Abstract Book

THE 1st BANDUNG INTERNATIONAL TELECONFERENCE ON PHARMACY

BITP 2021

BANDUNG INTERNATIONAL TELECONFERENCE ON PHARMACY

Pharmaceutical Research Toward a Sustainable Development of Society

http://conference.farmasi.unpad.ac.id/bitp2021/

WELCOME REMARK
From Chairman of Organizing Committee
1st Bandung International Teleconference on Pharmacy (BITP) 2021

Dear Excellencies, Colleagues, Ladies and gentlemen.
It is a great pleasure for me to welcome you to this virtual conference of the 1st Bandung International Teleconference on Pharmacy (BITP) 2021. I am grateful to acknowledge Keynotes and invited speakers and other participants joining us. I wishing you and your families my personal best—for your health and safety in this covid-19 pandemic.

This Seminar 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 Pharmaceutical Research Toward a Sustainable Development of Society with 2 keynote lectures, 3 invited speakers, 34 oral presentations, and 45 poster contributions from more than 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
From Dean of Faculty of Pharmacy, Universitas Padjadjaran
1st Bandung International Teleconference on Pharmacy (BITP) 2021

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

- Prof. Taifo Mahmud (Oregon State University, USA),
- Prof. Habibah A Wahab (University Sains Malaysia, Malaysia),
- Prof. Kunikazu Moribe (Chiba University, Japan),
- Prof. Dr. Syed Azhar Syed Sulaiman (University Sains Malaysia, Malaysia),
- and Prof. Marteen J Postma (Groningen University, Netherland).

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 1st Bandung International Teleconference on Pharmacy (BITP) 2021, 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 1st Bandung International Teleconference on Pharmacy (BITP) 2021 will be held through a webinar. The first BITP will focus on "Pharmaceutical Research Toward a Sustainable Development of Society" with many topics including Biotechnology, Natural products, pharmaceutical excipients, covid-19 vaccine 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 world wide. 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. apt. Ajeng Diantini, M.Si.

STEERING COMMITTEE

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SCHEDULE OF 1st BANDUNG INTERNATIONAL TELECONFERENCE ON PHARMACY (1st BITP) 2021

Topic : The Pharmaceutical Research Toward a Sustainable Development of Society
Date : Thursday, 29th July 2021
Time : 08.00 – 16.00 (Jakarta time)

Time	Event
07.30 - 08.00	Registration
08.00 - 08.22	Opening Ceremony: Welcome Speech: 1. Dean of Faculty of Pharmacy 2. Chairperson of the Organizing Committee
08.22 – 09.17	Keynote Speaker I: Prof. Taifo Mahmud (Oregon State University, USA) "Biotechnology in Natural Product-Based Drug Discovery"
09.17 – 09.47	Invited Speaker I: Prof. Habibah A Wahab (University Sains Malaysia, Malaysia) "Conjugated β-Cyclodextrin Enhances the Affinity of Folic Acid and its derivatives towards Folate Receptor alpha: Molecular Dynamics Study"
09.47 - 10.17	Invited Speaker II: Prof. Kunikazu Moribe (Chiba University, Japan) "Mechanistic And Structural Understanding Of Drug/Excipients In The Formulation To Develop Functional Pharmaceutical Product And To Assure The Quality"
10.17 - 10.27	QnA Invited Speaker I & II
10.30 – 12.00	Paralel Session 1
12.00 - 13.00	Lunch Break and Poster Session
13.00 - 13.50	Paralel Session II
13.50 - 14.30	Invited Speaker III: Prof. Dr. Syed Azhar Syed Sulaiman (University Sains Malaysia, Malaysia) "The Changing Pattern of Pharmacy Education in The Era of Covid-19 Pandemic: Are we doing the right thing?"
14.30 – 15.25	Keynote Speaker II: Prof. Marteen J Postma (Groningen University, Netherland) "Health Technology Assessment in infectious diseases: the case of Covid-19 Vaccines"
15.25 – 15.35	Announcement for Best Poster and Oral Presenter
15.35 - 15.40	Closing

TIME SCHEDULE PARALEL SESSION
(ORAL PRESENTATION)

Paralel Session 1

Room 1
Moderator: Norisca Aliza Putriana, M.Farm.

TIME	CODE	PRESENTER NAME	TITLE
10.30-10.40	OP03	WIDYA KARDELA	RATIONAL DRUG USE EVALUATION BASED ON WORLD HEALTH ORGANIZATION CORE DRUG-USE INDICATOR AMONG SELECTED COMMUNITY HEALTH CENTERS IN THE DISTRICT OF PADANG CITY
10.40-10.50	OP04	YULIET	GASTROPROTECTIVE EFFECT OF ETHANOL STEM BARK EXTRACT OF PEPOLO (*Bischofia javanica* Blume) AGAINST ASPIRIN-INDUCED IN WHITE RATS (*Rattus norvegicus*)
10.50-11.00	OP05	DIAN NOVRIADHY	THE EFFECT OF SOIL MINERAL OF PEAT, SWAMP, AND TOPSOIL TO SHALLOT CHEMICAL COMPOSITION
11.00-11.10	OP07	LAILA SUSANTI	EFFECT OF NONI FRUIT EXTRACT ON AN ANIMAL MODEL OF ALOPECIA
11.10-11.20	OP08	ISTI DARUWATI	SYNTHESIS OF 131I-1,3,-dihydroxy-7-methoxy-2,8-bis(3-methyilbut-2-en-1-il)-9-oxo-9H-xanthen-3-il 2-chloromethylbenzoat (131I-AMB10) AS A THERANOSTICS RADIOPHARMACEUTICAL CANDIDATE FOR BREAST CANCER
11.20-11.30	OP11	CYNTHIA MARISCA MUNTU	PRELIMINARY STUDY OF INSULIN DRY POWDER FORMULATION WITH TREHALOSE AND INULIN AS STABILIZER
11.30-11.40	OP12	YULIUS BAKI KORASSA	REVIEW ARTICLE: THE POTENTIAL OF MORINGA (Moringa oleifera Lamk) SEED OIL AS ANTI-ALOPECIA
11.40-11.50	OP43	ELLIN FEBRINA	*IN VITRO* AND *IN SILICO* STUDIES ON THE CYTOTOXIC ACTIVITY OF *Acalypha indica* L. TARGETING CASPASE-3 IN PROSTATE CANCER CELLS

Room 2
Moderator: Intan Timur Maisyarah, Ph.D.

