05$). The inclusion criteria were doctors with a license to practice for at least a year, handling patients directly, in charge of services, and willingness to participate in research. Exclusion criteria were doctors in the main service installation/pavilion and support specialists.

Results: In type A hospital, the doctors have good perceptions and expectations (83% and 95%), while type C has sufficient perceptions (77.25%) with good expectations (81.44%). There were no significant correlation data between perceptions with age ($p = 0.791$; $p = 0.282$) and length of work ($p = 0.165$; $p = 0.768$) and between expectations and age ($p = 0.506$; $p = 0.281$) and length of work ($p = 0.279$; $p = 0.803$) in the type A and C hospitals.

Conclusions: There are differences in doctors' perceptions of pharmacists in PCC in type A and C hospitals. This may be caused by the small number of pharmacists and prioritizing managerial systems in type C hospital.

Keywords: collaboration, expectations, interprofessional, perception, pharmacist.

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Immunomodulatory potential of ethanol extract of Banggai yam tuber (*Dioscorea alata* L.) Pau ateno variety on the phagocytic activity of macrophage cells in male mice Balb/C

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Abstract

Objectives: Immune-mediated diseases are a significant problem in developing countries, such as infectious diseases, cancer, and autoimmune disorders. Banggai yam (*Dioscorea alata* L.) Pau ateno variety is one of the plants thought to contain active compounds that act as agents immunomodulators. This study aimed to determine the immunomodulatory effect of ethanol extract of Banggai yam Pau ateno variety on macrophage cell phagocytosis of Balb/C mice.

Methods: The test animals used were male mice of the Balb/C and *Staphylococcus aureus* as the test bacteria. There were 25 test animals divided into five groups. Group 1 negative control Na CMC 0.5%; group 2 positive control Stimuno® 19.5 mg/kg BW; groups 3, 4 and 5 ethanol extract of Banggai yam Pau ateno variety with doses of 200, 250, and 300 mg/kg BW, respectively. The treatment was given for seven days, and on the 8th day, the *Staphylococcus aureus* bacteria suspension was injected intraperitoneally. Mice were dissected, and peritoneal fluid was taken to determine the activity of macrophage cells. The data were analyzed by one-way ANOVA and then continued with Duncan's post hoc analysis at the 95% confidence level.

Results: The results showed that the percentage of macrophage activity in each group of negative control, positive control, extract doses of 200, 250, and 300 mg/kg BW was 40.30%, 63.77%, 51.98%, 44.94%, and 45.66%.

Conclusions: These results highlighted that the ethanol extracts of Banggai yam Pau ateno variety can potentially act as an immunomodulators agent with an effective dose of dose 200 mg/kg BW.

Keywords: Banggai yam, *Dioscorea alata* L, immunomodulator, macrophages, phagocytosis.

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Investigation of potential compounds from Begonia Genus as 3-Chymotrypsin-Like protease (3CL^{pro}) SARS-CoV-2 inhibitor based on molecular docking and molecular dynamics study

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Abstract

Objectives: The emergence of pandemic coronavirus disease (Covid-19) caused by SARS-CoV-2 made medical emergencies around the world. Recently, numerous strategies have been conducted to treat the disease, including vaccine and drug discovery. Computer-aided drug discovery (CADD) based on target made progress discovery of antiviral more effective. The main protease was reported as promising target according to its essential function in viral replication. Begonia is one of the medicinal plants that empirically used to treat various diseases and reported inhibit viral protease. This study aims to identify the potential phytoconstituents of the Begonia genus as a SARS-CoV-2 3CL^{pro} inhibitor through molecular docking and molecular dynamics simulation.

Methods: Begonia structure compounds were retrieved from KNApSAck and several reports of begonia species; standard drugs protease inhibitor structures were obtained from PubChem. The structures are then optimized and docked in specific region according to baicalein (co-crystallized ligand) in extra precision mode with Glide. Predictive binding energies (MMGBSA) values were used to evaluate the activity as a 3CL^{pro} inhibitor. The compounds with lower binding energies were then selected to assess their stability interaction with molecular dynamics in NPT and physiologic conditions using RMSD and protein-ligand contacts as parameters.

Results: Molecular docking study reveal four compounds from Begonia genus were identified as 3CL^{pro} inhibitor i.e., Cyanidin 3-(6"-(E)-caffeylsambubioside), Cyanidin 3-(6"-(Z)-p-coumarylsophoroside), 9(11)α,16(17)α-dioxirane-20,25-dihydroxy-β-sitosterol-3-O-β-glucopyranoside, and Cyanidin 3-(2G-xylosylrutinoside) with MMGBSA value -104.99, -89.13, -88.75, -86.58 kcal/mol respectively which lower than standard drugs (Ritonavir (-86.33), Darunavir (-60.62), Lopinavir (-57.25)) and baicalein (-47.21). The complex was stable along 50 ns simulation which indicate with RMSD <3 Å and interact with the catalytic sites.

Conclusions: This result suggests Begonia might be a prospective medicinal plant developed as anti-SARS-CoV-2 by inhibiting 3CL^{pro} SARS-CoV-2.

Keywords: Begonia, SARS-CoV-2, 3-Chymotrypsin-Like protease (3CL^{pro}), Molecular docking, Molecular dynamics.

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Use of prophylactic antibiotics on surgical site infections in arthroplasty patients (scoping review)

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Abstract

Objectives: The increase in the number of arthroplasties also increases the number of surgical site infection (SSI). One of the effective strategies in preventing SSI is the use of appropriate prophylactic antibiotics. This study aims to identify and analyze various clinical research designs, risk factors associated with SSI, and factors affecting the effectiveness of prophylactic antibiotics in arthroplasty patients.

Methods: A scoping review was conducted through the PubMed, Scopus, and Google Scholar databases from January 2004 to August 2020. Study data are extracted and analyzed by a minimum of two reviewers.

Results: The search results found 2.419 articles, with 39 articles were included. Most article was in the form of cohorts (34 articles). Diabetes mellitus (DM) and cardiovascular disease, male sex, overweight, ASA score ≥ 3, and NNIS score ≥ 2 have a higher SSI percentage. There were 24 different antibiotic regimens in this scoping review. Cefazolin was the most frequently used antibiotic (15 studies (38.5%)) followed by vancomycin (8 studies (20.5%)). The antibiotics with the lowest SSI range incidence were fosfomycin mono-therapy (0%), cefazolin mono-therapy (0.20 - 16.05%), and vancomycin mono-therapy (0.27 - 3.88%). The correct antibiotic doses, duration of prophylactic antibiotics within single dose or < 24 hours, and administration before incision have a lower SSI percentage. There were no studies that discussed re-dosing of antibiotics.

Conclusions: The accuracy of dosing and timing of antibiotic prophylaxis has an important role in minimizing the incidence of SSI.

Keywords: prophylactic antibiotics, surgical site infection, arthroplasty.

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The effect of various concentrations of the addition of emulsifier tween 80 and span 80 on the stability of cream formulation containing ethanolic extract of basil leaves (*Ocimum americanum* L)

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Abstract

Objectives: This study aims to determine the effect of variations in the concentration of the addition of emulsifier tween 80 and span 80 on the stability of cream preparations containing ethanolic extract of basil leaves (*Ocimum americanum* L) before and after the freeze-thaw cycling test.

Methods: The formulation of the cream preparation uses 3 variations of emulsifier concentrations tween 80 and span 80 (1%, 3%, 5%). The evaluation tests carried out were organoleptic, pH, viscosity, spreadability, adhesion, centrifugal test, emulsion type, homogeneity and freeze-thaw cycling.

Results: The results of several tests for the three formulations before and after the freeze-thaw cycling test at cold temperatures (2-8˚C) for 24 hours, then placed at room temperature (15-30˚C) for 24 hours, for 3 cycles, such as pH, dispersion, adhesive, and viscosity met the requirements for cream formulation. It has pH 5-5.10, dispersion test 5.1-5.8 cm, adhesiveness test 06.05-06.65 seconds and viscosity test increased significantly with a value range of 2000-30000 cPs. Except, for the centrifugal test of formula 1 because of the separation of the cream phase.

Conclusions: This study concludes that the results of statistical tests analyzed using ANOVA showed no significant difference in the addition of emulsifier tween 80 and span 80 in three variations of cream dosage concentrations before and after freeze-thaw cycling for 3 cycles.

Keywords: basil, cream, emulsifier, span, tween.

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Antioxidant activity of nanochitosan from Green Mussels (*Perna viridis* L.) Shell

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Abstract

Objectives: Green Mussel (*Perna viridis* L.) is one of shellfish that is consumed by many people. Green mussel shell waste is a type of fishery waste whose processing has not maximized so that it is still an environmental problem. Chitin content that is high enough in green mussels can be used to be synthesized into chitosan. This research was conducted to determine the antioxidant activity of nanochitosan from green mussels shell.

Methods: Chitosan is produced through the process of deproteination, demineralization and deacetylation. The degree of chitosan deacetylation was determined using FTIR spectroscopy method. The ionic gelation method is used to synthesize nanochitosan and antioxidant activity of nanochitosan was carried out by DPPH method.

Results: The yield of chitosan obtained was 59% with the value of the degree of deacetylation was 49%. Nanochitosan has particle size of 278.1 nm, polydispersity index value of 0.389 and potential zeta value of -15.2 mV.

Conclusions: The nanochitosan produced has a strong antioxidant activity which is indicated by the IC50 value of 56.27 ppm.

Keywords: green mussels (*Perna viridis* L.), nanochitosan, antioxidant.

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Ethanolic extract of bulbs of Eleutherine sp. phytochemical screening and GC-MS analysis

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Abstract

Objectives: The Dayak community is known to use Eleutherine sp. as a wound and ulcer treatment. Other species of Eleutherine sp. are known to have wound healing activity based on research publications. The active compound components of Eleutherine sp. are known to have bioactivity as antibacterial and antioxidant, which can help accelerate the wound healing process. The purpose of this study was to identify active compounds in ethanol extract of Eleutherine sp. bulbs.

Methods: The extract was obtained through the maceration method with 70% ethanol as the solvent. Chemical compounds were analyzed using GC-MS, and the mass spectra of compounds found in extracts compared to the National Institute of Standards and Technology (NIST) library.

Results: Preliminary phytochemical screening revealed the presence of bioactive compounds such as triterpenoids, steroids, and tannins. The mass spectral measurements revealed 13 peaks, indicating the existence of 13 active phytochemical components. 1H-Indene, 2-butyl-5-hexyloctahydro; Benzene, 1,2,3-trimethyl; and Phenol, 2,5-bis (1,1-dimethyl ethyl).

Conclusions: It is intended that the findings of this study will provide more information on the active compound components of Eleutherine sp., which provide biological activity that aids in wound healing.

Keywords: Eleutherine sp., GC-MS analysis, phytochemical screening, ethanol extract.

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Dose evaluation of marketed ophthalmic preparations of several theraputics classess

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Abstract

Objectives: This study aimed to determine the number of drops per mL, the weight of 1 cm ribbon eye ointment, and the amount of active ingredient per drop in eye drops and per cm in eye ointment.
Methods: Three active ingredients for eye drops (gentamicin sulphate, timolol maleate, and tetrahydrozoline HCl) and two for eye ointment (chloramphenicol and gentamicin sulphate) were selected. Two different brands of the same active ingredient were compared. The number of drops was counted and measured using calibrated graduated cylinder and the weight of 1 cm ointment ribbon was measured using analytical balance. The data were converted into the amount of active ingredients and analyzed statistically.
Results: The number of drops per mL is inversely proportional to the active ingredient's amount per drop and the weight of eye ointment per cm is directly proportional to the amount of active ingredient per cm. Two brands with same active ingredient had a significantly difference in active ingredient's amount per drop and per cm.
Conclusions: There is significant variability in two different products for the same active ingredient. So, it is necessary to standardize the packaging design or rearrange the medicines regiment.

Keywords: Eye drop, eye ointment, dose, gentamicin sulphate, timolol maleate, chloramphenicol, tetrahydrozoline HCl.

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Knowledge, attitude and practice of antibiotic use and disposal

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Abstract

Objectives: This study aimed to identify the knowledge, attitude, and practice of antibiotic use and disposal among the community in Surabaya.

Methods: An electronic questionnaire was used in this cross-sectional study. The questionnaire was distributed to those who met the inclusion criteria. The information was gathered through social media through unintentional sampling. The questionnaire's demographic, knowledge, attitude, and practice sections had all been tested for validity and reliability. The collected data was then analyzed using descriptive and inferential methods.

Results: A total of 236 respondents have completed the questionnaire. Most of the respondents were female (73.7%), aged between 18-25 years old (54.2%), and most of them were students (41.9%). The research showed that most of the respondents had good knowledge (71.6%), a positive attitude (68.2%), and good practice (78%). The comparison test showed a significant difference in knowledge score based on gender and job position ($p<0,05$). The correlation test showed a positive correlation between knowledge and practice ($r=0,568; p<0,05$), Logistic ordinal regression showed that females had a doubled knowledge score better than male [OR=2,62; 95%CI(0,340;1,569), $p<0.05$] and students [OR=2,42; 95%CI(-0,620;1,832), $p<0.05$] potentially have a doubled higher score on knowledge. There was a significant correlation between knowledge and practice confirmed in multivariable linear regression analysis (R = 0.592, R square = 0.350, $p <0.001$).

Conclusions: Most respondents demonstrated good knowledge, attitude, and practice regarding antibiotic use and disposal. Nonetheless, education on rational antibiotic use and proper antibiotic disposal should be greatly expanded.

Keywords: Antibiotic use, disposal, knowledge, attitude, practice, family.

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In silico molecular docking and ADMET study of benzenesulfonyl azacyclic urea derivatives as antiviral against SARS-CoV-2

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Abstract

Objectives: This study aims to investigate the capability of benzenesulfonyl-azacyclic urea derivatives as antiviral for treating COVID-19 through in silico molecular docking against the main protease (M^{pro}) of SARS-CoV-2 and predict the absorption, distribution, metabolism, excretion, and toxicity (ADMET) profiles of the potential compounds.

Methods: Sixteen benzenesulfonyl-azacyclic ureas that indicated *in vitro* antiviral activity against HIV protease were selected as test compounds. Their physicochemical properties were calculated using ChemDraw and molecular docking which targeted M^{pro} of SARS-CoV-2 (PDB: 6LU7) was performed by Molegro Virtual Docker. ADMET profiles were characterized by pkCSM online.

Results: All compounds showed higher binding affinity than lopinavir which have re-rank score (RS) of -103.75 kcal/mol), but lower than ritonavir (RS: -136.66 kcal/mol). Six ligands were selected based on the docking scores in the range of RS from -135.52 to -129.21 kcal/mol, that were compounds 6a,1c, 6b, 6m, 6c, and 6d respectively from the lowest score. In general, the six derivatives could comply with the ADMET requirements. Even if the caco-2 permeability of the compounds were low (Log Papp $<0.9x10^{-6}$cm/s), their intestinal absorption was higher than 30%. The compounds could not be distributed across blood brain barrier, but 1c, 6m, dan 6c moderately permeated into CNS. Although all of them were hepatotoxic, they were not carcinogenic.

Conclusions: The sixteen benzenesulfonyl-azacyclic urea derivatives possessed higher *in silico* activity against M^{pro} than lopinavir and the selected compounds to be developed as antivirals against SARS-CoV-2 were 1c, 6m, and 6c.

Keywords: Benzenesulfonyl-azacyclic urea, docking, *in silico*, main protease, ADMET.

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Anti-cancer activity of *Peronema canescens* Jack leaves extracts against *in vitro* cancer cells

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Abstract

Objectives: Cancer is a disease caused by decreased apoptotic activity and proliferation of abnormal cells of dysregulation, which disturbed and attacked the surrounding tissue. Almost all cases of cancer are caused by genetic damage thus the loss of mutations and cellular regulation. Colorectal cancer occurs in the colon or rectum caused by the development of abnormal cells. Cervical cancer is a persistent or chronic infectious disease caused by one or more "high-risk" human papillomavirus (HPV) types. Natural material from plants is one source of natural medicine ingredients for cancer treatment and is known as herbal medicines. The purpose of this study was to determine the cytotoxicity (IC_{50}) of *P. canescens* Jack leaves of the chloroform, ethyl acetate, and ethanol extract against HT-29 colon cancer and HeLa cervical cancer cells.

Methods: *Peronema canescens* Jack leaves were extracted by maceration method using methanol solvent. The dried sample was separated by liquid-liquid method, and successive polarity gradient eluents: hexane, chloroform, ethyl acetate, and ethanol. Cell line: HT-29 and HeLa cells, DMEM and FBS media. Cytotoxicity test with MTT (3-(4,5-dimethyl azole-2-yl)-2,5-diphenyltetrazolium bromide). This test uses concentrations from 1.5 µg/mL to 200.0 µg/mL.

Results: The value of cytotoxic activity (IC_{50}) of each extract against HT-29 and HeLa cells: chloroform was 10.353 µg/mL and 38.913 µg/mL, ethyl acetate 48.635 µg/mL and 28.186 µg/mL, and ethanol 42.017 µg/mL and 253.190 µg/mL.

Conclusions: The chloroform and ethyl acetate extracts showed stronger activity on both cells and opened promising opportunities for further cytotoxicity studies.

Keywords: Cytotoxicity, HT-29 cells, HeLa cells, MTT, *Peronema canescens* Jack.

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The effect of writing gratitude in *Buku Syukur Beta* (BSB) on HbA1c in type-2 diabetes mellitus

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Abstract

Objectives: Diabetes Mellitus (DM) is the 6th cause of death worldwide (2015) and the top 5 cause of death in Indonesia. DM and depression are related, that both may be shared underlying biological and behavioral mechanisms, such as hypothalamic-pituitary-adrenal axis activation. A study had shown that gratitude journaling every day for 3 weeks increased the neural pure altruism response in the ventromedial prefrontal cortex (VMPFC). The aim of this study was to measure the effect of writing gratitude in the *Buku Syukur Beta* (BSB) on HbA1c in type-2 DM.

Methods: This was a single blind, Randomized Controlled Trial (RCT) study in 12 type-2 DM patients (the members of *Program Pengelolaan Penyakit Kronis* (Prolanis) at Oepoi Public Health Center, Kupang). From September to November 2020 (60 days) the test group wrote gratitude in the *Buku Syukur Beta* (BSB) every day for 10 minutes or 2-5 sentences, while the control group wrote daily activities in a *Buku Harian Beta*/BHB (diary). Pre-test and post-test of HbA1c were measured at Prodia Clinical Laboratory with an Ion Exchange of High Performances Liquid Chromatography (HPLC) that is standardized by National Glycohemoglobin Standardization Program (NGSP). Three patients were excluded.

Results: The mean of HbA1c in the test group is lower than the control group. However, the independent samples t-test showed a non-significant difference between the two groups (*p* value = 0.062).

Conclusions: Writing gratitude in the BSB may improve the glycemic control of HbA1c in type-2 DM patients but not statistically significant.

Keywords: *Buku Syukur Beta*, HbA1c, type-2 diabetes mellitus, writing gratitude.

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The pattern of drug prescribing in hypertensive patients at public health centers in Surabaya and between the suitability of antihypertensive drug prescribing with hypertension therapy algorithms

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Abstract

Objectives: Hypertension continues to increase every year both in the world and in Indonesia, this happens because of changes in people's lifestyles that change along with technological developments. Hypertension suffered by patients rarely stands alone without being accompanied by other diseases. Therefore, hypertensive patients are generally treated with multiple drug therapy regimens. In addition, the availability of drugs at public health centers can affect the prescribing pattern in hypertensive patients. The purpose of this study was to look at the prescribing pattern in hypertensive patients and to see the relationship between the suitability of antihypertensive drug prescribing with the therapeutic algorithm on the patient's blood pressure outcome.

Methods: The research method used is descriptive observational, data collection is carried out cross-sectional in August-December 2019 at 63 public health centers in Surabaya. From each public health center, a sample of 2 or 3 respondents was taken by purposive sampling. Respondents' inclusion criteria were patients who had been diagnosed with hypertension, received a prescription containing at least one antihypertensive drug, and were willing to become respondents. The results of observations from prescriptions received by patients and the results of blood pressure measurements at the public health centers. Data were analyzed descriptively and inferentially using SPSS version 21.

Results: 150 respondents meet the inclusion criteria, the largest percentage distribution of respondents' age is 50-65 years 54.7%, female sex 76%, primary school education 36.7%, and work as a housewife 43.3%, and hypertension status-controlled respondents 52.7%. The results of this study showed that the combination of three drugs was 45.3%, the most widely prescribed antihypertensive drug was amlodipine alone 79.3%, and the most common combination with other drugs was analgesic 72.0%.

Conclusions: There was a significant relationship between the suitability of prescribing with the therapeutic algorithm on the outcome of therapy in patients ($p < 0.05$).

Keywords: Prescribing pattern, therapy algorithm, therapeutic outcome.

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The influence of cocrystallization approaches on the compressional characteristics of ramipril/vanillin 1:1 cocrystals

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Abstract

Objectives: The present research aimed to synthesize and investigate the compressional and physicochemical properties of ramipril/vanillin 1:1 cocrystal.

Methods: The ramipril/vanillin 1:1 cocrystal were prepared using the solvent evaporation method. The solid phase generated were characterized by contact method using Polarized Light Microscopy (PLM), Differential Scanning Calorimetry (DSC), Scanning Electron Microscopy (SEM), Powder X-Ray Diffraction (PXRD) and Fourier Transform Infrared (FTIR) spectroscopy. Analysis of solubility and compressibility were performed to evaluate the solid phase cocrystal.

Results: Physical Characterization by PLM shown formation of new crystal habit in contact zone (mixing zone) between ramipril and vanillin. It had a different melting point than its single component. The Thermogram of DSC indicated a new endothermic peak corresponding to the melting point of a new crystalline phase at temperature 91.9°C. The PXRD pattern of ramipril/vanillin 1:1 cocrystal exhibited new diffraction peaks at 2θ = 6.12; 8.96; 11.88 dan 20.04. Solubility test of cocrystal ramipril/vanillin (12.82±0.07 mg/mL) increase compare to pure (10.43±0.06 mg/mL) and recrystallized ramipril (10.82±0.08 mg/mL). Compressibility characterization has shown that the compressibility of ramipril decreases after the cocrystallization process with vanillin.

Conclusions: The characterization results indicate that ramipril forms cocrystal with vanillin by a solvent evaporation method. Cocrystal formation altered compressional property and solubility of ramipril.

Keywords: ramipril, vanillin, cocrystal, compressibility.

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Formulation development and evaluation of itraconazole emulgel as antifungal activity

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Abstract

Objectives: Itraconazole is a triazole derivative systemic antifungal which is closely related to ketoconazole. Itraconazole has greater antifungal activity but less side effects, with orally taken such as nausea, vomiting, dizziness, leg edema, and loss of libido. Itraconazole is practically insoluble in water, to overcome this problem, one of the steps that can be taken is to formulate itraconazole in the form of a topical microemulsion with a particle size of 10-200 nm. This study aimed to determine and develop a gel preparation containing itraconazole microemulsion as an antifungal.

Methods: The results of optimal characterization of itraconazole microemulsion will be developed in the form of an emulgel preparation. Emulgel formulations of Itraconazole were prepared using tree formula with different concentration of Itraconazole and it were evaluated for their physical appearance, stability, skin irritation study and antifungal activity using *Candida albicans*.

Results: All the prepared emulgel showed acceptable physical properties concerning color, homogeneity, rheology and pH value during storage time of 28 day. The dispersion test showed semi-stiff type results in the range of 3-5 cm. while the centrifugation test showed all formulas there was no separation. This indicates that itraconazole emulgel preparations qualify as emulgel preparations. Based on the irritation test with Draize test, it was shown that all itraconazole emulgel formulas did not show any skin irritation effect. The antifungal activity showed all formulations of itraconazole emulgel preparations have greater antifungal activity compared to the positive standard.

Conclusions: All itraconazole emulgel formulations have antifungal activity.

Keywords: Emulgel, antifungal, itraconazole, *Candida albicans*, microemulsion.

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Effect of andrographolide and epigallocatechin gallate (EGCG) on the risk of addiction induced by nicotine and cigarette smoke extract (CSE) in mice

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Abstract

Objectives: Nicotine, a psychoactive compound from the tobacco plant, produces a reward effect that potentially causes addiction. Nicotine addiction occurs through increased reactive oxygen species production in nucleus accumbens, which causes damage to the endogenous antioxidant defense system resulting in an increased need for nicotine intake, leads to addiction. Andrographolide and EGCG, known as antioxidants, are expected as potential substances to decrease the risk of nicotine addiction. This study aimed to analyze the effect of andrographolide and EGCG on the risk of addiction induced by nicotine and CSE in mice.

