Abstract Book

The 2nd Bandung International Teleconference on Pharmacy 2022

BANDUNG INTERNATIONAL TELECONFERENCE ON PHARMACY

BITP 2022

Contribution of advanced pharmacy research in post pandemic era toward sustainable society

http://conference.farmasi.unpad.ac.id/bitp2022/

WELCOME REMARK
From Chairman of Organizing Committee
2st Bandung International Teleconference on Pharmacy (BITP) 2021

Dear Excellencies, Colleagues, Ladies and gentlemen. I wish you a very good moorning.
It is a great pleasure for me to welcome you to this virtual conference of the 2nd Bandung International Teleconference on Pharmacy (BITP) 2022. I am grateful to acknowledge invited speakers

- Dr. Felix Zulhendri, PhD (Kebun Efi)
- apt. Rara Merinda Puspitasari, M.Farm (University of Kuala Lumpur)
- Dr. Kalman E. Wijaya (Head of Market Access at Versantis, Switzerland)
- Ahmed Fouad Abdel Wahab, PhD (Minia University, Egypt)

and other participants joining us. I am wishing you and your families my personal best—for your health and safety in this covid-19 pandemic.

This Seminar is a continuation from 1st BITP which successfully held in 2021. This is not only a forum for researchers, but it can also be followed by students, educators, observers, and practitioners from universities, research institutions, industry, and the general public to exchange ideas and latest information in the field of pharmaceutical science.
The theme of the conference is Contribution of advanced pharmacy research in post pandemic era toward sustainable society with 4 invited speakers, 11 oral presentations, and 39 poster contributions from over 200 participants, which cover various topics in the field of pharmaceutical science, including Pharmaceutical Technology and Pharmaceutics, Pharmaceutical Analysis, Medicinal Chemistry, Pharmacology and Toxicology, Pharmaceutical Biology, Community Pharmacy, and Clinical Pharmacy.

Ladies and gentlemen,
Without the generous support provided by the Directorate of Research and Community Service of Universitas Padjadjaran, this conference would not have been possible at this scale. Many members of the organizing team worked very hard to turn our initial visions for this virtual seminar into reality. Additionally, I would like to warmly thank all the authors who, with their presentations and posters, generously contributed to the lively exchange of scientific information that is so vital to the endurance of scientific conferences of this kind.
I hope you all find this conference highly engaging and beneficial for your future venture. Your support will also make this a memorable and successful event.

Finally, let me wish you a successful virtual meeting.
Thank you.

Chairman
Apt. Holis Abdul Holik, M.Si., Ph.D.

OPENING REMARKS
Dean of The Faculty of Pharmacy, Universitas Padjadjaran

First of all, I would like to convey my greetings and appreciations to all of the invited speakers especially :

- Dr. Felix Zulhendri, PhD (Kebun Efi)
- apt. Rara Merinda Puspitasari, M.Farm (University of Kuala Lumpur)
- Dr. Kalman E. Wijaya (Head of Market Access at Versantis, Switzerland)
- Ahmed Fouad Abdel Wahab, PhD (Minia University, Egypt)

Thank you for your participation in our event.

Greetings from Universitas Padjadjaran,

Ladies and gentlemen,

It is a great pleasure to welcome you to The 2nd Bandung International Teleconference on Pharmacy (BITP) 2022, this event is a continuation of the 1st BITP organized by the International Unit, Faculty of Pharmacy, Universitas Padjadjaran.

I would like to start by wishing you and your families good health and safety in this difficult time. As society begins to slowly recover from the COVID-19 pandemic, it is clear that COVID-19 has reshaped the way we will live our lives for the foreseeable future. The world is facing many predicaments that require joint hands from different stakeholders involved in a wide range of actions for positive change. We also understand the importance of science, technology and innovation in this challenging situation for transforming the world.

Due to the pandemic situation, The 2nd Bandung International Teleconference on Pharmacy (BITP) 2022 will be held through a webinar. The 2nd BITP will focus on “Contribution of advanced pharmacy research in post pandemic era toward sustainable society” with many topics including Biotechnology, Natural products, pharmaceutical excipients, pharmaceutical education during covid-19 pandemic, and many other interesting topics of pharmaceutical research.

This seminar will serve as a venue for researchers, professionals and students that have interests in the area of pharmaceutical science and its related fields to build many collaborations for their own research projects and will also enrich collaborations of the activity in education, research and community service of Faculty of Pharmacy Universitas Padjadjaran.

I hope this seminar will accomplish all its aims and earnestly desire that all participants will be able to benefit from the presentations and discussions, and this seminar will enrich the development of pharmaceutical science, not only in Indonesia but also in Asia. I would like to thank the organizing committee for their tremendous efforts to make this program come to the realisation. I hope all of the speakers and participants will gain many benefits and insightful experiences. Hopefully, we will meet again in the next BITP program.

Best Regards,

Prof. Dr. Ajeng Diantini, M.Si., Apt.

STEERING COMMITTEE

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SCHEDULE OF 2nd BANDUNG INTERNATIONAL TELECONFERENCE ON PHARMACY (2nd BITP) 2022

Topic : Contribution of Advanced Pharmacy Research in Post Pandemic Era toward Sustainable Society
Date : Thursday, 28th July 2022
Time : 08.00 A.M– 1.55 PM (Jakarta time)

Time		Agenda
From	To	
8:00:00 AM	8:03:00 AM	Opening
8:03:00 AM	8:06:00 AM	Opening Prayer
8:06:00 AM	8:09:00 AM	Indonesia Raya
8:09:00 AM	8:15:00 AM	Welcoming Speech by Dean of Faculty of Pharmacy
8:15:00 AM	8:20:00 AM	Welcoming Speech by Chairperson of the Organizing Committee
8:20:00 AM	8:22:00 AM	Documentation
8:22:00 AM	8:52:00 AM	Invited Speaker I: **"Propolis, a beekeeping waste product with a wide range of therapeutic properties, as a natural resource for sustainable rural livelihood in Indonesia"** Speaker : Dr. Felix Zulhendri, PhD (Kebun Efi) Moderator : Dr. Med. apt. Melisa I Barliana
8:52:00 AM	9:02:00 AM	QnA Invited Speaker I
9:02:00 AM	9:32:00 AM	Invited Speaker II: **" Enhancing Online Learning Experiences for Pharmacy Students using MyDispense"** Speaker : apt. Rara Merinda Puspitasari, M.Farm (University of Kuala Lumpur) Moderator : Miski Aghnia Khairinisa
9:32:00 AM	9:42:00 AM	QnA Invited Speaker II
9:42:00 AM	10:12:00 AM	Invited Speaker III: **"Patient and Citizen Involvement Health Technology Assessment - Global Perspective"** Speaker : Dr. Kalman E. Wijaya (Head of Market Access at Versantis, Switzerland) Moderator : Auliya A. Suwantika, PhD., MBA., Apt.
10:12:00 AM	10:22:00 AM	QnA Invited Speaker III
10:22:00 AM	10:25:00 AM	Announcement to parallel session
10:25:00 AM	11:55:00 AM	Parallel Session 1
12:05:00 PM	12:55:00 PM	**Lunch Break and Poster Session**
12:55:00 PM	1:00:00 PM	Announcement to next session

1:00:00 PM	1:30:00 PM	Invited Speaker IV: **"Mechanistic and Structural Understanding of Drug/Excipients in the Formulation to Develop Functional Pharmaceutical Product and to Assure the Quality"** Speaker : Ahmed Fouad Abdel Wahab, PhD (Minia University, Egypt) Moderator : Prof. apt. Nasrul Wathoni, PhD
1:30:00 PM	1:40:00 PM	QnA Invited Speaker IV
1:40:00 PM	1:50:00 PM	Announcement for Best Poster and Oral Presenter
1:50:00 PM	1:55:00 PM	Closing

TIME SCHEDULE PARALEL SESSION
(ORAL PRESENTATION)

Parallel Session 1

Room 1
Time : 10.15-11.45
Moderator : Intan Timur Maisyarah, M.Si., PhD

TIME	CODE	PRESENTER NAME	TITLE
10.15 -10.30	OP01	REKA SAFITRI	NARRATIVE REVIEW: COMBINATION OF BACILLUS, ASPERGILLUS, AND LARVA GALLERIA MELLONELLA AS PLASTIC DEGRADERS
10.30 - 10.45	OP02	APT. VINA MAULIDYA, M.FARM	EXTRACTION AND CHARACTERIZATION OF BLACK BETEL LEAF (Piper acre Blume.) ESSENTIAL OIL FROM EAST KALIMANTAN
10.45 - 11.00	OP03	RINTO SUSILO	THE CORRELATION OF EARLY ANTIVIRAL TREATMENT TO LENGTH OF RECOVERY FOR COVID-19 PATIENTS
11.00 - 11.15	OP04	M. HASAN HAPID, DRG	ZINC AS AN ANTIVIRAL ALTERNATIVE TREATMENT FOR HERPES SIMPLEX VIRUS INFECTION: A LITERATURE REVIEW
11.15 - 11.30	OP05	IMME KRIS WICAKSONO	EFFICACY AND SAFETY OF SALIVA SUBSTITUTES OR ORAL MOISTURIZING AGENTS FOR DRY MOUTH AND XEROSTOMIA: A SYSTEMATIC REVIEW
11.30 - 11.45	OP06	WINDA TRISNA WULANDARI	CURCUMIN INCORPORATED IN CHITOSAN NANOPARTICLE: INHIBITORY ACTIVITY OF α-AMYLASE AND α-GLUCOSIDASE

Room 2
Time **:** 10.15-11.30
Moderator **:** Dr. apt. Sandra Megantara, M.Si.

Time	Code	Presenter Name	Title
10.15 -10.30	OP07	DESI ELVHIRA ROSA	PHARMACOLOGICAL MANAGEMENT OF ORAL LESIONS IN ADENOCYSTIC CARCINOMA PATIENT UNDERGOING RADIOTHERAPY
10.30 - 10.45	OP08	AGUSTIN NININTOWE T. SANTO	THE USE OF HERBAL MOUTHWASH THERAPY IN ORAL LICHEN PLANUS: A SYSTEMATIC REVIEW
10.45 - 11.00	OP09	SHENDI SURYANA	MOLECULAR DYNAMIC STUDY OF MECHANISM UNDERLYING NATURE OF MOLECULAR RECOGNITION AND THE ROLE OF CROSSLINKER IN THE SYNTHESIS OF SALMETEROL-TARGETING MOLECULARLY IMPRINTED POLYMER FOR ANALYSIS OF SALMETEROL XINAFOATE IN BIOLOGICAL FLUID
11.00 - 11.15	OP10	DR. SOFA FAJRIAH	HERBAL STANDARDIZATION, TOTAL PHENOLIC CONTENT AND ANTIOXIDANT EVALUATION FROM Centella asiatica
11.15 - 11.30	OP11	YULIUS BAKI KORASSA	IN SILICO STUDY OF 12 PHYTOSTEROL COMPOUNDS IN MORINGA (Moringa oleifera Lamk.) SEED OIL ON 5α-REDUCTASE ENZYME INHIBITOR ACTIVITY AS ANTI-ALOPECIA

TIME SCHEDULE
(POSTER PRESENTATION)

No	Code	Presenter Name	Title
1	PP01	NUR MASYITHAH ZAMRUDDIN	SYNTHESIS AND CHARACTERIZATION OF MAGNETIC MOLECULAR IMPRINTED POLYMER-SOLID PHASE EXTRACTION (MMI-SPE) FOR ANALYSIS OF MDR-TB DRUG CLOFAZIMINE IN BLOOD SAMPLES
2	PP02	APT. NUR RAHAYUNINGSIH, M.SI	ANTIDEPRESSANT ACTIVITY OF Muntingia Calabura L. ETHANOL EXTRACT IN MALE WHITE MICE WITH FORCED SWIMMING TEST, TAIL SUSPENSIONS TEST, AND OPEN FIELD TEST
3	PP03	IKE SUSANTI	SYNTHESIS OF MESOPOROUS SILICA IMPRINTED SALBUTAMOL WITH TWO TEOS / MTES RATIO COMPOSITIONS THROUGH DIRECT INCORPORATION METHOD FOR SALBUTAMOL SEPARATION
4	PP04	DR.APT.GARNADI JAFAR, M.SI	DEVELOPMENT OF FORMULA AND CHARACTERIZATION OF NANOSTRUCTURED LIPID CARRIER (NLC) VITAMIN E ACETATE USING LAURYL GLUCOSIDE SURFACTANT (PLANTACARE®)
5	PP05	LEVINA ARISTAWIDYA	RECENT DEVELOPMENT OF RADIONUCLIDE-BASED IMAGING IN DIAGNOSIS AND THERAPY OF LUNG CANCER
6	PP06	RIANI TANJUNG, SE., MSI.,AK.,CA	COST-EFFECTIVENESS ANALYSIS OF GASTRITIS THERAPY IN AN AIR FORCE HOSPITAL IN BANDUNG, INDONESIA
7	PP07	APT. YENNI PUSPITA TANJUNG, M.FARM.	FORMULATION AND EVALUATION OF THE ESSENTIAL OIL HAND CREAM PREPARATION OF BASIL LEAVES (Ocimum Basilicum) WITH VARIATION CONCENTRATION OF LIQUIDUM PARAFFIN AS AN EMOLLIENT
8	PP08	SRI AGUNG FITRI KUSUMA	NATURAL INHIBITOR OF AGRONOMICALLY REPELLENT PLANT TOWARDS CLINICAL ISOLATE OF Salmonella Typhi
9	PP09	SRI AGUNG FITRI KUSUMA	PHYTOCHEMICAL AND PHARMACOLOGICAL STUDY ON SELECTED INDONESIAN WEEDS

No	Code	Presenter Name	Title
			EXTRACTS: A NOVEL INSIGHT TO ANTI-SHIGELLOSIS
10	PP10	SRI AGUNG FITRI KUSUMA	SINGLE-STEP INTRACELLULAR PROTEIN PURIFICATION OF THE NON-TAG Mpt64-RECOMBINANT
11	PP11	DR.APT. YULIET,S.SI.M.SI.	CYTOTOXIC EFFECTS OF Hibiscus Surattensis L. LEAVES EXTRACTS ON BSLT, MCF-7 AND HELA CELLS
12	PP12	NORISCA ALIZA PUTRIANA	VALIDATION OF VITAMIN K2 (MK-4) LEVELS ANALYSIS METHOD IN HUMAN PLASMA USING HPLC
13	PP13	FIRMAN GUSTAMAN	ANTIOXIDANT ACTIVITY OF EFFERVESCENT GRANULES FROM KIRINYUH LEAVES (Chromolaena Odorata (L.) R.M.King & H.Rob) AND LEAF OF MAREME (Glochidion Arborescens Blume)
14	PP14	LUSI NURDIANTI	FORMULATION AND CHARACTERIZATION FACE SERUM OF ASTAXANTHIN-BETA CAROTENE NANOEMULSION AS ANTIOXIDANT
15	PP15	INSAN SUNAN KURNIAWANSYAH	GARGLE FORMULATION FROM TRIGONA SP PROPOLIS EXTRACT AND ITS ACTIVITY AGAINST Streptococcus Mutans
16	PP17	IRMA ERIKA HERAWATI	QUANTIFICATION OF ALKALOID, PHENOLIC, FLAVONOID, AND TANIN CONTENT FROM Arcangelisia Flava (L.) Merr.
17	PP18	INDRA	PARTICLE DESIGN OF KETOCONAZOLE BY SPHERICAL CRYSTALLIZATION
18	PP19	NYI MEKAR SAPTARINI	ISOLATION, IDENTIFICATION, AND QUANTIFICATION OF MAJOR FLAVONOID IN LEAVES OF Pereskia Bleo (Kunth) Dc
19	PP20	HANAFI TIRAN	COMPARISON OF PHARMACOKINETICS PROFILE OF OPHTHALMIC ANTIBIOTIC IN SITU GEL WITH CONVENTIONAL PREPARATION: A REVIEW
20	PP21	ENDAH KARTIKAWATI, M.SC	ANTIBACTERIAL ACTIVITY OF CALAMANSI (Citrofurtunella Microcarpa) PEEL EXTRACT AGAINTS Staphylococus Aureus Atcc 29213