TIME	CODE	PRESENTER NAME	TITLE
10.30-10.40	OP13	MUS IFAYA	POTENTIAL ANTIDIABETIC ACTIVITY OF FRACTIONS OBTAINED FROM PURIFIED EXTRACT OF *Lawsonia inermis* LEAVES IN ALLOXAN – INDUCED DIABETIC MICE
10.40-10.50	OP14	SOFA FAJRIAH	PHYTOCHEMICAL PROFILING, ANTIOXIDANT AND ANTIDIABETIC EFFECT OF GARCINIA MANGOSTANA EXTRACTS
10.50-11.00	OP15	SOFI NURMAY STIANI	FORMULATION AND CHARACTERIZATION OF SERUM COLLAGEN OF SEA CUCUMBER EXTRACT *Stichopus horeens* AS AN ANTIOXIDANT
11.00-11.10	OP17	ADE IRMA SURYANI	TARGETED DRUG DELIVERY SYSTEM NANOPARTICLE BASED CHITOSAN/ALGINATE FOR CANCER THERAPY : A REVIEW
11.10-11.20	OP18	GOFARANA WILAR	PHOSPHORYLATION OF CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASE II (CAMKII) AND EXTRACELLULAR REGULATED KINASE (ERK) IN STRIATUM MEDIATE NICOTINE DEPENDENCE IN BALB/c
11.20-11.30	OP19	ANI MEGAWATI	POTENTIAL OF HERBAL MEDICINE IN ASIA FOR ORAL CANDIDIASIS THERAPY: A SYSTEMATIC REVIEW
11.30-11.40	OP20	IIN HELDAYANI	EFFECTIVENESS OF THE NATURAL-BASED PRODUCTS AND MUCOADHESIVE FOR RECURRENT APTHOUS STOMATITIS THERAPY: A SYSTEMATIC REVIEW
11.40-11.50	OP21	HIDAYAH KARUNIAWATI	DEVELOPMENT AND PSYCHOMETRIC TESTING OF KNOWLEDGE, ATTITUDE, AND PRACTICE ON COVID-19 OUTBREAK QUESTIONNAIRE (KAPCovQ) FOR GENERAL COMMUNITY

Room 3
Moderator: Dr. apt. Rimadani Pratiwi, M.Si.

TIME	CODE	PRESENTER NAME	TITLE
10.30-10.40	OP22	ANGELA APRILIA KARYADI	SINGLE-NUCLEOTIDE POLYMORPHISM OF TNFSF4 (rs2205960) OF SYSTEMIC LUPUS RYTHEMATOSUS PATIENTS IN WEST JAVA, INDONESIA
10.40-10.50	OP23	FAISAL MAULANA IBRAHIM	IN SILICO STUDIES OF (S)-2-AMINO-4-(3,5-DICHLOROPHENYL)BUTANOIC ACID AGAINST LAT1 AS A RADIOTHERANOSTIC AGENT OF CANCER
10.50-11.00	OP25	KENI IDA	ANTIDIABETIC ACTIVITY OF NANOCHITOSAN KIRINYUH LEAVES EXTRACT IN RAT
11.00-11.10	OP26	FIRMAN GUSTAMAN	COMPARATIVE DISSOLUTION TEST OF GENERIC AND CREMOPHORE-EL SIMVASTATIN TABLETS
11.10-11.20	OP28	DOLIH GOZALI	SOLUBILITY AND MECHANICAL PROPERTIES IMPROVEMENT OF CARVEDILOL BY MULTICOMPONENT CRYSTAL APPROACH
11.20-11.30	OP29	ERICA WILLY	SINGLE NUCLEOTIDE POLYMORPHISM OF STAT4 (rs7574865) OF SYSTEMIC LUPUS RYTHEMATOSUS PATIENTS IN WEST JAVA, INDONESIA
11.30-11.40	OP30	NOVIA TRI HASANAH	CLINICAL EFFICACY AND SAFETY OF HERBAL MEDICINE THERAPY IN RECURRENT APHTHOUS STOMATITIS: A SYSTEMATIC REVIEW

Paralel Session 1

Room 4
Moderator: apt. Nasrul Wathoni, Ph.D.

TIME	CODE	PRESENTER NAME	TITLE
13.00-13.10	OP31	MIFTAKH NUR RAHMAN	SERUM BRANCHED SHORT CHAIN FATTY ACIDS SIGNATURE IN DYSLIPIDEMIA AND THEIR ASSOCIATION WITH TYPE 2 DIABETES MELLITUS
13.10-13.20	OP32	RICHA MARDIANINGRUM	SYNTHESIS OF α-MANGOSTIN DERIVATIVE COMPOUNDS WITH NUCLEOPHILIC ACYL SUBSTITUTION REACTION
13.20-13.30	OP33	ZAENAL KOMAR	COMMUNITY HEALTH CENTRES AS THE PHARMACEUTICAL SERVICES SUPPORT SYSTEM IN HEALTHY INDONESIA PROGRAM: AN OBSERVATIONAL STUDY IN WEST JAVA INDONESIA
13.30-13.40	OP34	WINDA TRISNA WULANDARI	SYNTHESIS OF ENCAPSULATED CHROMOLAENA ODORATA LEAF EXTRACT IN CHITOSAN NANOPARTICLE BY USING IONIC GELATION METHOD AND ITS ANTIOXIDANT ACTIVITY
13.40-13.50	OP36	LINA NURFAHILA	SYNTHESIS AND CHARACTERIZATION OF MOLECULARLY IMPRINTED POLYMER (MIP) EPHEDRINE FOR GAS CHROMATOGRAPHY ANALYSIS

Room 5
Moderator: apt. R. Bayu Indradi, M.Si.