Methods: Thirty-five Balb/c male mice, divided into seven groups, were used in this study. The administered drugs were normal saline 1.0 mL/kg BW as control group, nicotine 0.5 mg/kg BW, CSE 1.0 mg/kg BW, andrographolide 50 mg/kg BW, and EGCG 50 mg/kg BW as pre-treatment. Conditioned place preference (CPP) with a biased design method was used to evaluate the reward effects induced by nicotine and CSE. Several stages were carried out, namely pre-conditioning, conditioning, post-conditioning, extinction, and reinstatement tests.

Results: Based on the CPP score, both nicotine and CSE groups were increased the reward effect significantly compared to the normal saline group. While in the nicotine + andrographolide and CSE + andrographolide groups as well as nicotine + EGCG and CSE + EGCG groups, there were no increases in the reward effect.

Conclusions: Andrographolide and EGCG lower the risk of addiction induced by nicotine and CSE.

Keywords: addiction, nicotine, CSE, andrographolide, EGCG, antioxidant.

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Potential Kombucha leaf *Annona muricata* L. and *Clitoria ternatea* flower as an inhibitor to the growth of *Escherichia coli* bacteria

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Abstract

Objectives: Kombucha is the result of fermenting a solution of high phenol leaves added to the symbiosis of acetic acid bacteria *Acetobacter xylinum* and the yeast *Saccharomyces sp*. The content of organic acid compounds, flavonoids in kombucha has the potential to inhibit and kill the growth of pathogenic bacteria in the gastrointestinal tract. Soursop leaves and telang flowers contain phenolic compounds, steroids/terpenoids, tannins, alkaloids and flavonoids which have potential as antioxidants, anti-inflammatory and antimicrobial.

Methods: Soursop leaf kombucha (*Annona muricata* Linn) and telang flower (*Clitoria ternatea*) in various comparisons of boiling time and one control to determine the potential as antibacterial by inhibiting the growth of bacteria *Escherichia coli*. The measurement results are recorded in tabular form, then averaged for each group. Data analysis used one-way ANOVA test with a significance of $p < 0.05$. Analysis using SPSS 23 software.

Results: Soursop leaf and telang flower kombucha with 15 minutes of boiling time got the highest average inhibition zone of 14.52±1.7 mm in *Escherichia coli* but not greater than the comparison ZOI (gentamicin) which was 22.43±0.3 mm.

Conclusions: Soursop leaf kombucha and telang flower have significantly different antibacterial potential with gentamicin.

Keywords: Kombucha, *Annona muricata* L, *Clitoria ternatea*, Gentamicin, *Escherichia coli*.

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Nutritional composition, mineral content, antioxidant activity and quantitative estimation of vitamin C, phenolic and flavonoid in *Eleutherine bulbosa*

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Abstract

Objectives: The present study evaluated bulb of bawang Dayak (*Eleutherine bulbosa*) for nutritional composition, antioxidant activity, minerals, vitamin C and phytochemicals.

Methods: The nutritional compositions were analyzed as describes in the Association of Official Analytical Chemists (AOAC). Minerals, including macro and micro minerals, were determined by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES). The antioxidant properties were evaluated by using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity. The quantitation of phenolic, flavonoids, and vitamins C were carried out by colourimetric.

Results: The results of the investigation showed that 96% ethanol extract of bulb of bawang Dayak are rich sources of carbohydrate and minerals, especially calcium, sodium, and potassium. The IC_{50} value antioxidant activity was 95.53±1.78 µg/mL and showed a high correlation level with the content of phenolic, flavonoids, and vitamins C.

Conclusions: Furthermore, bawang Dayak includes a high concentration of physiologically active chemicals, which play a key role in determining the product's nutraceutical quality.

Keywords: Antioxidant, *Eleutherine bulbosa*, nutraceutical, phytochemicals.

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Hypothyroidism side effects analysis of ethionamid in MDR TB patients with short-term and individual therapy

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Abstract

Objectives: Ethionamide is known to cause adverse drugs reactions on the thyroid gland such as hypothyroidism and subclinical hypothyroidism. This study aimed to analyze the frequency of occurrence, the profile of thyroid function during ethionamide administration and associated factors of ethionamide induced hypothyroidism in multidrug-resistant tuberculosis (MDR-TB) patient.

Methods: Retrospective study from MDR-TB center in Surabaya, Indonesia. Data were collected from medical records of MDR-TB patients who received ethionamide between January 2018 and January 2020. Hypothyroidism is thyroid stimulating hormone (TSH) was elevated >10 microIU/ml.

Results: Of the 48 cases available for analysis. Only one case documented record of TSH >10.00 microIU/ml (10.78 microIU/ml) in 49 days after receiving an individual therapy (ethionamide and PAS). Four cases developed subclinical hypothyroid with a range of TSH >5.00 and <10.00 microIU/ml. They were the ones who received an individual therapy (ethionamide and PAS) developed TSH 5.573 microIU/ml after 192 days. One received individual therapy only ethionamide developed TSH 9.093 microIU/ml after 483 days and two received short-term therapy developed TSH 5.09 and 5.26 microIU/ml after 111 and 145 days.

Conclusions: The occurrence of hypothyroid is rare in MDR TB treatment. But the importance of regular thyroid function monitoring during treatment and early identifying hypothyroidism helps to improve compliance so prevent treatment failure.

Keywords: adverse drug reactions, hypothyroidism, ethionamide, MDR-TB.

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The ethanol extract activities of Red Ginger (*Zingiber officinale* var. Rubrum) in completed Freund's adjuvant-induced-induced chronic pain in mice

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Abstract

Objectives: Arthritis pain is one of the significant problems in bone and joint disorders. Red ginger (*Zingiber officinale* var. Rubrum) has been known to have anti-inflammatory and analgesic potency. However, its activity in chronic pain, such as the arthritis model, was not determined yet. This study aimed to analyze the ethanolic extract of red ginger in mice's arthritis model using CFA induction.

Methods: Red ginger was extracted using ethanol 96%. CFA intraplantar injected chronic pain mice (n = 25) with sham mice (n = 5) injected with normal saline. On day 7, mice were divided into six groups: sham, CFA, gabapentin 100 mg/kg BW, and red ginger extract (dose 200; 400; 600 mg/kg BW). All treatments were administrated orally once a day for seven days. Latency time was measured using a hot/cold plate, and plantar thickness was measured using calipers on days 0, 1, 3, 5, 7, 8, 10, 12, and 14. On day 15th, all mice were sacrificed, then blood and spinal cord animal blood were collected— hematology profiles such as leukocytes, lymphocytes, and neutrophils were determined. The spinal cord was stained using hematoxylin-eosin.

Results: The ethanolic extract of red ginger significantly prolonged the latency time towards thermal stimulus and decreased plantar thickness in arthritis mice, as same as gabapentin as control. The ethanolic extract of red ginger also reduced the number of leukocytes, and neutrophils. Moreover, red ginger administration improved the morphology of the spinal cord's dorsal horn of mice.

Conclusions: The ethanolic extract of 400 mg/kb BW red ginger showed a potent effect on CFA-induced chronic pain.

Keywords: CFA, hyperalgesia, leukocyte, plantar thickness, red ginger, spinal cord.

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Study of lopinavir/ritonavir in severe COVID-19 patients with comorbid hypertension and diabetes mellitus

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Abstract

Objectives: Lopinavir/Ritonavir is the antiviral studied for its effectiveness in severe COVID-19 which the results remain conflicting. This study aims to determine the efficacy and evaluate the side effects of lopinavir/ritonavir in severe COVID-19 patients with comorbid hypertension and diabetes mellitus.

Methods: The data for this observational study were obtained retrospectively from June to December 2020 and will be analyzed descriptively. Severe COVID-19 patients with hypertension and diabetes mellitus who received lopinavir/ritonavir will be observed in groups A, B, C, D based on other pharmaceutical therapies obtained. The efficacy of lopinavir/ritonavir was determined by RT-PCR, oxygenation saturation, chest X-ray. The side effects of lopinavir/ritonavir will also be evaluated.

Results: The total sample that met the inclusion criteria was 21. Based on the results of the study, it was found that the administration of lopinavir/ritonavir (2 x 400/100 mg) PO gave effectiveness in the therapy group A, B, C, and D to the negative RT-PCR results, respectively 10%, 48%, 5%, and 14%; normal oxygen saturation with breathing apparatus 10%, 33%, 5%, and 5%, respectively; and chest Xray improvement 10%, 29%, 5%, and 14%, respectively. The side effects of lopinavir/ritonavir found were an increase in SGOT (46%), SGPT (27%), as well as a QT interval prolongation (5%).

Conclusions: The administration of lopinavir/ritonavir is effective in terms of negative RT-PCR results, improvement of chest X-ray, and oxygen saturation. Monitoring side effects is needed to avoid the several potential side effects caused by the therapy.

Keywords: lopinavir, ritonavir, severe COVID-19, efficacy.

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A systematic review on the effect of bisphenol A and bisphenol S towards neurodevelopment: an *in vivo* and *in vitro* perspective

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Abstract

Objectives: Bisphenol A (BPA) is a human-made small chemical molecule used to manufacture plastics and resins. Following the banning and strict regulation on BPA use, Bisphenol S (BPS) has gained attention as a replacement for BPA. It is considered a safer alternative due to its stability on high thermal and light conditions. However, rising evidence has shown that BPS exposure is associated with neurodevelopmental impairment, which mechanisms are still not fully understood. Therefore, this paper systematically reviewed *in vivo* and *in vitro* studies investigating the neurodevelopmental effects of BPA and BPS exposure to reveal and compare the molecular mechanisms of BPS and BPA.

Methods: This systematic review was conducted following the National Institute of Environmental Health Sciences' Office of Health Assessment and Translation (OHAT) approach for systematic review and evidence integration.

Results: A total of 41 articles, including 36 studies on BPA and 5 studies on both BPA and BPS, were obtained from PubMed, ScienceDirect, and SpringerLink. The results showed that BPS exposure gives rise to similar neurodevelopmental effects as BPA, including anxiety-like behavior, poor learning and memory, and altered brain neuro-reproductive systems. However, BPS has been suggested to have a different mechanism compared to BPA.

Conclusions: Potentially, BPS produces similar neurodevelopmental toxicity as BPA despite demonstrating distinct underlying molecular mechanisms.

Keywords: bisphenol A, bisphenol S, endocrine disruptors, neurodevelopmental toxicity, neurotoxicity.

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The effectiveness and side effects remdesivir use in COVID-19 patients with pneumonia

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Abstract

Objectives: Remdesivir is one of the antiviral agents used as a treatment in COVID-19 infection. The active form of remdesivir prevented the RdRp (RNA-dependent RNA polymerase) and has antiviral activity directly related to activation of pro-inflammatory responses that can cause cytokine storm and multiorgan damage and mortality. Therefore, this study aimed to see the effectiveness and evaluated side effects of Remdesivir used in COVID-19 patients with pneumonia.

Methods: This was a cohort observational study which collected data retrospectively used the medical record of COVID-19 patients who received Remdesivir with loading dose (1x200mg) IV followed maintenance dose (1x200 mg) IV, which was analyzed in three groups at Bhayangkara H.S Samsoeri Mertojoso Hospital, Surabaya during October 2020-February 2021. The data obtained were swab PCR/rapid Ag, oxygen saturation, chest imaging, BUN, SCr, SGOT, and SGPT.

Results: A total of 60 patients evaluated in 1, 2, 3 therapeutic groups showed that Remdesivir use for 5-9 days was effective. Negative PCR/rapid Ag Swab, improved oxygen saturation by supplementary oxygen therapy, improved chest X-rays imaging parameters were seen in (77%), (52%), and (68%) of total patients, respectively. Common side effects were an increase in SGOT (85.30%), SGPT (79.88%), BUN (75.46%), and serum creatinine (43.33%).

Conclusions: The antiviral effect of Remdesivir with loading dose (1x200mg) IV followed maintenance dose (1x200 mg) IV for 5-9 days in COVID-19 patients with pneumonia has a clinical improvement with some side effects from the value of elevation liver and kidney function.

Keywords: antiviral, covid-19, pneumonia, remdesivir.

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In silico and *in vitro* analysis of anticholesterol extract of tempe peanut (*Arachis hypogaea*)

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Abstract

Objectives: Tempe is a traditional food that is processed through fermentation and contains probiotics. Peanut (*Arachis hypogaea*) is one of the raw materials for tempeh which contains isoflavones such as genistein, daidzein and glycitein. The purpose of this study was to predict the affinity formed between the active compound of peanut tempe and the target enzyme as well as predict the physicochemical, ADME, toxicity of the active compound of peanut tempe and measure the cholesterol level of peanut.

Methods: *In silico* research was conducted on 20 active compounds of peanut tempeh. The docking process uses the molecular docking method. The docking process uses the molecular docking method on the web http://www.dockingserver.com using orlistat control and pancreatic lipase enzymes. The compound and control 3D structures were taken from PubChem. Convert pdb format using http://swissmodel.expasy.org. Analysis of the affinity of the ligand compound to the enzyme compared the free energy, inhibition constant, surface interaction, and amino acid residue with orlistat. Physicochemical analysis, ADME, and toxicity using pkCSM on the active compounds of peanut tempeh and orlistat. Research with *in vitro* method on peanut tempeh. Cholesterol levels were determined using $FeCl_3$ reagent. Analysis of research results using analytical descriptive.

Results: Based on the affinity of catalpol, aloin, fraxin, and isosakuranetin compounds. predicted to have better ability than orlistat control in inhibiting pancreatic lipase enzyme. The pkCSM analysis showed that catalpol and peonidin-3-o-glucoside compounds had optimal potency in intestinal lumen and were not toxic. Test results cholesterol analysis on peanut tempeh showed that cholesterol levels had an average value of 6.91 mg/g.

Conclusions: The active compounds catalpol, aloin, fraxin, and isosakuranetin are predicted to be able to inhibit pancreatic lipase enzymes. The results of pkCSM that catalpol and peonidin-3-o-glucoside compounds were able to work optimally in the intestinal lumen. Peanut tempeh cholesterol levels obtained an average yield of 6.91 mg/g.

Keywords: anticholesterol, tempeh, active compound of peanut tempeh, *in silico*, pkCSM, *in vitro*.

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Effect of boiling time soursop leaves (*Annona muricata* L.) and telang flower (*Clitoria ternatea*) Kombucha on the differences of tannin levels and cholesterol levels

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Abstract

Objectives: Kombucha is a probiotic drink made from fermented tea and sugar that have beneficial for health. Soursop leaf (*Annona muricata* L.) and telang flower (*Clitoria ternatea*) contain active compounds that have the potential to reduce blood glucose and cholesterol levels. The purpose of this research is to measuring cholesterol levels and measuring tannin levels.

Methods: This study used *in vitro* methods on kombucha soursop leaves and telang flowers. Cholesterol and tannin levels were measured using a UV-Vis spectrophotometer. Cholesterol levels were determined using anhydrous acetic acid reagent and tannin levels using Folin Ciocalteau reagent. The measurement results were analyzed statistically with the one-way ANOVA test using the SPSS application.

Results: The lowest cholesterol levels were found in kombucha with 15 minutes boiling time is 3.33 ± 0.83 mg/g and the amount decreased in proportion to the increase in boiling time. Meanwhile, the highest tannin content was found in kombucha with a boiling time of 15 minutes at 0.42 ± 0.06 mg/ml. This represents that the longer the kombucha boiling process is directly proportional to the decrease in cholesterol and increase tannin levels.

Conclusions: Boiling time affects the decrease in cholesterol and increase tannin levels in kombucha soursop leaves and telang flowers.

Keywords: Kombucha, soursop leaves, telang flowers, cholesterol, tannin.

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Isolation and characterization of cellulose from fruit peel fiber *Borassus flabellifer* L from Semanding – Tuban compared with standard

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Abstract

Objectives: One of the plantations wastes not fully utilized is fruit peel fiber from *Borassus flabellifer*. In reality, the waste has nutritional value. The amount of cellulose in the fruit peel fiber of *Borassus flabellifer* is sufficient for it to be using. The goal of this study is to isolate cellulose from discarded *Borassus flabellifer* fruit fibers from plantations.

Methods: This cellulose isolation is accomplishing through a chemical process that comprises hydrolysis, delignification, and bleaching. The water content, pH, and FTIR have been using for the characterization of the sample and will compare with the standard.

Results: The results of *Borassus flabellifer* cellulose isolation were determined using FTIR analysis. O-H, 2893.22, C-H, 1371.38, and C-O-H, 1157.28 were the typical cellulose peaks. The water content test revealed that cellulose *Borassus flabellifer* has a pH of 6.8 and a moisture content of 7.34 percent. The processes of hydrolysis, delignification and bleaching are using to isolate cellulose in this chemical procedure. Water content testing, pH testing, and FTIR testing have been using to characterize the sample.

Conclusions: The cellulose isolated from *Borassus flabellifer* fruit fibers exhibits similarities to ordinary cellulose, according to the results.

Keywords: Fruit peel fiber*, Borassus flabellifer* L, isolation, cellulose, plantation waste.

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The effect of atorvastatin on lipid profile and inflammatory marker in patient with diabetes dyslipidemia

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Abstract

Objectives: Inflammation is the underlying cause of several comorbid diseases, including macrovascular complications that cause the highest mortality in diabetes patients. IL-6 is one of the pro-inflammatory cytokines use to assess inflammatory conditions in diabetes and its complications. This study analyzes the effect of atorvastatin administration on lipid profile and inflammatory markers after 30 days and the correlation between lipid profile and IL-6.

Methods: An observational prospective cohort study was conducted from November 2017 to January 2018 approved by the ethical committee of General Hajj Hospital, Surabaya. Nineteen patients who meet the inclusion criteria and signed the informed consent were enrolled in this study. The measurement of lipid profile and IL-6 level were done twice, before and after 30 days of therapy.

Results: After atorvastatin administration, there was a 40.55% decreased in LDL level, a 15.34% decreased in TG level, a 30.70% decreased in total cholesterol level which was statistically significant (p <0.05). There was a 6.06 % increase in HDL level and a 5.75 % decreased in IL-6 level but both were not statistically significant (p >0.05).

Conclusions: Atorvastatin administration can improve lipid profile in diabetes patients with dyslipidemia. There was a decreased of IL-6 but not statistically different.

Keywords: diabetes, atorvastatin, lipid profile, inflammation.

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Finding the scientific evidence for the antiplatelet and antithrombotic activities of the water extract of Sukun (*Artocarpus altilis*) leaves

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Abstract

Objectives: Breadfruit (*Artocarpus altilis*) leaves have been traditionally used for the treatment of cardiovascular diseases. The key mechanisms underlying cardiovascular diseases is platelet aggregation and thrombosis. There is no scientific evidence regarding the antiplatelet and antithrombotic effectivities of the water extract of *A. altilis* leaves (WEAAL). This study aimed to investigate the antiplatelet and antithrombotic activities of WEAAL to provide the scientific evidence of its usage as cardiovascular diseases remedy.

Methods: The water extract of *A. altilis* was prepared using infundation method. The antiplatelet activity of WEAAL was assessed using Light Transmittance Aggregometry method using human platelet induced by Adenosine Diphosphate; whereas the antithrombotic activity was evaluated using Acute Pulmonary Thromboembolism method in mice induced by the mixture of epinephrine and collagen. Ticagrelor, an antiplatelet drug was used as a positive control. The number and the onset of dead and paralysis mice were observed. The chemical constituent of the extract was analyzed using thin layer chromatography (TLC).

Results: We found that WEAAL demonstrated a weak antiplatelet activity (IC_{50} >1000 μg/mL). Based on the number and the onset of dead and/or paralysis, we found that WESSL failed to exhibit antithrombotic activity (at 200, 300, and 400 mg/kg). TLC analysis showed that WEAAL did not contain 2-geranyl-2,3,4,4'-tetrahydroxydihydrochalcone (GTDC), the antiplatelet compound previously identified from the ethanol extract of *A. altilis* leaves.

Conclusions: This study showed that the scientific evidence is lacking regarding the antiplatelet and antithrombotic activities of the WEAAL. This might be due to the absence of GTDC in the WEAAL.

Keywords: *Artocarpus altilis*, breadfruit, platelet aggregation, thrombus, 2-geranyl-2,3,4,4'-tetrahydroxydihydrochalcone.

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Antimicrobial activity of Tekelan's (*Chromolaena odorata* L.) leave extract

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Abstract

Objectives: Microorganism is one of the infectious causes. Antimicrobial agents are the treatment for this infectious. The biggest source for antimicrobial agent is plant. On of plant that can be used for treat infectious was Tekelan (*C. odorata* L.). Tekelan leaves in Padang Lawas (South Sumatera) traditionally were used for treat diarrhea and wounds. Objective of this study were determined antimicrobial activity and Minimum Inhibitor Concentration (MIC) of *C. odorata* leaves ethanol extract against *Escherichia coli*, *Staphylococcus aureus* and *Candida albicans*.
Methods: Leaves of *C. odorata* was extracted by maceration method using ethanol 96%. The extract was phytochemical screening and continued conducting antimicrobial test against *E. coli*, *S. aureus* and *C. albicans*. Ethanol extract of leaves of *C. odorata* were examine antimicrobial activity and Minimum Inhibitory Concentration (MIC) through disc diffusion method.
Results: Ethanol extract of Tekelan's leaves has antimicrobial against *E. coli*, *S. aureus* and *C. albicans*. Result showed better activity against *S. aureus* than *E. coli* and *C. albicans*. MIC for *Escherichia coli*, *Staphylococcus aureus* and *Candida albicans* was 50 mg/ml, 12,5 mg/ml, and 50 mg/ml, respectively.
Conclusions: Ethanol extract of tekelan's leaves has antimicrobial activity because based on phytochemical screening, it contained flavonoid, tannin and saponin.

Keywords: *C. odorata*, leaves, extract, antimicrobial, MIC.

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Effect of sodium alginate concentration on physical characteristics of inhalation quercetin microspheres

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Abstract

Objectives: Quercetin has been demonstrated to have potent anti-inflammatory and antioxidant activities. However poor stability, low solubility and poor bioavailability are main problems. As a result, the clinical application of the drug is greatly restricted. Microspheres are used to protect drugs from environmental effects such as moisture, heat and oxidation. The purpose of this study was to determine the effect of sodium alginate concentration (1, 1.5, 2 and 2.5%) on physical characteristics (moisture content, yield, particle size) and flow properties as dry powder for inhalation purposes.
Methods: Quercetin Microspheres was prepared by ionotropic gelation technique with aerosolization method. Formula of the microspheres consists of quercetin 0.2%, sodium alginate and calcium chloride crosslinker. Microspheres were then characterized in terms of size, moisture content, yield and flow properties.
Results: Result showed that particle size was less than 1.50 μm, moisture content was ranged of 2.74-4.48% and yield was ranged of 41.33-76.14%. Flow properties showed that F1-F4 had excellent flow as dry powder.
Conclusions: These findings indicated that quercetin-alginate microspheres are potential for inhalation to be delivered to the lung.

Keywords: quercetin, microsphere, inhalation, physical characteristic, flow properties, sodium alginate.

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Drug utilization study of pulmonary hypertension on outpatients at Dr. Soetomo General Hospital Surabaya Indonesia

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Abstract

Objectives: Pulmonary hypertension (PH) is a life-threatening disease caused by increased blood pressure in the arteries lungs especially at the right side of the heart. PH can cause many symptoms such as shortness of breath, dizziness, and can reduce heart function that leads to heart failure. One type of pulmonary hypertension is arterial hypertension (PAH) which known as an idiopathic disease. Management of PAH patients includes pharmacological therapy (supportive therapy and specific therapy) and invasive therapy. This study aims to observe the drug utilization and drug-related problems in outpatient pulmonary hypertension at SMF Cardiology and Vascular Medicine Dr. Soetomo Surabaya from March 2021 to April 2021.

Methods: This study was a prospective observational study with a sampling method of time-limited sampling during the period of March 2021 to April 2021.

Results: The results of 35 patients showed that the drug utilization that was often used in PAH patients included specific therapy, such as sildenafil at 97.14% and beraprost at 88.6%, and supportive therapy include bisoprolol at 62.9% and furosemide at 51.4%. Drug-related problems that found in this study were actual side effects, potential drug interactions, and some inappropriate doses compared to the guidelines.