No	Code	Presenter Name	Title
21	PP22	MUHAMMAD ILFADRY RIFASTA	IN SILICO STUDY OF YODIUM LEAF (Jatropha Multifida Linn) ACTIVE COMPOUND AS ANTIBIOTIC FOR DIABETIC WOUNDS
22	PP23	INE SUHARYANI	A REVIEW ON CHITOSAN-BASED MATERIALS AS POTENTIAL WOUND DRESSING
23	PP24	TUBAGUS AKMAL	FORMULATION AND EVALUATION OF BLUSH ON CREAM FROM ROSELLA FLOWER EXTRACT (Hibiscus Sabdariffa L.) WITH OLIVE OIL CONCENTRATION VARIATIONS AS EMOLLIENTS
24	PP25	NORISCA ALIZA PUTRIANA	VALIDATION OF VITAMIN K2 (MK-4) LEVELS ANALYSIS METHOD IN HUMAN PLASMA USING HPLC
25	PP26	IDA MUSFIROH	ISOLATION, CHARACTERIZATION AND IN VITRO ACTIVITY OF ANTIDIABETIC FROM Lawsonia Inermis LEAVES ACTIVE COMPOUNDS
26	PP27	APT. FAJAR SETIAWAN., M. FARM.	FORMULATION AND CHARACTERIZATION OF ZEAXANTHIN NANOEMULSION RADIANCE SERUM AS ANTIOXIDANT
27	PP29	YUNIARTI FALYA	NADES EXTRACT OF GEDONG MANGGO LEAVES AND MURBEI LEAVES IN SPRAY GEL AS A SUNSCREEN
28	PP30	RENNY AMELIA	DISCOVERING TYROSINASE INHIBITORS FROM Morus Sp. PLANTS: AN IN SILICO STUDY
29	PP31	APT. MUS IFAYA, S.FARM.,M.SI	ALPHA-GLUCOSIDASE INHIBITORY ASSAY-SCREENED ISOLATION FROM LAWSONIA INERMIS LEAVES ACTIVE COMPOUNDS
30	PP32	ADE YENI APRILLIA, M.SI	FORMULATION AND EVALUATION OF EDIBLE FILM LEAF SIRIH (Piper Betle L) AS MOUTH FRESHER
31	PP33	MUHAMMAD RYAN RADIX RAHARDHIAN	IN SILICO TARGETING OF BIOACTIVE COMPOUNDS FROM SUNGKAI (Peronema Canescens) To Il-6 AND Tnf-A ACTIVE SITES FOR THE TREATMENT OF COVID-19
32	PP34	GOFARANA WILAR	SIGNAL OF CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASE Ii AND EXTRACELLULAR REGULATED KINASE ON NICOTINE INDUCED CPP
33	PP35	AMI TJITRARESMI	PHARMACOKINETIC PREDICTIONS AND MOLECULAR DOCKING ANALYSIS OF TERPENOID AND FLAVONOID COMPOUNDS

No	Code	Presenter Name	Title
			FROM MIANA LEAVES (Plectranthus Scutellarioides (L.) R.Br.) AS AN ANTIMALARIAL ON PLASMEPSIN Ii RECEPTOR
34	PP36	INTAN TIMUR MAISYARAH, PH.D.	CYTOTOXIC ACTIVITY OF Pouteria Campechiana (Kunth) Baehni ON MCF-7 CELLS
35	PP37	ADE ZUHROTUN	TOPOISOMERASE INHIBITORS ACTIVITY OF CEMPAKA KUNING (Michelia Champaca L.) BARK EXTRACTS AND FRACTIONS AND ITS LIRIODENINE CONTENTS
36	PP38	RADEN BAYU INDRADI	PHARMACOGNOSTIC CHARACTERISTIC OF Kaempferia Galanga Rhizome DRIED BY OVEN AND COMBINATION METHODS
37	PP39	ADE ZUHROTUN	ANALYSIS OF GALLIC ACID, QUININE, TANNIC ACID, AND SAPONINS IN CIPLUKAN HERB EXTRACT (Physalis Angulata L.)
38	PP40	RESMI MUSTARICHIE	THE ANTI-INFLAMMATORY TABLET FORMULATION OF COLEUS (PLECTRANTHUS SCUTELLARIODES) LEAVES EXTRACT USING KOLLICOAT®PROTECT COATING
39	PP41	DANNI RAMDHANI	ANTIBIOTIC RESISTANCE PROFILES OF HAEMOPHILUS INFLUENZA ISOLATES FROM ADULT PATIENT: THE CITY CENTER STUDY IN INDONESIA

INVITED SPEAKER

PROPOLIS, A BEEKEEPING WASTE PRODUCT WITH WIDE-RANGING THERAPEUTIC PROPERTIES, AS A NATURAL RESOURCE FOR SUSTAINABLE RURAL LIVELIHOOD IN INDONESIA.

Felix Zulhendri

Kebun Efi, Karo Regency, North Sumatra, Indonesia
e-mail address of corresponding author: Felix.zulhendri@kebunefi.com

ABSTRACT

There are three main beehive-derived products a beekeeper can harvest, namely honey, bee pollen, and propolis. However, propolis is often considered a hindrance and a waste product due to its stickiness. Propolis is also difficult to remove and process. The therapeutic and biological properties of propolis such as its antioxidant, anti-inflammatory, immune-modulator, and antimicrobial properties in relation to various pathophysiologies will be discussed. The awareness and knowledge of its health-promoting potential will transform propolis into a valuable and sustainable natural ingredient to develop nutraceuticals, functional foods, and even standardized propolis-derived pharmaceuticals, and consequently improve the livelihood of Indonesian meliponiculturists.

Keywords: propolis, meliponiculture, nutraceutical, functional food, pharmaceutical, sustainable

References:

1. Zulhendri F, Fellitti R, Fearnley J, Ravalia M. 2021. The use of propolis in dentistry, oral health, and medicine: A review. Journal of Oral Biosciences 63 (1): 23-34
2. Zulhendri F, Ravalia M, Kripal K, Chandrasekaran K, Fearnley J, Perera CO. 2021. Propolis in metabolic syndrome and its associated chronic diseases: A narrative review. Antioxidants 10 (3): 348.
3. Zulhendri F, Perera CO, Tandean S, Abdulah R, Herman H, Christoper A, Chandrasekaran K, Putra A, Lesmana R. 2022. The Potential Use of Propolis as a Primary or an Adjunctive Therapy in Respiratory Tract-Related Diseases and Disorders: A Systematic Scoping Review. Biomedicine & Pharmacotherapy 146: 112595.

INVITED SPEAKER

PATIENT AND CITIZEN INVOLVEMENT IN HEALTH TECHNOLOGY ASSESSMENT – GLOBAL PERSPECTIVE

Kalman Wijaya

Member of Health Technology Assessment International (HTAi) Patient and Citizen Involvement Interest Group
International Society of Pharmacoeconomics and Outcome Research (ISPOR) Patient Centered Special Interest Group
e-mail address of corresponding author: kwijaya@versantis.com

ABSTRACT

Most developed countries achieved universal health coverage, and developing countries are striving to achieve universal health coverage. The involvement of different stakeholders in formal or informal ways in health technology assessment (HTA) must be culturally and socially relevant and acceptable. Challenges may be different from those seen in high-income countries. In the session, the author will present the overview of medicine access including key appraisal processes, overview of international payer archetypes and the study outcomes uncovering the context-related aspects of patient and citizen involvement (PCI) in key 5 countries with focus in developing countries. Last point also will further elaborate on the experiences encountered with PCI and identifying opportunities for patients and citizens toward contributing to local decision- and policy-making processes related to health technologies.

Keywords: Health Technology Assessment, Health Economics, Pharmacoeconomics, Patients Involvement, Medicine Access

References:

Holtorf A-P, Mueller D, Sousa MSA, Pretorius L, Wijaya KE, Adeyemi S, Ankleshwaria D (2021). Pilot approach to analyzing patient and citizen involvement in health technology assessment in four diverse low- and middle-income countries. International Journal of Technology Assessment in Health Care 37, e1, 1–9. https://doi.org/ 10.1017/S0266462320002263

INVITED SPEAKER

CYCLODEXTRIN MODIFIED PAMAM DENDRIMER AS A TARGETED CANCER siRNA AND DOX CARRIER

Ahmed Mohammed

Minia University University, Egypt

A ternary complex composed of Doxorubicin, siPLK1 and a folate appended PAMAM dendrimer modified with a β-cyclodextrin derivative "Fol-PEG-GUG-β-CDE/DOX/siPLK1" is prepared and evaluated for the selective co-delivery of Dox and siRNA to folate expressing tumor cells. The cytotoxic activity of Fol-PEG-GUG-β-CDE/DOX/siPLK1 ternary complex showed an FR-α-mediated cellular uptake and superior to that of the binary complex of Fol-PEG-GUG-β-CDE/siPLK1. Furthermore, the Fol-PEG-GUG-β-CDE/DOX/siPLK1 ternary complex exhibited a potent antitumor activity *in vivo* without causing severe adverse effects. Together, our results imply that the Fol-PEG-β-GUG-CDE may serve as a tumor-specific co-delivery carrier for siRNA and low-molecular anticancer medications.

OP01

NARRATIVE REVIEW: COMBINATION OF *BACILLUS*, *ASPERGILLUS*, AND LARVA *GALLERIA MELLONELLA* AS PLASTIC DEGRADERS

Reka Safitri, Indah Saputri, Abdul Samad Ratuloly, and Sukriani Kursia

Sekolah Tinggi Ilmu Farmasi Makassar
Jl. Perintis Kemerdekaan km 13.5, Daya, Makassar, 90242, Indonesia
e-mail address of corresponding author: rekasafitri20@gmail.com

ABSTRACT

Plastics are used globally with an important role in everyday life, due to their low cost, excellent oxygen/moisture barrier properties, and lightweight, which are why they are used as packaging materials[1]. There are four main treatment solutions for plastic waste disposal: stockpiling, incineration, recycling, and biodegradation[2-3]. Biodegradation by microorganisms is undertaken to overcome the limitations associated with conventional burning and stockpiling methods[4-5]. The purpose of this review is to find and explore secondary data sources related to efforts to deal with the problem of plastic waste through the use of microorganisms. The review method used is a narrative review system by digging up information in the form of secondary data from data sources, namely Pubmed, Google scholar and Science direct. Based on the literature study that has been done, the results show the microorganisms *Aspergillus, Bacillus, Galleria mellonella, Pseudomonas Amycolatopsis, Saccharothrix, Pseudonocardia, Aspergillus fumigatus, Pseudomonas fluorescens, Periculosum, Rhodococcus ruber, Comamonas acidovorans* dan *Pseudomonas aeruginosa* can degrade plastic types, PBS (Polybutylene succinate), PE (Polyethylene), PU (Polyurethane) and PHB (Poly-β-hydroxybutyrate). The conclusion of this review is that microorganisms *Aspergillus, Bacillus, Galleria mellonella* and *Pseudomonas* can degrade plastic.

Keywords: Plastics, Biodegradation, Microorganisms, *Aspergillus*, *Bacillus*, *Galleria mellonella*

References:

1. Dang, TCH *et al*, 2018, Plastic degradation by thermophilic Bacillus sp. BCBT21 isolated from composting agricultural residual in Vietnam, Advances in Natural Sciences: Nanoscience and Nanotechnology, 9 (1).
2. Danso, D., Chow, J. and Streita, WR, 2019, Plastics: Environmental and biotechnological perspectives on microbial degradation, Applied and Environmental Microbiology, 85 (19), pp. 1–14.
3. Dwicania, E, 2019, Biodegradation of Plastic Waste by Microorganisms.
4. Erlambang, BPD, Oktarianti, R. and Wathon, S, 2019, Potential Microorganisms as Biological Agents to Degrade Plastic Waste, Bio Trends, 10 (2), pp. 18–26.
5. North, E. J. and Halden, R. U, 2013, Plastics and environmental health: The road ahead, *Reviews on Environmental Health*, 28(1): 1–8.

OP02

EXTRACTION AND CHARACTERIZATION OF BLACK BETEL LEAF (*Piper acre* Blume.) ESSENTIAL OIL FROM EAST KALIMANTAN

Vina Maulidya[1,2], Aliya Nur Hasanah[1], Laode Rijai[2], Muchtaridi Muchtaridi[1*]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy Universitas Padjajaran, Bandung, Indonesia; Jl. Raya Jatinangor KM 21.5 Bandung-Sumedang, 45363.
[2]Faculty of Pharmacy Universitas Mulawarman, Samarinda, Indonesia
e-mail address of corresponding author: muchtaridi@unpad.ac.id; Tel. 022-84288888 ext.3210

ABSTRACT

Based on the identification, black betel belongs to *Piper betle* L., more detailed identification shows that black betel and *Piper betle* L. have the same shape and characteristics.[1] Widyo et al, reported that the results of the GC-MS analysis of *piper betle* L. essential oil obtained 10 dominant compounds, namely chavicol, eugenol, germacren D, caryophyllene, eugenol acetate, 2-alifenol, β-chamigrene, α-cadinene, terpineol, and α-humulen. *Piper crocatum* obtained 5 dominant compounds, namely sabinene, β-mirsen, linalool, caryophyllene, and β-pinene. *Piper nigrum* obtained 5 dominant compounds, namely β-pinene, limonene, linalool, caryophyllene, and germacrene B. *Piper cubeba* obtained 5 dominant compounds namely β-pinene, linalool, caryophyllene, ã-cadinene and cubebol.[2] It is possible that the black betel which is taxonomically belonging to the piper species has a different chemical content. Based on these components, linalool is also an active ingredient that can play a role compared to other minor compounds. The properties of linalool can be beneficial and contribute to its anti-anxiety (relaxation) effect.[3] In a literature study, it was stated that linalool is a compound that has strong antileukemic activity against lymphoma cells.[4] To develop traditional medicines that have been used for generations from the local area to a wider scope, it is necessary to conduct research related to the characterization of black betel essential oil and the content of the dominant compounds in it. Extraction was carried out using steam-water distillation. Essential oils have organoleptic characteristics such as observing color and solubility in ethanol. Essential oil analysis was carried out using an Agilent GC-MS device using a column type DB-5MS with a helium gas carrier. After essential oil analysis, the level of dominant compounds on it were determined. Obtained essential oil from samples of black betel leaf using steam-water distillation method with volatile oil characteristics that meet SNI standards. Based on the results of GCMS, the most dominant compound in 5 samples of black betel leaf essential oil from East Kalimantan was linalool so that the validation of the analytical method from linalool and obtained the conditions of analysis of the injector temperature of 250°C, the initial temperature of the oven 40°C with the first holding time for 2 minutes, reaches 125°C with a holding time of 10 minutes, then the temperature reaches 250°C with a holding time of 2 minutes, until the final temperature becomes 340°C with a holding time of 10 minutes. The carrier gas flow rate is 1 mL/min with a split ratio of 20:1. carried out at a molecular weight of 40-700 m/z. With a linearity value of 0.999; the percentage value of the relative standard deviation (% RSD) was 1.68%; the value of percent recovery (% recovery) on average was

102.27%; and the detection limit value (LOD) of 0.4% and the quantitative limit value (LOQ) of 1.2%. The highest linalool content of 5 samples of black betel leaf essential oil was found in the sample code MADSH 4, which was 10.92% with a standard deviation of 0.0055. The steam-water distillation extraction method can be used to obtain essential oil of black betel leaf with essential oil characteristics that meet SNI standards. Based on the results of GCMS, linalool is known to be the most dominant compound in the essential oil of black betel leaf from East Kalimantan with the highest concentration found in the MADSH4 sample of 10.92%.

Keywords: Extraction, Characteristics, Essential Oil, Black Betel Leaf

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OP03

THE CORRELATION OF EARLY ANTIVIRAL TREATMENT TO LENGTH OF RECOVERY FOR COVID-19 PATIENTS

Rinto Susilo, Nur Rahmi Hidayati, Tomi, Deani Asmarandani

College of Pharmacy Muhammadiyah Cirebon
Cideng Indah, Kertawinangun, Kedawung, Cirebon City, Jawa Barat 45133
e-mail address of corresponding author: rintosusilo88@gmail.com

ABSTRACT

Antiviral treatment that is not yet effective against the COVID-19 virus makes virus replication very fast, so it is necessary to optimize treatment for COVID-19 patients[1]. This study aims to determine the relationship between early antiviral treatment to the recovery time of COVID-19 patients. The study was conducted retrospectively using 94 medical records of COVID-19 patients at RS X Cirebon in 2021, taking random samples according to the inclusion-exclusion criteria. Data were analyzed univariately on patient characteristics and bivariate correlation using Spearman's rho. The 55-59 year age group was the largest with 27 patients (28.7%). Based on gender more men than women (52.1% vs 47.9%)[2]. Favipiravir therapy (43.6%) was mostly given to COVID-19 patients. Early antiviral treatment of antiviral most patients got initiation at 5-8 days (42.6%) after the onset of symptoms. The recovery time for COVID-19 patients experienced a recovery of 13-18 days (58.5%). This study shows that there is a strong positive correlation between early antiviral treatment to the recovery time of COVID-19 patients with a significance value of 0.000 and a correlation coefficient of 0.659, so the earlier an antiviral is given, the patient will recover faster[3].