TIME	CODE	PRESENTER NAME	TITLE
13.00-13.10	OP37	VINA MAULIDYA	STANDARDIZATION OF BLACK BETEL LEAF (*Piper acre* Blume) ETHANOL EXTRACT ORIGIN IN EAST KALIMANTAN
13.10-13.20	OP38	RESTU HARISMA DAMAYANTI	SECRETOME FOR DERMATOLOGY APPLICATION: A REVIEW
13.20-13.30	OP40	FAHRAUK FARAMAYUDA	ROSMARINIC ACID PRODUCTION FROM CELL SUSPENSION CULTURE OF *Orthosiphon aristatus* Blume Miq WHITE-PURPLE VARIETY
13.30-13.40	OP41	WIWIT NURHIDAYAH	SYNTHESIS OF 131I-ALPHA MANGOSTIN AS RADIOPHARMACEUTICAL CANDIDATE FOR DIAGNOSTIC AND THERAPY OF BREAST CANCER
13.40-13.50	OP42	SORAYA RIYANTI	POTENCY OF HONJE HUTAN FLOWERS (*Etlingera hemisphaerica* (Blume) R.M.Sm.) AS ALPHA-GLUCOSIDASE INHIBITOR

TIME SCHEDULE
(POSTER PRESENTATION)

No	CODE	PRESENTER NAME	TITLE
1	PP01	INSAN SUNAN KURNIAWANSYAH	IN VITRO DRUG RELEASE STUDY OF CHLORAMPHENICOL IN SITU GEL WITH BASES MIXTURE OF POLOXAMER 407 AND HPMC BY OPTIMIZATION WITH FACTORIAL DESIGN
2	PP03	GARNADI JAFAR	FORMULA DEVELOPMENT AND CHARACTERIZATION OF PEG-8 BEESWAX IN FORMULA NANOSTRUCTURED LIPID CARRIERS (NLC)
3	PP04	Apt. NUR RAHAYUNINGSIH, M.Si	ANTIDIARRHEAL EFFECTIVENESS TEST OF ETHANOL EXTRACT OF WHITE POMEGRANATE PEEL (PUNICA GRANATUM L) IN MALE WHITE MICE USING THE INTESTINAL TRANSIT METHOD
4	PP05	TAQIYYAH QOTHRUNNADAA	PATCHES FOR ACNE TREATMENT : AN UPDATE ON THE FORMULATION AND STABILITY TEST
5	PP06	Dr. Apt. BURHAN MA'ARIF Z.A, M.Farm.	IN VITRO ANTI-NEUROINFLAMMATORY EFFECT OF GENISTEIN (4',5,7-TRIHYDROXYISOFLAVONE) ON MICROGLIA HMC3 CELL LINE, AND IN SILICO EVALUATION OF ITS INTERACTION WITH ER-β
6	PP07	INDAH DAMAYANTI	INTERLEUKIN AS BIOMARKER IN RECURRENT APHTHOUS STOMATITIS (RAS): A SYSTEMATIC REVIEW
7	PP08	HISA FAADHILAH	REVIEW : THE FORMULATING AND EFFECTIVENESS OF THE COVID-19 VACCINE THAT HAVE BEEN CIRCULATED
8	PP09	KARINA OLGA WISEVA	REVIEW: NANOEMULSION FORMULATION OF COSMETIC WITH PLANT EXTRACTS AS THE ACTIVE INGREDIENT
9	PP10	Apt. HESTI RIASARI., M.Si	SCREENING MECHANISM IN VIVO OF ANTI-DIABETIC ACTIVITY OF *Archidendron bubalium* SEEDS
10	PP11	NYI MEKAR SAPTARINI	DECOCTION OF POMEGRANATE (*Punica granatum* L.) PEEL AS AN ANTELMINTIC AGAINST *Taenia saginata*
11	PP12	HERU NURCAHYO	DETERMINATION OF QUERCETIN IN SHALLOT (*Allium cepa* L.) ETHANOL EXTRACT AND ETHYL ACETATE FRACTION USING HPLC-MS METHOD