Conclusions: The conclusion of this study showed the profile of specific and supportive drug therapy was mostly appropriate but there were still PAH patients who had severe PASP (pulmonary artery systolic pressure) and experience side effects.

Keywords: drug utilization study, pulmonary arterial hypertension, DRP's.

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Antibacterial activity of cell-free fermentation probiotic filtrate from red passion fruit (*Passiflora edulis* Sims.) in de Man Rogosa Sharpe broth media againts *Mycobacterium tuberculosis*, *Escherichia coli* extended spectrum beta-lactamase and methycillin resistant *Staphylococcus aureus*

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Abstract

Objectives: Fermentation of probiotics (MM1, MM2, and MM3) isolated from red passion fruit (*Passiflora edulis* Sims.) in de Man Rogose Sharpe broth medium has been performed.

Methods: Determination of antibacterial activity of probiotics cell free fermentation filtrate (PCFFF) against *Mycobacterium tuberculosis* H37Rv has been carried out. The Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) of the PCFFF against *Escherichia coli* Extended Spectrum Beta Lactamase (ESBL) and Methycillin Resistant *Staphylococcus aureus* (MRSA) has also been done. Determination of the MM1 and MM2 PCFFF potential ratio to vancomycin against MRSA were also reported.

Results: It was found that, the PCFFF was unable to inhibit the growth of *Mycobacterium tuberculosis*, but the MM1 and MM2 PCFFF were able to inhibit the growth of ESBL and MRSA with MIC values of 25% and MBC 50% respectively, while the MM3 PCFFF was unable to inhibit ESBL at 100% concentration.

Conclusions: The MM3 PCFFF showed inhibitory activity against MRSA at a concentration of 100%. The potential ratio of the MM1 and MM2 PCFFF to vancomycin standard solution (10, 5, and 2.5 ppm) against MRSA were 92.70% and 82.77%, respectively.

Keywords: ESBL, MRSA, *Mycobacterium tuberculosis*, probiotics, red passion fruit, *Passiflora edulis* Sims.

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Potentially inappropriate medication uses among elderly patients in emergency department using the Beers criteria 2019

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Abstract

Objectives: Elderly patients are associated with an increasing prevalence of chronic degenerative diseases which need emergency services. Potentially Inappropriate Medications (PIM) are defined as drugs that should be avoided because the risks outweigh the benefits and when there are alternative drugs with the same therapeutic effect and are more effective. The use of PIM increases the risk of patients requiring hospitalization, drug-related problems, and adverse health outcomes with a prevalence of up to two to three times. Therefore, PIM use among elderly patients is associated with progressive worsening of health and can affect patient's quality of life.

Methods: This is a cross-sectional retrospective study at Universitas Airlangga Teaching Hospital in Surabaya for three months. This study involved elderly patients who visited the Emergency Department. Beers Criteria 2019 was used to identify the use of PIM. Chi-square analysis was used to determine the relationship between comorbid status, polypharmacy and triage of patients with PIM.

Results: Most patients were female (54.9%) and aged 60-96 years old. The Chi-square analysis showed a relationship between cardiac comorbidities (P-value 0.003, OR 2.752, 95% CI) and polypharmacy with PIM (P-value 0.000, OR 2.762, 95% CI). Other comorbidities and triage status did not provide a significant value for PIM.

Conclusions: Cardiac comorbidities and polypharmacy correlate with PIM. So that caution is needed in elderly patients with this condition.

Keywords: Potentially inappropriate medication, older people, Beers Criteria, comorbid, polypharmacy, medicine.

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Characterization of physical properties and stability test of microemulsion spray preparations from ethanol extract of *Moringa oleifera* L

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Abstract

Objectives: *Moringa oleifera* L are known have antioxidant activity which contain of flavonoids, so that they function to inhibit free radicals that can be used as anti-aging. The purpose of this study was to determine the ethanol extract of *Moringa oleifera* L can be used as a stable microemulsion spray preparation and have good physical properties.

Methods: Formulation of a microemulsion spray can accelerate the absorption process in the skin because it has a small particle size (microemulsion).

Results: The formulation of the microemulsion spray preparation made using ethanol extract of *Moringa oleifera* L with concentrations of 0%, 3%, 6% and 9% with additional ingredients of tween 20, hydrogenated castor oil, propylene glycol, sodium EDTA, sodium metabisulfite, aqua bidistilled, and *oleum rosae*. The tests carried out included organoleptic examination, storage stability test, pH test, BJ test, emulsion type test, viscosity test and antioxidant activity test. The results showed that the preparation was stable for 8 weeks of storage, the pH range was 4.4-7.3, the microemulsion spray produced had an average particle size of 6 m, the viscosity of the preparation was 6.30-811 cPs, and the IC_{50} value was 135.639 g/mL which shows moderate antioxidant activity.

Conclusions: From these results, it is known that the ethanol extract of Moringa leaves can be formulated as a microemulsion spray preparation with good characteristics and stability tests.

Keywords: *Moringa oleifera* L, antioxidant, anti-aging, microemulsion.

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In silico analysis of antiviral agent in dengue infection of compounds in faloak stem bark extract (*Sterculia quadrifida* R. Br)

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Abstract

Objectives: Indonesia is a tropical country with a high level of population density and humidity; therefore, the remarkable history of dengue infection is often found. Management dengue until now has not had a specific therapy. The development of dengue therapy using traditional plants as the main source for dengue therapy is needed. Faloak stem bark (*Sterculia quadrifida* R. Br) is known to contain flavonoid, alkaloid, tannin, and terpenoid compounds. There has never been a study on the potential of faloak bark as an antiviral therapy for dengue infection.

Methods: *In silico* analysis using compounds obtained in previous studies. All ligand sample preparations were retrieved on the PubChem database with format sdf and 3D structure. Drug-likeness using the Lipinski's rule of five method. Analysis used PyRx, PyMOL and Discovery Studio 2.0 to analysis the potency of faloak bark-specific compounds against the enzymes NS5 RNA dependent RNA polymerase (RdRp) from Dengue.

Results: β-sitosterol and 1,2-benzenedicarboxylic acid have antiviral potential against dengue by disposing of enzyme NS5 RNA dependent RNA polymerase. All two compounds have a lower affinity bond and similarity in the position of the amino acid interaction than control.

Conclusions: β-sitosterol and 1,2-benzenedicarboxylic acid have the potential to fight dengue by inhibition enzyme NS5 RNA dependent RNA polymerase.

Keywords: *Sterculia quadrifida* R. Br, β-sitosterol, 1,2-benzenedicarboxylic acid, antiviral, dengue.

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Community knowledge and attitude in recognizing symptoms and medication use for diarrhea in children: a cross-sectional study

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Abstract

Objectives: Diarrhea is the second leading cause of death among children worldwide. Children suffering from profound dehydration due to poor understanding of the proper treatment of diarrhea. This study aimed to analyze the level of community knowledge and attitude in the management of diarrhea in children.

Methods: This observational, cross-sectional study was conducted among the community in Gresik, Indonesia on 2019. Data were collected using a Likert scale questionnaire consisted of 10 items on knowledge and 5 items on community attitudes toward management of diarrhea in children.

Results: 107 participants responded to the survey consisted of 89.72% women, the mean age of 41.84 ± 11.27 years and various levels of education. The good knowledge of community showed by 84.11% of participants getting the right answer. Most of the participants had known the signs and symptoms of diarrhea in children. However, the knowledge on the proper treatment of diarrhea still lacking especially in identifying the medicine choice. The participants also showed a 'positive' attitude by getting a score of 89.72%. The participants agreed that oral rehydration solution is supposed to be given when the children get diarrhea and ensure to bring the children to the physician when diarrhea unresolved more than three days.

Conclusions: The level of knowledge in recognizing signs and symptoms of diarrhea in children was good, but missing in proper medication use. Overall, the respondents had a positive attitude toward the management of diarrhea in children.

Keywords: attitude, children, child health, diarrhea, knowledge, medicine.

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Characteristics and dissolution of the inclusion complex *p*-methoxycinnamic acid-hydroxypropyl-β-cyclodextrin made with milling method

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Abstract

Objectives: The formation of p-methoxycinnamic acid (*p*MCA) inclusion complexes with hydroxypropyl-β-cyclodextrin (HPβCD) complexing compounds is known to increase the solubility of *p*MCA. Inclusion complexes can be made milling method. In this method the material will be pounded with a certain speed and impact force. Therefore, milling time, ball size and the ratio of ball to material processed will affect the results. The aim of this study was to evaluate the characteristics and dissolution of the *p*MCA-HPβCD inclusion complex made by milling method with a milling time of 3 hours.

Methods: The *p*MCA compound used in this study was isolated from the rhizome of the kencur (*Kaempferia galanga* Linn) plant and has been identified. The inclusion complex was prepared by mixing *p*MCA and HPβCD with a molar ratio of 1:1, the mixture was milled using a ball mill. The results obtained were characterized using SEM, XRD, DTA and tested for dissolution. The dissolution test was carried out in 500 mL volume of aquadestilata medium at 37 ± 0.5 °C. The dissolved *p*MCA level was determined by the spectrophotometer method at its maximum wavelength. The Dissolution Efficiency (DE_{60}) value was analyzed statistically using the one-way ANOVA method with α 0.05.

Results: The results showed that the compound had a different morphology from its constituent compounds, the material was more amorphous, the melting temperature decreased and the DE60 value increased 4.3 times compared to the *p*MCA compound.

Conclusions: The *p*MCA-HPβCD inclusion complex has been formed and is able to significantly increase pMCA dissolution.

Keywords: *p*-methoxycinnamic acid, hydroxypropyl-β-cyclodextrin, inclusion complex, milling method, characteristic, dissolution.

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Impact of pharmacist-led education on knowledge, adherence, and glycemic control of type 2 diabetic outpatients

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Abstract

Objectives: Pharmacists are positioned to educate patients regarding medication-related knowledge and adherence. This study aimed to evaluate the impact of education on knowledge, adherence, and glycemic control among type 2 diabetic patients.

Methods: This prospective cohort study was conducted among type 2 diabetic outpatients from September to December 2019 in a secondary teaching hospital in Surabaya, Indonesia. Patients aged >18 years old, diagnosed with type 2 diabetes mellitus (DM), received antidiabetic agents, and provided informed consent were included in the study. One family member was chosen to be the *Pengawas Minum Obat* (PMO) during initiation and obliged to make sure the patient takes the medicine and record the timing in a medication chart. The pharmacist-led diabetes education program was then delivered to patients and their PMO. Patient knowledge and adherence were assessed using validated Diabetes Medication Knowledge Questionnaire (DMKQ) and Brief Medication Questionnaire (BMQ) during initiation and after follow-up. Fasting and postprandial blood glucose levels were measured at the start and end of the study.

Results: Twenty-six patients completed the study (median (IQR) age 61.5 (58.3–65.0) years, female 57.7%, median (IQR) duration of DM 5.0 (3.0–15.0) years). After follow-up, the education program improved patient's knowledge by 19.0% (p = 0.409) and medication adherence by 46.0% (p = 0.002). Glycemic control in fasting and postprandial blood glucose levels were achieved in 19.2% and 23.1% of patients, respectively.

Conclusions: Education program led by pharmacist improved patient's knowledge on diabetes and its medication, adherence to therapy, and glycemic control.

Keywords: blood glucose, diabetes mellitus, medication therapy management.

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Lactobacillus and *Bifidobacterium* bacteria potential as psychobiotic for depression and anxiety disorder

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Abstract

Objectives: In 2019 approximately 450 million people in the world are diagnosed with mental disorder, whilst the highest prevalence is occupied by depression and anxiety disorder. Current medication of antidepression and antianxiety drugs often cause many undesirable adverse effects that affect patient adherence. Psychobiotic appears as a better solution, referring to a live organism that is being ingested in adequate amounts and produces a health benefit in patients suffering from psychiatric illness. Amongst many genera of bacteria that have been referred to as psychobiotics, Bifidobacterium and lactobacillus are proofed to be the most beneficial to treat mental health. The aim of this research is to study about which species from Bifidobacterium and Lactobacillus used as depression and anxiety disorder treatment and their mechanism of action is work.
Methods: A literature review performed using the following databases: PubMed, Scopus, and Science direct. The research was performed using the following keywords: ((Lactobacillus OR Bifidobacterium) AND (Depressive Disorder OR Depression Symptoms) AND (Anxiety Disorder OR Anxiety State)).
Results: A total of 17 article were included in this review, among those studies we discovered 14 species from genus Bifidobacterium and Lactobacillus show significant results to treat depression and anxiety disorder trough brain monoamine production, GABA production, inflammatory response reduction and balancing gut microbiome.
Conclusions: This review provides comprehensive summaries regarding the psychobiotic which holds substantial potential clinical outcomes for patients with depression and anxiety.

Keywords: Mental health, microbiota, probiotic, psychiatric medication, psychobiotic.

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Comparison of adverse event following immunization of Sinovac and Astra Zeneca. an interim report

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Abstract

Objectives: One way to prevent Covid-19 infection and transmission is vaccination. Indonesia is one of the countries that organize mass vaccination using various types of vaccines, like inactivated and mRNA. The study aimed to look at Adverse Events Following Immunization (AEFI) of Sinovac (SIN) and Astra Zeneca (AZ) vaccines.

Methods: Subjects who received Sinovac or Astra Zeneca were sent questionnaire twice, each after they received the first and second dose of vaccine, respectively. Raw data was extracted from the Microsoft system and analyzed descriptively.

Results: There were 1547 people vaccinated with Sinovac; and 529 subjects responded the first questionnaire, and 248 subjects responded the second questionnaire. Moreover, there were 936 people vaccinated with Astra Zeneca, and 477 respondents answered the first questionnaire, and 113 respondents answered the second questionnaire. Percentagewise some important AEFI in the first- and second-day post vaccination were as follows (SIN vs AZ): fever 4% vs 59%; pain at the injection site 27% vs 87%; redness and swelling at the injection site 4% vs 18%; nausea 5% vs 30%; diarrhea 1.8% vs 5.7%, respectively. The differences of AEFI between SIN and AZ could be caused from the materials of the vaccine and its excipients.

Conclusions: It is shown in this study that from our study Sinovac seems to have less AEFI than Astra Zeneca. This is an on-going study, after 3 months post-vaccination the efficacy of both vaccines will be analyzed.

Keywords: AEFI, Sinovac, Astra Zeneca, mass vaccination.

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Acute and subchronic toxicity tests of Indonesian House Dust Mites (IHDM) allergenic extract for asthma allergy immunotherapy

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Abstract

Objectives: Asthma is a heterogeneous disease characterized by chronic airways inflammation with many symptoms such as wheezing, shortness of breath, chest tightness, and cough with varying intensity. One of the trigger factors for asthma is exposure to allergens, such as house dust mites (HDM). This study aims to determine the acute and subchronic toxicity of the administration of IHDM allergen extract using experimental animal models.

Methods: Female BALB/c mice, female, and male Wistar rats were used as experimental animal models. While the IHDM allergen extract was used with the level of Der p1 is 11.3 – 26.6 ng/mL and was administered by intravenous route. The acute toxicity test was carried out for 14 days on four groups of experimental animals which each group was given different doses of IHDM. The subchronic toxicity test was carried out for 28 days using three groups of experimental animals which each group was given different doses of IHDM.

Results: The administration of a single-dose of IHDM allergen extract at various doses did not cause changes in behavior in mice and no death was shown in each group. Likewise, there was no change in the main organs by microscopic observations. Meanwhile, the IHDM allergen extract administration at repeated doses given for 28 days could show signs of toxicity. The symptoms were shown in the histopathological structure of the liver, kidney, and heart organs.

Conclusions: It can be concluded that the IHDM allergen extract is safe by the single-dose administration, but showing toxic signs when were given in repeated doses. Further tests are needed for 90 days of subchronic toxicity and satellite testing.

Keywords: acute toxicity, subchronic toxicity, IHDM safety, asthma allergy, neglected disease.

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Effectiveness of Indonesian House Dust Mite (IHDM) allergenic extract in triggering allergic rhinitis sensitivity in a mouse model

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Abstract

Objectives: Perennial allergic rhinitis is a chronic upper respiratory disease with inflammation-mediated by immunoglobulin-E in the nasal mucosa caused by house dust mites. Recently, Allergen Immunotherapy (AIT) has been promising allergic healing for a patient who has a definite history of sensitization. Thus, a house dust mite product has been developed with dust originating from Indonesia (IHDM) for this purpose. There requires appropriate in vivo testing to ensure the safety and sensitivity of the product.

Methods: There were seven groups of mice used in this effectiveness testing, namely: normal, negative control with IHDM challenge, positive control with 0,1% histamine challenge, and allergic rhinitis group by both IHDM-induced sensitization at 12,5; 50; 250; or 500 µg and IHDM challenge. Sensitization was given intraperitoneally once a week for three consecutive weeks. Three weeks later, the challenge was given intranasally between day for five times. The number of noses rubbing and sneezing were calculated. Eosinophil infiltration was assessed histologically with hematoxylin & eosin staining. Level of mRNA IL-5 expressions in nasal mucosa was examined by gel-based PCR.

Results: This study showed that the induction of allergic rhinitis with IHDM significantly increased the number of noses rubbing and sneezing behaviors in the mouse model. Concomitant results also occurred in nasal mucosal eosinophil infiltration, although IL-5 mRNA expression showed no significant change.

Conclusions: Taken together, the data indicated IHDM allergenic extract can be an effective sensitizing agent in allergic rhinitis mice models.

Keywords: allergic rhinitis, allergen immunotherapy, Indonesian house dust mites, allergic healing, neglected disease.

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Role of 5-HT$_{1A}$ receptor on fluvoxamine induced gastrointestinal mucosa protection and healing in animal with stress-induced gastric ulcer

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Abstract

Objectives: One factor that could contribute to the developing of gastric ulcer is stress. Fluvoxamine, an SSRI antidepressant showed protective effects to ulcers when administered before stress induction. In opposite, administration of fluvoxamine after stress induction will delays the mucosa healing. This study aimed to investigate the effects of pre-treatment and post-treatment of buspirone a 5-HT$_{1A}$ receptor partial agonist in the inhibition of gastric mucosal protection and healing by fluvoxamine in animals with stress-induced gastric ulcers.

Methods: This study used ddY, male mice, weighed 25-30 grams, which divided into two groups, pre-treatment and post-treatment groups. Each group consisted of subgroups that were administered low doses of buspirone (0.1 and 0.3 mg/Kg) and high doses of buspirone (10.0 and 30.0 mg/Kg). In the pre-treatment group, buspirone was administered intraperitoneally at 60 minutes before and continued with oral fluvoxamine 100 mg/Kg administration at 30 minutes before stress induction. In the post-treatment group, buspirone was administered intraperitoneally followed fluvoxamine orally 30 minutes after stress induction done. The stress model used is water immersion restrain stress for 6 hours.

Results: In the pre-treatment group, the combination of high dose, but not low dose buspirone significantly ($p < 0.001$) inhibit the protection effects of fluvoxamine on stress-induced gastric ulcers. In addition, in the post-treatment group, the combination of low dose buspirone and fluvoxamine strengthen the delays of mucosal healing by fluvoxamine ($p < 0.0001$) in mice with stress-induced gastric ulcers.

Conclusions: Fluvoxamine protects and heals gastric mucosa from stress-induced gastric ulcer through the activation of 5HT$_{1A}$ receptor.

Keywords: Gastric ulcer, stress, fluvoxamine, buspirone.

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PEG-4000 ameliorates morphine-induced constipation in mice through inhibition of AQP-3 mRNA expression

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Abstract

Objectives: The common side effect of acute or chronic use of morphine as an analgesic is constipation. Instead of activation of μ-opioid receptor in GIT, Morphine also increase AQP-3 expression causing constipation by reabsorbing more water from luminal to vascular. PEG-4000 is an osmotic laxative that inhibit water reabsorption in GIT lumen. This study aimed to analyze the effect of PEG-4000 on the changes in AQP-3 mRNA expression and fecal parameters in both acute and chronic constipation mice model.

Methods: This experiment were conducted in acute and chronic morphine (10 mg/kg) i.p. injection. PEG-4000 3 g/kg was administered orally after morphine injection. The effectiveness of laxative was evaluated through fecal parameters i.e., fecal water content (FWC), fecal weight (FW), and fecal number (FN). Furthermore, mucosal tissue of the mice colon was extracted to observe AQP-3 mRNA expression using the Polymerase Chain Reaction method.

Results: The results showed that PEG-4000 inhibit AQP-3 mRNA expression ($P < 0.05$) in both acute and chronic model. The improvement was also showed in fecal parameters. In acute model, the first dose of PEG-4000 increased FW from (0.00 ± 0.00 g) to (0.93 ± 2.35 g). In addition, repeated administration of PEG-4000 in chronic constipation model significantly increased FWC from ($44.16 \pm 2.35\%$) to ($59.13 \pm 0.80\%$) and also increased FN from (6.33 ± 2.11) to (20.83 ± 2.14).

Conclusions: The administration of PEG-4000 is effective to reduce AQP-3 expression and improve the fecal parameters in both acute and chronic morphine-induced constipation model.

Keywords: PEG-4000, constipation, morphine, aquaporin-3.

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Development liquid crystal nanoparticles formula of binjai leaves methanol extract for topical use

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Abstract

Objectives: Excessive sun exposure is a factor in the formation of melanin which causes hyperpigmentation. The natural antioxidants directly can inhibit tyrosinase activity in the melanogenesis process. Binjai leaves methanol extract has antioxidant activity with IC_{50} 6.48 µg/ml, so it can be developed into nanoparticle to increase penetration of active compounds extract. Liquid crystal nanoparticle (LCNPs) is one of the delivery systems for an active pharmaceutical ingredient that have hydrophobic and hydrophilic properties. This study aimed to develop an antioxidant derived from Binjai leaves in the form of nanoparticles.

Methods: The manufacture of LCNPs made using the top-down method with various ratios of lipids and surfactants. Physicochemical and morphological characterization of the systems investigated by X-ray diffraction, Transmission Electron Microscopy (TEM), polarizing microscopy, size nanoparticles, size distribution, zeta-potential, entrapment efficiency, and stability. In vitro release test was performed using membrane dialysis, then the results were analyzed using an ANOVA with a 95% confidence level.

Results: The results show the concentration optimum formula of LCNPs is 0.5% extract, 6% Capmul® GMO 90 as lipid, and 5% Plantacare® 818 UP as surfactant. TEM and polarizing microscopy showed non-lamellar shapes. The particle size of 62.17 ± 0.16 nm with a polydispersity index of 0.257, the zeta potential of -30.4 ± 0.2 mV, and entrapment efficiency of 85%. The stability testing shows that LCNPs were stable. The release test shows the LCNPs have percent release better than extract with a p-value <0.05.

Conclusions: Liquid crystal nanoparticles can enhance the solubility of the Binjai leaves extract.

Keywords: antioxidant, Binjai leaves, liquid crystal nanoparticles, stratum corneum, topical.

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Microwave-assisted synthesis of 3,4-dimethoxycinnamic acid and evaluation of its anti-blood clotting activity

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Abstract

Objectives: Cinnamic acid and its derivatives have been widely studied because they have various pharmacological effects such as anti-analgesic, antioxidant and anti-platelet properties. This study aims to synthesize 3,4-dimethoxycinnamic acid utilizing microwave irradiation and test the anti-blood clotting activity of the test compounds in mice using measuring blood clotting time.

Methods: 3,4-dimethoxycinnamic acid is synthesized from malonic acid and 3,4-dimethoxybenzaldehyde as a starting material using ammonium acetate catalyst under microwave irradiation (960 Watt, 4 minutes). The purity of the synthesized compounds was tested by thin layer chromatography and a melting point determination. Structure identification was also carried out using UV-Vis, infrared, and proton NMR spectroscopy.

Results: The results showed that the synthesis of 3,4-dimethoxycinnamic acid could be carried out with the help of microwave irradiation in a 960-Watt oven for 4 minutes and resulted in a yield percentage of 39.98%. Its activity showed that 3,4-dimethoxycinnamic acid had anti-blood clotting activity with an ED30 value of 49 mg and had the same activity as acetosal (ED_{30} 68 mg).

Conclusions: The activity of 3,4-dimethoxycinnamic acid was 2.5-fold greater than cinnamic acid which had an ED_{30} value of 124 mg.

Keywords: Synthesis, cinnamic acid, 3,4-dimethoxycinnamic acid, anti-blood clotting, microwave irradiation.