Keywords: COVID-19, early antiviral treatment, length of recovery

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OP04

ZINC AS AN ANTIVIRAL ALTERNATIVE TREATMENT FOR HERPES SIMPLEX VIRUS INFECTION: A LITERATURE REVIEW

M. Hasan Hapid[1], Riani Setiadhi[2]

[1]Oral Medicine Specialist Program, Faculty of Dentistry, Padjadjaran University, Jl. Sekeloa Selatan no 1, Bandung, West Java, Indonesia 40132,
[2]Department of Oral Medicine, Faculty of Dentistry, Padjadjaran University, Jl. Sekeloa Selatan no 1, Bandung, West Java, Indonesia 40132
e-mail address of corresponding author: Mochapid@gmail.com

ABSTRACT

Herpes simplex virus (HSV) is a double-stranded DNA virus that can cause oral mucosa infection.[1,2] This viral infection can cause primary infection, and latent in ganglion nerve causes recurrence.[3,4] The main treatment is antiviral drugs such as acyclovir.[2,5] It is now known that zinc also has antiviral activity, including against the herpes simplex virus.[6] This article's purpose was to review zinc's effectiveness as an antiviral in treating herpes simplex virus infection. The herpes simplex virus that often causes symptoms in humans are HSV type 1 and type 2.[1,2] The lesions appear as vesicles which then rupture into ulcers.[1,7] Zinc is one of the most abundant nutrients or metals in the human body besides iron.[8] In vitro studies about the effects of zinc on HSV have shown that it has an inhibitory role in almost every aspect of the viral life cycle.[9] HSV attaches to the host cells to replicate and synthesize new viral proteins. Zinc can inhibit this process by depositing on the surface of the virion and inactivating the enzymatic function which is required for the attachment to the host cell, disrupting the surface glycoprotein of the viral membrane so it could not adhere and carry out the next life cycle, it can also inhibit the function of DNA polymerase that works for viral replication in the host cell.[6,8,9,10] Zinc has effectiveness as an antiviral against the herpes simplex virus, therefore patients infected with HSV can be treated with zinc as an alternative to acyclovir.

Keywords: Herpes Simplex Virus (HSV), Zinc, Antiviral

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OP05

EFFICACY AND SAFETY OF SALIVA SUBSTITUTES OR ORAL MOISTURIZING AGENTS FOR DRY MOUTH AND XEROSTOMIA: A SYSTEMATIC REVIEW

Imme Kris Wicaksono,[1] **Indah Suasani Wahyuni.**[2]

[1]Oral Medicine Specialist Study Program, Faculty of Dentistry, Universitas Padjadjaran, Jalan Sekeloa Salatan I, Bandung, Indonesia, 40132
[2]Oral Medicine Department, Faculty of Dentistry, Universitas Padjadjaran, Jalan Sekeloa Selatan I, Bandung Indonesia, 40132
e-mail address of corresponding author: indah.wahyuni@unpad.ac.id

ABSTRACT

This systematic review aimed to explore the efficacy and safety of saliva substitutes or oral moisturizing agents for dry mouth and xerostomia. Dry mouth and xerostomia are often experienced by the elderly, patients undergoing or after radiotherapy, hypertension, diabetes mellitus, and Sjogren's syndrome.[1,2] Saliva substitutes or oral moisturizing agents improve the patient's quality of life because they can moisturize the oral mucosa and maintain the buffer capacity. This review was structured following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. Pubmed and Ebscohost-CINAHL plus databases were used for article searching. The JADAD or Oxford quality scoring system was used to assess the risk of bias. The saliva substitutes or oral moisturizing agents tested consisted of moisturizer mouthwash, Verramin gel, oral moisturizer jelly (OMJ), GC Dry Mouth Gel®, aloe vera mouthwash, and ginger mouthwash. All of them can reduce discomfort and dry mouth complaints in patients, even OMJ could increase salivary pH and reduce the risk of Candidiasis. There was no significant difference after using moisturizer mouthwash in patients with Sjogren's Syndrome compared to giving natural water as a control. Mild to moderate adverse effects were found due to the use of moisturizer mouthwash. Saliva substitutes or oral moisturizing agents can overcome the problem of dry mouth or xerostomia, however, were less effective for patients with Sjogren's syndrome.[2]

Keywords: Dry mouth, oral moisturizing agents, saliva substitutes, xerostomia.

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OP6

CURCUMIN INCORPORATED IN CHITOSAN NANOPARTICLE: INHIBITORY ACTIVITY OF α-AMYLASE AND α-GLUCOSIDASE

Winda Trisna Wulandari, Ratna Anggraeni, Shafa Anindya Budiani, Ade Yeni Aprilia, Lilis Tuslinah

Faculty of Pharmacy, Universitas Bakti Tunas Husada, Jalan Cilolohan No. 36 Kota Tasikmalaya, West Java, Indonesia 46115
e-mail address of corresponding author: windatrisna@universitas-bth.ac.id

ABSTRACT

Curcumin is a polyphenol compound that has pharmacological activity as an antihyperglycemic by inhibiting α-amylase and α-glucosidase enzymes.[1] However, curcumin is classified into class IV of BCS (Biopharmaceutical Classification System) because it has poor water solubility (4.375 µg/mL) and low bioavailability (1,498 ± 0.402 µg h/mL).[2] Therefore, a technique is needed to increase the bioavailability of curcumin, one of which is nanotechnology.[3] This research was conducted to determine inhibition activity of curcumin nanoparticles against α-amylase and α-glucosidase enzymes. Curcumin nanoparticle was made by ionic gelation method using chitosan as cation, sodium tripolyphosphate as polyanion, and tween 80 as surfactant. Curcumin nanoparticles were tested for inhibitory activity of α-amylase and α-glucosidase enzymes using UV-Vis spectrophotometry at λ= 595 nm and 305 nm respectively. Curcumin nanoparticles produced have 198.1 nm of particle size with PdI value of 0.349 and zeta potential value of -8,33 mV. The IC_{50} value of curcumin nanoparticles against α-amylase was 56.140 ppm, while acarbose was 63.32 ppm. While, the IC_{50} value against α-glucosidase was 3.95 ppm and 4.11 ppm for curcumin nanoparticles and acarbose, respectively. It can be concluded that curcumin nanoparticles have great potential as antihyperglycemic by inhibiting α-amylase and α-glucosidase enzymes.

Keywords: curcumin, nanoparticle, α-amylase, α-glucosidase.

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OP07

PHARMACOLOGICAL MANAGEMENT OF ORAL LESIONS IN ADENOCYSTIC CARCINOMA PATIENT UNDERGOING RADIOTHERAPY

Desi Elvhira Rosa[1], Tenny Setiani Dewi[2]

[1]Oral Medicine Residency Program, Faculty of Dentistry, Universitas Padjadjaran, Jalan Sekeloa Selatan I, 40132, Bandung, Indonesia
[2]Departement of Oral Medicine, Faculty of Dentistry, Universitas Padjadjaran, Jalan Sekeloa Selatan, I, 40132, Bandung, Indonesia
e-mail address of corresponding author: desi20004@mail.unpad.ac.id

ABSTRACT

Head and neck cancers are often treated with high radiation doses to the radiation area that includes the oral cavity, jaws, and salivary glands. In addition to its effect on inhibiting the growth of cancer cells, head and neck radiation also has some adverse reactions, especially in the oral cavity.[1,2] This case report aimed to describe pharmacological management of oral lesions in adenocystic submental carcinoma patient undergoing radiotherapy. A 48-year-old female patient with a history of adenocystic submental carcinoma was referred to the Department of Oral Medicine from the Department of Radio-Oncology. The patient complained of difficulty in eating, swallowing, and speaking due to severe pain in her oral cavity for 3 weeks. She could only eat liquid foods. Intra oral examination revealed painful yellowish white plaques that could not be scraped on the tongue, maxillary and mandibular anterior gingiva, left and right buccal mucosa, and the palate, diagnosed with oral candidiasis. Oral mucositis was found on the left buccal mucosa and upper labial mucosa with clinical features of multiple shallow ulcers. The patient was given nystatin oral suspension for oral candidiasis, benzydamine hydrochloride for the complaint of pain when swallowing, and saline for promoting wound healing and keeping the oral mucosa moist. These lesions healed only in a week, so she could eat solid food without pain. Appropriate pharmacological management of oral lesions in patient undergoing radiotherapy provides significant healing to improve the quality of life.

Keywords: radiotherapy, oral mucositis, oral candidiasis, nystatin oral suspension, benzydamine, saline.

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OP08

THE USE OF HERBAL MOUTHWASH THERAPY IN ORAL LICHEN PLANUS: A SYSTEMATIC REVIEW

Agustin Ninintowe T. Santo[1], Tenny Setiani Dewi[2], Wahyu Hidayat[2]

[1]Oral Medicine Residency Program, Faculty of Dentistry, Universitas Padjadjaran, Jl. Sekeloa Selatan no 1, Bandung, West Java, Indonesia 40132.
[2]Department of Oral Medicine, Faculty of Dentistry, Universitas Padjadjaran, Jl. Sekeloa Selatan no 1, Bandung, West Java, Indonesia 40132.
e-mail address of corresponding author: agustin20001@mail.unpad.ac.id

ABSTRACT

Oral lichen planus (OLP) is a chronic disease that rarely undergoes spontaneous remission and affects most of the oral mucosa, tongue, and gingiva.[1,2] OLP is a symptomatic or asymptomatic condition whose main treatment is corticosteroids. Corticosteroids have side effects, including candidiasis, burning sensation, mucosal atrophy, and dry mouth.[3,4] Research on herbal ingredients is carried out to find drugs that are effective and have advantages in reducing the side effects of synthetic products.[5] To describe the advantages of herbal mouthwashes therapy in oral lichen planus. This systematic review was based on PRISMA guidelines. The selection of articles published in the last 5 years from Pubmed and Google Scholar was conducted in June 2022 with the keywords mouthwash, mouthrinse, and oral lichen planus. The risk assessment of bias uses the Oxford Scoring System. 2225 journals were found and through screening 7 articles were obtained. After going through a bias test, 6 articles of high range quality and 1 article of low range quality were obtained. The six journals are randomized clinical trials of herbal mouthwashes and synthetic mouthwashes. Three articles of herbal mouthwash, two articles of synthetic mouthwash and one article comparing herbal and synthetic mouthwashes. These six articles showed differences in the time, size and pain of using herbal and synthetic mouthwashes, and also found that side effects were higher with synthetic mouthwashes compared to herbal mouthwashes. Herbal mouthwash has fewer side effects than synthetic mouthwash, while clinically, synthetic mouthwash is more effective than herbal mouthwash.

Keywords: mouthwash, mouthrinse, oral lichen planus

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OP09

MOLECULAR DYNAMIC STUDY OF MECHANISM UNDERLYING NATURE OF MOLECULAR RECOGNITION AND THE ROLE OF CROSSLINKER IN THE SYNTHESIS OF SALMETEROL-TARGETING MOLECULARLY IMPRINTED POLYMER FOR ANALYSIS OF SALMETEROL XINAFOATE IN BIOLOGICAL FLUID

Shendi Suryana[1,2], Mutakin Mutakin[1], Yudi Rosandi [3]and Aliya Nur Hasanah[1,4*]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21, Sumedang 45363, Indonesia
[2]Pharmacy Department, Faculty of Mathematics and Natural Sciences, Universitas Garut, Jl. Jati No.42B, Garut 44151, Indonesia
[3]Geophysic Department, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21, Sumedang 45363, Indonesia
[4]Drug Development Study Center, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21, Sumedang 45363, Indonesia
e-mail address of corresponding author: aliya.n.hasanah@unpad.ac.id

ABSTRACT

The rational preparation of molecularly imprinted polymers (MIPs) to have selective extraction of salmeterol xinafoate (SLX) from serum was studied. SLX is an acting β adrenergic receptor agonist used in the treatment of asthma[1] and has an athletic performance-enhancing effect[2]. Molecular dynamics were used to simulate the SLX-imprinted pre-polymerization system, to determine the system's stability. The computational simulation showed that SLX as a template, 4-hydroxyethyl methacrylate (HEMA) as a monomer, and trimethylolpropane trimethacrylate (TRIM) as a crosslinker in a mol ratio of 1:6:20 had the strongest interaction in terms of the radial distribution function. To validate the computational result, four polymers were synthesized using the precipitation polymerization method, and MIP with composition and ratio corresponding with the system with the strongest interaction as an MD simulation result showed the best performance, with a recovery of 96.59 ± 2.24% of SLX in spiked serum and 92.25 ± 1.12% when SLX was spiked with another analog structure. Compared with the standard solid phase extraction sorbent C-18, which had a recovery of 79.11 ± 2.96%, the MIP showed better performance. The harmony between the simulation and experimental results illustrates that the molecular dynamic simulations had a significant role in the study and development of the MIPs for analysis of SLX in biological fluid.

Keywords: salmeterol; molecularly imprinted polymer; molecular dynamics; precipitation polymerization

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OP10

HERBAL STANDARDIZATION, TOTAL PHENOLIC CONTENT AND ANTIOXIDANT EVALUATION FROM *Centella asiatica*

Sofa Fajriah, Rizna Triana Dewi, Marissa Angelina, Sukirno

[1]Research Center for Pharmaceutical Ingredients and Traditional- BRIN
Kawasan PUSPIPTEK, Serpong, South Tangerang, Banten- Indonesia 15314
e-mail address of corresponding author: sofafajriah@gmail.com; sofa001@brin.go.id

ABSTRACT

Standardization is an important stage in conducting research and development of natural medicines in Indonesia to ensure their quality and safety.[1] This study aimed to standardize simplicia and extracts from three regions in Indonesia (Sukabumi (P1), Lembang (P2), and Solo (P3)) and evaluate their antioxidant activity. The standardization methods tested included non-specific parameters (loss on drying, ash content, acid insoluble ash content, and water content), and extract-specific parameters (organoleptic, chromatogram pattern, and secondary metabolite content)[2,3], while the antioxidant test used DPPH and ABTS methods. The results obtained showed that both the simplicia and the extract met the quality standards of the Indonesian herbal pharmacopoeia[3]. P1 extract had the highest total phenolic content of 7.29±1.19 mg GAE/g extract and P2 had the highest asiaticoside content of 5.83%. In addition, P1 extract also had the highest antioxidant activity of 118.16±2.00 µg/mL with the DPPH method and 142.67±0.45 µg/mL with the ABTS method. Therefore, *Centella asiatica* extract can be used as one of the antioxidant herbs.

Keywords**:** *Centella asiatica*, standardization, antioxidant, asiaticoside

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OP11

IN SILICO STUDY OF PHYTOSTEROL COMPOUNDS IN MORINGa (*Moringa oleifera* Lamk.) SEED OIL ON 5A-REDUCTASE ENZYME AS ANTI-ALOPECIA

Yulius Baki Korassa[1,2], Nyi Mekar Saptarini[1], Resmi Mustarichie[1], Rini Hendriani[3], Putra Jiwamurwa Pama Tjitda[2]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Padjadjaran University. St. Raya Bandung Sumedang, Km. 21 Jatinangor 45363
[2] Pharmacy Study Program, Health Polytechnic of Ministry of Health, St. Piet A. Tallo, Liliba, Kupang – East Nusa Tenggara
[3]Department of Pharmacology & Clinical Pharmacy, Faculty of Pharmacy, Padjadjaran University. St. Raya Bandung Sumedang, Km. 21 Jatinangor 45363
e-mail address of corresponding author: nyi.mekar@unpad.ac.id

ABSTRACT

Moringa seed oil has potential as androgenic anti-alopecia because it contains phytosterol compounds[1,2]. This compound has the ability to inhibit 5*a*-reductase enzyme so that it can inhibit the formation of dihydrotestosterone (DHT) which is the cause of alopecia[3]. This study was conducted to determined interaction of expression inhibition of 5*a*-reductase enzyme (PDB Code: 7BW1) by 12 phytosterol compounds in Moringa seed oil as anti-alopecia with molecular docking approach using Autodock Tools 1.5.6 and visualization using Biovia Discovery Studio 2021[4]. Data analysis was carried out based on the inhibition constant (KI) of 1.87-4.30 nM and the binding energy of 12 phytosterol compounds. The results showed that ergostadienol in moringa seed oil was predicted to have potential as anti-alopecia. The results of molecular docking of this compound against inhibition of 5*a*-reductase enzyme obtained the binding energy value of -11.60 kcal/mol and the inhibition constant of 3.17 nM. Interaction of ergostadienol with amino acid residues in inhibiting 5*a*-reductase is similar to finasteride, i.e. GLU57 and TYR91.