No	CODE	PRESENTER NAME	TITLE
12	PP13	INDAH SUASANI WAHYUNI	THE DETERMINATION OF ETHYL p-METHOXY CINNAMATE IN KAEMPFERIA GALANGA L. RHIZOME EXTRACT HARVESTED IN RAINY AND DRY SEASONS
13	PP14	Apt. RIZKA KHOIRUNNISA GUNTINA, S.Farm.	A REVIEW: NATURAL PRODUCT DRUG DELIVERY SYSTEM FOR CANCER TREATMENT DOSAGE FORM AND EVALUATION
14	PP15	IRMA ERIKA HERAWATI	QUANTIFICATION OF RICIN PROTEIN FROM RICINUS COMMUNIS ORIGINATED FROM NGANJUK, EAST JAVA, INDONESIA
15	PP17	RENNY AMELIA	ACUTE TOXICITY OF β-KITIN EXTRACTED FROM THE SHELL OF BLUE SWIMMING CRAB (Portunus pelagicus Linn.)
16	PP18	Apt. NORISCA ALIZA PUTRIANA, M.Farm	FORMULATION OF BLACK GARLIC (*Allium Sativum* L.) ETHANOL EXTRACT LOZENGES USING WET GRANULATION METHOD AS AN ANTIOXIDANT SUPPLEMENT
17	PP19	AMI TJITRARESMI, M.Si.	MEDICINAL HERBS USED IN MANAGEMENT OF MALARIA IN PAMOTAN VILLAGE COMMUNITY, KALIPUCANG DISTRICT, PANGANDARAN REGENCY, WEST JAVA PROVINCE, INDONESIA
18	PP20	RASPATI DEWI MULYANINGSIH	COMPARISON OF THREE EXTRACTION METHODS OF ALLOPURINOL IN URIC ACID HERBAL MEDICINE WITH HIGH PERFORMANCE LIQUID CHROMATOGRAPHY QUANTIFICATION
19	PP21	IKE SUSANTI	REVIEW: APPLICATION OF MAGNETIC SOLID-PHASE EXTRACTION (MSPE) IN VARIOUS TYPES OF SAMPLES
20	PP22	NISA AMALIA	DEVELOPMENT OF PAPER BASED ANALYTICAL DEVICE FOR DETECTING DIAZEPAM IN URINE
21	PP23	SRI AGUNG FITRI KUSUMA	ANTIFUNGAL ACTIVITY OF FERMENTED JACKFRUIT (ARTOCARPUS HETEROPHYLLUS LAM) SEED BY-PRODUCT AGAINST FOODBORNE FUNGI
22	PP24	SHENDI SURYANA	SYNTHESIS AND CHARACTERIZATION OF MIP (MOLECULARLY IMPRINTED POLYMERS) OF THEOPHYLLINE WITH MONOMER METHACRILATE ACID AND POROGEN CHLOROFORM-METHANOL
23	PP25	Apt ABD. KAKHAR UMAR, M.Farm	FILM PATCH WATER SOLUBLE CHITOSAN CONTAINING LIPOSOME-COATED HUMAN EPIDERMAL GROWTH FACTOR FOR WOUND HEALING

No	CODE	PRESENTER NAME	TITLE
24	PP26	Apt. RINA TRIANA, M.Farm	THE INVERSE CORRELATION BETWEEN FECAL PROPIONATE AND SERUM ADMA IN TYPE 2 DIABETIC PATIENTS
25	PP27	Dr. Apt. LINA WINARTI, S.Farm, M.Sv	MELOXICAM SELF-NANOEMULSIFYING DRUG DELIVERY SYSTEM: FORMULATION AND RELEASE KINETICS ANALYSIS
26	PP28	SISKA DARMAYANTI, S.Si, M.Farm	EFFECTIVENESS OF INTEGRATED PROTEIN PURIFICATION SYSTEM FOR QUANTITATIVE PROTEOMICS APPLICATION
27	PP29	AHMAD SODIKIN	BEYOND USE DATE DRY SYRUP PREPARATION AZITROMISIN AGAINST BACTERIA *Staphylococcus aureus* AND *Escherichia coli*
28	PP30	SHIDQI FAJRI ROMADHON	PRELIMINARY STUDY OF TMEPAI (TRANSMEMBRANE PROSTATE ANDROGEN-INDUCED) PROTEIN STRUCTURE MODELLING ISOFORM A, B, C1, C2, AND D USING I-TASSER, RAPTOR X, AND ROBETTA SERVERS
29	PP31	Dr. Apt. LINA WINARTI, S.Farm, M.Sc	OPTIMIZATION OF STIRRING SPEED AND STIRRING TIME IN THE PREPARATION OF DILTIAZEM HYDROCHLORIDE NANOPARTICLES
30	PP32	Apt. YENNI PUSPITA TANJUNG, M.Farm.	FORMULATION AND EVALUATION OF PEEL-OFF GEL FACIAL MASK FROM ARABICA COFFEE FRUIT PEEL EXTRACT (Coffea arabica L.)
31	PP33	HOLIS ABD HOLIK	MOLECULAR DOCKING AND ADMET PREDICTION OF MODIFIED JPH203 AS A POTENTIAL RADIOPHARMACEUTICAL KIT FOR MOLECULAR IMAGING OF CANCER
32	PP34	FAISAL MAULANA IBRAHIM	MOLECULAR DOCKING AND ADMET PREDICTION OF 5-BENZYLOXYTRYPTOPHAN AS A POTENTIAL RADIOPHARMACEUTICAL KIT FOR MOLECULAR IMAGING OF CANCER
33	PP35	WINASIH RACHMAWATI	MOLECULAR DYNAMIC SIMULATION OF ACRYLAMIDE AS MONOMER FOR ALPHA MANGOSTIN MOLECULAR IMPRINTED POLYMER
34	PP36	RIEZKI AMALIA	VIABILITY ASSAY OF CISPLATIN COMBINATION WITH POLYETHYLENEIMINE (PEI) MW 600.000, MW 750.000, AND PEI-g-PEG IN TRIPLE-NEGATIVE BREAST CANCER MDA-MB-231 CELL LINE
35	PP37	ADE YENI APRILLIA, M.Si	EMULGEL ITRACONAZOLE AS ANTIFUNGAL