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Systematic review: Potential phytochemical compound bark of *Parameria laevigata* on biofilm formation

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Abstract

Objectives: Infectious disease is one of the problems in the health sector that continues to grow from time to time. Microorganisms are able to differentiate and develop in complex ways to form new morphologies that grow on the surface known as biofilms. *Parameria laevigata* contains a variety of secondary metabolites so that it has potential as an anti-biofilm. The purpose of this study was to examine the effect of the compounds contained in the bark of *Parameria laevigata* in forming biofilms.
Methods: This systematic review research method is Systematic-Meta Analysis, which identifies research articles from journal databases including Academy Microsoft, Google Scholar, PubMed, and Science Direct. Meta-Analysis was used to analyzed, identified, and interpreted all the data in the articles that are served systematically.
Results: The results of the search for research articles using a specific search PRISMA guideline, found 28 research journals as primary data for systematic review research. The results of this systematic review showed that the bark of *Parameria laevigata* contains alkaloids, flavonoids, tannins, and saponins. Alkaloid has the ability to interfere with the components of peptidoglycan in bacteria. Flavonoids have able to inhibit the growth of microorganisms. Tannins have a role in influencing cell wall polypeptides so that the formation of cell walls becomes less than perfect. Saponins hydrolyze bacterial cell walls.
Conclusions: Bark of *Parameria laevigata* has the potent activity to develop as anti-microbial through inhibiting formation of biofilms mechanism.

Keywords: Biofilm formation, natural product, *Parameria laevigata*, phytochemical.

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Systematic review: Potential epigallocatechin-3-gallate (EGCG) phytochemical compound of *Camelia sinensis* as antibacterial

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Abstract

Objectives: Epigallocatechin-3-gallate (EGCG) is the major polyphenolic compound present in *Camelia sinensis* and is generally regarded as an effective antioxidant. Many studies can be found in the literature reporting the health benefits of several Camellia species, namely *C. sinensis*, *C. oleifera* and *Camellia japonica*. These species have been highlighted as possessing antimicrobial (antibacterial, antifungal, antiviral) and antitumoral activity and as being a huge source of polyphenols such as the catechins. Particularly, epicatechin (EC), epigallocatechin (EGC), epicatechin-3-gallate (ECG), and specially epigallocatechin-3-gallate (EGCG), the major polyphenols of green tea. This paper presents a detailed review of Camellia species as antibacterial activity. The aim of this study was to examine the effect of epigallocatechin-3-gallate (EGCG), the compounds contained in the leaf of *Camellia sinensis* as antibacterial.

Methods: This systematic review research method is Systematic-Meta Analysis, which identifies research articles from journal databases including Elsevier, Google Scholar, PubMed, and Science Direct. The results of the search for research articles using a specific search prism guideline, found 34 research journals as primary data for systematic review research.

Results: The results of this systematic review showed that epigallocatechin-3-gallate (EGCG), the compounds contained in the leaf of *Camellia sinensis* the major polyphenols. EGCG can inhibit the growth and biofilm formation of bacterial and interacts with other component(s) of the bacterial membrane aside to inhibit biofilm formation and damage biofilms. EGCG activity increases when given in combination with other antibacterial.

Conclusions: This review provide an alternative approach for the utilization of EGCG that may be used synergistically with conventional antibiotics to block bacterial adaptation and treat infections.

Keywords: epigallocatechin-3-gallate (EGCG), *Camellia sinensis*, antibacterial.

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Arcangelisia flava as a SARS-CoV-2 M[Pro] inhibitor: Molecular docking, ADME studies, and toxicity prediction

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Abstract

Objectives: Research to find potential inhibitors of SARS-CoV-2 M[Pro] is still ongoing, and several active compounds from medicinal plants show promising results. One of the often-studied plants is *Arcangelisia flava*, but its potential as an inhibitor of SARS-CoV-2 M[Pro] has not been known. This study aims to identify the active compound of *A. flava*, which has the potential as an inhibitor of SARS-CoV-2 M[Pro], through an *in silico* study.

Methods: Molecular docking was carried out on 11 major known metabolites of *A. flava* using AutoDock Vina 1.1.2 against the SARS-CoV-2 M[Pro] target receptor (PDB 6LU7) with remdesivir as a comparison compound. All the tested ligands were analyzed for their ADME profile using a combination of SwissADME and pkCSM. The toxicity profile of each ligand was then predicted by ProTox-II.

Results: The best docking results were shown by 6-hydroxyfibraurin with a difference in the free energy of binding 0.48 kcal/mol higher than remdesivir, while the highest similarity interaction with remdesivir was shown by berberine with 52.27%. All test ligands showed relatively similar ADME profiles and acceptable drug-likeness properties. However, berberine, columbamine, jatrorrhizine, and palmatine, were predicted to had lower LD_{50}. Also, berberine could be immunotoxic, cytotoxic, and toxic to aryl hydrocarbon receptors and mitochondrial membrane potential.

Conclusions: 6-hydroxyfibraurin has the potential to be developed as a SARS-CoV-2 M[Pro] inhibitor with acceptable ADME and toxicity profiles. Further *in vitro* and *in vivo* studies are needed to prove the activity of the compound.

Keywords: 6-hydroxyfibraurin, *Arcangelisia flava*, Covid-19, *In silico* study, SARS-CoV-2 M[Pro], toxicity.

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In-silico analysis of bioactive compounds from roselle's calyx (*Hibiscus sabdariffa* L) as antioxidant through inhibition of xantin oxidase: Molecular docking and ADMET prediction

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Abstract

Objectives: This *in silico* study aims to explore which of the bioactive compounds from aqueous extract of roselle's calyx were potential as antioxidant and predict the pharmacokinetics and toxicity (ADMET) profile of the selected compounds that showed high potency.

Methods: The structures and physicochemical properties of eleven test compounds were obtained using ChemDraw. The compounds were docked into xanthine oxidase or XO (PDB code: 3NVY) in docking simulation performed by AutoDockTools program. The ADMET profiles were predicted using pkCSM on line tools.

Results: Docking results showed 8 compounds have lower free energy than quercetin (ΔG^o= -9.783 kcal/mol) in binding interaction with XO. Quercetin-3-rutinoside, cyanidin-3-glucoside, and delphinidin-3-glucoside showed higher binding affinity than the other compounds. ADMET profiles revealed the six compounds could be absorbed from intestine (>30%). Almost all of 8 compounds showed moderate volume of distribution (Vd) except 3-caffeoyl-quinic acid which showed the lowest Vd (<-0.15) while all compounds were poorly distributed through blood-brain barrier (Log BB <-1). The compounds responsible for the inhibition of CYP1A2 were predicted to be gossypetin, cyanidin. All compounds were relatively safe according to their oral LD_{50} (>15g/kgBW of rat) but cyanidin-3-sambubioside was carcinogenic while 3-caffeoyl-quinic acid was hepatotoxic.

Conclusions: Based on the better binding interaction with XO and good ADMET profiles, quercetin-3-rutinoside, cyanidin-3-glucoside, and delphinidine-3-glucoside were proposed as potential antioxidant.

Keywords: antioxidant, docking, *in silico*, xanthine oxidase, ADMET, *Hibiscus sabdariffa*.

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Scoping review: Effectiveness of vitamin C as wound healing in burn injury

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Abstract

Objectives: This scoping review aims to analyze and summarize the evidence regarding the effectiveness of vitamin C as a wound healing therapy in burns injury.

Methods: The data sources were obtained using the electronic literature search of the PubMed database, DOAJ, CINAHL Database, Google Scholar, CrossRef, and Cochrane publication from 2010 to September 2020. The literature was then extracted based on inclusion criteria, namely research on burn injury and vitamin C application interventions, analyze the effectiveness of vitamin C in wound healing conditions on skin affected by burns, experimental or observational research, and literature in English or Indonesian. Literature review and narrative review were exclusion criteria.

Results: Results of identification of the initial total database obtained 1108 literature. However, after extraction based on inclusion criteria, 6 literatures were obtained consisting of four *ex-vivo* studies and two clinical trials. The effectiveness of vitamin C in the entire *ex-vivo* study was assessed using semi-quantitative analysis, SEM and a spectrophotometer. Meanwhile, clinical trial research uses BWAT which further uses statistics in analyzing results.

Conclusions: Overall, the results showed that vitamin C or ascorbic acid was effective in accelerate wound healing in burns. More studies are needed with other analytical methods, especially in finding and adjusting the correct concentration of vitamin C or ascorbic acid at various degrees of burns.

Keywords: burns, scoping review, vitamin C, wound healing.

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Scoping review: Effects of probiotics against the immune system in burn patients

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Abstract

Objectives: This scoping review aims to explore literature about the effects of probiotics on the immune system in burn patients and to identify gaps in the existing literature.

Methods: A systematic search was conducted in seven electronic bibliographic databases (PubMed, ScienceDirect, Scopus, Cochrane, EBSCO/CINAHL, DOAJ and other databases) to identify relevant peer-reviewed studies, with time limits from June 2005 until November 2020, using search terms with database-appropriate keywords. Articles were screened and assessed for eligibility.

Results: We identified 901 articles. Of these, 10 articles met inclusion criteria. In this Scoping Review, the proportion of probiotic combination types mostly used multi-strain probiotic combinations. The frequency and types of probiotic strains most often and widely used was *Lactobacillus spp.* (58%). The highest concentration of oral probiotics route used was in the total probiotic cell content of 10^9 CFU (42%) and duration of probiotic administration was 14 days (50%). Meanwhile, improvement of the immune system in burns has been shown by the laboratory outcome parameters (increased secretion of IgA, decreased serum CRP, IL-6, leukocytes and neutrophils), and also the clinical outcome parameters (improvement of GI imbalance, decreased mortality, decreased risk of SIRS/sepsis, and shortened LOS).

Conclusions: To perform the modulation of the immune system in burns, the optimal dose, strain and duration of probiotic administration has not been established or still varies widely. Therefore, more clinical studies are needed using placebos or controls to get better validity regarding the evidence of effectiveness and safety at various degrees of burns.

Keywords: probiotics, lactobacillus, monostrain, multistrain, immune system, burns.

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Pharmacist' perceptions, attitude, and barriers in the ability to provide service to patients with minor ailments in Sidoarjo Regency

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Abstract

Objectives: This study aims to determine pharmacists' perceptions, attitudes, and barriers in Sidoarjo Regency in providing services to patients with minor ailments.

Methods: A total of 120 Pharmacists who practice in pharmacies and have provided self-medication services were included in this cross-sectional study using random sampling method. Data was collected by distributing questionnaires via WhatsApp or visiting pharmacies from May to July 2021.

Results: The majority of pharmacists, as many as 119 (99.2%), had positive perceptions. Whereas for attitudes, the entire pharmacist, that was 120 pharmacists (100%) had positive attitudes, and most of the pharmacists, as many as 51 pharmacists (42.5%) had high barriers. From each category of barriers, namely internal and external barriers, two barriers were most felt by the pharmacist, namely the lack of knowledge possessed and the lack of data on the patient's medical history obtained.

Conclusions: The perceptions and attitudes of pharmacists in the ability to provide self-medication services at Sidoarjo pharmacists were included in the positive category. Meanwhile, pharmacists' barriers to providing self-medication services at Sidoarjo pharmacists were included in the high category.

Keywords: minor ailments, pharmacist, perception, attitude, barrier.

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Evaluation of leucovorin on 5-MTHF (5-Methyltetrahydrofolate) levels after high-dose methotrexate therapy in pediatric patients with acute lymphoblastic leukemia (ALL)

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Abstract

Objectives: One of the cytotoxicity of high-dose methotrexate (HD-MTX) is the occurrence of 5-MTHF depletion in the body. Leucovorin can be used to selectively "rescue" cells from the adverse effects of methotrexate. Leucovorin supplies the necessary cofactor blocked by methotrexate, enters the cells via the same active transport system as methotrexate. This study aims to evaluate the effectiveness of leucovorin in preventing 5-MTHF depletion post HD-MTX in pediatric patients with ALL consolidation phase.

Methods: A prospective observational study was conducted in the Hematology-Oncology Division Pediatric Department, Dr. Soetomo Teaching Hospital Surabaya. The blood serum sample was collected before hydration, 36 hours after hydration and HD-MTX administration and 90 hours after hydration and leucovorin use. The 5-MTHF levels were measured using ELISA Human 5-MTHF (5-methyltetrahydrofolate).

Results: 13 patients met the inclusion criteria with 19 cycles of chemotherapy. The 5-MTHF levels depletion reached 7.88 ± 3.69 ng/mL before hydration, 7.75 ± 2.52 ng/mL after hydration/HD-MTX administration, and 7.38 ± 3.75 ng/mL after hydration/leucovorin use. Based on the cut-off value of 5-MTHF levels, the percentage of patients who had 5-MTHF depletion were 84.2%, 100.0%, and 79.0%, respectively, before hydration, after hydration/HD-MTX and after hydration/leucovorin.

Conclusions: Leucovorin dosage of 10 mg/m^2 every 6 hours for five times administration had not been effective to prevent depletion of 5-MTHF levels after HD-MTX.

Keywords: Acute Lymphoblastic Leukemia; ALL; cancer; High-Dose Methotrexate (HD-MTX); leucovorin; 5-MTHF (5-methyltetrahydrofolate).

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Predictor factor of long COVID-19 on COVID-19 patients: An observational cross-sectional study in Indonesia

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Abstract

Objectives: Several COVID-19 patients have symptoms that persist for long term. As stated by WHO, symptoms of COVID-19 that persist after 2 weeks period since the onset of symptoms are referred to long COVID-19. The cases of long COVID-19 could occur in 30% of COVID-19 patients, which could affect the patient's quality of life. Limited information established regard the predictor factors that could affect the occurrence of Long COVID-19 cases, making it difficult to predict. This study aims to analyze the effect of predictor factors on the occurrence of long COVID-19.

Methods: The study was conducted in August 2021, engaged the entire population of Indonesian society. The study design is an observational cross-sectional study. The data were collected by filling out the g-form questionnaire, and a saturated sample technique used for sampling method. The study participants were COVID-19 survivors from Indonesian society who filled out the questionnaire, aged more than 17 years, while the exclusion criteria were participants with insufficient data. The data were processed by using SPSS 21 with ordinal regression test, with an alpha level of 5%.

Results: 101 samples were obtained with a distribution of 16 men (15.8%) and 85 women (84.2%). The results showed that comorbid status had a significant effect on the occurrence of long COVID-19 with a p-value of 0.000, with the power of effect is 0.05, meanwhile the age, gender, type of occupation, and vaccination status had no significant effect with p-value of 0.230, 0.210, and 0.323.

Conclusions: Predictor factor comorbid status had a significant effect on the occurrence of long COVID-19.

Keywords: COVID-19, long COVID-19, predictor-factor, public health.

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Satisfaction self home care of Covid-19 patient using telepharmacy services

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Abstract

Objectives: The impact of COVID-19 pandemic makes the hospital innovate using technology services, one of which is telepharmacy. Telepharmacy has the potential to improve COVID-19 outpatient through the use of telecommunications with self-home care patient. In July, 120 patients received telepharmacy services with teleconsultation with pulmonologist, pediatrics, internist, otorhinolaryngologic, and general practitioners. In August, telepharmacy patients was reduced to 39 patients. Evaluating outpatients with telepharmacy services by measuring satisfaction patients.

Methods: This program integrated with interprofessional doctor, pharmacy, nurse, driver and customer care unit. The satisfaction of patient depends on the multi-professional services. This research to evaluate the satisfaction COVID-19 outpatients with received telepharmacy services. Desain study are descriptive, non-experimental and study cross-sectional. Data collected 2 months dan the samples are 159 patients with patient surveys to evaluate patient satisfaction.

Results: 159 patients received telepharmacy ranged in age from 5-69 years, consisting of 90 women (56.6%) and 69 men (43.3%) with 78% satisfaction with telepharmacy services. Patients also reported telepharmacy services moderate levels of satisfaction and significant increased of quality telepharmacy of services.

Conclusions: The decrease of patients in August was probably due to a decrease of COVID-19 cases. Hospitals can improve the quality of telepharmacy services to increase patient satisfaction and visit telepharmacy patients.

Keywords: telepharmacy, satisfaction patient, COVID-19.

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Predictor factors of COVID-19 exposure: A cross sectional study on Indonesian communities

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Abstract

Objectives: Cases of COVID-19 in Indonesia are emerging. A patient's exposure to COVID-19 could be influenced by several factors, such as gender, age, type of occupation, comorbid status, and vaccination status. Individuals who have many predictor factors have a higher risk of being exposed to COVID-19. There are no studies that show the significance of predictor factors on COVID-19 exposure in Indonesia. The study aims to determine the effect of predictor factors on COVID-19 exposure therefore individuals with multiple predictor factors could be more alerted of COVID-19 exposure.

Methods: The study used a cross-sectional method with a population of all Indonesian communities. The study was conducted in August 2021, with data collection using a questionnaire through completing a g-form. The sampling process applied the saturated sample technique. The study's subjects were 776 Indonesian communities, aged more than 17 years, who complete the questionnaire. Whereas subjects with inadequate data are excluded from this study. The data processing utilizing SPSS 21 with binary logistic regression test, with an alpha level of 5%.

Results: The samples of 776 were obtained with a distribution of 134 men (17.3%) and 642 women (82.7%). The results showed that the occupation type and vaccination status had a significant effect on COVID-19 exposure with a p-value of 0.000 (OR 2.508; 95% CI 1.681-3.741) and 0.000 (OR 0.478; 95% CI 0.335-0.683), while the gender, age, and comorbid status had no significant effect on COVID-19 exposure with a p-value of 0.755; 0.190; and 0.518.

Conclusions: The predictor factors of occupation and vaccination status had a significant effect on COVID-19 exposure.

Keywords: COVID-19 exposure, predictor factors, public health.

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Evaluation of Covid-19 effectiveness among healthcare workers using Cascade analysis

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Abstract

Objectives: To overcome the Covid-19 pandemic, healthcare workers in Indonesia prioritized to be vaccinated. Healthcare workers with fully vaccinated status are still at risk of being infected with Covid-19 but will be less likely to develop the risk of severity, hospitalization, serious illness, and death compared to those who have not been vaccinated. The aim of this study is to analyze the incidence of Covid-19 in healthcare workers after complete vaccination.

Methods: The study was conducted in 2021, a cross-sectional research with all healthcare workers in Indonesia as participants. Inclusion criteria: Healthcare workers who have been fully vaccinated, ever experienced Covid-19 (2-4 weeks after vaccination) and filled out a complete questionnaire. The collected data were analyzed using the cascade method.

Results: Based on the 529 collected questionnaires, it can be conclude that the percentage of healthcare workers who have been fully vaccinated was 99%, the percentage of healthcare workers who have been fully vaccinated and then exposed to Covid-19 was 14%, the percentage of healthcare workers who have been fully vaccinated, exposed to Covid-19 and hospitalized was 4%, and the percentage of healthcare workers who have been fully vaccinated, exposed to Covid-19, hospitalized and ever experienced the long haul effect of Covid-19 was 0%.

Conclusions: Complete vaccinations on healthcare workers did not reduce the risk of being confirmed Covid-19 due to the very high risk of got infected at work, but the vaccination can reduce the severity and the risk of long haul Covid-19.

Keywords: Covid-19, healthcare worker, vaccination.

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Efffectiveness of the lowest cost options of anti VEGF therapy, bevacizumab, in patients with retinopathy of prematurity (ROP) treatment type 1 in Public Hospital Surabaya

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Abstract

Objectives: Retinopathy of prematurity (ROP), a retinal vascular disease of premature infants, remains one of the leading causes of childhood blindness. In ROP neovascularization occurs due to retinal immature and primarily caused by VEGF. Bevacizumab is the lowest cost of anti VEGF therapy and the most used in General Hospital Dr. Soetomo. It binds to VEGF and inhibits the binding of VEGF molecules to their receptors on the surface of vascular endothelial cells. Therefore, inhibition of VEGF activity may inhibit abnormal angiogenesis in retina. The study aim is to describe the risk factors and therapy outcome of bevacizumab.

Methods: Retrospectively and prospectively observational study were used using time limited sampling method within period 1 January 2015 – 30 April 2018. All data were analyzed descriptively.

Results: 35 eyes of 20 patients (11 males and 9 females) were included in the study. Most patients were 36- and 38-weeks' gestational age when receiving bevacizumab therapy. The main risk factors in ROP patients are low gestational age (90.0%), low birth weight (60.0%), and followed by oxygen therapy (55.0%). Patients with ROP stage III+ (76.0%) were the most diagnosed ROP receiving bevacizumab injection. The dosage used for intravitreal injection of bevacizumab in ROP patients is 0.625 mg/0.025 mL for once during hospitalization. 88.0% eyes shown positive results while 6.0% eyes worsen after bevacizumab injection.

Conclusions: Bevacizumab is effective for ROP with plus disease patients and this comply with BEAT-ROP.

Keywords: Bevacizumab, effectiveness, intravitreal, ROP, Surabaya.

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Validity and reliability test of mental health instruments during Covid-19 pandemic: Case study on Indonesian

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Abstract

Objectives: Mental health issues have become an important concern for the past year during the Covid-19 pandemic. Many studies have been carried out to determine the mental health of the affected community. Validity and reliability instrument are important components that must fulfill before collecting research data. This study aims to retest the validity and reliability of the combined instruments in mental health research.

Methods: This research is an analytic observational study with cross sectional design. The study was conducted in August 2021 and all Indonesian as research population. Data collection was obtained through three stages, i.e. collecting mental health questionnaires that had previously been tested for validity and reliability, combining questionnaires by taking several questions that were deemed appropriate and re-testing the questionnaire. The sample size in the study was 30 respondents with purposive sampling technique. Data analysis was done by Cronbach Alpha and Pearson Correlation test.

Results: The total number of relevant questions on the questionnaire obtained as many as 11 questions. The results of the re-validity test showed that from the 11 questions collected, there was 1 invalid question, i.e. question 7 with a calculated R-value greater than the R-table ($0.244 < 0.409$). The results of the reliability re-test on the questionnaire showed a p-value of 0.713.

Conclusions: Retest of the combined mental health research instrument showed that 1 question should be eliminated. The level of reliability on the instrument does not show significant difference because it is included in the high degree of reliability category.

Keywords: Covid-19, instrument, mental health, reliability, validity.

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Quantitative and qualitative analysis of antibiotics in the Intensive Care Unit (ICU): A literature review

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Abstract

Objectives: The aim of this study was to determine quality and quantity of antibiotic use in the Intensive Care Unit (ICU). Qualitative analysis is carried out by using Gyssens algorithm while quantitative analysis using defined daily dose (DDD)/100 patient-days or (DDD).

Methods: A literature review was conducted by searching articles through PubMed Central (PMC), ResearchGate, and Google Scholar with a range of publication years being the last 10 years.

Results: There are 25 articles used in this study, consisting of 21 articles with quantitative data and 4 articles with qualitative data. The most widely used antibiotics in the ICU were ceftriaxone with DDD value was 358.139 DDD/100 patients-days, meropenem 289.747 DDD/100 patient-days, and piperacillin-tazobactam 164.816 DDD/100 patient-days. Variation of antibiotics use in hospital correlated with several reasons such as interventions of physicians, patient conditions, length of stay, and policies in each hospital. In general, application of antimicrobial stewardship shows a decrease in the number of antibiotics use.

Conclusions: This study showed that use of antibiotics in the ICU is quite high. Therefore, apply the Antimicrobial Stewardship Program (ASP) important to reduce the incidence of antibiotic resistance.

Keywords: Antibiotic, ATC/DDD, Gyssens, Intensive Care Unit.

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Mental health during Covid-19 pandemic, impact patient characteristic: A cross-sectional study in Indonesia

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Abstract

Objectives: The Covid-19 cases are still ongoing with various Covid-19 variants. The Covid-19 situation can influence the patients' mental condition affecting their immunity level. This article aims to understand the mental health prevalence of Covid-19 survivors, including anxiety, sadness, fear, panic, and determine whether these factors are influenced by patients' characteristics, including gender, age, and work history.

Methods: The research method was observational, cross-sectional. Inclusion criteria: Indonesian people, ever experienced Covid-19 fill out a complete questionnaire through g-form. Questionnaires were tested for validity and reliability. Data were analyzed by logistic regression.