Keywords: Moringa oil, Phytosterols, 5*a*-reductase, Anti-alopecia, ergostadienol

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PP01

SYNTHESIS AND CHARACTERIZATION OF MAGNETIC MOLECULAR IMPRINTED POLYMER-SOLID PHASE EXTRACTION (MMI-SPE) FOR ANALYSIS OF MDR-TB DRUG CLOFAZIMINE IN BLOOD SAMPLES

Nur Masyithah Zamruddin[1,2], Herman Herman[2], Aliya Nur Hasanah[1,3,*]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Padjadjaran University, Jl. Raya Bandung Sumedang KM 21, Sumedang 45363, Indonesia; nur21050@mail.unpad.ac.id
[2]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Mulawarman University, Gunung Kelua 75119, Indonesia.
[3]Drug Development Study Centre, Faculty of Pharmacy, Padjadjaran University, Jl. Raya Bandung Sumedang KM 21, Sumedang 45363, Indonesia
e-mail address of corresponding author: aliya.n.hasanah@unpad.ac.id

ABSTRACT

Clofazimine (CLF) is a non-first-line drug for multidrug-resistant tuberculosis (MDR-TB)[1]. CLF has a half-life of 70 days and is suboptimal[2,3]. Suboptimal drug levels cause therapy failure and become a more difficult disease to treat such as extensively drug-resistant TB (XDR-TB), so that therapeutic drug monitoring (TDM) is needed[4,5]. CLF levels are low in serum, so it requires a sensitive analytical method to be measured[2,6,7]. Separation techniques using molecular imprinting polymers (MIPs) have been developed[8], making certain improvements using magnetic properties. Compared to MIP, Magnetic molecularly imprinted polymers (MMIPs) have high selectivity in sample pre-treatment, and allow fast and easy isolation of the target analyte. Its magnetic properties and good extraction performance depend on the MMIP synthesis step [9,10]. The purpose of this study was to synthesize MIP sorbents for CLF analysis using MMIP technology in the presence of magnets. The stages of this research include computational selection of functional monomers and crosslinkers, determination of association constants and jobsplots, synthesis of CLF polymer MMI-SPE, extracting templates from polymers, and determining the adsorption ability, capacity, and selectivity of the polymer. The first step before doing the synthesis is to conduct a computational study using the Hyperchem 8.0.7 application to select the best functional monomer and crosslinker to be used in the MMIP synthesis stage. The results of the computational selection of functional monomers and crosslinkers showed that 3 functional monomers were selected in the mol ratio 1:4, namely Methyl methacrylate (MMA), itaconic acid (ITA), and acrylamide (AAM) with the lowest ΔE values of -29.969, -24.835 and -21.460, and 2 crosslinkers were selected in the mol ratio 1:1 namely divinylbenzene (DVB) and trimethylolpropane trimethacrylate (TRIM) with the highest ΔE values of -5.928 and -3.463, respectively. The results of this computation will be continued for the determination of association constants and the synthesis stage.

Keywords: Clofazimine, MDR-TB, Magnetic Molecularly Imprinted Polymer (MMIP); Computational Study

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PP02

ANTIDEPRESSANT ACTIVITY OF *Muntingia calabura* L. ETHANOL EXTRACT IN MALE WHITE MICE WITH FORCED SWIMMING TEST, TAIL SUSPENSIONS TEST, AND OPEN FIELD TEST

Nur Rahayuningsih, Syifa Nur Fadhila, Keni Ida Cahyati
Department of Pharmacy, University of Bakti Tunas Husada
Jl. Cilolohan No. 36 Kel. Kahuripan Tawang, Jawa Barat 46115

e-mail address of corresponding author: nur.rahayuridwan@gmail.com

ABSTRACT

Muntingia calabura L. with flavonoids, saponins, tannins, triterpenoids and polyphenols compounds [1] has antidepressant activity by increasing the concentration of serotonin (5-HT) and glutamate (neurotransmitter) [2]. The purpose of this study was to determine the activity and optimal dose of *Muntingia calabura* L. as an antidepressant using Forced Swimming Test (FST), Tail Suspensions Test (TST) and Open Field Test (OFT) [3]. Mice were divided into 5 groups, negative (CMC 1%), positive (Fluoxetine 0.052 mg/20 mice BW), test dose of 1,2,3 (ethanol extract of *Muntingia calabura* L. leaves 0.7; 1.4; 2.8 mg /20gram mice BW) with immobility time, grooming duration, central square and rearing parameters [4]. Data analysis using SPSS included normality test, homogeneity test, ANOVA, and LSD at 95% confidence level. The results showed that all test dose groups had antidepressant activity and test dose 3 was the optimal dose marked by a decreasing in immobility time in the Forced Swimming Test (FST) and Tail Suspension Test (TST) with an average percentage decrease of 33.70 % and 13.95%. In the Open Field Test (OFT) method, it is characterized by increasing the average percentage of the duration of central square and rearing by 63.46% and 76.25%, respectively and a decreasing in the average percentage of grooming duration by 27.57%.

Keywords: Antidepressants; Muntingia calabura L; FST; TST; OFT.

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PP03

SYNTHESIS OF MESOPOROUS SILICA IMPRINTED SALBUTAMOL WITH TWO TEOS/MTES RATIO COMPOSITIONS THROUGH DIRECT INCORPORATION METHOD FOR SALBUTAMOL SEPARATION

Ike Susanti[1], Mutakin Mutakin[1], Aliya Nur Hasanah[1,2*]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia
[2]Drug Development Study Center, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia
e-mail address of corresponding author: aliya.n.hasanah@unpad.ac.id.

ABSTRACT

Salbutamol is a short-acting beta-2 agonist (SABA) drug. Analysis of salbutamol in the biological samples is necessary to monitor therapeutic doses in severe acute asthma.[1] Molecularly imprinted mesoporous silica (MIP-MS) is one of the methods to improve site accessibility of molecule targets on molecularly imprinted polymer (MIP) for application in solid-phase extraction (SPE).[2] This study aimed to synthesize the MIP-MS using salbutamol sulfate as template molecule, cetyltrimethylammonium bromide as a directing agent, tetraethyl orthosilicate (TEOS) and methyltriethoxysilane (MTES) were used as silica precursor and organosilane by the direct incorporation method. In this study, two TEOS: MTES ratios were used to synthesize MIP-MS. The results showed that the MIP-MS-2 with 3:1 ratio of TEOS:MTES has better analytical performance than the MIP-MS-1 with 2:1 ratio of TEOS:MTES. The adsorption capacity of MIP-MS-2 is about 0.0934 mg/g and 0.0407 mg/g for NIP-MS-2. The extraction ability of MIP-MS-2 was good, with a recovery of about 104,79% ± 1,01% of salbutamol in spiked serum. The imprinting factor (IF) value obtained is 1.2. When serum was spiked with salbutamol and terbutaline, the ability of NIP-MS-2 to recognize salbutamol increased. Therefore, optimizing the conditions for the MIP-MS synthesis is necessary to produce a sorbent with better selectivity.

Keywords: salbutamol, mesoporous silica, molecularly imprinted polymer, solid-phase extraction.

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PP04

DEVELOPMENT OF FORMULA AND CHARACTERIZATION OF NANOSTRUCTURED LIPID CARRIER (NLC) VITAMIN E ACETATE USING LAURYL GLUCOSIDE SURFACTANT (PLANTACARE®)

Garnadi Jafar, Syifa Salsabilla, Rahmat Santoso

· Department of Pharmaceutics and Pharmaceutical Technology, Bhakti Kencana University
Jl.Soekarno Hatta 754 Bandung West Java Indonesia Bandung, Indonesia
e-mail address of corresponding author: garnadi.jafar@bku.ac.id

ABSTRACT

Vitamin E acetate is a medicinal ingredient that can be used as an antiaging agent.[1] Vitamin E acetate has a Log P value of 12.2 and is highly lipophilic, has low water solubility, and has the potential to be degraded.[2,3] Vitamin E acetate has a high antioxidant effect so that it can bind free radicals and prevent premature aging.[1] NLC is a nano-delivery system based on solid lipids and liquid lipids which are stabilized by surfactants and then form a colloidal system.[4] The purpose of this study was to obtain an NLC vitamin E formula that satisfies several specified parameters. NLC was prepared by homogenization with a magnetic stirrer and sonicated using a probe sonicator. The NLC Vitamin E acetate formula consists of Vitamin E acetate 2%, Compritol® 2-6%, Myritol® 1%, and Plantacare® 1-3%. The characterizations were carried out by measuring particle size, polydispersity index, entrapment efficiency, zeta potential, and morphological characterization using Transmission Electron Microscopy (TEM)[2]. The results of the particle size characterization test at < 300 nm, PdI < 0,5 Zeta potential > -20 mV; efficiency entrapment of > 90 % and has a spherical particle morphology. NLC is able to be produced and has good stability at room temperature.

Keywords: antiaging, NLC, vitamin E acetate

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PP05

RECENT DEVELOPMENT OF RADIONUCLIDE-BASED IMAGING IN DIAGNOSIS AND THERAPY OF LUNG CANCER

Levina Aristawidya[1], Holis Abdul Holik[2]

[1]Faculty of Pharmacy, Universitas Padjadjaran, Hegarmanah, Jatinangor, Sumedang, West Java, 45363
[2]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Hegarmanah, Jatinangor, Sumedang, West Java, 45363
e-mail address of corresponding author: levina19001@mail.unpad.ac.id

ABSTRACT

Well-timed diagnosis, appropriate treatment, and follow-up become a concern for researchers to reduce the mortality caused by lung cancer. Many researchers developed radiopharmaceutical therapy because this method has become an effective, safe, and preferred method for the diagnosis and treatment of cancer [1]. This review was conducted to update the development of clinical studies on the use of radiopharmaceuticals for the diagnosis and treatment of lung cancer that was carried out in the last five years. A comprehensive article search used a systematic review method based on *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidelines. It was conducted in May – July 2022. The article search was conducted using online databases, such as Pubmed, ScienceDirect, and Google scholar with inclusion criteria: studies related to lung cancer, radiopharmaceuticals, and articles containing clinical research results. Five articles were selected and they were analyzed and summarized. The radionuclides that have been described in the five articles are ^{131}I-Bevacizumab, ^{89}Zr-DFO-nimotuzumab, ^{68}Ga-3PTATE-RGD, ^{177}Lu-Satoreotide Tetraxetan, and ^{89}Zr-radioimmunoconjugates SC16-MB1 and hIgG1-MB1. ^{131}I-Bevacizumab showed had been confirmed significantly reduce up to 81% of the tumor cell uptake in animals ^{177}Lu-Satoreotide Tetraxetan showed a promising clinical response rate of 45% with the PFS median was 21.0 months even though it reported some adverse effects and unexpected severe hematologic toxicity. ^{89}Zr-DFO-nimotuzumab showed high uptake up to 6.2% IA/cc at 4 hp.i and persistently high up to 18,3%IA/cc at 168 hp.i in tumor (DLD-1) xenografts. ^{68}Ga-3PTATE-RGD showed good images in two representative lung cell lines A549 and H69 tumor-bearing models with tumor uptake up to 6.46 ± 0.59 %ID/g and 9.78 ± 2.77 %ID/g within 30 min after injection and a high T/NT ratio. ^{89}Zr-DFO$_{PODS}$-^{DAR2}SC16-MB1 showed better results than other ^{89}Zr-radioimmunoconjugates SC16-MB1 and hIgG1-MB1. It showed a high uptake up to 23.3 ± 4.8 %ID/g at 120 h in the DLL3-positive H82 tumors and produced a 30% lower uptake in the kidneys compared to 89Zr- DFOMal-DAR2SC16-MB1, despite showing comparable radioactivity concentrations in most healthy non-target organs. Taken together, the radionuclides in included articles have shown good results and potential for diagnosis and therapy. However, some radionuclides still require further complement assessment research to improve their shortcomings.

Keywords: Lung cancer, radiopharmaceutical, radionuclide, systematic review.

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PP06

COST-EFFECTIVENESS ANALYSIS OF GASTRITIS THERAPY IN AN AIR FORCE HOSPITAL IN BANDUNG, INDONESIA

Riani Tanjung[1], Yulia Wardati[2], Dini Nur Azizah[2], Bhekti Pratiwi[3], Resmi Mustarichie[4], Nyi Mekar Saptarini[4]

[1]Department of Accounting, Vocational School, International Logistics and Business University, West Java, Indonesia, 40151, [2]Department of Pharmacy, Faculty of Mathematic and Natural Sciences, Al Ghifari University, West Java, Indonesia, 40293, [3]School of Pharmacy, Bandung Institute of Technology, West Java, Indonesia, 40116, [4]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, West Java, Indonesia, 45363
e-mail address of the corresponding author: rianitanjung@poltekpos.ac.id

ABSTRACT

Gastritis is an inflammatory condition of the gastric mucosa characterized by basic histological changes[1]. The prevalence in West Java reached 31.2%, in the city of Bandung it reached 15.37%[2]. This study aimed to analyze cost-effectiveness of gastritis treatment and the influence factors of cost-effectiveness at an air force hospital in Bandung, West Java, Indonesia. Data were collected retrospectively from patient medical records and Hospital Information System (HIS). This study was conducted from August to October 2020. Cost data includes total costs from the perspective of the hospital (health care) and the perspective of the Social Security Administrator for Health (Badan Penyelenggara Jaminan Sosial, BPJS, payer) based on Indonesian-Case Based Groups rates. Outcomes in this study were length of stay (LOS) and leukocytes. There were 129 patients in inpatient units in the year of 2018-2019. The medicines for gastritis therapy were omeprazole and ranitidin injection and lansoprazole and ulsidex tablet. The most cost-effective therapy based on LOS was ranitidine injection, while based on reducing leukocytes was ranitidine injection from payer's perspective and lansoprazole from healthcare perspective. There was no significant cost difference between the four treatment options. The sensitivity test showed that the influence factor of ICER value was decreased leukocytes.

Keywords: LOS, leukocytes, medicine, pharmacoeconomic, sensitivity test

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PP07

FORMULATION AND EVALUATION OF THE ESSENTIAL OIL HAND CREAM PREPARATION OF BASIL (*Ocimum basilicum*) LEAVES WITH VARIATION CONCENTRATION OF LIQUID PARAFFIN AS AN EMOLLIENT

Yenni Puspita Tanjung*, Tubagus Akmal, Haifa Virginia

Bumi Siliwangi Academy of Pharmacy, Bandung, West Java 40286, Indonesia
e-mail address of corresponding author: yennipuspitatanjung85@gmail.com

ABSTRACT

Basil (*Ocimum basilicum*) leaf essential oil contains terpenoid compounds that have antibacterial activity[1]. This study aims to obtain hand cream preparations of basil essential oil, as well as to determine the effect of variation concentration of liquid paraffin on the results of the evaluation of the preparation. In this study, three formulations of hand cream preparations of basil essential oil were made with three variations in the concentration of liquid paraffin, namely F1 (9%), F2 (10%), and F3 (11%). Furthermore, the preparation was evaluated for 28 days of storage at room temperature (15-30 ^{o}C) which included organoleptic, pH, viscosity, homogenity, spreadability, and type. The results showed that the formulas F1, F2, and F3 met all the requirements for evaluating the preparation which included organoleptic, pH, viscosity, homogeneity, spreadability, and type. Variations in the concentration of liquid paraffin gave a significant effect ($p<0.05$) on the evaluation of viscosity and did not significantly affect the evaluation of organoleptic, evaluation of pH determination, evaluation of homogenity, evaluation of spreadability, and evaluation of emulsion type.