No	CODE	PRESENTER NAME	TITLE
36	PP38	Apt. NORISCA ALIZA PUTRIANA, M.Farm	ASSOCIATION BETWEEN USUAL VITAMIN K INTAKE AND ANTICOAGULATION IN PATIENTS WARFARIN THERAPY
37	PP39	Apt. NORISCA ALIZA PUTRIANA, M.Farm	EVALUATION OF ADVERSE DRUG REACTION IN PATIENTS WARFARIN THERAPY
38	PP41	LUSI NURDIANTI	FORMULATION, CHARACTERIZATION AND DETERMINATION OF THE DIFFUSION RATE STUDY OF ANTIOXIDANT SERUM CONTAINING ASTAXANTHIN NANOEMULSION
39	PP42	FAJAR SETIAWAN	FORMULATION AND EFFECTIVITY OF THE ANTIOXIDANT SERUM PREPARATION CONTAINING ZEAXANTHIN AS ANTIAGING FOR TOPICAL ADMINISTRATION
40	PP43	Apt. PRISKA ERNESTINA TENDA, SF, M.SC	ANTIHYPERLIPIDEMIC EFFECT OF THE ETHANOL EXTRACT FRACTION FROM MULBERRY (*Morus australis* Poir.) LEAVES ON RATS INDUCED HIGH FAT-DIET AND PTU
41	PP44	DR. APT. IDA MUSFIROH, M.SI.	HYPOGLYCEMIC ACTIVITY OF ETHYL ACETATE FRACTION COMBINATION OF MORINDA FRUIT AND CINNAMON BARK USING GLUCOSE-INDUCED IN MICE
42	PP45	TITA NOFIANTI	CYCLOARTANE TRITERPENOIDS FROM THE FRUIT PEEL OF *Musa balbisiana* Colla, ITS MOLECULAR DOCKING AS ANTIDIABETIC
43	PP46	FAIZAL HERMANTO	THE EFFECT OF APIGENIN ON THE PROFILE OF HEMATOLOGICAL OF MICE INFECTED WITH *Plasmodium berghei* ANKA
44	PP47	Dr. Apt. IDA MUSFIROH, M.Si.	3D-PHARMACOPHORE MODELLING OF OMEGA-3 DERIVATIVES WITH PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR GAMMA AS AN ANTI-OBESITY AGENT
45	PP48	SANDRA MEGANTARA	IN SILICO STUDY OF DITERPENOID LACTONES FROM *Andrographis paniculate* TO INTERLEUKIN-6 (IL-6) PROTEIN TARGET

KEYNOTE SPEAKER

BIOTECHNOLOGY IN NATURAL PRODUCT-BASED DRUG DISCOVERY

Taifo Mahmud

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

ABSTRACT

Natural products continue to play an important role in drug discovery. About two-thirds of recently approved pharmaceuticals are natural products, botanicals, natural product-derivatives, or nature-inspired synthetic compounds. Plants, marine animals, algae, and microorganisms are known to be prolific sources of bioactive natural products. Despite their enormous potential, the number of new natural products identified in recent years has significantly declined. This trend has called for alternative approaches to drug discovery and development. Among them is the application of biotechnology to identify and/or generate novel bioactive natural products and their derivatives. Examples of biotechnological tools available for natural product-based discovery include genome mining, biosynthetic pathway engineering, biotransformation, and synthetic biology. Combinations of these cutting-edge technologies and state-of-the-art instrumentations have accelerated the discovery of new natural products.

KEYNOTE SPEAKER

HEALTH TECHNOLOGY ASSESSMENT IN INFECTIOUS DISEASES: THE CASE OF COVID-19 VACCINES

Prof. Marteen J Postma

Groningen University, Netherland

ABSTRACT

This talk will address the general aspects of infectious diseases modelling for Health Technology Assessment (HTA). In particular HTA so far for Covid-19 vaccines will be considered with a view to the past as well into the future. Notably, similarities with influenza vaccines and modelling will be addressed, inclusive the need for cost-effectiveness analysis if stable situations - with Covid-19 being controlled - arise. Differences between High-Income Countries (HICs) and Low-Middle ICs are to be highlighted.

INVITED SPEAKER

CONJUGATED β-CYCLODEXTRIN ENHANCES THE AFFINITY OF FOLIC ACID AND ITS DERIVATIVES TOWARDS FOLATE RECEPTOR ALPHA: MOLECULAR DYNAMICS STUDY

Mohammad G. Al-Thiabat [1,2] and Habibah A Wahab [1,2]

[1]School of Pharmaceutical Sciences, University Sains Malaysia, 11800 Penang, Malaysia; mohd.althiabat@gmail.com (M.G.A.-T.); habibahw@usm.my (H.A.W.)
[2]Pharmaceutical Design and Simulation (PhDS) Laboratory, University of Science, Malaysia, 11800 Gelugor, Penang, Malaysia

ABSTRACT

Drug targeting is a progressive area of research with folate receptor alpha (FRα) receiving significant attention as a biological marker in cancer drug delivery. The binding affinity of folic acid (FA) to the FRα active site provides a basis for recognition of FRα. In this study, FA and its derivatives were conjugated to beta-cyclodextrin (βCD) and subjected to *in silico* analysis (molecular docking and molecular dynamics (MD) simulation (100 ns)) to investigate the affinity and stability for the conjugated system compared to unconjugated and apo systems (free ligand). Docking studies revealed that the conjugated FA bound into the active site of FRα with high affinity (free binding energy <-15 kcal/mol), with a similar binding pose to that of unconjugated FA. Subsequent analyses from molecular dynamics (MD) simulations, root mean square deviation (RMSD), root mean square fluctuation (RMSF), and radius gyration (Rg) demonstrated that FA and FA-βCD created more dynamically stable systems with FRα than apo-FRα system. All systems reached equilibrium with stable RMSD values ranging from 1.9–2.4Å and the average residual fluctuation values of the FRα backbone atoms for all systems were less than 2.1 Å with a consistent Rg value of around 16.8 Å throughout the MD simulation time (0-100 ns). The conjugation with βCD improved the stability and decreased the mobility for all the residues (except the residues 149-151) compared to FA-FRα and apo-FRα systems. Further analysis of H-bonds, binding free energy (MM-PBSA) and per residue decomposition energy revealed that besides APS81, residues HIS20, TRP102, HIS135, TRP138, TRP140, and TRP171 were shown to have more favourable energy contributions in the holo systems than in the apo-FRα system, and these residues might have a direct role in increasing the stability of holo systems.