Results: A total of 175 respondents have participated, consisting of 84% women, 16% men. Work history includes health workers 75.4%, others 24.6%. The average age was 32 years. Respondents who have experienced anxiety were 32%, sadness 25.7%, fear 22.9%, and panic 14.3%. The results of logistic regression show that all characteristics have no significant effect on mental status of anxiety, fear, panic with p-values of 0.388, 0.893, and 0.166; 0.245, 0.691, and 0.353; 0.612, 0.410, and 0.828. However, from the test results, it is observed that gender has a significant effect on sadness mental conditions with a p-value of 0.027 with an OR value of 5.308 (CI = 1.204-23.399) with sadness percentage of female respondents (29.3%) while male ones (7.1%). Other characteristics, which were age and work history, have no significant effect on sadness mental conditions with p-values of 0.650 and 0.844.

Conclusions: The highest prevalence of mental disorders in Covid-19 patients was anxiety. The characteristics of people with Covid-19 have no significant impact on mental disorders, except for gender condition, that women tend to feel sadder than men.

Keywords: anxiety, covid-19, mental disorder, mental health.

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Increased knowledge through counseling and training regarding physical and mental health during the COVID-19 Pandemic

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Abstract

Objectives: The Covid-19 pandemic has lasted for more than one year and has affected all aspects of life, starting from the economic, social, educational aspects, especially health, both physical and mental health. There are various mental health responses in pandemic outbreaks. Activities such as quarantine, self-isolation, and keeping a distance have an effect on a person's physical and psychological health and trigger a person's reaction to the pandemic itself. For some people, misinformation, uncertainty, and fear of contagion may increase stress and anxiety, which can induce mass panic, so it is necessary to provide counseling and training to overcome problems related to physical and mental health during the Covid-19 pandemic.

Methods: This cross-sectional study was conducted in 2021, with data collection using a questionnaire through filling out a g-form. The research sample was obtained using the saturated sample technique. The inclusion criteria were all Indonesian people who filled out the pre-test and post-test questionnaires, while the exclusion criteria were samples that only filled out the pre-test or post-test. The data were processed using SPSS 21 and analyzed with the Wilcoxon signed-rank test.

Results: A total of 622 respondents participated in this study. The average score of the respondents before being given the counseling and training was 74.42 (SD 21.39). After being given the counseling and training, the average score of respondents increased to 78.30 (SD 15.90). The result of the Wilcoxon test was a p-value of 0.001, which indicates there was a difference in the level of knowledge before and after being given counseling and training.

Conclusions: The provision of counseling and training has an impact on the level of public knowledge about physical and mental health during the COVID-19 pandemic.

Keywords: mental health, public health, health care, COVID-19, knowledge.

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Application of ATC/DDD methodology to analyze antibiotic consumption in internal medicine department: A literature review

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Abstract

Objectives: Antibiotic resistance become a major problem due to its impact on higher medical costs, prolonged hospital stay, and increased mortality. Methicillin-resistance Staphylococcus aureus (MRSA), Extended-spectrum beta-lactamases (ESBL) and Vancomycin-resistant Enterococci (VRE) are threats in United States. Internal Medicine Ward has a high consumption on antibiotic particularly for gastroenteritis, typhoid, diabetic ulcer, urinary tract infection, and sepsis. A global action plan on antimicrobial resistance by WHO suggests ATC/DDD as a standard method to evaluate antibiotic usage quantitatively.

Methods: We conducted a comprehensive review of published studies on antibiotic consumption in Internal Medicine from 2006 to 2020. Seventeen studies met the inclusion criteria. We searched in PubMed, Research Gate, and Google Scholar using keyword "(Antibiotic OR Antimicrobial) AND DDD/100 AND Internal Medicine", "Antibiotic DDD in Internal Medicine Ward", "Antibiotic AND DDD/100 AND (Internal Disease OR Medical Unit)", "(Antibiotic OR antimicrobial) AND DDD/100 AND (evaluation OR consumption OR use OR surveillance) AND (internal medicine OR internal disease OR medical)".

Results: The most common antibiotics use in Internal Medicine were Penicillin with 101.48 DDD/100 bed-days, followed by Cephalosporine 11.21 DDD/100 bed-days and Fluoroquinolone 6.97 DDD/100 bed-days. Ceftriaxone, ciprofloxacin, metronidazole, gentamycin, benzylpenicillin, ampicillin, cloxacillin, and amoxicillin were the most commonly consumed antibiotics. Countries with high antibiotic resistance are Indonesia, Turkey, Italy, Israel, Germany, and Switzerland.

Conclusions: Penicillin, Cephalosporine, and Fluoroquinolone were the highest antibiotic use in Internal medicine. The intervention showed an improvement on a rational antibiotic consumption in hospital.

Keywords: Antibiotic, ATC/DDD, consumption, defined daily dose, internal medicine.

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The consistency of algorithm based dosing and INR monitoring as predictors of anticoagulation control quality in patients receiving warfarin

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Abstract

Objectives: Although direct oral anticoagulants have now been discovered, warfarin remains the only option for mechanical heart valves and atrial fibrillation with moderate to severe mitral stenosis. Many factors could contribute to the inability to achieve anticoagulation control including adherence to dosing algorithm and lack of International Normalized Ratio testing. Our preliminary study showed that anticoagulation quality of warfarin in our institution was suboptimal. This study aimed to analyze providers' consistency to dosing and International Normalized Ratio monitoring algorithm and their influence to anticoagulation quality.

Methods: It was an observational prospective study conducted at cardiology outpatient for 3 months. We used Pearson correlation to show the link between algorithm dosing consistency, International Normalized Ratio monitoring interval consistency and time in therapeutic range. We also carried out an analysis of linear regression in order to find out about predictors of time in therapeutic range.

Results: In this study, we obtained a number of 48 patients that fulfilled our criteria of inclusions. The average time in therapeutic range was below 65%. The consistency level to dosing algorithm and INR monitoring algorithm were 75.1 ± 26.9 and 48.2 ± 38.4 respectively. Analysis of linear regression showed that 66.6% of time in therapeutic range can be explained by two independent variables which were consistency of dosing algorithm and International Normalized Ratio monitoring algorithm.

Conclusions: In summary, our study suggests that consistency of dosing and International Normalized Ratio monitoring algorithm can improve anticoagulation quality of warfarin. A future experimental study is urged to verify the study findings.

Keywords: warfarin, dosing algorithm, INR monitoring, anticoagulation quality.

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Mapping of pharmaceutical service facilities (pharmacy) based on geographic information in Surabaya

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Abstract

Objectives: One of the crucial factors in implementing health services in Indonesia is the availability of health services by health care workers in every region in Indonesia. The need for accessibility to health facilities, including pharmacies, hospitals, health centers, health clinics, and others, increases due to population growth in Indonesia. The approach to mapping the geographic location of health facilities needs to be used as a policy reference in determining the achievement of national health care coverage. This study aims to see the distribution of pharmacy locations in Surabaya and its relationship with the population and epidemiological parameters.

Methods: Geographic information of pharmacies in Surabaya was collected from a database provided by the Indonesian Ministry of Health. Population data in 2019 included the number of district residents in the Surabaya area, the number of hospitals and clinics, the number of disease cases were obtained from the Central Statistics Agency of Surabaya.

Results: A total of 791 pharmacies are spread across 31 districts in the city of Surabaya. The ratio of pharmacies number to the population per district varies from 1 : 1426.71 to 1 : 49806.00. The number of pharmacies per district significantly correlates with the number of hospitals and clinics in each district of Surabaya ($r = 0.830$).

Conclusions: The distribution of pharmaceutical service facilities (pharmacies) in Surabaya is still uneven and centralized, following hospitals and clinics distribution in each district. The role of policymaker to use the location distribution map is needed to evaluate the licensing process for establishing new pharmacies.

Keywords: Pharmacy, geographic location, pharmaceutical services.

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Laboratory scale up of chitosan-*Aloe vera* hydrogel spray: Geometrical and mechanical approach

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Abstract

Objectives: Chitosan-*Aloe vera* hydrogel spray showed antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*, and provided a wound-healing effect. In pharmaceutical mass production, the scale-up stage is a transition from research production to industrial production, thus requiring intermediate stages that are larger than the research scale but smaller than the industrial scale. Scale-up results can be achieved by using several approaches. This research aim was to determine the effect of the geometric (volume) and mechanical (agitation time) dimensions on the physical characteristics of chitosan - *Aloe vera* hydrogel spray.

Methods: Chitosan-*Aloe vera* hydrogel was prepared in various volumes of 100 mL, 750 mL, and 3000 mL. The hydrogel was also prepared at a volume of 3000 mL with agitation speeds of 500 rpm for 15, 30, 45, and 60 minutes. All hydrogels were evaluated for the organoleptic, pH, viscosity, dispersion, and drying time.

Results: Chitosan-*Aloe vera* hydrogels had clear yellowish color with *Aloe vera* smell; average pH of 3.6; and drying time of 40 minutes. The average hydrogel spreadability was 9.0 cm. The viscosity slightly increased for the 750 mL compared to other volumes. From the one-way ANOVA analysis, it was concluded that the pH and viscosity were significantly different between 100 ml, 750 ml, and 3000 ml. The pH evaluation was also significantly different between 60 minutes with other agitation times.

Conclusions: From the study, it can be concluded that the geometric and mechanical dimensions did not affect chitosan-*Aloe vera* hydrogel spray organoleptic, drying time, and spreadability. However, there was a slight increase in the hydrogel viscosity from the scale-up mechanical approach.

Keywords: chitosan, *Aloe vera*, hydrogel, lab scale-up, geometric dimension, mechanic dimension.

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Strategic treatment of hydration in preventing kidney toxicity after high dose methotrexate in Acute Lymphoblastic Leukemia (ALL) patient

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Abstract

Objectives: This study aims to analyze the effectiveness of hydration in preventing kidney toxicity after administration of high-dose methotrexate in ALL pediatric patients.

Methods: The study used the prospective-observational method and was analyzed descriptively. Inclusion criteria were all patients aged 2 to18 years. They were in a consolidation phase of 2018 ALL Protocols (standard or high risk). The effectiveness of hydration was reflected by urine pH, creatinine serum (SCr), BUN, and serum electrolytes in pediatric patients with ALL given high dose methotrexate of 1000 mg/m^2.

Results: The results showed that urine alkalinization was achieved at pH 8.42 ± 0.69, and there was a significant difference in pH measurement after hydration 500 ml and 1000 ml (p <0.05). Serum creatinine (SCr) and BUN values showed there were no significant differences (p >0.05), Scr and BUN values were at the normal range. Scr values were 0.49 ± 0.13 before hydration and 0.53 ± 0.44 after hydration. BUN values 5.80 ± 2.75 before hydration and 9.51 ± 5.96 after hydration. However, there were an imbalance of serum electrolytes in patients after hydration administration, namely hyponatremia (100%), hyperkalemia (31.57%), hypokalemia (15.78%), hypercalcemia (5.265%), hypocalcemia (89.47%), hypermagnesium (84.21%) and hypomagnesium (5.26%). Electrolyte imbalance can be caused by aggressive hydration (hyperhydration), patient's nutrition problem, ALL progression, and the possibility of tumor lysis syndrome.

Conclusions: Hydration was effective in preventing kidney toxicity after high-dose methotrexate. However, hydration could also cause an electrolyte imbalance in the body. As a result, the closely serum electrolytes monitoring was needed after hyperhydration.

Keywords: acute lymphoblastic leukemia, cancer, hydration, kidney toxicity, serum creatinine.

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Formulation of spray gel oleum citri with combination of edible bird's nest as wound healing

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Abstract

Objectives: To determine the effect of variations in citri oleum levels combined with edible bird's nest on the effectiveness of wound healing *in vivo* in mice (*Mus musculus*). In addition, to determine the effect of antibacterial activity on the bacteria *Staphylococcus aureus* and *Pseudomonas aeruginosa*. As well as looking at the characteristics and stability of the physicochemical preparations.

Methods: The research method used is experimental by comparing the effect of variations in the levels of oleum citri (2%, 4% and 6%) combined with edible bird's nest 5% by testing the characteristics and physicochemical stability of the preparation. After that, an in vivo wound healing effectiveness test was conducted on mice, as well as the inhibition zones produced in bacteria by data analysis using One-Way ANOVA.

Results: Based on the results of statistical tests, the increase oleum citri content in the spray gel formulation has a significant effect on the characteristics of viscosity and pH. The results of the stability test using the freeze thaw cycling and real time methods have a significant effect on the pH value. The results of the inhibition zone diameter of testing the antibacterial activity on *Staphylococcus aureus* bacteria showed an average concentration of 2% 11.91 mm, 4% content 13.93 mm, 6% content 15.55 mm, positive control 18.08 mm, and negative control 8.16 ± 1.88 mm. *Pseudomonas aeruginosa* had an effect on the positive control ±14.65 mm and the level of 6% ±24.45 mm, while the levels of 2%, 4% and the negative control showed no antibacterial effect. Increasing the concentration of lime oil can increase the effectiveness of wound healing with the active ingredients of 6% lime oil and 5% edible bird's nest proved to be the most effective in wound healing.

Conclusions: Increasing the concentration of lime oil can increase the antibacterial effect and the effectiveness of wound healing. Also has a significant effect on the characteristics of viscosity and pH.

Keywords: Oleum citri, edible bird's nest, stability, wound healing, antibacterial.

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Potential of Kombucha leaves *Annona muricata* L. and flower *Clitoria ternatea* as amylase enzyme inhibitors and total sugar levels analysis

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Abstract

Objectives: Soursop leaf kombucha and telang flower contain organic acids such as acetic acid, gluconic acid, glucuronic acid, phenolic group compounds, which have potential as antioxidants, anti-inflammatory and antimicrobial, and antihyperglycemic. The purpose of this study was to determine the potential of soursop leaf and telang flower kombucha as an inhibitor of amylase enzymes and total sugar content.

Methods: Soursop leaf kombucha (*Annona muricata* Linn) and telang flower (*Clitoria ternatea*) in various comparisons of 5 minutes, 10 minutes and 15 minutes of boiling time, then analyzed for amylase inhibitors and total sugar content. The measurement results were recorded in tabular form. Data analysis used one-way ANOVA test with a significance of $p < 0.05$. Analysis using SPSS 23 software.

Results: In the combination of soursop leaf and telang flower kombucha with 5 minutes, 10 minutes, and 15 minutes of boiling time there was no significant difference for total glucose levels and in 5 minutes boiling on soursop leaf and telang flower kombucha there was higher amylase inhibitory activity than kombucha. soursop leaves and telang flowers by boiling for 10 minutes and 15 minutes.

Conclusions: The combination of soursop leaf kombucha and telang flower on 5 minutes of boiling has potential as an antihyperglycemic agent with amylase inhibitory activity.

Keywords: Kombucha, *Annona muricata* L, *Clitoria ternatea*, amylase, analysis of total glucose levels.

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Potential of Kombucha leaves *Annona muricata* L. and flower *Clitoria ternatea* as amylase enzyme inhibitors and total sugar levels analysis

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Abstract

Objectives: Hypernatremia and acid-base imbalance could probably correlate with severe Covid-19 as well as a higher risk of mortality. Remdesivir is one of the drugs of choice for severe Covid-19, yet potentially worsen the renal function leading to acute kidney injury. The aim of this study is to report the efficacy and safety of Remdesivir in severe Covid-19 with hypernatremia and acid-base imbalance.
Methods: This research reports clinical characteristic and treatment of a 32 years old man who was admitted to intensive care unit isolation ward Dr. Ramelan Navy Hospital, Surabaya, Indonesia on November 22, 2020. On admission, the patient had hypotension, hyponatremia, and acidosis state (base excess (BE) was-24.4 and pH of 7.136). Acid-base imbalance was recorded from the day of admittance onward daily. The past medical history of this patient was diabetes, but there was no record on the past medication history. Antivirus remdesivir had been started as a dose of 200 mg loading dose intravenously on day-1, and 100 mg since day-2 onward.
Results: On day-3 D dimer was significantly reduced from 17.650 to 2660, and BE which had been successfully corrected with natrium bicarbonate. On the next 4 days' patient had hypotension, hypernatremia, acute kidney injury, and probably cytokine storm with IL-6 of 510 consecutively. The patient passed away on November 28, 2020.
Conclusions: Remdesivir had been the first line antivirus in severe Covid-19, but less effective in hypotension, hypernatremia, and acid base imbalance condition due to their association with higher risk of death.

Keywords: hypernatremia, acid-base imbalance, covid-19, remdesivir, efficacy, acute kidney injury.

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Association between sodium intake and biopsychosocial factors with knee joint pain in osteoarthritis patient

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Abstract

Objectives: Osteoarthritis is a chronic, degenerative disease with unknown etiology. Sodium can induce the secretion of IL-17 which causes cartilage destruction, decreases the secretion of chondrocytes and proteoglycans and induces the secretion of inflammatory mediators. No one knows that sodium is a risk factor for osteoarthritis. The aim of this study was to determine the effect of sodium intake and biopsychosocial factors on knee joint pain in Osteoarthritis patients.
Methods: This research was an observational study conducted at the Orthopedic Outpatient Poly with a quantitative descriptive method with cross sectional sampling. Data were taken through interviews using the Semi Quantitative Food Frequency Questionnaire and Visual Analog Score. The data obtained were analyzed using Partial Least Square ($p \leq 0.05$). This research has obtained permission No. B/404/V/2021 from Level III Brawijaya Hospital.
Results: There were 40 subjects in the inclusion criteria. The analysis of biopsychosocial factors (age, sex, body mass index, education, occupation) that affect sodium levels and knee joint pain were education ($p < 0.00001$). Sodium levels also affect knee joint pain ($p < 0.00001$). The higher the level of sodium intake caused an increase in knee joint pain in osteoarthritis patients.
Conclusions: This study shows that there is a correlation between sodium intake, education and knee joint pain in osteoarthritis patients. It is necessary to reduce sodium intake in the diet of osteoarthritis patients.

Keywords: body mass index, sodium, osteoarthritis, semi quantitative food frequency, visual analog score.

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Molecular docking studies of flavonoid compounds from *Syzygium cumini* (L) Skeel. Var. Album with target of type 2 diabetes

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Abstract

Objectives: *Syzygium cumini* leaf extract have been reported to have antidiabetic activity. It contains various types of chemical constituents including terpenoids, tannins, anthocyanins, flavonoids and other phenolic compounds. This study aimed to predict the molecular target of chemical constituents of *Syzygium cumini* (L) Skeel Var. Album as well as study their interactions with macromolecular targets of an antidiabetic agent.

Methods: Molecular docking of ligands was studied using the AutoDock Vina program in PyRx, and the results are presented as binding affinity values (kcal/mol) of ligand against α-glucosidase. PyMOL is used to visualize the 3D molecular of docked conformation and ligand-protein interactions.

Results: Some flavonoids and other phenolic compounds from *Syzygium cumini* were reported in literature to have type 2 antidiabetic potential. Myricetin and fasciculiferin was found to inhibit α-glucosidase. However, they are predicted to have poor absorption properties. Myricetin and Rutin are predicted to have good interaction with glucokinase and showed good pharmacokinetic properties.

Conclusions: Bioactive compounds from *Syzygium cumini* Skeel Var. Album is potentially used as antidiabetic agent targeting α-glucosidase inhibitor. This information can be utilized for the design and development of potent multi-functional candidate drugs with minimal side effects for type 2 diabetes therapeutics.

Keywords: Antidiabetic, *Syzygium cumini* (L) Skeel Var. Album, α-glucosidase.

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Extract of *Acacia mangium* enhance anti-hepatitis C virus activity of simeprevir

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Abstract

Objectives: Medicinal plants was known to possess potential anti-hepatitis C virus (HCV) activities including *Acacia mangium*. Current study evaluated the combination treatment among ethanol extract of *A. mangium* and simeprevir, an NS3 protease inhibitor of HCV.

Methods: Leave of *A. mangium* was extracted with 70% of ethanol. The extract was concentrated and further evaporated to remove the remaining solvent till the constant weight. The various concentrations of extracts, simeprevir, and the mixture of extract and simeprevir were tested for anti-HCV activities. Anti-HCV activities was conducted by *in vitro* culture cells in hepatocyte cells of Huh 7it. The percentage inhibition of single treatment and combination was calculated and 50% inhibition concentration (IC_{50}) was determined by SPSS probit analysis.

Results: The result obtained that *A. mangium* possess anti-HCV activities with IC_{50} of 6.24 ± 0.3 µg/ml. Ethanol extract of *A. mangium* enhanced anti-HCV activity of simeprevir by increasing the activity up to 48.7%, with the IC_{50} value of combination was 9.44 ± 0.7 nM, while simeprevir alone revealed the IC_{50} value of 11.7 ± 0.8 nM.

Conclusions: These results suggest that extract of *A. mangium* may a potential candidate for complementary agents of anti-HCV treatment.

Keywords: *Acacia mangium*, Hepatitis C Virus, Simeprevir, Combination, Medicine, Health.

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NOD3 expression on green tea with EGCG intervention in rat middle cerebral artery occlusion model

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Abstract

Objectives: Stroke is one of the largest causes of death and disability in the world. There is an increase in oxidative stress during ischemic stroke. r-TPA is the preferred treatment, but only 2-8.5% of patients undergo this treatment because many patients are contraindicated or have passed the thrombolysis period. Green tea (*Camellia sinensis*) is a potential source of neuroprotection. The goal of this study is to determine the changes of NOD3 expression on the intervention of green tea with its active compound EGCG in microglia cell of *Rattus norvegicus* MCAO model.
Methods: Male *Rattus norvegicus* were randomly divided into six groups with 11 animals in each. Sham = healthy rats' group, P0 = control group, P1 = EGCG 10 mg/kgBW, P2 = EGCG 20 mg/kgBW, P3 = EGCG 30 mg/kgBW, P4 = green tea extract 'Meditea' 30 mg/kgBW. The intervention was given for seven days, once a day. Then we perform brain tissue for IHC examination. The number of NOD3 expressions is expressed in Allred score. For the statistical analysis, we perform a descriptive analysis, the Kolmogorov-Smirnoff test, the Independent sample T-test, and the Pearson test.
Results: The expression of NOD on EGCG and green tea extract intervention is decrease. The significant different in NOD3 expression started at 10 mg/kgBW treatment ($p = 0.000$). There is correlation between NOD3 and green tea with its active compound EGCG ($r = -0.330$; $p = 0.007$).
Conclusions: Green tea, with its active compound EGCG decreases NOD3 expression, so it might represent the treatment of ischemic stroke.

Keywords: EGCG, green tea, ischemic stroke, microglia, NOD3.

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In silico study of polyelectrolyte complex formation as an approach to chitosan-alginate microparticles development

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Abstract

Objectives: Chitosan-alginate microparticle is one of the most widely used drug delivery systems, which can control drug delivery. Chitosan and alginate can form a polyelectrolyte complex (PEC) where its characteristics are affected by the concentration of chitosan and alginate. The optimization of formulas to produce complexes with the desired characteristics and release was often costly and time-consuming. An in silico molecular docking is a computational study that can predict the interaction pattern between two molecular structures. The approach is expected to cut resources used in conventional experiments. The objective of this study was to predict the interactions and the binding energy between various numbers of chitosan monomers (glucosamine) and alginate monomers (mannuronic/guluronic acid).

Methods: In this study, the flexible ligand-rigid receptor docking was performed via AutoDock followed by Discovery Studio Visualizer to visualized the bonds formed. The glucosamine monomer numbers of 1; 2; 3; 4; 5 and the mannuronic-guluronic acid numbers of 2; 4; 6 were used.

Results: The result showed that the different numbers of glucosamine and mannuronic-guluronic monomers affected binding energy, number of bonds, and ionic bonds distances. The interaction of the glucosamine : mannuronic-guluronic with ratio 5:6 had the smallest binding energy. The bonds formed were ionic bonds and hydrogen bonds.

Conclusions: The *in silico* studies showed that the difference in the glucosamine and the mannuronic-guluronic number affected the binding energy of the PEC and the bonds numbers.

Keywords: alginate, chitosan, *in silico*, molecular docking, polyelectrolyte complex.

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QSAR of acyl pinostrobin derivatives as anti-breast cancer against HER-2 receptor and their ADMET properties based on *in silico* study

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Abstract

Objectives: Pinostrobin is a compound with potential anti-breast cancer activity, but its activity is lower than the drugs used clinically. Modifying pinostrobin to form 9 acyl pinostrobin derivative (AP1-AP9) is a method that changes physicochemical properties to affect the activity and ADMET properties. This study aims to predict the anti-breast cancer activity of pinostrobin and acyl pinostrobin derivatives against HER-2 receptor by molecular docking, obtain the most influential descriptor by QSAR study, and predict ADMET properties of these compounds.