Keywords: antiseptic, hand cream, essential oil of basil (*Ocimum basilicum*) leaves

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PP08

NATURAL INHIBITOR OF AGRONOMICALLY REPELLENT PLANT TOWARDS CLINICAL ISOLATE OF *SALMONELLA TYPHI*

Sri Agung Fitri Kusuma[1], Irma Erika Herawati[2], Danni Ramdhani[3], Bagus Maulana[1]

[1]Department of Biology Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia 45363, [2]Indonesian School of Pharmacy, Bandung, West Java, Indonesia, 40266, [3]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia 45363
e-mail address of corresponding author**:** s.a.f.kusuma@unpad.ac.id

ABSTRACT

Different leaves of plants, i.e. kirinyuh (*Chromolaena odorata*), kenikir (*Cosmos caudatus*), bandotan (*Ageratum conyzoides*), teki grass (*Cyperus rotundus*), lemongrass (*Cymbopogon citratus*), and suren (*Toona sureni*) are traditionally reported to be agronomically repellent plants which produce substances to exploit defense reactions against pests and pathogens. Such potential substances are interesting to be exploited as a substitute for conventional antibiotics to treat infections caused by *Salmonella typhi* because they are known to be significant against resistant organisms by acting on the pathogens cell membrane[1-3]. This study was purposed to determine the most effective inhibition among those repellent plants towards *S. typhi* clinical isolate. Phytochemical screening was done using the standard methods. The inhibition of the repellent leaves ethanolic extract was assayed using the agar diffusion method and statistically analyzed by ANOVA followed by the Duncan test. The most potential plant was further studied to determine the minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) value using the microdilution test. As the result, all ethanolic leaves extracts contain alkaloids, flavonoids, tannins and were found to produce inhibitory activity against the tested *S. typhi*. However, suren leaves showed the strongest inhibition with MIC value in the range of $0{,}15625 < x \leq 0{,}3125\%$ w/v and the MBC value in the range of $1{,}25 < x \leq 2{,}5\%$ w/v. In summary, suren leaves are future excellent inhibitor candidate for utilize as the lead substances for the expansion of novel anti-typhoid fever agents.

Keywords: repellent, *Toona sureni*, *Salmonella typhi*, isolate.

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PP09

PHYTOCHEMICAL AND PHARMACOLOGICAL STUDY ON SELECTED INDONESIAN WEEDS EXTRACTS: A NOVEL INSIGHT TO ANTI-SHIGELLOSIS

Sri Agung Fitri Kusuma, Ade Zuhrotun, Dwi Rahmat Noari

Department of Biology Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia 45363
e-mail address of corresponding author: s.a.f.kusuma@unpad.ac.id

ABSTRACT

Elephant grass (*Pennisetum purpureum* S.), weed grass (*Imperata cylindrica* L.), pearl grass (*Hedyotis corymbosa* L.), and nut grass (*Cyperus rotundus* L.) are selected weeds found in Indonesia which have been used as ruminants feeding with a complete diet component and evidently reported that bioactive contents of weeds provide more protection to microbial attack than that of crops[1-3]. This has led to increase the interest in the investigation of weed extracts as anti-shigellosis agents for humans and animals, but there is still no data regarding on phytochemical and pharmacological of our selected weeds as an anti-shigellosis. Therefore, this study was aimed to analyze phytochemical and anti-shigellosis properties of those selected weeds towards sensitive (S) and metronidazole-resistant *S. dysentriae* (R) strains. Phytochemical screening was done using standard method and further analyzed by the thin layer chromatography (TLC). The anti-shigellosis activity was evaluated using the agar diffusion method, meanwhile the minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) value was determined using the microdilution method, then statistically analyzed using ANOVA. In general, the weeds contain flavonoid, steroid, and quinone compounds. The resulted anti-shigellosis showed that all weed extracts produced higher inhibition to sensitive than resistant strains. The MIC-MBC values of each weed on sensitive and resistant, respectively, were as follow: elephant grass (S ≥1.25%; R ≥2.5% w/v); weed grass (S ≥2.5%; R ≥ 5%w/v); pearl grass (S ≥2.5%; R ≥5-10%w/v); and nut grass (S ≥1.25%; R ≥2.5-10%w/v). In summary, elephant grass extractcould be promoted as a novel supplement phytopharmaceutical for the treatment of bacillary dysentery.

Keywords: *Pennisetum purpureum* S., *Imperata cylindrica* L., *Hedyotis corymbosa* L., *Cyperus rotundus* L., *Shigella dysentriae*, resistant.

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PP10

SINGLE-STEP INTRACELLULAR PROTEIN PURIFICATION OF THE NON-TAG MPT64-RECOMBINANT

Sri Agung Fitri Kusuma[1], Toto Subroto[2,5], Ida Parwati[3], Yaya Rukayadi[4], Tina Rostinawati[1], Muhammad Fadhlillah[2,5,6], Raden Indah Puspita Syafitri[1], Carla Florencia[1]

[1]Department of Biology Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, [2]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Sumedang, Indonesia, West Java, Indonesia 45363, [3]Department of Clinical Pathology, Faculty of Medical, Universitas Padjadjaran, Bandung, [4]Department of Food Science, Faculty of Food Science and Technology, Universiti Putra Malaysia, Serdang, Malaysia, [5]Research Center of Molecular Biotechnology and Bioinformatics, Universitas Padjadjaran, Bandung, Indonesia, [6]PT. Genpro Multiguna Sejahtera, Sumedang, Indonesia
e-mail address of corresponding author: s.a.f.kusuma@unpad.ac.id

ABSTRACT

Purification of MPT64 intracellular recombinant protein without purification tag is a more difficult defiance than extracellular protein purification, considering that *Escherichia coli* BL21 (DE3) as a host cell synthesizes other intracellular proteins more than extracellularly.[1,2] MPT64 protein is the main secretory protein of *Mycobacterium tuberculosis* which can be used as a target protein for TB diagnosis. This study aimed to obtain pure MPT64 intracellular protein in a simple and inexpensive method. MPT64 protein overproduction was carried out under optimal conditions as follows: 37^0C, double strength medium, pH 8.0, induced by Rhamnose 4 mM at 5 h incubation. Intracellular MPT64 protein then was isolated using sonication method, followed by detection of MPT64 protein presence in the total intracellular protein extract using Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) and a commercial diagnostic kit. The intracellular MPT64 protein was purified by a simple electroelution method with variations in the amount of protein gel used, then the purity of the protein was characterized by SDS PAGE and commercial diagnostic kits and the protein levels were measured using a nanodrop device. As a result, the electroelution with variations of 12 gel protein bands produced the highest concentration of MPT64 protein i.e. 1970 mg/ml. In summary, the electroelution method is a simple and inexpensive purification method that is recommended for the acquisition of purified non-tagged recombinant proteins.

Keywords: Intracellular, *Escherichia coli*, MPT64, purification, non-tag protein, electroelution

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PP11

CYTOTOXIC EFFECTS OF *Hibiscus surattensis* L. LEAVES EXTRACTS ON BSLT, MCF-7, AND HELA CELLS

Yuliet[1], Lusi Lestari[2], Donna Meliya P[2], Khildah Khaerati[1]

[1]Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Tadulako University, Palu-94118, Central Sulawesi, Indonesia
[2]Laboratory of Pharmacology and Clinical Pharmacy, Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Tadulako University, Palu-94118, Central Sulawesi, Indonesia
e-mail address of corresponding author: yuliet_susanto@yahoo.com

ABSTRACT

Hibiscus surattensis L leaves have been known as a folk medicine[1]. It has exhibited antidiabetic[2], antibacterial[3], anti-diarrheal, analgesic[4], hepatoprotective[5], and antioxidant[6]. Some previous reports have shown several potential therapeutic effects, but no toxicity study is similar to the current one. Therefore, it is necessary to investigate the cytotoxic effect of these commonly consumed medicinal leaves. This study aimed to investigate the cytotoxicity of *Hibiscus surattensis* L. leaves extract (HSL). The cytotoxic effect was determined through brine shrimp lethality bioassay (BSLT) and *in vitro* MTT assay of MCF-7 and Hela cell. The BSLT results showed that the HSL has an LC_{50} value of 224,814 µg/mL. MTT assay results showed the IC_{50} value of the HSL extract on MCF-7 cells was 1419.83 µg/mL, and Hela cells were 2050.50 µg/mL. Based on the LC_{50} value that has been analyzed against HSL extract showed an LC_{50} value of less than 1000 µg/mL, which can be concluded while having potential cytotoxic activity against experimental animal larvae of *A. salina* Leach. The results of the cytotoxic test with MTT assay on two cancer cells used showed that the HSL extract was not toxic.

Keywords: BSLT, *Hibiscus surattensis* L., cytotoxicity, MCF-7, Hela

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PP12

VALIDATION OF WARFARIN ANALYSIS METHOD IN HUMAN BLOOD PLASMA USING HPLC WITH FLUORESCENCE DETECTOR

Norisca Aliza Putriana[1], Taofik Rusdiana[1]*, Tina Rostinawati[2], Mohammad Rizki Akbar[3], Ilma Nurfuadah[1]

[1]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
[2]Department of Biology Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
[3]Department of Cardiovascular, Faculty of Medicine, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
e-mail address of corresponding author: t.rusdiana@unpad.ac.id

ABSTRACT

Warfarin is an anticoagulant drug with a narrow therapeutic index, it is necessary to study its pharmacokinetic and pharmacodynamic profiles[1]. The method of analysis of warfarin in plasma can use a high performance liquid chromatography (HPLC) fluorescence detector, and bioanalytic validation can be guided by the EMA (European Medicine Agency). This study aims to obtain a warfarin analysis method using a valid HPLC fluorescence detector according to EMA (European Medicine Agency)[2]. This study aimed to obtain a warfarin analysis method using a valid fluorescence detector HPLC according to EMA. The research validates the warfarin analysis method in human plasma using an HPLC fluorescence detector with an OD-RH chiral column (4.6 x 150 mm id 5µm) and a chiral RH OD-RH shield column (4.0 x 10 mm, 5µm) at room temperature column 45^{o}C. The mobile phase used was acetonitrile: phosphate buffer pH 2 in a ratio of 40:60 v/v with a flow rate of 1 ml/min iscoratically and injection volume of 20 µl. The excitation and emission wavelengths were 310 and 350 nm for warfarin and 300 and 400 nm for the internal standard (griseofulvin). Plasma samples were prepared by the protein precipitation method. This method produces a LOD value of 0.0674 ppm for R-warfarin and 0.0897 ppm for S-warfarin. Meanwhile, the LOQ value is 0.225 ppm for R-warfarin and 0.298 ppm for S-warfarin. Linearity exists at a concentration of 0.2 – 3 ppm with the equation y = 0.0705x + 0.0704 with R^2 = 0.978 for R-warfarin and y = 0.0513x + 0.0297 with R^2 = 0.9924 for S-warfarin and 75% of the 7 concentrations met the reverse concentration requirement, which is below ± 15%. This method meets the accuracy and precision requirements within run and between run, selectivity, and carry over where the %CV and %diff values are below ±15%. Based on these results, this analytical method has met the validation requirements for sample measurement for warfarin pharmacokinetic studies.

Keywords: Warfarin, Validation, Fluorescence HPLC, EMA

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PP13

ANTIOXIDANT ACTIVITY OF EFFERVESCENT GRANULES FROM KIRINYUH (*Chromolaena Odorata* (L.) R.M.King & H.Rob) LEAVES AND MAREME (*Glochidion Arborescens* Blume) LEAVES

Firman Gustaman[*], Saeful Amin, Lusi Nurdianti, Winda Trisna Wulandari, Keni Idacahyati, Leti Nurlathifah

[1] Faculty of Pharmacy, Universitas Bakti Tunas Husada, Jalan Cilolohan No.36 Kota Tasikmalaya, West Java, Indonesia 46115
e-mail address of corresponding author: firmangustaman@universitas-bth.ac.id

ABSTRACT

Antioxidants are substances that can protect body cells from oxidative damage, which is usually caused by the presence of free radicals[1]. Kirinyuh (*Chromolaena odrorata* L.) leaves and mareme (*Glochidion arborescens* Blume.) leaves are plants that have antioxidant activity[2,3]. Therefore, effervescent granule preparations will be made which have antioxidant properties. The purpose of this study was to prepare and evaluate the formulation of effervescent granules from kirinyuh and mareme leaves as antioxidants. The method of making granules with the wet granulation method. The evaluations carried out included organoleptic tests, water content, solubility time, pH of the preparation, compressibility, flow time and angle of repose. As well as examination of antioxidants through the DPPH method (2,2-diphenyl-1-picrylhydrazyl) by measuring absorption at a wavelength of 516 nm. The results showed that kirinyuh and mareme leaves can be made into effervescent granules, have good evaluation results, and contain antioxidant activity.

Keywords: Effervescent granule; kirinyuh leaf; mareme leaf; antioxidant.

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PP14

FORMULATION AND CHARACTERIZATION FACE SERUM OF ASTAXANTHIN-BETA CAROTENE NANOEMULSION AS ANTIOXIDANT

Lusi Nurdianti, Winda Trisna Wulandari, Keni Ida Cahyati

Faculty of Pharmacy, Universitas Bakti Tunas Husada, Jalan Cilolohan No. 36, 46115
e-mail address of corresponding author: windatrisna@universitas-bth.ac.id

ABSTRACT

Astaxanthin and beta-carotene are fat-soluble xanthophyll carotenoids that are found in various microorganisms, marine animals and fruits.[1] The problem in its use as an active ingredient as an antioxidant source is its lipophilic nature and low stability in gastrointestinal so that its bioavailability is low.[2] To overcome this problem, nanotechnology is offered to develop nanoemulsion from combination of astaxanthin and beta-carotene which are used to increase their bioavailability and also in the future to develop new delivery pathways in the use of antioxidants via topical routes so that their use can be optimally.[3] In this research, a combination of astaxanthin-beta carotene nanoemulsion has been formulated to produce good physical and chemical characteristics. Nanoemulsions were prepared using Spontaneous Nanoemulsion (SNE) method. The optimization of the formula was carried out starting from determining oil phase:surfactant:cosurfactant ratio. Physical nanoemulsion characterization includes globule size, polydispersity index, zeta potential, visual appearance, pH and entrapment efficiency test. The best results from nanoemulsion were then combined into serum preparations which were then tested for evaluation of the preparations including organoleptic, homogeneity, viscosity, pH, adhesion and stability test (Cycling Test). The results showed that nanoemulsion of astaxanthin and beta-carotene combination that had been developed had a globule size of <50 nm (with a normal globule size distribution curve), polydispersity index value was less than 0.5, zeta potential was greater than -20 mV, and entrapment efficiency was ranging from 80-85%. The results of preparation evaluation showed that serum astaxanthin-beta carotene nanoemulsion had good results in physical, chemical and stability tests during storage.

Keywords: serum, astaxanthin-beta carotene combination, antoxidant, carotenoids

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PP15

GARGLE FORMULATION FROM *TRIGONA SP* PROPOLIS EXTRACT AND ITS ACTIVITY AGAINST *STREPTOCOCCUS MUTANS*

Insan Sunan Kurniawansyah[1]*, Anis Yohana Chaerunisaa[1] and Arif Budiman[1,2]

[1]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia
[2]Center of Dosage Form Development Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia
e-mail address of corresponding author: insan.sunan.kurniawansyah@unpad.ac.id

ABSTRACT

Propolis was known that have activity of inhibiting the bacteria *Streptococcus mutans*, which was known as the cause of dental caries.[1,2] In this research, carried out formulations of gargle with *Trigona sp* propolis extracts as an alternative of dental caries therapy and test its activity against *Streptococcus mutans*.[1,3] The research includes phytochemical screening, determination of minimum inhibitory concentration, formulation of gargle, appeal test of formulas and contact time test. Results of phytochemical screening showed that *Trigona sp* propolis extracts containing flavonoids, polyphenols, quinones, monoterpenoid and sesquiterpenoid. Minimum Inhibitory Concentration of *Trigona sp* propolis extract was 0.25% w/v. The results of formulations gargle with *Trigona sp* propolis extract were yellow solution with mint odor and taste of mint and sweet. Appeal test results of gargle preparation and formulas in the market showed that the formula with a concentration of 1% w/v gave significant difference to the market preparation. Formulas with *Trigona sp* propolis extract capable of killing bacteria test with a contact time of 60 seconds and are physically stable during the 35 days of storage time.

Keywords: Gargle, *Trigona sp*, propolis, *Streptococcus mutans*, dental caries

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PP17

QUANTIFICATION OF ALKALOID, PHENOLIC, FLAVONOID, AND TANIN CONTENT FROM *Arcangelisia flava* (L.) Merr.