INVITED SPEAKER

MECHANISTIC AND STRUCTURAL UNDERSTANDING OF DRUG/EXCIPIENTS IN THE FORMULATION TO DEVELOP FUNCTIONAL PHARMACEUTICAL PRODUCT AND TO ASSURE THE QUALITY

Kunikazu Moribe

Graduate school of Pharmaceutical Sciences, Chiba University,
1-8-1 Inohana, Chuo-ku, Chiba 260-8675, JAPAN
e-mail address of corresponding author: moribe@faculty.chiba-u.jp

ABSTRACT

Recently, large number of promising new drug candidates have been discovered and developed in pharmaceutical companies by screening. However, more than half of the newly developed drugs are poorly water-soluble. In addition, some of them are failed to produce as the simple formulation due to the poor material properties. To solve the problem, top down and bottom up approach have been performed for the formulation study, especially for oral product. Amorphous solid dispersion and drug nanosuspension are the representative formulations. Our laboratory has been studying solid formulation of poorly water-soluble drugs focusing on not only solid state but also suspended and dissolved state after dispersing in aqueous media. In addition, some of drug-incorporated delivery carriers such as liposomes have been prepared and evaluated structurally and mechanistically. In this conference, recent formulation and the characterization studies, such as synergic effect of polymers for drug dissolution from amorphous solid dispersion, liquid-liquid phase separation on drug supersaturation, morphological changes of amorphous drug nanosuspension during storage, and morphological and molecular-state differences of drug-loaded liposomes are going to be presented.

Keywords: amorphous solid dispersion, amorphous drug nanosuspension, supersaturation, liposome

INVITED SPEAKER

THE CHANGING PATTERN OF PHARMACY EDUCATION IN THE ERA OF COVID-19 PANDEMIC: ARE WE DOING THE RIGHT THING?

Prof. Dr Syed Azhar Syed Sulaiman

School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia

ABSTRACT

Covid -19 has changed almost every aspect of life in the new Millennium. All over the world suffered from such catastrophic situation physically, emotionally, economically and politically. Such situation also dragged education system to move to another new level of how education need to survive and how students need to accept the difference approach in learning process. In Pharmacy education, most of the classes need to have a 360 degree turn over in order to survive. Lab attendance, clinical ward round and all other face to face teaching is almost disappeared in thin air as we are not able to follow all the procedures like before. Coronavirus disease 2019 (COVID19) pandemic led to the need for an abrupt shift from in-person to online learning for many healthcare programs with minimal time left for preparation and planning to do so.

The process to transform the curriculum in a sustainable and iterative manner involved multiple steps including: (1) Communication, (2) Maintaining faculty engagement especially in E-learning process, (3) Allowing outside the box thinking based on internet-based facility, (4) Providing resources and tools and (5) Creating accountability and timelines in pandemic era of covid 19.

The shifting paradigm leading to demanding use of online learning created many problems from the educators and students wise. The facility provided by the university are very much dependent on the availability of internet connection in specific cities or rural area.

Pharmacy educators are stressed in a way to fulfil the increased demand of using innovative, advanced, and contemporary educational technology in higher education as a mode of teaching and learning, highlights the needs to ascertain that these technologies help to achieve the learning outcomes that were not achieved previously and that the technology is not developed just to satisfy the quest for its use.

With proper planning, pharmacy education can still survive in the new era of covid19. It should be aligned organizational interests, consistent and regular communication, provision of resources and tools, engaging faculty and creating accountability and timelines with deliverables the implementation can be successful. The changing pattern of how pharmacy education is being handled and the reconstruction method of teaching and learning need to ensure the graduates will have appropriate level of knowledge, skill and exposure

OP03

RATIONAL DRUG USE EVALUATION BASED ON WORLD HEALTH ORGANIZATION CORE DRUG-USE INDICATOR AMONG SELECTED COMMUNITY HEALTH CENTERS IN THE DISTRICT OF PADANG CITY

Widya Kardela, Yoneta Srangenge, Sri Oktavia, Astrid Rahmadinda, Pusva Sandra Dewi

Department of Pharmacology and Clinical Pharmacy, School of Pharmaceutical Sciences
STIFARM, St. Raya Siteba Padang, 25417
e-mail address of corresponding author: kardelawidya@stifarm-padang.ac.id

ABSTRACT

Rational drug use (RDU) encompasses appropriate dose, clinical need on the adequate time along with an affordable price. The purpose of this condition is to enhance cost effective medical interventions[1]. The World Health Organization (WHO) has developed three indicators to evaluate the practice of RDU in health facilities. These indicators are assessment of prescribing, patient-care indicators, and health-facility. Therefore, this study was focused at describing the practice of rational drug use in selected community health centers, including Padang Pasir and Andalas health center. A cross-sectional design with random sampling for prescribing and accidental sampling for patient-care indicator method was conducted at two community health centers during the study period. Taking WHO procedure, a total of 1100 prescription papers were investigated. In every community health center, 30 outpatients consented to assess their knowledge of correct dosage by open interview and 32 key essential drugs were also observed. Descriptive data are given using frequency, proportion, and summary measure. There are average differences between Padang Pasir and Andalas health center. Mean, 2.6 and 3.2 drugs were prescribed, respectively. Generic was used in 99% for both and nearly 90% of drugs were prescribed from an essential-drug list. Prescriptions containing antibiotics were 100 and 16.67%, respectively. Padang Pasir health center has an average consultation and dispensing time of 178 seconds and 9.26 minutes. Andalas Health center 46 seconds faster than Padang Pasir, meanwhile it needs 6.3 minutes for dispensing drugs. The prescribed drugs were 100% dispensed with 82-100% adequately labeled. This result has an impact on patient knowledge as 77-95%. Only 3 key essential drugs were unavailable. Moreover, all of the community health centers included in the study had drug formulary and essential drug list but none of them had guideline therapy. Hence, several parameters have met the standards set by WHO.