Methods: The molecular docking was using MVD on the HER-2 receptor (5JEB.pdb). The parameters observed were the Rerank Score (RS) and the amino acid residues. The physicochemical properties (logP, total energy, and molecular weight) for the QSAR study were determined using ChemDraw and Chem3D. The QSAR study was carried out using SPSS. Prediction of ADMET properties was determined using the pkCSM.

Results: The molecular docking result showed that all acyl pinostrobin derivatives have a lower RS than pinostrobin. The lowest RS was indicated by pinostrobin nonanoate (AP8) with a value = -108.156 kcal/mol. The most influential descriptor in the QSAR study was the molecular weight. The results of this study also showed that the ADME properties of acyl pinostrobin derivatives were mainly better than pinostrobin, and all derivatives were also less toxic than pinostrobin.

Conclusions: These results indicate that acyl pinostrobin derivatives, especially pinostrobin nonanoate (AP8), can be further synthesized as anti-breast cancer by considering the QSAR study's best equation.

Keywords: *in silico* study, acyl pinostrobin, breast cancer, QSAR, ADMET prediction.

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The effect of green tea with EGCG active compound in enhancing the expression of M2 microglia marker (CD206)

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Abstract

Objectives: Stroke is a neurological deficit due to vascular disorders. The first-line defense against brain injury is microglia. M2 microglia are activated by anti-inflammatory cytokines, which upregulate CD206. Green tea (*Camellia sinensis*) is very abundant in EGCG as an anti-inflammatory. This study aims to discover green tea's effect with its active compound EGCG in increasing CD206 expression.

Methods: Mice were divided into six groups; a negative control group (Sham), positive control group (P0), MCAO mice given 10 mg/kg BW EGCG (P1), 20 mg/kg BW EGCG (P2), 30 mg/kg BW EGCG (P3) and 30 mg/kg BW standardized green tea extract (P4). Immunohistochemical methods measured CD206 expression. The expressions were scored in Allred score. Statistical analysis was used are Descriptive test, Levine test, the Kolmogorov-Smirnoff test, Independent Sample T-Test, the Pearson test.

Results: We found a significant difference in CD206 expression between Sham to P0, P1, P2 ($P < 0.05$). Meanwhile, P3 and P4 show no significantly different results ($P > 0.05$). Compared to P0 group, starting from P2 group has shown a significant difference ($P < 0.05$), as well as P3 and P4. There is also a significant correlation between variables ($P < 0.05$). The correlation is positive.

Conclusions: Green tea with EGCG active compound enhances CD206 expression as an M2 marker.

Keywords: CD206, EGCG, M2, MCAO, standardized green tea extract.

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Synergistic and efflux pump inhibitory activity of cocoa (*Theobroma cacao* L.) and antibiotics on *Salmonella enterica serovar* Typhi strains

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Abstract

Objectives: To evaluate the influence of extraction solvents on efflux pump inhibitory activity of *Salmonella enterica serovar* Typhimurium of the cocoa (*Theobroma cacao* L.).

Methods: Firstly, the efflux pump resistance of *S. Typhimurium* was detected by inhibitors of pumps efflux (EPIs). Antibacterial activities of ethyl acetate, acetone, and ethanol extracts exhibited against *S. Typhimurium* with minimum inhibitory concentration values was 0.1% combined with gold antibiotic standards.

Results: All the extracts increased the sensitivity of ciprofloxacin, only ethanol extract on ampicillin. However, none of the extracts were able to improve chloramphenicol and tetracycline sensitivity.

Conclusions: Our study highlights the potential of these extracts of the cocoa as drug EPIs.

Keywords: Efflux pumps inhibitors, Multi drug resistance, solvent.

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Construction of gene encoding LL37 (pJ411_LL37) and its expression in *Escherichia coli* BL21(DE3)

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Abstract

Objectives: LL-37 is an antimicrobial protein expressed by the CAMP gene in humans. This protein has antibacterial, antiviral and anticancer activity. For research purposes, a recombinant LL-37 was made.
Methods: The gene encoding recombinant LL-37 was constructed with pJ411 expressed in *E. coli* BL21 (DE3) using IPTG as an inducer and was designed to be purified by Ni affinity chromatography so that the residue histaq was added to the N terminal. The pJ411_LL37 was transformed into *E. coli* BL21(DE3). The transformed plasmid was isolated and sequenced. Then, colony was grown for 24 h at 37ºC for making a growth curve. Afterward, pJ411_LL37 was expressed as intracellular protein using 0.5 mM IPTG with induction time was 4 h at 37ºC. The expressed protein as soluble and insoluble form was characterized with 15% Tricine SDS PAGE gel.
Results: pJ411_L37 was transformed in *E. coli* BL21 (DE3) and confirmed containing gene encoding LL37 from gene sequencing result. Gene encoding LL37 was expressed in *E. coli* BL21 (DE3) using 0.1; 1; 2 mM IPTG with induction time i.e. 4 h. The LL37 recombinant was successfully purified using Ni-Affinity Chromatography with concentration 0.59 mg/ml.
Conclusions: Gene encoding LL37 protein (pJ411_LL37) was successfully expressed and purified with Ni-Affinity Chromatography.

Keywords: pJ411_LL37, construction, transformation, expression, purification.

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Dissolution profile of fast disintegrating tablet (FDT) Graptophyllum leaf extract (*Graptophyllum pictum* (L.)Griff) with Ac-Di-Sol as superdisintegrant

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Abstract

Objectives: Graptophyllum leaves contain flavonoids which provide medicinal benefits as an analgesic. In order to get an analgesic effect quickly, one dosage form that can be made is Fast Disintegrating Tablet (FDT). FDT tablets must disintegrate quickly when in contact with saliva in the mouth in a limited amount so that in the formulation an additional ingredient is required in the form of a superdisintegrant. In FDT preparations, it is necessary to carry out a dissolution test because after dissolving in the FDT saliva it will enter the digestive tract in the form of small particles and release the active substance quickly from the preparation.

Methods: Fast Disintegrating Tablet (FDT) Graptophyllum Leaf Extract was prepared by dry granulation method with concentration of Ac-Di-Sol 3% (F1) and 5% (F2). The tablet evaluation included hardness, friability, invitro dispersion time, weeting time, absorption ratio, flavonoid assay. The dissolution test used 500 ml of phosphate buffer pH 7.4 as much as 500 ml, type 2 device (paddle) with a stirring speed of 100 rpm with sampling time intervals of 5, 10, 15, 20, 25 and 30 minutes.

Results: The result shows increasing concentration of Ac-Di-Sol will decrease hardness tablet, friability, wetting time and invitro dispersion. The results of statistical analysis of the dissolution test of all FDT formulas for Graptophyllum leaf extract did not significantly differ (p 0.337 >0.05).

Conclusions: FDT Graptophyllum leaf extract gave the best dissolution results in the 15th minute with a concentration of 93.15 ± 0.58% flavonoids (F1) and 94.48 ± 0.55% (F2).

Keywords: Ac-Di-Sol, dissolution, fast disintegrating tablets.

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Determination of Non-Specific and Specific Parameter Values of Crude Drug and 70% Ethanol Extract of *Elaeocarpus serratus* L. Leaf from Baung Forest, Pasuruan

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Abstract

Objectives: This study aims to obtain the standard parameter values of crude drug and 70% ethanol extract *Elaeocarpus serratus* L. grown in Baung Forest, Pasuruan.

Methods: The method was determined to Indonesian Herbal Pharmacopeia book, and determination of total flavonoid content was calculated as rutin using a spectrophotometer.

Results: The macroscopic test can be seen as the type of single leaf, having an elliptical leaf shape with shallow serrated leaf edges. In the microscopic, the leaves of *Elaeocarpus serratus* L. have identification fragments such as transport file with ladder thickening, unicellular trichomes with glandular, prismatic calcium oxalate, and anomocytic stomata. The result standard parameters of crude drug *Elaeocarpus serratus* L. leaf were 6.88±0.10% of water-soluble matter, 5.58±0.08% of ethanol-soluble matter, 0.29±0.00% of total flavonoid content, 4.54±0.05% of total ash content, 1.55±0.005% of acid-insoluble ash content, 13.84±0.27% of loss on drying, and 0.04±0.00% of essential oils content. The standard of 70% ethanol extract of *Elaeocarpus serratus* L. leaf were 60.37±0.59% of water-soluble matter, 51.68±0.40% of ethanol-soluble matter, 1.26±0.005% of total flavonoid content, 5.27±0.10% of total ash content, 0.46±0.005% of acid-insoluble ash content, 17.46±0.33% of loss on drying, 0.50±0.00% of essential oils content, and 6.87±0.07% of moisture content. Levels of heavy metal contamination of extracts, namely lead levels of <0.0164 mg/Kg, cadmium of <0.0277 mg/Kg, mercury of <0.0003 mg/Kg, and Arsenic 0.006 mg/Kg. Levels of microbial contamination of the extract, namely the total plate number of 2.5×10^2 colonies/g, and the number of yeasts <10 colonies/g. Meanwhile, pathogenic microbes such as *Escherichia coli*, *Salmonella spp*., *Pseudomonas aeruginosa*, and *Staphylococcus aureus* all showed negative results.

Conclusions: As the standard parameters of crude drugs and 70% ethanolic extract of *Elaeocarpus serratus* L. leaves are not yet included in any formal monograph in Indonesia, the values of parameters reported in this study can be used as the reference of the standard quality parameter for those materials.

Keywords: standards parameters, *Elaeocarpus serratus* L., total flavonoid content.

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First report of *Entamoeba spp*. in long tailed macaque (*Macaque fascicularis*) in Baluran National Park, Indonesia

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Abstract

Objectives: *Entamoeba spp*. is one of the most common protozoa in humans and non-human primates. Several species of Entamoeba are considered as pathogenic and one of them has become a major public health concern. Contact between humans and long-tailed macaques in Baluran National Park has become more frequent in the last 10 years due to the habit of tourists providing food. This condition increases the potential of zoonoses between humans and long-tailed macaques. Aims of this study is to determine the diversity species of *Entamoeba spp*. and the potential zoonotic from the long-tailed macaque in Baluran National Park.

Methods: In this study, 100 Fecal samples were collected from long-tailed macaques from Baluran National Park and examined both morphological and molecular examination with Entamoeba genus specific primer. Positive samples were continued examined for the presence of 7 Entamoeba species by PCR amplification of the SSU rRNA gene.

Results: It was found that 53% (53/100) of the samples were identified as *Entamoeba spp*. Four Entamoeba species were identified, *Entamoeba coli* 72.9% (42/53), *Entamoeba chattoni* 56.6% (30/53), *Entamoeba hartmanni* 7.5% (4/53), and *Entamoeba moshkovskii* 13.2% (7/53), and among these, 50.9% (27/53) were mixed infections.

Conclusions: The current study revealed the prevalence and diversity of Entamoeba species in long-tailed macaques in Baluran National Park. The risk of zoonosis transmission in the region needs to be closely monitored.

Keywords: *Entamoeba spp*., long tailed macaque, zoonosis, Baluran National Park, public health.

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Screening antimicrobial activity of randu flower honey (*Ceiba pentandra*) from Sidoarjo

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Abstract

Objectives: Every year Indonesia can produce about 2000 tons of honey. Various kinds of honey are produced, one of them is monofloral honey from randu flowers (*Ceiba pentandra*). Randu honey has a clear brownish yellow color, acid pH, sweet and sour taste. The main content in honey is in the form of invert sugar and the rest is in the form of phenolic compounds, vitamins, organic acids with different levels depending on the type of bee, climatic conditions, and source of nectar. The content of polyphenols, hydrogen peroxide, and methylglyoxal in honey are known to be factors that cause honey to have antimicrobial activity. The purpose of this study was as an initial screening to determine the antimicrobial activity of randu honey from Sidoarjo.

Methods: Antimicrobial activity tests were carried out using well diffusion method. The test bacteria used were *Staphylococcus aureus* ATCC 6538, *Escherichia coli* ATCC 8739, and Extended Spectrum Beta-Lactamase (ESBL) bacteria, while *Candida albicans* was used for antifungal testing. The positive control for the antibacterial and antifungal tests respectively was streptomycin and ketoconazole. Antimicrobial activity was indicated by the presence of an inhibitory zone around the well. The inhibition zone diameter data were then analyzed statistically using one-way ANOVA.

Results: The average diameter of the inhibition zone against the bacteria tested for *Staphylococcus aureus* ATCC 6538, *Escherichia coli* ATCC 8739, ESBL was 13.73+0.65 mm; 15.13+0.78 mm; 15.15+0.40 mm, respectively. While the average diameter of the inhibition zone against *Candida albicans* was 18.90+0.21 mm.

Conclusions: Randu honey has the greatest antimicrobial activity against *Candida albicans*.

Keywords: antimicrobial, cotton flower, honey, screening.

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Anti-diarrheal activity of guava leaf ethanol extract (*Psidium guajava* L.) nanosuspension against *Escherichia coli* bacteria

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Abstract

Objectives: Diarrhea is one of the diseases with a high rate of pain and death in various countries, one of which is Indonesia that needs serious and maximum treatment. One of the bacteria that causes diarrhea is *Escherichia coli*. One plant that can be utilized in the treatment of diarrhea is guava leaves (*Psidium guajava* L.) because of their tannin content. To facilitate the use of guava leaves (*Psidium guajava* L.) as a drug, formulations can be made in the form of nanosuspension preparations. Objectives: to find out the activity of guava leaf extract (*Psidium guajava* L.) as an anti-bacterial against *Escherichia coli*, the anti-bacterial activity of guava leaf extract (*Psidium guajava* L.) in nanosuspension, knowing the characterization of guava leaf extract nanosuspension (*Psidium guajava* L.).
Methods: The methods used in the manufacture of nanosuspension are ionic glassing and its characterization.
Results: The characterization of guava leaf nanosuspension (*Psidium guajava* L.) with the best formula of 0.01% results in a particle size of 245.7 nm, the polydispersity index of 0.406, and zeta potential +26.9 mV, with Minimum Bland Concentration (KHM) of guava leaf ethanol extract at a concentration of 1% has a bland force of 4.05 mm, and at the nanosuspension extract of guava leaves (*Psidium guajava* L.) the concentration of 0.01% indicates a bland zone value of 11.45 mm.
Conclusions: Guava leaf extract (*Psidium guajava* L.) was successfully developed in nanoemulsion preparations with good anti-diarrheal characteristics and activity.

Keywords: Anti-diarrheal, guava leaf ethanol extract, ionic gelation method, *Escherichia coli*.

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The effect of hesperetin concentration on physical characteristics of TPGS-poloxamer P84 mixed micelles and release profile of hesperetin

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Abstract

Objectives: The use hesperetin as an anti-cancer has problems related to its poor solubility in water, so a mixed micellar system TPGS – Poloxamer P84 (1:4) was developed to overcome this problem. The aim of this study is to investigate the effect of loaded hesperetin concentration on the physical characteristics and hesperetin release from the mixed micelles.

Methods: The mixed micelles of TPGS – Poloxamer (1:4) were prepared using the thin film hydration method. The micelles formed were tested for physical characteristics such as particle size, CMC, entrapment efficiency, and drug loading. The *in vitro* release of hesperetin from TPGS/P84 mixed micelles was monitored in a phosphate buttered saline (PBS) pH7.4 using a dialysis bag.

Results: The results of the micelle particle size ranged from 17.07 to 20.37 nm, it had a low CMC value of 0.0029% w/v, and the maximum entrapment efficiency of 98.45%. The entrapment efficiency of the micellar system decreased with increasing hesperetin concentrations of 4% and 8%. From the in vitro drug release test, it was found that in 24 hours only 49.15 ± 0.72% hesperetin was released from the mixed micelles of TPGS – Poloxamer (1:4).

Conclusions: In conclusion, increasing hesperetin loaded in mixed micelles resulted in micelle particle size with narrow differences and increased the amount of hesperetin loaded. The entrapment efficiency reached optimum at the 2% hesperetin loading concentration. The use of TPGS and Poloxamer P84 mixed micelles in ratio 1: 4 can provide a slower release of hesperetin.

Keywords: mixed micelles, TPGS, poloxamer P84, physical characteristic, drug release.

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Effect of green tea (*Camellia sinensis*) with its active compound EGCG supplementation on BDNF levels in acute thrombotic infarct stroke patients: a pilot study

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Abstract

Objectives: To determine the mean difference of (Brain-derived neurotrophic factor) BDNF levels in acute thrombotic infarct stroke patients who received green tea (*Camellia sinensis*) therapy with the active compound EGCG.

Methods: This study was a double-blind, randomized, placebo-controlled trial. Twenty-nine participants who met the inclusion criteria were randomized into two groups supplemented with green tea or placebo along with the main therapy of stroke for 14 days. Each patient in the treated group received 350 mg green tea (*Camellia sinensis*) with its active compound EGCG daily. Venous blood samples were drawn at first day onset of stroke and day 14 to evaluate serum BDNF level.

Results: 29 participants, 58.6% males and the median age was 57 (35-77) years old. Among the subject 93.1% hypertension, 6.9% cardiac disease, 20.7% type-2 diabetes mellitus, and 3.4% hypercholesterol. Smoking and alcohol were found in 34.5% and 3.4% of the participants, respectively. The baseline of BDNF rate before intervention was 0.81 (0.37-3.55) in control group and 1.14 (0.43-7.62) in treatment group. After the intervention BDNF rate in control group decreases to 0.72 ± 0.6 while in the treatment group it increases to 2.32 ± 2.21. There is significant different of mean serum BDNF level between two groups with P value 0.001. On the other hand, the difference of delta NIHSS in day 14 was significant with p=0.023.

Conclusions: Extract green tea significantly increase mean serum BDNF level.

Keywords: Green tea, EGCG, BDNF.

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In vitro acetylcholinesterase inhibitory activity of isoagelasine C isolated from a marine sponge *Agelas nakamurai*

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Abstract

Objectives: Alzheimer's disease (AD) is a neurodegenerative disorder, which is the most common cause of dementia. One of the strategies for treatment of AD is the use of acetylcholinesterase inhibitors (AChEi) as cholinergic deficiency is a common feature in the early stage of AD and in patients with mild cognitive impairment. The oceans with their unique and wide range of biodiversity, producing unusual metabolites, emerges as a good candidate for new therapeutic agents, including as acetylcholinesterase inhibitor. In our previous study, the methanolic extract of *A. nakamurai* gave potency as AChEi. This study aims to isolate and characterize compound with acetylcholinesterase inhibitory activity from *A. Nakamurai*.

Methods: The isolation of isoagelasine C was carried out based on bioassay guided isolation procedure. The structure of isoagelasine C was determined based on ^{1}H and ^{13}C NMR spectroscopy and mass spectrometry analyses. The specific rotation of the compound was also measured to determine the configuration. The acetylcholinesterase inhibitory assay was conducted by using the modified Ellman's method.

Results: Isoagelasine C was isolated as a major peak in the HPLC profile at a rt 44 min. The UV profile of the isolated compound showed strong peaks at 210 and 269 nm, which suggested the present of a pyrrole-2-carbonyl ring. This data was further supported by ^{1}H NMR and ^{13}C NMR spectra. The sample exhibited a molecular ion at m/z 422.3280 [M]$^+$ in mass spectrometry. The isolated compound showed [α]^{20}D +28.0 (MeOH, c 0.25). These data are similar to that reported for a diterpene alkaloid, isoagelasine C. The isolated compound inhibited AChE enzyme with IC50 value of 30.68±1.30 µg/mL.

Conclusions: The diterpene alkaloid, isoagelasine C from *A. nakamurai* can be a good candidate for acetylcholinesterase inhibitor.

Keywords: Alzheimer's disease, *Agelas nakamurai*, isoagelasine C, acetylcholinesterase inhibitor, marine sponge.

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Diabetic gangrene healing by *Stichopus variegatus* and *Allium sativum* extract combination in emulgel in white rats

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Abstract

Objectives: Diabetic gangrene is the chronic complications of diabetes mellitus caused by neuropathy, vascular disorders, and bacterial infection of *Staphylococcus aureus*. Gold sea cucumber (*Stichopus variegatus)* was known to have a growth factor to stimulate fibroblast proliferation so gangrene healing occurs faster. Garlic (*Allium sativum*) was known to have an antibacterial effect. The aim of this study was to determine the effect of *Stichopus variegatus* and *Allium sativum* extracts combination in emulgel affected the number of neoangiogeneses, fibroblasts, and collagen density in white rats with diabetic gangrene.
Methods: Carrageenan was injected subcutaneously into the plantar area of the hind leg to induce inflammation in diabetic rats. After that, hindlimb incised and *Staphylococcus aureus* was injected to trigger gangrene. White rats with diabetic gangrene were divided into 4 groups: positive control, F1 (emulgel base), F2 (gold sea cucumber extract emulgel), F3 (combination of golden sea cucumber and garlic extract). Observations were made for 7 and 14 days.
Results: The number of angiogenesis and fibroblast after emulgel application (F2 and F3) for 7 and 14 days increased significantly and had no differences with control positive for fibroblast, and more than control positive for angiogenesis. Collagen density also increased significantly after application F2 and F3, give the differences significantly and more than the positive control.
Conclusions: The emulgel of Golden *Stichopus variegatus* and *Allium sativum* extracts combination is effective to accelerate the diabetic gangrene healing process by significantly increase the number of neoangiogenesis, fibroblasts, and collagen density.

Keywords: *Allium sativum*, collagen, diabetic gangrene, fibroblasts, *Stichopus variegatus*, neoangiogenesis.

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Evaluating patients' perception and satisfaction on community pharmacists' services in Yemen

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Abstract

Objectives: This current study evaluates satisfaction and perception regarding Yemeni community pharmacists' pharmaceutical services toward patients in their society study.

Methods: This cross-sectional study was conducted in Sana'a, Yemen, from April to May 2020, for 220 patients who visited several community pharmacies distributed in different Sana'a places. A questionnaire was designed along with their demographic data to evaluate these patients' satisfaction and perception towards the services provided by community pharmacists.

Results: The patient's responses were interpreted as percentages. In this study patient responses and perceptions were very positive regarding community pharmacists being experts in dispensing and using drugs and providing information about side effects, interactions, drug-related problems, and how to solve them. They had a poor perception of pharmacists' ability to treat mild illnesses and awareness of various public health issues. Patient satisfaction was good about community pharmacists in the gentle way and simple language in which pharmacists deal with patients. On the contrary, their satisfaction was lower community pharmacists' expectations about the time pharmacists spend with them and the privacy that pharmacists maintain during their discussion and dispensing of drugs.

Conclusions: It is to conclude that patients have a very positive perception and expectation towards the pharmaceutical care services provided by community pharmacists with reservations in some aspects such as counseling, treating mild diseases, and the time and privacy that the pharmacist maintains.

Keywords: Community pharmacists, perception, satisfaction, pharmaceutical services.

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Comparative analysis of nitric oxide production of Pulutan (*Urena lobata*) leaf fraction with the removal of chlorophyll on rat hepatocyte culture

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Abstract

Objectives: The study aims to examine effect of chlorophyll removal of *Urena lobata* leaf fraction on nitric oxide production using rat hepatocyte culture.

Methods: Ethanolic extract of *U. lobata* leaf was fractionated by partition with ethyl acetate solvent. The chlorophyll of the fraction was removed and some in its original form. Nitric oxide (NO) production was measured in the presence of fraction in the medium for interleukin (IL)-1β- treated rat hepatocyte culture using the Griess method. The half-maximal inhibitory concentrations (IC_{50}) were determined (n=3) for at least three different concentrations.

Results: Chlorophyll removal of the fraction increased NO level about 70% compared to without removed. Ethyl acetate fraction of *U. lobata* (IC_{50}=74.9 ppm) inhibit NO production stronger than fraction with chlorophyll removed (IC_{50}=129.13 ppm). Chlorophyll removal is useful to facilitate isolation of active compound due to they are known as disruptor. However, their activity to suppress NO as pro-inflammatory mediator is also disappeared as a result of the process.

Conclusions: The removal of chlorophyll in ethyl acetate fraction increased NO production and reduced their activity to inhibit NO.

Keywords: chlorophyll, fraction, inflammation, nitric oxide, *Urena lobata*.

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Correlation between medication adherence and quality of life of hypertensive patients

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Abstract

Objectives: Hypertension is a condition that requires long-term therapy. Adherence is needed for the success of a therapy. One of the important criteria for evaluating the success of a therapy is the quality of life of the patient. The objective of this study was to determine the correlation between medication adherence and quality of life of hypertensive patients in Primary Health Care Centre in Surabaya.