Irma Erika Herawati[1], Lisna Dewi[2]

[1]Indonesian School of Pharmacy, West Java, Indonesia, 40266
[2]Department of Pharmacy, Faculty of Mathematic and Natural Sciences, Al Ghifari University, West Java, Indonesia, 40293
e-mail address of the corresponding author: irmaerika@stfi.ac.id

ABSTRACT

Arcangelisia flava (L.) Merr., family of Menispermaceae, is a plant grown in Kalimantan and has been used as a medicinal plant. *A. flava* can be used for antimalarial, antioxidant, antibacterial, anticancer, antiinflammatory[1]. *A. flava* is known as a plant that is rich in benefits because it contains active compounds of secondary metabolites in the form of alkaloids, saponins, tannins, steroids, triterpenoids, and flavonoids that play a role in traditional medicine[2]. The purpose of this study was to quantify secondary metabolites of alkaloids, phenolics, flavonoids, and tannins. Quantification was measured using the colorimetric method. The results showed that the levels of alkaloids, phenolics, flavonoids, and tannins in *A. flava* were 81.76 ± 0.404 g QE/mL; 87.32 ± 3.951 g GA/mL; 73.79 ± 0.255 g QE/mL; 4.81 ± 0.059 g TA/mL, respectively.

Keywords: alkaloids, phenolics, flavonoids, tannins, *Arcangelisia flava*

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PP18

PARTICLE DESIGN OF KETOCONAZOLE BY SPHERICAL CRYSTALLIZATION

Indra Indra, Risa Azahra, Rika Yulianti

Faculty of Pharmacy, University of Bakti Tunas Husada, Tasikmalaya, Indonesia, 46115
e-mail address of corresponding author: indra@universitas-bth.ac.id

ABSTRACT

Ketoconazole is a drug that is classified in Class II of the Biopharmaceutical Classification System (BCS), which means it has low solubility and high permeability [1]. This research aimed to make ketoconazole spherical crystals as an attempt to improve the micromeritic properties and the dissolution rate using the solvent change method [2]. The solvent that is used in the process of spherical crystallization consists of three types, i.e. ether (good solvent), aquadest (bad solvent), and n-hexane (bridging liquid) with a 20:70:10 ratio of each [3]. Based on PXRD, DSC, and FTIR spectrophotometer results, it was determined that there was no internal change of ketoconazole crystalline structure during the recrystallization process into spherical crystals, and SEM results revealed that the morphology of crystal became spherical. Based on the results of the micromeritic properties evaluation, it was concluded that the ketoconazole spherical crystals have superior micromeritic properties than the conventional ketoconazole. The examination results of ketoconazole spherical crystal content in a percentage were obtained at 99.25%. The dissolution test results showed an enhancement in the dissolution rate of spherical crystals compared with the untreated ketoconazole. Thus, spherical crystals of ketoconazole appear to be a feasible technique for improving dissolution characteristics and thus bioavailability.

Keywords: ketoconazole, spherical crystallization, particle design

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PP19

ISOLATION, IDENTIFICATION, AND QUANTIFICATION OF MAJOR FLAVONOID IN LEAVES OF *Pereskia bleo* (Kunth) DC

Nyi Mekar Saptarini[1], Resmi Mustarichie[1], Irma Erika Herawati[2], Ginayanti Hadisoebroto[3]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, West Java, Indonesia, 45363
[2]Indonesian School of Pharmacy, West Java, Indonesia, 40266
[3]Department of Pharmacy, Faculty of Mathematic and Natural Sciences, Al Ghifari University, West Java, Indonesia, 40293
e-mail address of the corresponding author: nyi.mekar@unpad.ac.id

ABSTRACT

Pereskia bleo (Kunth) DC, family Cactaceae, is a medicinal plant. This plant has been cultivated in many tropical and subtropical countries, including Indonesia[1]. Flavonoids, as the secondary metabolites, are known to have many pharmacological activities[2,3]. This study aimed to isolate, identify, and quantify major flavonoid in *P. bleo* leaves from West Java Regency, Indonesia. Isolation began with maceration, followed by liquid-liquid extraction and various chromatographic separations. Identification of isolates was carried out using 2D TLC and shear reagents. Quantification was determined with the colorimetric method. The results showed that extract, ethyl acetate, and distilled water fractions contain flavonoids. The flavonoid screening showed positive results for flavonols. The vacuum liquid chromatography separated 21 sub-fractions, the 12th and 13th sub-fractions were predicted to contain flavonols. It concluded that the major flavonoid of *P. bleo* leaves can be isolated and identified as catechin. The content of the compound was 3.795 ± 0.096 g QE/mL with a purity of 94.89%.

Keywords: catechin, chromatographic separations, flavonol, shifting reagent, purity

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PP20

COMPARISON OF PHARMACOKINETICS PROFILE OF OPHTHALMIC ANTIBIOTIC *IN SITU* GEL WITH CONVENTIONAL PREPARATION: A REVIEW

Hanafi Tiran[1], Insan Sunan Kurniawansyah[2], Nyi Mekar Saptarini[3]

[1]Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia, [2]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia, [3]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia
e-mail address of the corresponding author: insan.sunan.kurniawansyah@.unpad.ac.id

ABSTRACT

Fluoroquinolone, macrolide, and aminoglycoside are a class of antibiotics widely used for the treatment of eye infections.[1-2] Antibiotics for the eye are many used in conventional preparations such as eye drops, ointment, and cream.[3] Ophthalmic gel *in situ* is a drug delivery system for the eye which is thought to have better bioavailability than ophthalmic conventional preparations. This article review was aimed to see a significant comparison of the bioavailability of *in situ* gel preparations compared to conventional preparations in terms of pharmacokinetic profile parameters such as AUC (Area Under Curve), C_{max}, T_{max}, T½, *k (*elimination rate constant) and MRT (Mean Residence Time*)*. This article review was conducted by looking for available articles with a different assessment based on original research articles published during 2002 – 2022. An electronic search was conducted from the Pubmed and Google Scholar. The significant increase in bioavailability was produced in *in situ* gel preparations compared to conventional preparations, this happened because the polymer polymers used improved the drug delivery system to the targets of previous conventional preparations. It can be concluded that *in situ* ophthalmic gel preparations have better bioavailability based on pharmacokinetic profiles compared to conventional preparations.

Keywords: Fluoroquinolone, Macrolide, Aminoglycoside, Bioavailability

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PP21

ANTIBACTERIAL ACTIVITY OF CALAMANSI (*Citrofurtunella microcarpa*) PEEL EXTRACT AGAINTS *Staphylococus aureus* ATCC 29213

Endah Kartikawati[1] and Irma Erika Herawati[2]

[1]Universitas Al-Ghifari Bandung, 140th Cisaranten Kulon, West Java, 40293
[2]Sekolah Tinggi Farmasi Bandung, 354th Soekarno-Hatta, West Java, 40266
e-mail address of corresponding author: endah.kartikawati27@gmail.com

ABSTRACT

Calamansi (*Citrofortunella microcarpa*) is a plant that can become herbal medicine[1]. Calamansi peels extract contains secondary metabolites such as flavonoid, tannin, alkaloid and saponin that act as antibacterial[2]. The objective of this study was to identify the effect of calamansi peel extract towards *Staphylococcus aureus* ATTC 29213 bacteria growth. The research method of inhibitory testing used the Kirby Bauer method. Inhibition testing was performed with three repetitions in the extract treatment of 60, 30, 15, 7.5, and 3.75%, Ciprofloxacin 5µg as positive control and DMSO 10% as negative control. After incubating for 24 hours a clear zone was measured around the medicine disc, the results showed the in clear zones that formed are 29.3, 22.0, 14.8, 6.0, and 6.0 mm, for sample concentrations of 60, 30, 15, 7.5, and 3.75% respectively. Based on the results, calamansi peel extract can inhibit bacteria *Staphylococcus aureus* ATTC 29213 at the concentration of 60% with inhibition zone diameter 29.3 mm.

Keywords**:** *Citrofortunella microcarpa*, Kirby Bauer method, *Staphylococcus aureus*

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PP22

IN SILICO STUDY OF YODIUM LEAF (*Jatropha multifida* Linn) ACTIVE COMPOUND AS ANTIBIOTIC FOR DIABETIC WOUNDS

Muhammad Ilfadry Rifasta, Niky Murdaya, Salsa Sagitasa, Holis Abdul Holik

Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang- 45363, (West Java) Indonesia
e-mail address of corresponding author: holis@unpad.ac.id

ABSTRACT

Diabetes Mellitus is a non-communicable disease that causes many complication to death. According to WHO 2021, complications of diabetic wounds are the leading cause of lower limb amputation with an 85% chance that people with diabetes will undergo amputation. Wounds healing is an urgent goal in the management of diabetic wounds to reduce the risk of amputation. One management of diabetic wounds is the management of infection using antibiotics because the infection will hinder the healing process[1]. However, the availability of antibiotics now still has several deficiencies such as antibiotic resistance. Empirically, a leaf from *Jatropha multifida* Linn. is used as an herbal antibiotic to treat an open wound and prevent infection[2]. In this study, an in silico test of 13 active compounds of leaf *Jatropha multifida* Linn. was carried out against the Topoisomerase II receptor (PDB ID: 2XCT)[3]. In silico methods used include molecular docking, ADMET prediction, and review of Lipinski's Rule of Five. Molecular docking simulation results obtained 3 test compounds with Free Energy of Binding (ΔG) and Inhibition Constants (Ki) at active site A which are lower than the comparison compound, ciprofloxacin (ΔG -5.41 kcal/mol). The three compounds are C2 (Multidione), C5 (Citlalitrione), and C6 (Cleomiscosin A) which have Free Energy of Binding (ΔG) of -6.00; -6.90; and -5.56 kcal/mol. Based on the prediction of ADMET, compound C5 has better pharmacokinetics, pharmacodynamics, and toxic activities compared to ciprofloxacin (a reference antibiotic commonly used for diabetic wounds). Therefore, C5 is the best active compound from iodine leaf which can be used as a candidate for new antibiotics in the treatment of diabetic wounds.

Keywords: Diabetic Wound, *Jatropha multifida* Linn, Molecular Docking

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PP23

A REVIEW ON CHITOSAN-BASED MATERIALS AS POTENTIAL WOUND DRESSING

Dolih Gozali[1], Annisa Rafashafly Hudaya[1], Ine Suharyani[1,2], Nasrul Wathoni[1*]

[1]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, 45363, Indonesia, dolih.gozali@unpad.ac.id.
[2]School of Pharmacy Muhammadiyah Cirebon, Jl. Cideng Indah No.3, Kertawinangun, Kedawung, Cirebon, 45153, Indonesia, ine18001@mail.unpad.ac.id
e-mail address of corresponding author: nasrul@unpad.ac.id

ABSTRACT

The skin wound is a common clinical problem that can affect an individual's physical, psychological and social well-being. Several researchers have studied the potential of Chitosan as a promising wound dressing material.[1] The aim of this review is to study the chitosan as a material based in wound dressing preparation. The method in this review is the approximation method. Chitosan is a biocompatible and biodegradable polysaccharide with the ability to provide a non-protein matrix for tissue growth, making it an ideal material in the biomedical field, including as a wound-healing material. This article summarizes studies involving chitosan application in wound healing. In addition, this article provides a brief explanation of the wound healing process, describes the properties of chitosan, and explains how chitosan promotes wound healing.[2] Almost all of the preparation proposed the porous structure of chitosan-based materials lead to the improvement of healing activity. The combination of chitosan with some polymer, ion and other materials resulting the chitosan-based materials namely nanofibrous membranes, composites sponge, polyelectrolyte complex, and composites, that used in topical preparation such as membranes, fibers, sponge, film, and gel.[3–5] Thus, the modified of chitosan wound healing preparation resulting in the improve of healing activity of each preparation from.

Keywords: Chitosan, Wound Healing, Wound Dressing, Biomedical Field

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PP24

FORMULATION AND EVALUATION OF BLUSH ON CREAM FROM ROSELLA (*Hibiscus Sabdariffa L.*) FLOWER EXTRACT WITH OLIVE OIL CONCENTRATION VARIATIONS AS EMOLLIENTS

Tubagus Akmal, Yenni Puspita Tanjung, Yudhea Afrizki
Akademi farmasi Bumi Siliwangi
Jl. Rancabolang No. 104 Margahayu Raya Bandung, 40286
e-mail address of corresponding author: tb.akmal@akfarbumisiliwangi.ac.id

ABSTRACT

In the promotion of cosmetics, color is crucial. It makes a product more appealing. Color also aids in capturing the customers' attention. In the past, these products were colored using synthetic dyes. Natural dyes have become more popular as a result of the harmful and carcinogenic effects of synthetic dyes[1]. To lessen the use of artificial dyes in the domains of the cosmetic industries, anthocyanins derived from *Hibiscus sabdarrifa* (L.) were examined for dye applications and additionally served as an antioxidant[2]. This study aimed to obtain blush on cream preparations from rosella flower extract with the addition of olive oil as an emollient and to determine the effect of variations in olive oil concentration on the evaluation results of the preparation. The blush on cream formulation was made with 3 variations of olive oil concentration, namely F1 (13.5%), F2 (15.5%), and F3 (17.5%). Furthermore, the preparation was evaluated for 28 days of storage at controlled room temperature (15 – 30ºC) which included organoleptic tests, pH, homogeneity, spreadability, adhesion, cream type, and viscosity. The results of the evaluation of the blush on cream preparation of rosella flower extract with the addition of variations of olive oil as an emollient showed that F1, F2, and F3 met the requirements for evaluating the preparation for organoleptic tests, pH, homogeneity, spreadability, adhesion, cream type, and viscosity. Variations in the concentration of olive oil in the formulation gave no significant effect ($p>0.05$) on the organoleptic test, pH test, homogeneity test, spreadability test, and cream type test and had a significant effect ($p<0.05$) on the test. adhesion and viscosity test. The findings demonstrate that rosella (*Hibiscus sabdariffa L.*) flower extract can be made in blush on cream formulations with the addition of olive oil as emollients.

Keywords: blush on cream, natural dyes, anthocyanins, rosella flower extract

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PP25

VALIDATION OF VITAMIN K_2 (MK-4) LEVELS ANALYSIS METHOD IN HUMAN PLASMA USING HPLC

Norisca Aliza Putriana[1], Taofik Rusdiana[1]*, Tina Rostinawati[2], Mohammad Rizki Akbar[3], Nurhanifah Puspitadewi[1]

[1]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia

[2]Department of Biology Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia

[3]Department of Cardiovascular, Faculty of Medicine, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia

E-mail address of corresponding author: t.rusdiana@unpad.ac.id

ABSTRACT

Vitamin K is a vitamin that works competitively with warfarin, can reduce the anticoagulant effect of warfarin, and is one of the causes of response variation among individuals taking warfarin[1–3]. Measuring vitamin K levels in human plasma can be helpful in patients receiving warfarin therapy[4]. One of vitamin K's forms is menaquinone-4 (MK-4). Measurement of vitamin K_2 (MK-4) levels can be done using High-Performance Liquid Chromatography (HPLC)[4,5]. Measurement of vitamin K_2 (MK-4) levels requires validated analytical methods. Validation of analytical methods for biological samples can be based on the 2019 EMA (European Medicines Agency) guidelines[6]. This study aimed to obtain an analytical method of Vitamin K_2 (MK-4) in human plasma using HPLC that was validated according to the 2019 EMA guidelines. The method used in this study was HPLC with a UV detector at 245 nm, using a T3 column set at 30^{o}C and an isocratic mobile phase containing methanol: phosphate buffer pH 3 (95:5) with a flow rate of 1 ml/minutes. Samples were prepared using the protein precipitation method. This study found that analysis of selectivity parameters showed no response in the blank plasma at analyte retention time. The analysis of the calibration curve parameter showed that more than 75% of concentration levels met the requirements of %diff and obtained LOD at 0,421 ppm and LOQ at 1,402 ppm. The accuracy and precision parameters analysis found that %diff and %CV met the requirements. In contrast, the carry-over parameter showed no response at analyte retention time in the blank that was analyzed after ULOQ. This method meets the parameters of selectivity, calibration curve, accuracy, precision, and carry-over based on the 2019 EMA guidelines.