Keywords: Rational drug use, WHO core drug-use indicator, prescribing, patient-care, health-facility

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OP04

GASTROPROTECTIVE EFFECT OF ETHANOL STEM BARK EXTRACT OF PEPOLO (*Bischofia javanica* Blume) AGAINST ASPIRIN-INDUCED IN WHITE RATS (*Rattus norvegicus*)

Yuliet, Rini Saputri, Khildah Khaerati

Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Tadulako University, Palu-94118, Central Sulawesi, Indonesia
e-mail address of the corresponding author: yuliet_susanto@yahoo.com

ABSTRACT

Prolonged use of nonsteroidal anti-inflammatory drugs (NSAIDs) can trigger injury/ulcers and bleed in the gastric mucosa[1]. One plant that has the potential to be a gastroprotective is the stem bark of pepolo. Pepolo stem bark (*Bischofia javanica* Blume) is empirically used for the treatment of gastric ulcers[2]. It contains secondary metabolites such as flavonoids that can increase the production of prostaglandins and reduce the secretion of acids and tannins that can form a protective layer of the gastric mucosa. This study aims to determine the effect of gastroprotective pepolo stem bark extract against gastric ulcers of white male rats (*Rattus norvegicus*) induced by Aspirin. The study used 24 rats grouped into six groups at random. Normal group (Na CMC 0.5%), negative group (Na CMC 0.5% + aspirin induction), positive group (omeprazole 3.6 mg/kg BW + aspirin induction), pepolo stem bark extract group 100 mg/kg BW + aspirin induction, pepolo bark extract group 200 mg/kg BW + aspirin induction, and pepolo bark extract group 300 mg/kg BW + aspirin induction. The treatment was given orally for eight days. On the 9th day, the rats were dissected and tested on the stomach organs. The parameters measured were scores based on the severity of rat peptic ulcers, ulceration index, and percentage protection ratio. The scoring data were analyzed using the non-parametric Kruskal Wallis test and the Mann-Whitney advanced test. The average ulcer score for the normal control group, negative control, positive control, and ethanol extract at doses of 100, 200 and 300 mg/kg BW was 0.00; 0,00; 5,75; 0,00; 4,33; 0,00; and 0,00 respectively with a percentage of successive ulcer healing rates; 100%; 0%; 100%; 24,69%; 100%; and 100%. Based on the study results, the extract of pepolo stem bark at a dose of 200 mg/kg BW is the best dose that can provide activity as an anti-peptic ulcer with a percent ulcer healing rate of 100%.

Keywords: *Aspirin, stem bark pepolo (Bischofia javanica* Blume*), gastric ulcer*

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OP05

THE EFFECT OF SOIL MINERAL OF PEAT, SWAMP, AND TOPSOIL TO SHALLOT CHEMICAL COMPOSITION

Dian Novriadhy, Oom Komalasari, Tili Karenina, Sri Maryani, Desri Yesi, Efriandi, Wenni Tania Defriyanti, Oktaf Juairiyah

Badan Penelitian dan Pengembangan Daerah Provinsi Sumatera Selatan, Jalan Demang Lebar Daun No. 4864, Palembang 30137
e-mail address of corresponding author: dian.novriadhy@gmail.com

ABSTRACT

Shallots (*Allium cepa*) bulb is rich in chemical compounds so frequently used for medicinal purposes. Unfortunately, its chemical composition is affected by fertilizer[1] and soil minerals[2]. The study aimed to explain the effect of soil type (peat, swamp, and topsoil) and cultivation method (organic and inorganic) on shallots bulb chemical content. The shallots grow for 60 days in six demonstration plots (peat-organic, peat-inorganic, swamp-organic, swamp-inorganic, topsoil-organic, and topsoil-inorganic) consisted 40 tillers in each plot. The harvested bulb then sun-dried for seven days and kept in storage for two months before analyzed. The chemical compositions of bulbs were analyzed using FTIR. The findings showed that peat soil gave a better wet and dry mass of shallots than other soil with slightly different organosulfur content.

Keywords: shallots organosulfur, soil mineral

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OP07

EFFECT OF NONI FRUIT EXTRACT ON AN ANIMAL MODEL OF ALOPECIA

Laila Susanti[1,2], Resmi Mustarichie[1], Eli Halimah[3], Dikdik Kurnia[4]

[1]Department of Pharmaceutical and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, 45363, Bandung, Indonesia
[2]Department of Pharmacy, Faculty of Mathematics and Natural Science, Universitas Tulang Bawang, Bandar Lampung-35121, Indonesia
[3]Department of Pharmacology, Faculty of Pharmacy, Universitas Padjadjaran, Bandung-45363, Indonesia
[4]Department of Chemistry, Faculty of Mathematics and Natural Science, Universitas Padjadjaran, Bandung-45363, Indonesia
e-mail address of the corresponding author: laila19006@mail.unpad.ac.id

ABSTRACT

Androgenic alopecia begins with the miniaturization of hair follicles which causes the anagen phase of hair growth to stop and the telogen phase becomes active[1,2]. Minoxidil and Finasteride treatments have dangerous side effects, so herbal remedies need to be developed because they are more affordable, inexpensive, and have low toxicity and side effects. Noni fruit is empirically used as a hair mask to treat hair loss, dandruff, and eliminate head lice. This study was aimed to determine the anti-alopecia activity of noni fruit extract in alopecia rabbits by histological of animal skin section concerning to the previous method[3,4]. *In vivo* results statistically showed that 25% noni fruit extract had a follicular density of 115.33 ± 1.00 and Anagen/Telogen ratio (1.38:1) which was better than standard (Minoxidil) but lower than the normal control (1.94:1). From these results, it was concluded that the noni fruit extract had anti-alopecia activity.