Methods: This study was designed cross sectional. Data collection was done by using Adherence to Refills and Medication Scale (ARMS) questionnaires to measure patients' medication adherence and Assessment of Quality of Life (AQoL-4D) questionnaires to measure patients' quality of life.

Results: A total of 70 patients from 15 Primary Health Care Centre were included in the study. Results showed that both the total score of adherence and quality of life ranged from 12 to 28 with a median value of 17 and 16 respectively. The Spearman's correlation test sought to obtain the significant correlation between medication adherence and quality of life with p value 0.0001 and r = 0.713. This means there was a significant correlation between medication adherence and quality of life in hypertensive patients.

Conclusions: This study proved that medication adherence could improve the quality of life of hypertensive patients. It is important for pharmacists to provide motivation to patient to improve patient medication adherence so that the expected therapeutic outcome can be achieved.

Keywords: adherence, quality of life, hypertension, ARMS, AQoL-4D.

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Investigation of African Leaf methanol extract as new anti-inflammatory agents

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Abstract

Objectives: African leaves contain polyphenols and flavonoids that are efficacious as anti-inflammatory, *in vitro* anti-inflammatory activity testing with membrane stabilization methods has been carried out previously with the results of an EC_{50} value of 131.80 g/mL. *In vivo* anti-inflammatory testing also proves that African leaf infusion has effectiveness as an anti-inflammatory. The flavonoid content in African leaves can be extracted more optimally in methanol solvent which is a polar solvent and the extract can be stored longer than using water solvents, therefore research is carried out to find anti-inflammatory activity of African leaf methanol extract. This study aimed to test the anti-inflammatory activity of African leaf methanol extract in vitro as a new anti-inflammatory agent using protein denaturation inhibition method.

Methods: The extraction method was carried out by the multilevel maceration method then *in vitro* testing was carried out by giving high temperature heating to three treatment groups, namely African leaf extract as a test group (1, 10, and 100 ppm), diclofenac sodium as a positive control, and without giving anything as a control. negative. Analysis of the absorbance value of the sample was carried out using a UV-Vis spectrophotometer at a wavelength of 660 nm.

Results: The results showed that the IC_{50} value of African leaves was 87.92 g/mL and the IC_{50} value of diclofenac sodium as a positive control was 10.0592 g/mL so that African leaves belonged to the strong anti-inflammatory group because they had IC_{50} values in the range of 50-100 g/mL.

Conclusions: The flavonoid content in African leaves has inhibition of COX-2 enzyme activity and/or lipoxygenase, inhibition of leukocyte accumulation, inhibition of neutrophil degranulation, inhibition of histamine release, and stabilizer of reactive oxygen species (ROS). The results of this study prove that methanol extract of African leaves can be developed as a new anti-inflammatory drug in the future.

Keywords: African Leaf, extract, anti-inflammatory, denaturation protein.

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Anti-inflammatory activity of Pulutan (*Urena lobata*) leaf extract and its fraction by protein denaturation inhibition test

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Abstract

Objectives: The study aims to evaluate anti-inflammatory activity of *Urena lobata* leaf extract and its fraction through protein denaturation inhibition test.

Methods: *U. lobata* leaf was extracted by digestion methods using ethanol solvent, therefore, the extract was fractionated using ethyl acetate solvent (fraction A), n-butanol (fraction B) and aqueous (fraction C) respectively. Anti-inflammatory activity of herbs was examined by protein denaturation inhibition test and observed using spectrophotometer with wavelength 660 nm. The half-maximal inhibitory concentrations (IC_{50}) were determined (n=3) for at least three different concentrations. Ibuprofen is used as reference drugs.

Results: Fraction B showed inhibition on protein denaturation (IC_{50}= 208.75 ppm) stronger than fraction A (IC_{50}= 491.69 ppm) and fraction C (not applicable). Meanwhile, the activity of ethanolic extract *U. lobata* (IC_{50}= 338.80 ppm) more weak compare to their fraction. Inhibitory activity of herbs on protein denaturation indicated anti-inflammatory potency.

Conclusions: Extract and fraction of *U. lobata* leaf have anti-inflammatory activity.

Keywords: anti-inflammation, extract, fraction, protein denaturation, *Urena lobata*.

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Analysis of collaboration pharmacist-doctor in handling diabetes mellitus patients at Airlangga University Hospital Surabaya-Indonesia

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Abstract

Objectives: Collaboration between health care professionals illustrates the magnitude of team work in solving problems to make a significant contribution to patients. Collaboration between doctors and pharmacists is needed in treating Diabetes Mellitus patients to optimize treatment regimens. Diabetes mellitus is a chronic disease that requires continuous medical care and the risk of long-term complications.

Methods: This study was conducted to obtain an overview of the variable characteristics of the exchange that affect the practice of collaboration according to pharmacists and according to doctors. In dealing with Diabetes Mellitus patients at the Airlangga University Hospital, Surabaya. This research is an observational study with a cross sectional design. The research respondents were all doctors who practice in Internal Medicine polyclinics and pharmacists who work in Pharmacy Installations. The instrument used is a collaboration questionnaire between pharmacists and doctors which includes independent variables (characteristics of exchange with the domain of trust, initiation relationship, role specification and the dependent variable of collaborative practice. Data analysis using Multiple Linear Regression.

Results: The results of the study, on the t-test, it is known that the collaborative practice according to pharmacists is influenced by the trust variable with a value of sig = 0.017, the results of the ANOVA test, the three exchange characteristics variables have no effect on the practice of pharmacist-doctor collaboration in dealing with diabetes mellitus patients with a value of sig = 0.075. While the results of the t-test on collaborative practice according to doctors are influenced by the initiation relationship variable with a value of sig = 0.021, while the results of the ANOVA test of the three exchange characteristics variables affect the practice of doctor-pharmacist collaboration in dealing with diabetes mellitus patients.

Conclusions: collaborative practice according to pharmacists is influenced by trust while collaborative practice according to doctors is influenced by initiation relationships in dealing with Diabetes Mellitus patients.

Keywords: Collaboration between doctors and pharmacists, Diabetes Mellitus, Unair Hospital.

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Metabolite profiling of the environmental-controlled growth of *Marsilea crenata* Presl. and it's *in vitro* and *in silico* antineuroinflammatory properties

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Abstract

Objectives: This study was aimed to evaluate metabolite contents and antineuroinflammatory effect of compounds of *Marsilea crenata* Presl., which grown under a controlled environmental condition. The antineuroinflammatory test has been carried out in vitro using 96% ethanol extract of *M. crenata* Presl. leaves on HMC3 microglia cells. An *in silico* approach was applied to predict the active compounds of the extract.

Methods: The HMC3 microglia cells were induced with IFNγ to create prolonged inflammatory condition and then treated with 96% ethanol extract of *M. crenata* leaves at 62.5; 125; and 250 µg/mL. The expression of MHC II was analyzed using immunocytochemistry with CLSM instrument. The compounds of the extract were identified using UPLC-QToF-MS/MS instrument and MassLynx 4.1 software. *In silico* evaluation was conducted with molecular docking on ERβ protein with code 3OLS using PyRx 0.8 software, and physicochemical properties of the compounds were analyzed using SwissADME webtool.

Results: The 96% ethanol extract of *M. crenata* Presl. leaves could reduce the MHC II expression in HMC3 microglia cells in all concentrations with the value 97.458; 139.574; and 82.128 AU. The result of metabolite profiling found 79 compounds in the extract. *In silico* evaluation showed that 19 compounds gave agonist interaction toward ERβ, and three of them met all parameters in physicochemical analysis.

Conclusions: The 96% ethanol extract of the environmental-controlled growth of *M. crenata* leaves has antineuroinflammatory activity on HMC3 microglia cells. The extract was predicted to contain some phytoestrogen compounds which act as ERβ agonists.

Keywords: Environmental-controlled growth, HMC3 microglia cells, *Marsilea crenata* Presl., neuroinflammatory, phytoestrogens.

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Knowledge, awareness, and practices towards COVID-19 among international students studying in Indonesia: an online cross-sectional study

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Abstract

Objectives: Extraordinary measures have been implemented globally to control the spread of highly infectious coronavirus. The individual's adherence to the pandemic is influenced by their knowledge, awareness, and practices. The current study aimed to assess the knowledge, awareness, and practices towards COVID-19 among international students in Indonesia.

Methods: An online cross-sectional survey was completed through a questionnaire. The questionnaire consists of 20 questions divided into three portions. The knowledge portion consists of 9 questions about the information and spread of COVID-19, while the awareness and practice portions contain 4 and 7 questions, respectively. All the data were analyzed using IBM SPSS (version 25).

Results: A total of 97 students responded to the survey, and 85 (87.6%) students completed the questionnaire. The majority of the students, 52 (61.2%), were male, and 39 (45.5%) students fall into the age group (26-35 years). Most respondents were knowledgeable about COVID-19 with a mean score of 8.19 ± SD = 1.01 (Range 0-9). Furthermore, the mean awareness score was 17.80 ± SD = 3.69 (Range 4-20), while the mean practices score was 6.11 ± SD 0.39 (range 0-7). The majority of the students, 42 (49.4%), have a high-level knowledge, 37 (43.5%) have a high level of awareness, and 43 (50.6%) students follow preventive practices of moderate level. Afterward, a significant difference in the demographic in terms of age and level of practice ($P = 0.000$) was found. The student's knowledge significantly affects their practices by 17.4% ($R^2 = 0.17$).

Conclusions: The study concluded that international students are knowledgeable and aware of COVID-19, and their knowledge affects their practices towards COVID-19. Health education interventions are needed to improve students' practices against COVID-19.

Keywords: knowledge, awareness, practices, COVID-19, international students, Indonesia.

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Assessment and comparison of inpatient antibiotic use on orthopedic patients using ATC/DDD methodology: a literature review

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Abstract

Objectives: The aim of this study was to assess and compare antibiotic consumption on orthopedic patients by Defined Daily Dose (DDD) per 100 patient-days. ATC/DDD system is a method of counting the amounts of drugs recommended by WHO and Ministry of Health, so it is useful for monitoring and comparing antibiotic use among departments, within hospital, as well as between countries or regions.
Methods: A literature review was conducted by searching articles through PubMed, Scopus, Cochrane Library, and Google Scholar databases up to November 2020 with the various keywords.
Results: More than one thousand articles were identified, both abstracts or full articles, but only sixteen articles met the inclusion criteria. The value of DDD on orthopedic unit were various from 27.71 DDD/100 patient-days to 212.7 DDD/100 patient-days. The most widely used antibiotic for prophylaxis was Cefazolin, with the value of 984.66 DDD/100 operations. Whereas cephalosporin was found to be the most antibiotic used for therapeutic, with the value of 190.93 DDD/100 patient-days. The antimicrobial stewardship program showed a decrease in the use of antibiotics, but the decrease/increase in the use of antibiotics is not the only parameter to assess the wise use of antibiotics.
Conclusions: The antibiotic use was found very high on orthopedic patients, especially as prophylaxis antibiotic. The quality of antibiotic use may be improved through better compliance with guideline and implementation of antimicrobial stewardship program.

Keywords: Antibiotic, orthopedic, defined daily dose, antimicrobial stewardship.

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Transdermal patches development of 96% ethanol extract of Dayak Onion bulbs (*Eleutherine bulbosa* Urb.) with plasticizer variation

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Abstract

Objectives: Pain is a response that arises as a result of damage that occurs in the body caused by physical trauma, and inflammation. The use of oral analgesic drugs in long term cause side effects. The use of herbal plants is known to be safer and has small side effects. One of the herbal plants known as analgesics is the Dayak onion bulb (*Eleutherine bulbosa* Urb.), developed in the form of a transdermal patch to avoid the first pass effect and increase drug penetration. This study aims to determine the optimum formula for transdermal patches with variations and concentrations of plasticizers.

Methods: Dayak onion bulb was extracted with maceration method used 96% ethanol. It is made into transdermal patch with solvent casting method with variation of PEG 400 and dibutyl phthalate. There are 6 formulas evaluated, which the evaluation carried out were organoleptic, homogeneity, uniformity of weight, patch thickness, folding endurance, pH, moisture content, and hedonic test.

Results: The result of physical properties show all patches have dark brown colored, typical of Dayak onion bulb extract etanol odor and homogeneous. The weight and thickness of patches obtained were uniformly, with pH range $5.0 \pm 0.00 – 5.86 \pm 0.04$; moisture content from $1.04 \pm 0.04\%$ to $4.13 \pm 0.08\%$; while the folding endurance show F1 have 267 and F2-F6 were >300. The hedonic test showed difference in preference of each formula.

Conclusions: Transdermal patches at F6 formula show as the optimum formula with excellent physical properties.

Keywords: transdermal patches, ethanol extract, *Eleutherine bulbosa*.

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Analysis of obedience factors of distribution facilities in distributing cosmetics in East Java

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Abstract

Objectives: The purpose of this study was to analyze the factors that affect the obedience of cosmetics distribution facilities in distributing cosmetics that have marketing authorization number (NIE) in East Java based on Niven's theory (understanding of instructions, quality of interaction, beliefs, attitudes, personality, social isolation) and Milgram's theory (status of facilities, personal responsibility, legitimacy of authority figures, status of authority figures, peer support, proximity of authority figures).

Methods: This study was an observational cross-sectional study, using a validated questionnaire. 179 participants were randomly chosen using simple random sampling. The data were analyzed using Partial Least Square (PLS) ($\alpha=0.05$).

Results: PLS test showed the personality ($p=0.001$, $\beta = 0.197$), the legitimacy of authority figures ($p = 0.025$, $\beta = 0.147$) and peer support ($p = 0.000$, $\beta = 0.470$) affect the obedience of cosmetics distribution facilities in distributing cosmetics that have NIE in East Java. Whereas, understanding of instructions ($p = 0.513$, $\beta = 0.054$), the quality of interaction ($p = 0.860$, $\beta = - 0.012$), the beliefs ($p = 0.064$, $\beta = 0.169$), the attitudes ($p = 0.597$, $\beta = 0.037$), the social isolation ($p=0.333$, $\beta = 0.063$), the status of facilities ($p = 0.504$, $\beta = - 0.049$), the personal responsibility ($p = 0.707$, $\beta = - 0.029$), the status of authority figures ($p = 0.060$, $\beta = -0.104$) and the proximity of authority figures ($p = 0.072$, $\beta = 0.116$) have no affect the obedience.

Conclusions: Milgram's theory more affect obedience than Niven's theory. Various kinds of education and monitoring evaluation of distribution facilities were implemented to improve obedience.

Keywords: cosmetics, obedience, Niven, Milgram, NIE.

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In silico studies of potential drug-like compounds from various medicinal plants: the discovery of JAK1 inhibitors and JAK3 inhibitors

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Abstract

Objectives: Allergic asthma is a chronic respiratory disease mediated by Immunoglobulin E (IgE) and T helper type 2 (Th2) cells. Janus kinase 1 (JAK1) and JAK3, which are interleukin-4 signaling components, are crucial in Th2 cell differentiation. Thus, inhibition of JAK1 and JAK3 is a promising therapeutic target to treat allergic asthma. This study explores the potential of secondary metabolites from various medicinal plants to be developed as JAK1 inhibitors and JAK3 inhibitors through *in silico* studies.

Methods: *In silico* pharmacokinetic and drug-likeness predictions were performed on 106 secondary metabolites from various medicinal plants using the SwissADME online tool. Molecular docking was carried out on 60 medicinal plant metabolites with good pharmacokinetic profiles and meeting the drug-likeness criteria by targeting the Janus kinases family proteins (JAK1, JAK2, JAK3, TYK2) using AutoDock Vina software.

Results: A total of eleven medicinal plant metabolites, namely chrysophanol; aloe emodin; genistein; daidzein; glycitein; apigenin 7,4'-dimethyl ether; laburnetin; formononetin; afrormosin; kaempferol; and isothankunic acid, had a good pharmacokinetic profile, met the criteria for drug-likeness, and had a good binding affinity to the target protein JAK1. Then, as many as four medicinal plant metabolites, namely madasiatic acid; madecasseic acid; lupeol; and chrysophanol also had a good pharmacokinetic profile, met the criteria for drug-likeness, and had a good binding affinity to the target protein JAK3.

Conclusions: Based on the results of the *in silico* studies, it was found that several medicinal plant metabolites potential to be developed as JAK1 inhibitors and JAK3 inhibitors.

Keywords: allergic asthma, chronic respiratory disease, JAK1, JAK3, Janus kinases, molecular docking studies.

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Cost-effectiveness analysis of fentanyl compared to oxycodone in post operative pain

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Abstract

Objectives: Fentanyl is the drug often used to control post-operative pain, there has been a tendency to switch to oxycodone. Oxycodone has been included in the national formulary (FORNAS) since 2018. In addition, many studies have shown the analgesic effect of oxycodone is better than fentanyl for postoperative pain management. The study to analyze the cost-effectiveness of fentanyl and oxycodone in postoperative pain patients.

Methods: A randomized controlled trial single blind, two group study of 20 patient's post-operative divided into 2 groups. The first group (n = 10 patients) treated with fentanyl and the other group (n = 10 patients) treated with oxycodone. Observations carried out for twelve hours. The efficacy of therapy was measured by NRS pain scale.

Results: The NRS (Numerical Rating Scale) pain scale after 12 hours showed no difference both two group, so it could be said that both fentanyl and oxycodone had the same effectiveness in reducing the NRS pain scale. In terms of cost fentanyl and oxycodone, the cost of oxycodone was lower (Rp. 2,208,704) compared in the fentanyl group (Rp. 2,332,000). The ACER (Average Cost-Effectiveness Ratio) value in the two groups showed no significant difference.

Conclusions: The oxycodone group was less cost-effectiveness than the fentanyl group with equal effectivity in post-operative pain.

Keywords: fentanyl, oxycodone, cost-effectiveness analysis, pain.

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Effectiveness of shrimp allergenic extract as an immunotherapy agent in mice model of gastrointestinal allergy

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Abstract

Objectives: Allergen extract as allergen-specific immunotherapy (AIT) is the only therapy that is causative and/or provides protection/tolerance to allergen in long term. However, allergen extracts from different countries may have different effectiveness. This study aimed to evaluate the effectiveness of shrimp allergenic extract (SAE) developed in Indonesia as an immunotherapy agent in gastrointestinal allergy mice model.

Methods: Mice were divided into 5 groups consisting of normal group, allergic group, and allergic group received SAE immunotherapy at high dose (100 μg/week), moderate dose (50 μg/week), and low dose (10 μg/week). The treatment administered to each group include sensitization and desensitization phase, followed by oral challenge of SAE 100 μg. The effectiveness of SAE immunotherapy was assessed based on the parameters of systemic allergic symptoms, IL-10 mRNA expression in ileum tissue, IgG2a serum concentration.

Results: We found that SAE immunotherapy decreased the systemic allergic symptoms score, regardless of dosage, and the effect still persisted on the third challenge. IgG2a as a parameter of humoral immunity showed a significant increase in the high-dose immunotherapy group and IL-10 mRNA expression as a parameter of cellular immunity also showed an increased in the high-dose group. Both data showed dose-dependent increased.

Conclusions: It can be concluded that SAE has good effectiveness as an immunotherapy agent and dose-dependent characteristics.

Keywords: gastrointestinal allergy, shrimp allergenic extract (SAE), allergy specific-immunotherapy (AIT), IL-10, IgG2a, neglected disease.

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Drug related problem and cost effectiveness analysis of antihypertension in geriatrics with chronic kidney disease

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Abstract

Objectives: Hypertension is a major risk factor for death. In geriatric patients, the drug administration process needs special attention because of the deterioration in organ function that affects the pharmacokinetics of the drug. Appropriate antihypertensive drug therapy in geriatric patients can reduce morbidity and mortality. This study aims was to determine the rationality of the use of antihypertensive drugs, a description of direct medical costs and the cost effectiveness of antihypertensive drugs treatment in hypertensive patients with geriatric kidney disease in Dr. Soekardjo Hospital Tasikmalaya for the period of January-December 2019.

Methods: This research is a descriptive observational study with retrospective data collection.

Results: The results of the study showed irrational drug use (9.00%), inappropriate drug (4.50%) and improper dose (4.50%). Based on the results of the analysis, the average direct medical cost of using the furosemide-amlodipine combination is Rp. 83,082,277.73 greater than furosemide-captopril of Rp. 18,939,501.65. The more cost-effective drug with relatively lower cost is antihypertensive, combination of furosemide-amlodipine therapy with an ACER value of Rp 9,482,043 and an ICER value of Rp 4,185,505.

Conclusions: The drug that has the best effectiveness and more cost-effective in the treatment of hypertension and is relatively cheaper is the furosemide-amlodipine group with lower ACER and ICER values.

Keywords: hypertension, cost effectiveness, ACER, ICER.

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The preparation of cocrystal of *p*-methoxycinnamic acid and succinic acid by solution evaporation technique

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Abstract

Objectives: *p*-Methoxycinnamic acid (PMCA) was a compound which had antinociceptive and antihyperglycemic activity. As a pharmaceutical active ingredient, it had limitation which was very poorly soluble and might cause a major problem in the drug development, such as decreasing drug absorption. In this study, we aimed to increase solubility of PMCA by making the co-crystal with succinic acid as its conformer by solution evaporation technique.

Methods: PMCA-succinic acid cocrystal was made by the solvent evaporation method with 1:1 molar ratio. Physicochemical characterization of PMCA and succinic acid cocrystal was performed by differential scanning calorimetry (DSC), powder X-ray diffraction (PXRD), and scanning electron microscope (SEM).

Results: The DSC thermogram showed the decreasing in the melting point of cocrystal compared to the melting point of PMCA (173.55°C), succinic acid (187.55°C), and its physical mixture (159.53°C). The cocrystal thermogram also displayed an endothermic peak at 158.46 ° C which represented the melting point of the cocrystal. Diffractogram of PMCA-succinic acid cocrystal exhibited a new diffraction peak at an angle of 2θ = 21.92; 25.91; 39,25° which was not found in the diffractogram of each single component and its physical mixture. SEM photomicrograph showed PMCA-succinic acid cocrystal possessed a different surface morphology and smaller size than the constituent materials.

Conclusions: We accomplished to form the cocrystal of PMCA and succinic acid. This formation was one of the methods to improve the solubility of PMCA, therefore in the future, we need to examine the solubility of this cocrystal.

Keywords: *p*-methoxycinnamic acid, succinic acid, cocrystal, solvent evaporation, drug development.

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Activity fermented filtrate of yellow passion fruit (*Passiflora edulis* var. Flavicarpa) in Man de Rogose Sharpe media as anti bacterial

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Abstract

Objectives: Yellow passion (*Passiflora edulis* var. Flavicarpa) fruit is the fruit of a local plant that grows abundantly in Indonesia with various health benefits. The active ingredients in the pulp have been reported, including lactic acid bacteria and probiotics, which are known to have advantages, especially as antibacterial.

Methods: Fresh passion fruit of pulp, fermented in the MRS medium a shaker incubator. The potency ratio to kanamycin and streptomycin standards was calculated using a 3x3 random block design. The fermentation broth was filtered and the filtrate was tested for its inhibitory activity against *E. coli*, *S. aureus*, and *B. subtilis*, Methicillin-Resistant *Staphylococcus aureus*, and Extended spectrum beta-lactamase. Analysis was monitored by MIC and ratio potency.

Results: The growth inhibitory activity of the fermentation filtrate MIC at a concentration of 12.5%. The ratio potency of filtrate from fermented yellow passion fruit to kanamycin and streptomycin in the concentration range 25-60 ppm and 6-10 ppm, respectively 97.82% and 101.44%; 114.52% and 96.49%; 91.52% and 106.31%; 100.27% and 99.46%; 99.65% and 65% for against *E coli*, *S. aureus*, *B. subtilis*, Methicillin-Resistant *Staphylococcus aureus*, and Extended spectrum beta-lactamase.

Conclusions: It was shown this method that the fermented filtrate of yellow passion fruit pulp in MRS media has the potential to be developed as a candidate for antibacterial agent.

Keywords: *Passiflora edulis*, Kanamycin sulphate, Streptomycin sulphate, *Escherichia coli*, S*taphylococcus aureus*, MRSA, ESBL.

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Dose adjustment and clinical outcome of antihypertension in patient with hypertension and chronic kidney disease

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Abstract

Objectives: Hypertension is a disease of increasing blood pressure that is not normal continuously, this causes the pressure in the kidneys to increase, resulting in damage to the nephron. Decreased kidney function disturbs the pharmacokinetics of drugs in the body, resulting in toxic effects. Antihypertensive therapy in hypertension with chronic kidney disease (CKD) patient are necessary to adjust the dose using the GFR value. The aim of this study is to evaluate the dose adjustment and blood pressure and to analyze the correlation both of them.