Keyword: Vitamin K, Warfarin, HPLC, EMA

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PP26

ISOLATION, CHARACTERIZATION AND IN VITRO ACTIVITY OF ANTIDIABETIC FROM *Lawsonia inermis* LEAVES ACTIVE COMPOUNDS

Ida Musfiroh[1], Mus Ifaya[2,4], Sahidin[3], Syawal Abdurrahman[5], Gofarana Wilar[2], Yasmiwar Susilawati[6]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran
[2]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran
[3]Faculty of Pharmacy, Universitas Halu Oleo Kendari, Southeast Sulawesi Indonesia
[4]Departemen of Pharmacy, Faculty of Science and Technology, Universitas Mandala Waluya Southeast Sulawesi Indonesia
[5]Departement of Medical Laboratory Technology, Faculty of Science and Technology, Universitas Mandala Waluya Southeast Sulawesi Indonesia
[6]Department of Biological Pharmaceutical, Faculty of Pharmacy, Universitas Padjadjaran
e-mail address of corresponding author: Ida.musfiroh@unpad.ac.id

ABSTRACT

Henna (*Lawsonia inermis* L.) leaves contain the main active compounds such as flavonoids, phenols, alkaloids, glycosides, saponins, tannins, and essential oils. Phenols and flavonoids are the most commonly found as active compounds.[1,2] The antidiabetic test on rats, purified extract of henna (*L. inermis* L.) leaves with a dose of 800 mg/kg BW had a decrease of 54.61%.[3] These results show very good activity, so it is necessary to determine for antidiabetic active compounds of its isolates. The purpose of this study is to isolate, purify and characterize active compounds from *L. inermis* leaves and to know the antidiabetic activity of *L. inermis* leaves compounds through inhibition of Dipeptidyl Peptidase IV (DPP – IV). The methods were sample extraction that was carried out by maceration, purification by liquid-liquid extraction. The isolation was carried out by vacuum liquid chromatography (VLC). The isolated bioactive components were characterized based on analysis of extensive spectroscopic data (UV, IR, MS, 1H and 13C NMR). Antidiabetic activity tests against active compounds through inhibition of DPP – IV *in vitro* at 405 nm every 10 seconds for 30 minutes. The VLC results from the ethyl acetate extract of *L. inermis* leaves obtained 7 fractions (A-G) and 1 fraction (D) was taken because it had the best activity as antidiabetic based on in vivo tests and isolates were obtained (D5c). The extensive spectroscopic data analysis (UV, IR, H1-NMR, C13-NMR and MS spectroscopy result reveals that, the isolated bioactive compound elucidated as 5,7,2,5-tetrahydroxy-flavone. The results showed that the inhibitory activity of the DPP-IV from isolate at 56.85 ± 0.30 µg/mL that was significantly different compared to the IC_{50} of sitagliptin (0.306 µg/ml) based on t-test result with 90% of confidence level. It concluded that 5,7,2,5-tetrahydroxy-flavon (isolated (D5c) from *L. inermis* leaves had an inhibition potency towards DPP-IV as one of the mechanisms of type 2 diabetes mellitus treatment.

Keywords: *L. inermis*, Bioactivity guided fractionation, Dipeptidyl Peptidase IV (DPP – IV)

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PP27

FORMULATION AND CHARACTERIZATION OF ZEAXANTHIN NANOEMULSION RADIANCE SERUM AS ANTIOXIDANT

Fajar Setiawan[1], Taofik Rusdiana[2], Dolih Gozali[2], Lusi Nurdianti[1], Keni Ida Cahyati[1], Winda Trisna Wulandari[1]

[1]Faculty of Pharmacy, Universitas Bakti Tunas Husada, Jalan Cilolohan No. 36 Kota Tasikmalaya, West Java, Indonesia 46115
[2]Faculty of Pharmacy, Universitas Padjadjaran, Jalan Ir. Soekarno Km. 21 Jatinangor, Kabupaten Sumedang, West Java, Indonesia 45363
e-mail of corresponding author: lusinurdianti83@gmail.com

ABSTRACT

Zeaxanthin is a group of xanthophyll carotenoids that are lipophilic[1]. There are many limitations that arise in the administration of these substances through the oral route, among others, is the first-pass metabolism that occurs in the gastrointestinal and liver. As a strong antioxidant, there are many health benefits obtained from consumption of these carotenoids, one of which is the benefits on the skin, namely lightening. Therefore, to increase the effectiveness of using zeaxanthin, this study developed nanoemulsion containing zeaxanthin which was then formulated into radiance serum for topical use[2]. Nanoemulsions are made using spontaneous nanoemulsification methods/techniques which are relatively simple technologically because they rely on the right combination of selected surfactants and co-surfactants[3]. The optimization of the formula was carried out starting from determining the oil:surfactant:co-surfactant phase ratio and concentration of zeaxanthin. Nanoemulsion characterization in the form of physical characterization includes organoleptic tests, globule size and polydispersity index, zeta potential, pH and entrapment efficiency tests. The best results from nanoemulsion were then combined into serum preparations which were then tested for evaluation of the preparations including organoleptic, homogeneity, viscosity, pH, spreadability, antioxidant test and stability test (cycling test). The results showed that the developed zeaxanthin nanoemulsion had a globule size in the range of 20-24 nm (with a normal globule size distribution curve), polydispersity index value of less than 0.3, zeta potential greater than -20 mV and entrapment efficiency ranging from 80-85%. The results of evaluation showed that the serum radiance of zeaxanthin nanoemulsion had good physical, chemical and stability properties during storage with an IC_{50} value of zeaxanthin less than 50 ppm.

Keywords: radiance serum, zeaxanthin, antioxidant, nanoemulsion

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PP29

NADES EXTRACT OF GEDONG MANGO LEAVES AND MULBERRY LEAVES IN SPRAY GEL AS A SUNSCREEN

Yayan Rizikiyan[1], Ine Suharyani[1,2*], Yuniarti Falya[1], Renny Amelia[1], Muhammad Nuh[1], Lela Sulastri[1]

[1]School of Pharmacy Muhammadiyah Cirebon, Jl. Cideng Indah No.3, Kertawinangun, Kedawung, Cirebon, 45153, Indonesia
[2]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, 45363, Indonesia
e-mail address of corresponding author: ine18001@mail.unpad.ac.id

ABSTRACT

Antioxidants and sunscreens have a positive relationship. The Sun Protection Factor (SPF) increase correlated with antioxidant activity.[1] Both Gedong mango leaves (GL) and Mulberry leaves (ML) have antioxidant activity[2,3; the] potential to combine these leaves extract into a spray gel preparation as a sunscreen. This study's purpose is to formulate spray gel containing the combination of mango leaves and Mulberry leaves as a sunscreen preparation. Each leaf was extracted by NADES (Natural Deep Eutectic Solvent)-MAE (Microwave Assisted Extraction) method.[4] The extract formulated in spray gel in a ratio of GL and ML were 3:0.5 (GM-CarSG 1) ; 3:3 (GM-CarSG 2); and 3:6 (GM-CarSG 3). Furthermore, the spray gel was evaluated, and the SPF value was determined. The physical appearance, spreadability, pH and viscosity of GM-CarSG 1, GM-CarSG 2 and GM-CarSG 3 met the requirements. In addition, the three preparations have a sunscreen activity, with the SPF value of GM-CarSG 1, GM-CarSG 2 and GM-CarSG 3 being 2.08±0.03; 2.78±0.05; and 3.53±0.04, respectively. It was concluded that the combination of GL and ML extract was potentially used as a sunscreen in spray gel preparation.

Keywords: gedong mango leaves, mulberry leaves, spray gel, SPF, sunscreen

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PP30

DISCOVERING TYROSINASE INHIBITORS FROM MORUS sp. PLANTS: AN *IN SILICO* STUDY

Yuniarti Falya[1], Renny Amelia[1,2], Yayan Rizikiyan[3], Lela Sulastri[3], Nur Rahmi Hidayati[1]

[1]Department of Pharmacology and Clinical Pharmacy, School of Pharmacy Muhammadiyah Cirebon, Cirebon, Indonesia.
[2]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran West Java, Indonesia.
[3]Department of Pharmaceutics and Pharmaceutical Technology, School of Pharmacy Muhammadiyah Cirebon, Cirebon, Indonesia.
Corresponding Author: rennyamelia@stfmuhammadiyahcirebon.ac.id

ABSTRACT

Hyperpigmentation is caused by an excess of melanin that forms brown or uneven patches on the skin. TYRP1 can inhibit tyrosinase, thereby inhibiting excess melanin production[1]. *Morus sp*. contains catechin, quercitrin, sanggenon H, dihydromorin, quercetin, kaempferol, sanggenon F, steppogenin, isorhamnetin, rutin and morusin. The aim of this study was to examine the bonding mode of *Morus sp.* compounds with critical amino acid residues in the binding pocket of the enzyme tyrosinase and TRP1 in *in silico* so that it can be used as a support in the design of skin lightening cosmetics based on *Morus sp*. Docking is done using autodock tools software, chem office 2019, ChemDraw professional 12, autodock 4.2, discovery studio 2016. From eleven compounds in the leaves of *Morus sp*., isorhamnetin provides the lowest energy (-6.15 kcal/mol) than hydroquinone (-4.26 kcal/mol). Isorhamnetin produces affinity, good biological activity, and has potential as a tyrosinase inhibitor.

Keywords: *Morus sp*, melanogenesis, tyrosinase, tyrosinase-related protein, *in silico*

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PP31

ALPHA-GLUCOSIDASE INHIBITORY ASSAY-SCREENED ISOLATION FROM *Lawsonia inermis* LEAVES ACTIVE COMPOUNDS

Mus Ifaya[1,4], Ida Musfiroh[2], Sahidin[3], Filmaharani[4]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran
[2]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran
[3]Faculty of Pharmacy, Universitas Halu Oleo Kendari, Southeast Sulawesi Indonesia
[4]Department of Pharmacy, Faculty of Science and Technology, Universitas Mandala Waluya Southeast Sulawesi Indonesia
e-mail address of corresponding author: mus18001@unpad.ac.id

ABSTRACT

Diabetes mellitus is a disease characterized by an increase in glucose in the blood[1]. One class of drugs used to control this activity are alpha-glucosidase inhibitors. Diabetes treatment is not only done with the use of synthetic drugs, but also with the use of natural medicines. One of them is *Lawsonia inermis* leaves[2]. The aim of this research was to establish the constituents of *L. inermis* leaves as anti-diabetic agents. The method included maceration, purification by liquid-liquid extraction. The extract was dissolved in EtOH: H_2O (1:1), and the aqueous fraction was then partionated with EtOAc to give a free chlorophyll extract[3], Fractionation using vacuum liquid chromatography (VLC) furthermore, purified on radial chromatography. The inhibitory activity of the alpha-glucosidase enzyme was measured by ELISA reader at λ 400 nm and quercetin as a comparison. The results showed that the inhibitory activity of the alpha-glucosidase enzyme from *L. inermis* leaves isolate with an IC50 value of isolate ($D5_{c.1}$)was 39.34±0.27 µg/mL with an active inhibitory category while for positive control quercetin with an IC_{50} value of 2.27±0.00 µg/ mL is a very active category. The isolate ($D5_{c.1}$) of *L. inermis* leaves was active in inhibiting the alpha-glucosidase enzyme so that it could be a candidate as an alpha-glucosidase inhibitor.

Keywords: *L.inermis*, *isolate* ($D5_{c.1}$), antidiabetic; alpha-glucosidase inhibition, *quercetin*.

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PP32

FORMULATION AND EVALUATION OF EDIBLE FILM OF BETEL (*Piper betle* L) LEAF AS MOUTH FRESHER

Ade Yeni Aprillia, Lusi Nurdianti, Sri Nurdalis

Pharmacy Study Program, Facultas of Pharmacy, Bakti Tunas Husada University, Jl. Cilolohan No.36, 46115, Tasikmalaya, Indonesia
e-mail address of corresponding author: lusinurdianti83@gmail.com

ABSTRACT

Halitosis is a general term that describes bad breath that comes from inside or outside the oral cavity.[1] In addition to toothpaste and mouthwash preparations, edible films can also be developed into products to remove bad breath. The edible film is a thin layer made of edible materials, widely used to coat food [4-6]. The main components of edible films are divided into three categories, namely hydrocolloids, lipids, and complexes[6]. Ethanol extract of betel leaf can be used as an active ingredient in edible film formulations because betel leaf (*Piper betle* L.) is a traditional medicinal plant that plays a role in dental and oral health[3,4]. Betel leaf contains flavonoids and phenols as an antibacterial against *Streptococcus mutans* bacteria. The purpose of this study was to make edible film from betel leaf and then to characterize its mechanical properties and antibacterial activity against *Streptococcus mutans* bacteria with betel leaf extract concentration of 0% (F0), 2% (F1), 4% (F2), 6% (F3)[3,4]. Betel leaf extracted by maceration using 96% ethanol as solvent2. The betel leaf extract was then formulated in the form of edible film and evaluated which included organoleptic examination, pH, thickness, weight uniformity, disintegration and dissolution time, multiple resistance, preference, FTIR. Mechanical properties were also evaluated namely tensile strength, % elongation and modulus of elasticity[6]. Then it was tested for their antibacterial activity against *Streptococcus mutans* bacteria. The results showed that the yield of betel leaf extract was 11.89%, the results of the evaluation of edible film showed that all edible film formulations meet the requirements of the preparation and the best was in formula 3. Betel leaf extract produces an inhibition zone of 18.3 mm and for edible film (formula 3) of 11.61 mm. The ethanol extract of betel leaf can be applied in the form of edible film using Na-CMC polymer as a film former and has strong antibacterial activity.

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Keywords: Betel (*Piper betle* L.) leaf, antibacterial activity, *Streptococcus mutans*, Edible Film

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PP33

IN SILICO TARGETING OF BIOACTIVE COMPOUNDS FROM SUNGKAI (*Peronema canescens*) to IL-6 and TNF-α RECEPTORS FOR THE TREATMENT OF COVID-19

Muhammad Ryan Radix Rahardhian[1,4], Yasmiwar Susilawati[2], Ida Musfiroh[3], Raden Maya Febriyanti[2], Muchtaridi[3]

[1]Doctor Program, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor 45363, Indonesia
[2]Department of Pharmaceutical Biology, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor 45363, Indonesia.
[3]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor 45363, Indonesia
[4]Department of Pharmaceutical Biology, Semarang College of Pharmaceutical Sciences (STIFAR), Semarang 50192, Indonesia.
e-mail address of the corresponding author: yasmiwar@unpad.ac.id

ABSTRACT

Hyperactive inflammatory response to SARS-CoV-2 infection plays a significant role in the pathogenesis of COVID-19[1]. Panel for the treatment of COVID-19 recommends the use of anti-Interleukin-6 (IL-6) Receptor Monoclonal Antibodies (Sarilumab and Tocilizumab) for certain non-hospitalized and hospitalized patients. Tumor necrosis factor-alpha (TNF-α) is a cytokine that plays a crucial role in the inflammatory process. Recent studies demonstrate that compounds from *Peronema canescens* (PC) are efficient inhibitors of IL-6 and TNF-α. However, the interactions between IL-6 and TNF-α with PC compounds such as peronemin are still unclear. This study aimed to find a lead compound of peronemins derivates with mechanisms such as inhibitor interleukin 6 (IL-6) and tumor necrosis factor α (TNF-α) as potential drug targets for the treatment of COVID-19. Computer-assisted drug design techniques of *in silico* Molecular Docking research were conducted using Autodock 4. The targets are the active site of IL-6 and TNF-α with seven peronemins derivatives. Lipinski predicts the drug-likeness of a chemical compound with a specific biological activity designed for the oral route of administration. ADMET inheritance of the ligands was investigated using the pkCSM website. This study finds that Peronemin C1 and Peronemin A3 show the lowest binding energy to IL-6 and TNF-α, respectively, and binds to an essential protein with molecular docking. The seven peronemins compounds meet Lipinski's five requirements for oral use. All seven peronemins met the requirements for pharmacokinetic parameters and had no toxic effects except for the hepatotoxic for Peronemin B2 and Ames test for Peronemin D1. This study indicates that the two lead molecules, Peronemin C1 and Peronemin A3, showed reliable physicochemical properties, hence the potential for further development of COVID-19 drugs, which effectively inhibit human IL-6 and TNF-α receptors.

Keywords: Peronemin, IL-6, TNF-α, COVID-19

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PP34

SIGNAL OF CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASE II AND EXTRACELLULAR REGULATED KINASE ON NICOTINE INDUCED CPP

Gofarana Wilar[1], Sri Adi Sumiwi[1], Yasmiwar Susialawati[2]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Sumedang, Indonesia 45363
[2]Department Biology of Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Sumedang, Indonesia 45363
e-mail address of corresponding author: g.wilar@unpad.ac.id

ABSTRACT

Nicotine is a psychoactive compound in tobacco that induces a rewarding effect in the central nervous system (CNS), which may lead to dependence. Although nicotine dependence is elucidated by brain mechanisms, synaptic molecular substrates underlying the dependence remain unclear[1]. We hypothesized that reward signaling is mediated by dopamine and glutamate receptors, in where calcium/calmodulin-dependent kinase II (CaMKII) and extracellular signal regulated kinase (ERK) may mediate the synaptic sigaling of dependence[1]. To investigate the signal of both CaMKII and ERK on nicotine induced-CPP, we first measured CaMKII and ERK activity after establishment of nicotine induced CPP. Mice were first habituated to the CPP apparatus for five days, followed by a preconditioning test to determine the nicotine-paired compartment. Mouse entered conditioning training for one month in which 0.5 mg/kg nicotine was administered intraperitoneally followed by confinement in the designated compartment of CPP apparatus for 30 minutes. Four hours later, the same procedure was repeated, only this time saline was given instead of nicotine and the mouse was confined in the opposite of the nicotine compartment. One day after conditioning, preference scores were measured to evaluate the nicotine induced-CPP. Mice were sacrificed and their brains were dissected out for immunoblotting analyses of CaMKII and ERK phosphorylation. CaMKII and ERK Activity significantly increased along with development of nicotine induced-CPP.

Keywords: Nicotine induced-CPP, CaMKII, ERK, Conditioned place preference, Preference score.

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PP35

PHARMACOKINETIC PREDICTIONS AND MOLECULAR DOCKING ANALYSIS OF TERPENOID AND FLAVONOID COMPOUNDS FROM MIANA LEAVES (*Plectranthus scutellarioides* (L.) R.Br.) AS AN ANTIMALARIAL ON PLASMEPSIN II RECEPTOR

Ami Tjitraresmi[1], Kirka Dwi Apriali[1], Kamila Nurvianita[1], Ida Musfiroh[2], Moelyono M. Wardoyo[1], Yasmiwar Susilawati[1]**

[1]Department of Pharmaceutical Biology, Faculty of Pharmacy, Padjadjaran University, Sumedang 45363, Indonesia
[2]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Padjadjaran University, Sumedang 45363, Indonesia
e-mail address of corresponding author: *ami.tjitraresmi@unpad.ac.id; **ida.musfiroh@unpad.ac.id

ABSTRACT

Malaria remains a significant public health problem. The occurrence of *Plasmodium falciparum* strains that are resistant to anti-malarial drugs requires the search and development of new drug targets in malaria control. Plasmepsin II, an aspartic protease from the human intraerythrocytic parasite *Plasmodium falciparum*, is involved in the degradation of hemoglobin within the parasite's acidic food vacuole. Plasmepsin II is essential in providing nutrients (amino acids) needed for parasite growth, so Plasmepsin II is a potential target for structurally based novel anti-malarial design[1]. Many plants from the Lamiaceae family have been proven to have antiplasmodial activity. Terpenoids and flavonoids are known to be responsible for the antiplasmodial activity of the Lamiaceae family[2]. Miana (*Plectranthus scutellarioides* (L.) R.Br.) is one of the plants from the Lamiaceae family that has been used by the people of Indonesia as an anti-malarial herbal medicine[3]. This study aimed to find anti-malarial candidates by investigating the interaction of the Plasmepsin II receptor with terpenoid and the flavonoid compounds found in miana leaves. The research was conducted in silico through molecular docking simulation, analysis of potential compounds using Lipinski's rule, and prediction of ADMET based on ligands. The results showed that among all the test ligands, fredericone B and isophytol had the best interaction with the plasmepsin II receptor based on the lowest bond energy value ((ΔG) respectively of -6.87 kcal/mol and -6.45 kcal/mol with a subsequent inhibition constant respectively of 9.24 μM and 18.85 μM. The fredericone B and isophytol showed the presence of hydrogen bonding with the Plasmepsin II receptor's crucial amino acid, Asp 34, and hydrophobic bonds with some amino acid residues similar to its natural ligands. Fredericone B and isophytol meet the requirements under Lipinski's rule; hence they can be developed as a drug and, based on pharmacokinetic predictions, they can permeate into biological systems and do not show carcinogenic potential.

Keywords: miana, in silico, malaria, plasmepsin II

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PP36

CYTOTOXIC ACTIVITY OF *Pouteria campechiana* (Kunth) Baehni ON MCF-7 CELLS

Intan T Maisyarah, Kaila Keyshia Mei, Yunitasya Guspira, Moh Haidar Hilmi, Raden Bayu Indradi

Department of Biology Pharmacy, Faculty of Pharmacy,
Universitas Padjadjaran, Sumedang, West Java, Indonesia 45363
e-mail address of corresponding author: intan.timur@unpad.ac.id

ABSTRACT

Besides as a source of edible fruits, *Pouteria campechiana* (Kunth) Baehni or locally known as campolay, is also reported to have been used as traditional medicine to treat fever, ulcer, and antiseptic[1]. Many reports on *Pouteria* plants have shown cytotoxic activity against different types of cancer cell lines[2]. This study aimed to investigate the cytotoxicity of ethanolic extract of leaf and bark as well as their fractions. Extraction was conducted by maceration with ethanol, then followed by fractionation by liquid-liquid extraction. Cytotoxic activity was evaluated on human breast adenocarcinoma cell line (MCF-7) by the WST-8 method. The leaf extract showed moderate cytotoxicity on MCF-7 cell line with IC_{50} value 109.4 ppm, and ethyl acetate fraction showed better cytotoxicity with IC_{50} value 90.5 ppm. The bark extract and its ethyl acetate fraction exhibited strong cytotoxicity on MCF-7 cell line with IC_{50} value 87.7 ppm and 84.3 ppm. N-hexane fractions from both leaf and bark showed lower cytotoxicity with IC_{50} value 371.3 ppm and 245.8 ppm.

Keywords: *Pouteria campechiana*, cytotoxicity, MCF-7

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PP37

TOPOISOMERASE INHIBITORS ACTIVITY OF YELLOW CEMPAKA (*Michelia champaca* L.) BARK EXTRACTS AND FRACTIONS AND ITS LIRIODENINE CONTENTS

Ade Zuhrotun[1]*, Yuni Elsa Hadisaputri[1], Frederick Alexander[1], Imam Adi Wicaksono[2]

[1]Biological Pharmacy Department, [2]Pharmacology and Clinical Pharmacy Department
Faculty of Pharmacy, Universitas Padjadjaran, Jalan Ir. Soekarno Km. 21 Jatinangor, Sumedang West Java, Indonesia 45363
e-mail address of corresponding author: ade.zuhrotun@unpad.ac.id

ABSTRACT

Breast cancer is included in the two common cancer diseases worldwide and also in Indonesia[1,2]. The methanol extract of *Michelia champaca* L. bark known in Indonesia as yellow Cempaka and its isolate (liriodenine) was active as topoisomerase inhibitors by the yeast bioassay[3,4]. This research is aimed to investigate the activity of various extracts and fractions of *M.champaca* by mechanism-based yeast bioassay (MBYB) against the mutant yeasts[5]. Liriodenin content, an active compound in *M.champaca*, will analyze to know the correlation with this assays.The bark of *M.champaca* was extracted by maceration and graded maceration using n-hexane, ethyl acetate, and methanol. The methanol extract then fractionated using water, n-hexane and ethyl acetate in the liquid-liquid extraction process. Each extract and fractions were tested *in vitro* by mechanism-based yeast bioassay for their topoisomerase inhibitor activity Liriodenin content of all samples was analyzed by thin layer chromatography (TLC) densitometry method. The yeast bioassay results showed that all extracts were active as topoisomerase inhibitors (IC_{12} values under 8000 µg/ml) except MGM. Liriodenine can be used as a marker of active compound in ethyl acetate samples i.e EAM, EAGM and EAF with Pearson analysis value -.887 (P=0.153) and these samples were relatively more active than others. This research showed that various extracts and fractions of yellow Cempaka bark have topoisomerase inhibitors activity. It can be concluded that yellow Cempaka bark is a potent natural agents for breast cancer.

Keywords: *Cempaka Kuning*, *Michelia champaca* L., topoisomerase inhibitors, anti-breast cancer, mechanism-based yeast bioassay, MTS assay

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PP38

PHARMACOGNOSTIC CHARACTERISTIC OF *Kaempferia galanga* RHIZOME DRIED BY OVEN AND COMBINATION METHODS

Raden Bayu Indradi[1,2], Yasmiwar Susilawati[1,2], Zelika Mega Ramadhania[1,2], Asri Savitri[1], Soleh Soleh[1], Ade Zuhrotun[1,2], Yoppi Iskandar[1,2]

[1]Department of Pharmaceutical Biology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia 45363
[2]Center of Herbal Study, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia 45363
e-mail address of corresponding author: bayu.indradi@unpad.ac.id

ABSTRACT

Production of dried herbal materials, one of which is Kencur (*Kaempferia galanga*), is important as it is used widely in Indonesia as traditional medicine and should meet the government quality standard. The critical point that might affect the quality of the herbal material is drying process, thus it should be evaluated.[1,2] The research objective was to determine the effect of drying process on the pharmacognostic characteristic of dried *K. galanga* produced in Post-Harvest Processing Center of Medicinal Plants facility. The drying methods were oven-based drying in 80°C temperature and combination-based drying process, which included greenhouse drying for 6-8 hours and transferred to an 80°C oven. The pharmacognostic characteristic of products were evaluated based on Indonesian Herbal Pharmacopeia standard, which included macroscopic and microscopic evaluation, thin-layer chromatography, water and ethanol soluble content, total ash and acid-insoluble ash content, volatile oil content, ethyl para-methoxycinnamate content, total plate count, and total yeast and mold count. The result showed dried *K. galanga* from both drying methods met the quality standard. Interestingly, the combination-based methods were 6-7 hours quicker in drying time compared to oven-based methods despite lower temperature being used at the greenhouse. It can be concluded that both methods could retain the quality of *K. galanga* rhizome

Keywords: *Kaempferia galanga*, pharmacognostic characteristic, oven drying, combination drying

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PP39

ANALYSIS OF GALLIC ACID, QUININE, TANNIC ACID, AND SAPONINS IN CIPLUKAN HERB EXTRACT (*Physalis angulata* L.)

Ade Zuhrotun[1], Enny Rohmawaty[2], Rini Hendriani[3], Yoga Windhu Wardhana[4], Savira Ekawardhani[5], Hesti Lina Wiraswati[5], Winda A.M Saragih[6], Sumartini Dewi[7]

[1]Department of Biological Pharmacy Faculty of Pharmacy, [2]Division of Pharmacology and Therapy, Department of Biomedical Sciences, Faculty of Medicine, [3]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, [4]Study Center of Pharmaceutical Dosage Development, Department of Pharmaceutics and Pharmaceuticals Technology, Faculty of Pharmacy, [5]Department of Biomedical Sciences, Faculty of Medicine, [6]Department of Internal Medicine, Faculty of Medicine, [7]Immunology Study Center, Division of Rheumatology, Department of Internal Medicine, Universitas Padjadjaran, Jalan Ir. Soekarno Km. 21 Jatinangor, Sumedang West Java, Indonesia 45363
e-mail address of corresponding author: ade.zuhrotun@unpad.ac.id

ABSTRACT

Indonesian people have used the ciplukan herb (*Physalis angulata* L.) as traditional medicine, including as a remedy for worms, epilepsy, sore throat, and jaundice (icterus). Ciplukan herbs are proven to have several activities by research, such as anti-inflammatory, antimicrobial, antimalarial, antioxidant, and antifibrotic[1,2]. Phytochemical studies on ciplukan herbs showed the presence of bioactive compounds such as gallic acid, quinine, tannic acid, and saponins, which reported many activities[3,4]. In this study, the levels of bioactive compounds from ciplukan herb extract (Physalis angulata L.) were measured using Thin Layer Chromatography (TLC) and High-Performance Thin Layer Chromatography (HPTLC) and then were analyzed quantitatively using ImageJ application[6,7]. The sample was collected from Cisarua Bandung, West Java, Indonesia, and extracted with 70% of ethanol. The results showed that the optimal mobile phase for analysis of the bioactive compounds was toluene: ethyl acetate: formic acid (5:4:1) for gallic acid and tannic acid, chloroform: methanol (9:1) for kinins, and toluene: ethyl acetic: formic acid (1:9:1) for saponins. The analysis results of TLC and HPTLC showed that the content of gallic acid, quinine, tannic acid, and saponins was, respectively are, in the range of 0.262-0,307%, 1.365-1,938%, 0.011-0.022%, and 2.07-2.278%. Gallic acid has active as antioxidants[7], quinine as anti-inflammatory and antimalarial[8], tannic acid as antimicrobial and antiallergic[9], and saponins as antifungal and antiviral[10]. It can be conclude that ciplukan herb (*Physalis angulata* L.) is potential to be developed as modern medicine as standardized herbal drug and phytopharmaceuticals.

Keywords: Ciplukan herb, gallic acid, quinine, tannic acid, saponins, HPTLC, ImageJ Software, Levels.

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PP40

THE ANTI-INFLAMMATORY TABLET FORMULATION OF COLEUS (*Plectranthus scutellariodes*) LEAVES EXTRACT USING KOLLICOAT®PROTECT COATING

Resmi Mustarichie, Danni Ramdhani, Nyi Mekar Saptarini

Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, Indonesia 45363
e-mail address of corresponding author: resmi.mustarichie@unpad.ac.id

ABSTRACT

Leaves of coleus (*Plectranthus scutellariodes*), known as iler in Indonesia, is a traditional medicinal plant with anti-inflammatory properties.[1] It is necessary to make better preparations, to maximize the use of coleus leaves, longer-lasting stability, cover the bitter taste, and practical to use, i.e. film-coated tablets.[2] The material used as the coating polymer is Kollicoat@Protect. The purpose of this study was to find the concentration of weight gain on the use of Kollicoat@Protect to produce coleus leaf extract film-coated tablets with good physical properties. Coleus extract was obtained by maceration using 70% ethanol. Core tablets were prepared using the wet granulation method, then evaluated (uniformity of weight, size, hardness, friability, and disintegration time). Coated tablets were made in four variations of polymer concentration, i.e. 5, 6, 7, and 8%. To determine the effect of the weight gain concentration of Kollicoat@Protect, an evaluation of the coated tablets was carried out, namely the uniformity of weight, size, hardness, disintegration time, and physical observation of the film-coated tablets. The four variations in weight gain of film-coated tablets showed the physical appearance results per the applicable requirements. However, the physical observation test at room temperature showed the instability of the film-coated tablet. The qualitative analysis of thin-layer chromatography showed that the productive substances in the extracts, core tablets, and film-coated tablets were still contained even though they had undergone several formulation stages.

Keywords: Coleus leaves, *Plectranthus scutellariodes*, Kollicoat® Protect, Film-Coated Tablet, weight gain concentration

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PP41

ANTIBIOTIC RESISTANCE PROFILES OF HAEMOPHILUS INFLUENZA ISOLATES FROM ADULT PATIENT: THE CITY CENTER STUDY IN INDONESIA

Danni Ramdhani[1], Sri Agung Fitri Kusuma[2], Shinta Nur Azizah[2], Ika Khumairoh[2], Hilarius BAP[2], Dede Sediana[3]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy;
[1]Department of Biology Pharmacy, Faculty of Pharmacy, Padjadjaran University, Sumedang, West Java, Indonesia 45363.
[3]Tasikmalaya City Health Office, Pharmaceutical Division, West Java, Indonesia
e-mail address of corresponding author**:** d.ramdhani@unpad.ac.id

ABSTRACT

In developing countries, cases of *Haemophilus influenzae* (HI) resistance to levofloxacin, cefixime, and tetracycline have become a serious problem in clinical treatment[1,2]. This study was conducted to determine the antibiotic resistance profile of HI from adult patient isolates and to provide guidelines for more effective clinical treatment in Indonesia. The patient isolate stock was rejuvenated, cultured on growth media and the *Kirby-Bauer* disc diffusion method was used to test for antibiotic susceptibility. Evaluation was guided by recommendations from the Clinical and Laboratory Standard Institute (CLSI). A total of 643 isolates obtained from the respiratory tract, isolated and identified 73 HI strains**.** The resistance rates of the HI isolates to tetracycline, cefixime, and levofloxacin were 10.54 %, 4.31%, and 5.67%. Cefixime showed more effective activity than levofloxacin and tetracycline to treat the HI strain.

Keywords : *Haemophilus influenzae*, levofloxacin, cefixime, tetracycline, resistance, clinical isolates.

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