Methods: The study design is cross sectional with retrospective data through medical records of outpatient hypertensive with CKD from 2016-2020 in RSUP Fatmawati.

Results: The results showed that out of 174 patients who were included in the inclusion criteria, there were 343 drugs prescribed and 139 patients (79.9%) who had appropriate dose adjustment with 54.3% controlled and 26.4% uncontrolled blood pressure. While 35 patients (20.1%) were inappropriate dose adjustment with 12.6% controlled and 7.6% uncontrolled. Of 343 drugs prescribed, the most inappropriate dose adjustment is from the use of bisoprolol. There was no significant correlation between the suitable of dose adjustment with blood pressure control (p-value= 0.651). Comorbid can affect the suitable of dose adjustment (p-value = 0.024) and the blood pressure (p-value = 0.037).

Conclusions: The conclusions that more hypertensive patients with chronic kidney disease had adjusted their antihypertensive dose, with the most use of antihypertensive drugs that have appropriate dose adjustment is amlodipine as many as 68 cases (22.6%) while the most drugs that do not match the dose adjustment are bisoprolol in 9 cases (21.4%). More patient's blood pressure has been controlled according to the appropriate dose adjustment, but the results of statistical tests with Chi Square analysis showed that there was no significant relationship between the accuracy of dose adjustment and the clinical outcome of antihypertensives on blood pressure of patients. Based on the results obtained this can occur largely influenced by the patient's comorbid factors.

Keywords: antihypertensive, dose adjustment, blood pressure.

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The effect of physical exercise during chronic nicotine exposure on somatic nicotine withdrawal signs in mice

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Abstract

Objectives: Nicotine is the neuropsychoactive substance of tobacco cigarettes that is responsible for the addiction. Chronic nicotine exposure followed by nicotine withdrawal triggers the negative effect that becomes the primary aspect of smoking relapse. One effort to reduce nicotine withdrawal symptoms is by increasing physical activity. Physical activity increases cell proliferation and hippocampal neurogenesis, which results in a decrease in maladaptive behaviors. This study aims to determine the effect of physical exercise during chronic nicotine exposure on somatic nicotine withdrawal signs in mice.

Methods: Physical exercise was performed using forced wheel running for an hour (with three breaks) every day on mice during chronic nicotine exposure. Chronic nicotine exposure was administered subcutaneously 1.0 mg/kg three times daily for ten consecutive days. Twenty-four hours after the last injection of nicotine, mecamylamine 2.0 mg/kg was injected to induce precipitation. Somatic nicotine withdrawal symptoms were observed using a chamber equipped with a video recorder for 30 minutes.

Results: Chronic nicotine exposure followed by mecamylamine-precipitated significantly increased the total somatic symptoms ($p < 0.0001$). There was a significant decrease in total somatic symptoms in the nicotine withdrawal group with exercise during chronic nicotine exposure ($p < 0.01$); and the nicotine withdrawal group with physical exercise before and during chronic nicotine exposure ($p < 0.05$). The most significant decrease in somatic nicotine withdrawal symptoms with physical exercise was sniffing ($p < 0.001$) and rearing ($p < 0.05$).

Conclusions: Physical exercise using forced wheel running during nicotine exposure reduces somatic signs of nicotine withdrawal.

Keywords: addiction, forced wheel running, nicotine withdrawal, physical exercise.

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Effect of psychiatri drugs on metabolic profile in patients ansiethic depression

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Abstract

Objectives: Globally, the prevalence of depression occurs in 300 million people, and the prevalence of anxiety occurs in about 264 million people in the world. In Indonesia, it was recorded that 6.1% of the population aged more than 15 years experienced depression, and 9.8% experienced mental emotional disorders, one of which can be indicated by symptoms of anxiety. The use of psychiatric drugs has provided side effect on lipid profile. This study aims to determine the effect of psychiatric drugs on lipid profiles in patients with anxiety mixed depression.

Methods: The research design was prospective cohort with consecutive sampling which carried out in February - March 2020 on 20 patients at dr. Soekardjo Hospital. Data collection techniques were carried out by interview, review of medical records, measurements of body weight, waist circumference, body mass index and metabolic profiles as much as two measurements on day 1 and day 30. Data analysis was performed using paired sample t test.

Results: The results showed an increase in average triglyceride levels of 8.95 mg/dL (p = 0.427), a decrease in average HDL levels, cholesterol levels, and LDL levels by -0.05 mg/dL (p = 0.978), -5.1 mg/dL (p = 0.284), and -7.55 mg/dL (p = 0.178), however this result was not significant difference (p >0.05). No difference significant of fasting plasma glucose (p >0.05). In the results of body weight, waist circumference, and body mass index an increase of an average of 1.7 kg (p = 0.001), 1.5 cm (p = 0.000), and 0.695 kg/m^2 (p = 0.001) which showed a significant difference (p <0.005).

Conclusions: Psychiatric drugs used in patients with mixed anxiety depression did not significantly change the lipid profile within 30 days.

Keywords: Metabolic, depression, glucose, lipid.

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Formulation and optimization of pining fruit extract gel based on various concentrations of Na-CMC as a burn healing gel in wistar rats

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Abstract

Objectives: Burns are a form of trauma that occurs as a result of human activities. The types of burns are diverse and have different treatments depending on the type of tissue affected by the burn. The principle of burn treatment is to restore the function and form of skin tissue back to normal. Gel preparations are used by the community because it has properties that cool, moisturize and easily penetrate so as to provide a healing effect. Research on the preparation of fruit ethanol extract gel pining against burns aims to see the activity of gel preparations pining fruit extract as a treatment of burns in rats.

Methods: Evaluation of gel preparations including organoleptic tests, pH, dispersion, viscosity, and homogeneity A total of 5 groups in induction of wounds on the back rat, positive control was given bioplacenton, dose group 1-3 given gel fruit pining concentrations of 2.5%, 5% and 7.5%, Wound observation was carried out for 21 days. Data were analyzed using SPSS one-way ANOVA.

Results: Results show that form of semisolid gel, pH 5, Viscosity of about 2000-4000 cPs, dispersion of 5 cm, characteristic odor of pining fruit and homogeneous gel. The average percent of wound healing in the negative group was 12.55%, positive 15.20%, group I 12.5%, group II 17.10% group II 13.45% and there was a significant difference between groups p= 0.003 (p <0.05).

Conclusions: Gel preparations of pining fruit extract have activity as a healing of burns in rats. Formula II test group (Na-CMC gel base 5%) has effectiveness against the healing of burns in rats.

Keywords: Healing, wound, pining, gel.

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Factors that influence adverse drug reactions (ADRS) reporting practices by healthcare professionals in several hospitals in Surabaya

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Abstract

Objectives: The purpose of this study was to determine the factors that influence ADRs reporting practice by doctors and nurses at hospitals in Surabaya.

Methods: This was a cross sectional research conducted in two hospitals which contributes reporting of ADRs to Indonesia National Agency of Food and Drug Control (NA-DFC). A total of 160 respondents consisting of doctors and nurses had filled out the questionnaire. The questionnaire had been tested for validity and reliability. The questionnaire contained statements that included demographics, knowledge, attitude, access to reporting facilities and infrastructure, environment, and practices related to ADRs monitoring and reporting. Interview was also used to obtain data on the availability of facility/infrastructure and policy and incentive.

Results: Results showed that there were influences of attitude and environmental variables on the practice of ADRs reporting with a significance value of 0.001 and 0.000 ($p < 0.05$) using multiple linear regression test. The results also showed differences in knowledge between doctors and nurses regarding the purpose of ADRs reporting, good reporting method, reporting policy, drug safety, and reporting program ($p < 0.05$).

Conclusions: It can be concluded that attitudes and environment become the factors that influence the practice of ADRs/ESO reporting done by doctors and nurses. Access to the means of reporting such as the reporting form still needs to be improved to encourage and increase the number of ADRs/ESO reports by healthcare professionals.

Keywords: Adverse drug reactions (ADRs), reporting, healthcare professionals.

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The effect of quercetin on expression of NMDA subtype glutamate receptor, MC4 receptor, POMC, and Nrf2 mRNA in the hippocampus area of mice induced ischemic stroke

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Abstract

Objectives: Ischemic stroke is a condition that may affect the hippocampus, an important area for cognitive function. The disruptive process involved several processes, including glutamate excitotoxicity, the presence of inflammation, and may also involve functional peptide in the area such as melanocortin. Quercetin is a potent exogenous antioxidant against oxidative damage. Administration of quercetin may improve cognitive function in ischemic stroke conditions. This study aims to find out the effect of quercetin administration on the cognitive remedy after ischemic stroke and mRNA expression of several functional proteins such as NR2A, NR2B, MC4r, POMC, and Nrf2 in the hippocampus

Methods: Mice are divided into a sham and stroke groups with 5% tween, and stroke groups with quercetin doses of 50, 100, 200 mg/kg weights for 7 days. Mice are induced by common carotid artery occlusion method for 4 hours. Before the induction of stroke, pretraining is performed. Measurements of cognitive function are taken on days 2 to 8 and day 14. mRNA expression of targets in the hippocampus was measured using RT-PCR.

Results: Stroke significantly reduced cognitive function. Quercetin significantly improved cognitive function. Quercetin had no significant effect on the expression of NR2A, NR2B, MC4r, POMC, and Nrf2 mRNA.

Conclusions: Quercetin provides an improved effect on the cognitive function of mice using T maze and possible through the involvement of NR2A, NR2B, MC4r, POMC, and Nrf2 in the hippocampus area of mice induced ischemic stroke.

Keywords: ischemic stroke, MC4, NMDA, Nrf2, POMC, quercetin.

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Effect of andrographolide and resveratrol on OX1R and prepro-orexin mRNA expression in CIPN-induced hypothalamus of mice with oxaliplatin

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Abstract

Objectives: Chemotherapy-induced peripheral neuropathy (CIPN) is a common side effect experienced by cancer patients receiving antineoplastic treatment, including oxaliplatin and other platinum analogues. Studies revealed the roles of the hypothalamus, specifically the orexinergic system, in nociceptive modulator as well as neuropathy. Since antioxidants such as resveratrol and andrographolide may prevent the CIPN, this study aimed to analyze the effect of andrographolide and resveratrol treatment on OX1R and PPOrx mRNA expression in the hypothalamus oxaliplatin-induced mice.

Methods: The study was conducted for 22 days, where mice were injected with oxaliplatin, then followed by giving andrographolide or resveratrol. The peripheral neuropathy pain was evaluated based on a withdrawal threshold value, mRNA OX1R expressions, and mRNA Prepro-orexin expression.

Results: The result showed that intraperitoneal administration of 20 mg/kg andrographolide and 100 mg/kg resveratrol after oxaliplatin induction increased the withdrawal threshold. In addition, resveratrol administration also significantly increased the relative expression of PPOrx mRNA, but not with the OX1R mRNA relative expression. On other hand, andrographolide administration in oxaliplatin-induced mice did not cause changes in OX1R and PPOrx expression in the hypothalamus.

Conclusions: Andrographolide and resveratrol intraperitoneal administration significantly reduce the mechanical allodynia pain responses in oxaliplatin-induced mice. Andrographolide's mechanism of increasing the withdrawal threshold is not through the orexinergic system, but resveratrol's mechanism through the orexinergic system.

Keywords: andrographolide, CIPN, hypothalamus, OX1R, prepro-orexin, resveratrol.

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Heme polymerization inhibition of isolates *Carthamus tinctorius* Linn flowers

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Abstract

Objectives: To determine the inhibition of heme polymerization isolates from the ethanolic extract of *Carthamus tinctorius* Linn based on the IC_{50} value.

Methods: Testing of an inhibitory polymerization initial test to determine its antimalarial potential. In principle, this *in vitro* test resembles the mechanism of action of antimalarials which inhibits heme polymerization in Plasmodium. Samples and positive control (chloroquine) were prepared in several graded concentrations, reacted with hematin and glacial acid and then their absorbance was measured on an ELISA Reader at a wavelength of 405 nm, which was equated to the standard curve.

Results: The value of percent inhibition versus concentration was analyzed with gain to obtain IC_{50}. The standard curve equation obtained is $y = 1.9578x + 0.3418$ the resulting R^2 value is 0.9911. Compounds IS1, IS2, and positive control had the potential to inhibit heme polymerization because the IC_{50} value was not more than 12,000 g/mL or 37.5 mM for IS1 7042,602 g/mL with more inhibition on hematin by 44.77% and IS2 6011,585 g/mL. mL with 46.26% inhibition of hematin and 6322,269 g/mL of positive control with 41.449% inhibition of hematin.

Conclusions: Pure compounds IS1 and IS2 have inhibition of heme polymerization.

Keywords: *Carthamus tinctorius* Linn, antimalarial, hematin inhibition, *in vitro*.

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The practice of self-medication to treat headaches due to stress in the era of the COVID-19 pandemic

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Abstract

Objectives: Stress related to the COVID-19 pandemic can cause health problems such as headaches. In terms of responding to health problems, self-medication often become an option. However, self-medication is strongly associated with the risk of developing Drug Therapy Problems (DTP). Therefore, this study aims to see the level of stress and the incidence of headaches experienced and self-medication of drugs to treat headaches by the community in the era of the Covid 19 pandemic.

Methods: This type of research is descriptive, and the sampling technique used is accidental and snowball sampling. Data collection was carried out by an online survey. In this study, the sample size studied was 320 respondents with the target respondents being people over 18 years of age, domiciled in the City or Regency of Kediri, had experienced headaches during the COVID-19 pandemic, and self-medicated headaches suffered by using drugs.

Results: This research showed that respondents experienced Stress Related Pandemic COVID-19 with moderate stress levels. The profile of self-medication to treat headaches shows that most of the drug information came from relatives/friends. Self-medication were mostly done at pharmacies and respondents chose to use analgesic. Before using the drug, respondents had the willingness to read and follow the instructions and the dosage recommendations.

Conclusions: From the description above, it can be concluded that the level of Stress Related Pandemic COVID-19 experienced by respondent is moderate. Then, some of the respondents have used drugs appropriately to deal with headache.

Keywords: Self-medication, headache, stress, pandemic COVID-19.

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Translation, validation, and reliability of the Indonesian version AQoL-4D

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Abstract

Objectives: Chronic conditions often result in a person experiencing both physical and mental disorders, limiting them from carrying out their daily activities and further affecting the patient's quality of life. The AQoL-4D is a generic quality of life instrument consisting of 4 dimensions of quality of life, namely independent living, relationships, senses, and mental health, that can be used for all conditions and levels of disease. This study aims to translate and determine the validity and reliability of the Indonesian AQoL-4D instrument.

Methods: The translation and adoption of AQoL-4D originally in English to Indonesian consists of 4 stages, namely forward translation, expert panel, backward translation, and cognitive interviewing and pre-testing. Face validity was carried out at the cognitive interviewing and pre-testing stages. The final version of AqoL-4D was tested for construct validity and reliability.

Results: The results of the construct validity test showed that among a total of 12 AQoL-4D questions, question number 6 had the strength of a weak correlation, while the rest had the strength of a moderate correlation. Meanwhile, the results of the split-half reliability test showed that each question item has moderate internal consistency.

Conclusions: The AQoL-4D Indonesia version has moderate validity and reliability.

Keywords: AQoL-4D, Indonesian, validity, reliability.

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Potential some phenolic acid compounds toward SARS-CoV-2 Main Protease (M^pro) and their physicochemical-ADMET properties: *In silico* approach

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Abstract

Objectives: Coronavirus Disease 2019 or COVID-19 is caused by virus called Severe Acute Respiratory Syndrome Coronavirus 2. In globally there are no specific drug treatment guide in dealing with COVID-19. The curative pharmacological therapy such as antiviral drugs are currently based on trial and error, and inappropriately, some of those have unpleasant side effects, so research to combat that virus still important until now.

Methods: This study carried out using a molecular docking analysis of 5 compounds owned by the phenolic acid derivates (i.e. rosmarinic acid (RA), vanillic acid (VA), gallic acid (GA), ellagic acid (EA), cinnamic acid (CA)). Validation was carried out on a natural ligand, namely boceprevir against the main protease CoV or M^pro, PDB ID 7C6S using Toshiba hardware and AutoDock Tools version 1.5.6, ChemDraw 3D Pro 12.0, Discovery Studio, UCSF Chimera software, SwissADME and ProTox-II Online Tool.

Results: Validation result showed the RMSD was 1.47 Å. The binding energy and inhibition constant values of RA -4.67 kcal/mol and 374.378 µM; CA -4.51 kcal/mol and 492.61 µM; EA -3.92 kcal/mol and 1350 µM; VA -3.30 kcal/mol and 3800 µM; GA -2.98 kcal/mol and 6580 µM, respectively. Among those compounds, RA had poor intestinal adsorption. CA which had the weakest binding energy and inhibition constant value, it had the best intestinal adsorption. All of the tested compounds had toxicity at class 4, except EA.

Conclusions: All that phenolic acid derivates have the potential to inhibit M^pro SARS-CoV-2, but some of those need to modify on the structure to improve their intestinal adsorption. So, these compounds would be potentially effective for oral consumption.

Keywords: infectious disease; SARS-CoV-2; M^pro; phenolic acid; *in silico* study.

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Cholinesterase inhibitory activity of the methanolic extract of a marine sponge *Aaptos suberitoides* against AchE and BuChE enzymes

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Abstract

Objectives: Marine habitats are promising sources for the identification of novel organisms as well as natural products. Marine sponges have been the potential sources of unique metabolites and bioactivities, such as cholinesterase inhibitors for Alzheimer's disease treatment. Continuing our study on the search for potent cholinesterase inhibitors from plant and marine sources, we have discovered that several marine sponges exhibited great potential as cholinesterase inhibitors. The current study aims to examine the acetylcholine (AChE) and butyrylcholine (BuChE) inhibitory activities of the methanolic extract of a marine sponge *Aaptos suberitoides* collected from Tulamben, Bali.
Methods: Extraction of the marine sponge was carried out by the maceration method. The AChE and BuChE inhibitory assays were carried out according to the modified Ellman's method. The absorbance of the reaction product was measured by using microplate reader at 405 nm.
Results: The results showed that the methanolic extract of *A. suberitoides* gave a strong inhibition against AChE with an IC_{50} value of 9.12 ± 0.19 µg/mL, and exhibited lower inhibition against BuChE with an IC_{50} value of 90.12 ± 0.28 µg/mL.
Conclusions: The methanolic extract of *A. suberitoides* can inhibit both AChE and BuChE enzymes, however based on the IC_{50} values it can be seen that the extract is more selective against AChE compare to BuChE enzymes.

Keywords: Aaptos suberitoides, acetylcholinesterase inhibitor, Alzheimer's disease, butyrylcholinesterase inhibitor, marine sponge.

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The effect of 1,2-dioleoyl-3-trimethylammonium propane (DOTAP) addition on the physicochemical characteristics of β-ionone liposomes

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Abstract

Objectives: This study aimed to evaluate the effect of 1,2-dioleoyl-3-trimethylammonium propane (DOTAP) addition on the physicochemical characteristics of liposomes for improving water solubility and permeability of β-ionone in cancer drug delivery.

Methods: Liposomes were composed of β-ionone, HSPC, cholesterol, DSPE-mPEG2000 at a molar ratio of 35:25:10, respectively, and prepared using thin layer hydration method. Characterization of particle size, ζ-potential as well as vesicle morphology were evaluated. Moreover, the liposomes were further determined for IR spectra profiles, thermograms, and calcein release to evaluate the physicochemical characteristics of the bilayer membrane.

Results: The results show that the addition of DOTAP increased the particle size, the zeta potential became more positive with the spherical layered vesicle morphology. It was also found that the addition of DOTAP affected the spectroscopical and thermogram profiles of the liposomes indicating the changes on the ordered phospholipids structures of liposomal membranes. Moreover, the calcein release profile shows that the addition of DOTAP increased the fluidity of the liposome membrane.

Conclusions: In conclusion, DOTAP addition increased the particle size and produced positively charged vesicles with an increased fluidity of bilayer membrane of β-ionone liposomes.

Keywords: β-ionone, DOTAP, liposomes, physicochemical characteristics, cancer.

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The use of nanoparticles for delivering ursolic acid in cancer therapy: A scoping review

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Abstract

Objectives: This study aims to provide a review of the efficacy and safety of various types of ursolic acid-loading nanoparticles within the setting of preclinical and clinical anticancer studies.

Methods: This literature study used scoping review method, where the extracted data must comply with the journal inclusion criteria of the last 10 years. The identification stage produced 237 suitable articles. Duplicate screening was then conducted followed by the initial selection of 18 articles that had been reviewed and extracted for data analysis.

Results: Based on this review, liposome, nanosphere and polymeric micelle were reported to be used as the carriers for ursolic acid delivery in cancer. The use of nanoparticles can be seen to increase the anticancer efficacy of ursolic acid in terms of several parameters including pharmacokinetic data, survival rates and inhibition rates, as well as the absence of serious toxicity in preclinical and clinical trials in terms of several parameters including body weight, blood clinical chemistry, and organ histopathology. Even more, the liposome carrier provides development data that has reached the clinical trial phase I.

Conclusions: In conclusion, the use of nanoparticle provides high potential for ursolic acid delivery in cancer therapy.

Keywords: ursolic acid, cancer, nanoparticle, efficacy, toxicity.

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Association between barriers and medication adherence in patients with hypertension: a cross-sectional study

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Abstract

Objectives: The study aimed to identify the relationship between barriers to medication adherence and adherence in hypertensive patients at primary healthcare centers in Surabaya, Indonesia.

Methods: A cross-sectional study using convenience sampling was conducted. The barriers to medication adherence were measured using The Identification of Medication Adherence Barriers Questionnaire (IMAB-Q), and the medication adherence was measured using the Adherence to Refills and Medications Scale (ARMS) questionnaire. All the analyses were performed using IBM SPPS version 25.0.

Results: About 341 hypertensive patients participated in this study. The mean age of participants was 62, and 74.8% (n=255) of respondents were female. About 220 (64.5%) participants are taking hypertensive medications for 1-5 years. About 52.2% of participants had no family history of hypertension. The majority of participants (78%) did not adhere to their treatments. The median IMAB-Q score was 20 (max: 32, min: 10), indicating few barriers to medication adherence. Linear regression analysis revealed a significant relationship between adherence barriers and medication adherence (R=28.7 %, P = 0.000). Barriers to adherence were found to reduce medication adherence by 8.2% (R^2 =0.082). A significant correlation was also observed between comorbidity and adherence (R=15.9%). No significant correlation was found between education and adherence (p >0.05).

Conclusions: Poor adherence to medication leads to poor blood pressure control. The majority of the participants in the study are non-adherent towards their therapy. The role of healthcare professionals, including pharmacists, is essential in improving adherence in patients with chronic diseases such as hypertension.

Keywords: blood pressure, chronic diseases, hypertension, primary care.

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Physical and chemical characterization of granules from 70% ethanol extract of Ganitri leaves (*Elaeocarpus serratus* L.) using wet granulation method as anti-osteoporosis

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Abstract

Objectives: This study aims to determine physical and chemical characteristics of granule formula from 70% ethanol extract of *Elaeocarpus serratus* L. leaves by wet granulation method.

Methods: Granules were made using the wet granulation method and the physical and chemical characteristics of the granules were tested.

Results: The organoleptic result showed that all formulas have a strong characteristic plant extract odor and a slightly bitter taste. Formula A has a dark brown color, while formulas B and C are whitish browns. Based on the results of the flow properties test, all formulas have good flow properties because they have gone through the granulation process. The results of measurements of compressibility index, Hausner ratio, and % moisture content displayed that all formulas meet the requirements and have almost the same value. In the assay process, the average %w/w content of formula A (0.68 ± 0.017) %, formula B (0.66 ± 0.044) %, and formula C (0.16 ± 0.006) % were determined. The most optimum formula is formula C with whitish brown color, slightly bitter taste and strong characteristic plant extract odor, flow rate (10.90 ± 0.000) g/s, angle of repose (25.41 ± 0.000) °, % moisture content (4.36 ± 0,214) %, compressibility index 13.80%, Hausner ratio 1.1601, particle average distribution 1772.04 μm, and percent routine flavonoid content (0.66 ± 0.044) %w/w.

Conclusions: The physical and chemical characteristics of the three granule formulas meet the requirements of the granule test and it was found that the most optimum formula was formula B.

Keywords: *Elaeocarpus serratus* L., physical and chemical characterization, wet granulation.

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