Keywords: Noni fruit, androgenic alopecia, follicular density, Anagen/Telogen ratio

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OP08

SYNTHESIS OF ^{131}I-1,3,-dihydroxy-7-methoxy-2,8-bis(3-methyilbut-2-en-1-il)-9-oxo-9H-xanthen-3-il 2-chloromethylbenzoat (^{131}I-AMB10) AS A THERANOSTICS RADIOPHARMACEUTICAL CANDIDATE FOR BREAST CANCER

Isti Daruwati[1,2], Richa Mardianingrum[1,3], Wiwit Nur Hidayah[4], Abednego Kristande[1], Tri Hanggono Achmad[5], Mukh Syaifudin[6], Muchtaridi Muchtaridi[1]

[1]Departement of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jl Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia;
[2]Center for Applied Nuclear Science and Technology, National Nuclear Energy Agency (BATAN), Jl Tamansari No. 71 Bandung 40132, Indonesia, isti19002@mail.unpad.ac.id
[3]Departement of Pharmacy, Universitas Perjuangan, Jl Peta 177, Tasikmalaya 46115
[4] Departement of Chemistry, Faculty of Mathematic and Natural Science, Universitas Padjadjaran, Jl Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia;
[5]Faculty of Medicine, Universitas Padjadjaran, Jl Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia,
[6]Center for Technology of Radiation Safety and Metrology, National Nuclear Energy Agency (BATAN), Jl Lebak Bulus Raya No. 49 Jakarta, Indonesia,
e-mail address of corresponding author: muchtaridi@unpad.ac.id

ABSTRACT

Alpha mangostin is known as the potential isolates for breast cancer drugs[1-4]. Several drug candidates have been successfully synthesized which are derivatives of the alpha mangostin compound, i.e 1,3, -dihydroxy-7-methoxy-2,8-bis (3-methylbut-2-en-1-il) -9-oxo-9H-xanthen-3-il 2-chloromethyl benzoate (AMB10)[5]. In order to find radiopharmaceutical candidates for breast cancer, synthesis of AMB10 with Iodine-131 has been carried out. Iodine is a radioactive compound which emits alpha and gamma, ^{131}I-AMB10 can be used as a theranostics agent[6]. Synthesis was carried out by the radioiodination method[7-8] using chloramine T as an oxidizing agent and several optimizations were carried out including the amount of AMB10, the amount of oxidizing agent, and temperature and incubation reaction time. Determination of Radiochemical purity ^{131}I-AMB10 was carried out by electrophoresis method, using phosphate buffer pH 7.4, and Whatman 1 paper as stationary phase. The optimization results obtained radiochemical purity of 97.53 ± 1.08 % (n=9) with incubation reaction time for 15 minutes at low temperature (2-4 °C). Further research will be carried out in vitro and in vivo testing to prove the radiopharmaceutical capability as a radiopharmaceutical for breast cancer.

Keywords: theranostics radiopharmaceutical, Alpha mangostin derivatives, breast cancer, radioiodination

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OP11

PRELIMINARY STUDY OF INSULIN DRY POWDER FORMULATION WITH TREHALOSE AND INULIN AS STABILIZER

Cynthia Marisca Muntu[1,2], Silvia Surini[1*], Christina Avanti[2], Hayun[1]

[1]Faculty of Pharmacy, Universitas Indonesia, Kampus UI Depok, Depok, Indonesia, 16424
[2]Faculty of Pharmacy, Universitas Surabaya, Raya Kalirungkut, Surabaya, Indonesia, 60293
*e-mail address of corresponding author: silvia@farmasi.ui.ac.id

ABSTRACT

Insulin products are available in liquid preparations with short shelf life[1], which is called as cold chain product[2]. Therefore, in this study insulin was formulated in dry powder formulation[3,4] with trehalose and inulin as stabilizers for stability optimization. The aim of this study is to obtain insulin dry powder formulation through Spray-Freeze Drying (SFD) method and formula modification ratio of trehalose and inulin. The weight ratio of insulin and sugar used is 1: 249, with seven variations of trehalose and inulin weight ratio. SFD method is carried out with several modifications to the atomization process of insulin formula solution. The atomization process is carried out by spraying the solution through a nozzle to produce droplets that will directly contact with liquid nitrogen to produce frozen droplets. The next step is the Freeze Drying (FD) process to produce dry powder through solvent sublimation. In the early optimization, there was a slight time lag between the atomization process and FD process so some frozen droplets were melted, as a result, some of the powder coagulated and crystallized. This problem is overcome by immediate storage of frozen droplets in the freezer (-80^{o}C) if the FD process is not carried out immediately. Another critical parameter is that the FD process should not be interrupted. Some formulations with interrupted processes obtained coagulated and crystallized powder. The optimal formulation is obtained with a minimum 50 hours FD process without any time lag. The optimal formulation proceeded with physicochemical characterization including crystallinity properties, moisture content, particle morphology, particle size distribution and efficiency encapsulation. Formulas without insulin showed semi crystalline properties, while six other formulas have amorphous properties due to combination of inulin and trehalose. All formulas have spherulite shape and rough surface characteristics. Five formulas with combination of trehalose and inulin obtained dry powders with spherical morphology and amorphous properties, diameter range of 30-40 µm, low moisture content (not more than 4%) and high encapsulation efficiency (not less than 90%). This study concluded that the optimal SFD process and combination of trehalose and inulin obtained insulin dry powder formulation which met the criteria.

Keywords: insulin, dry powder, trehalose, inulin, formulation

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OP12

REVIEW ARTICLE: THE POTENTIAL OF MORINGA (*Moringa oleifera* Lamk) SEED OIL AS ANTI-ALOPECIA

Yulius Baki Korassa[1,2*], Nyi Mekar Saptarini[1], Resmi Mustarichie[1]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran. Jl. Raya Bandung Sumedang, Km. 21 Jatinangor 45363
[2] Pharmacy Study Program, Health Polytechnic of Ministry of Health in Kupang, Jl. Piet A. Tallo, Liliba, Kupang – East Nusa Tenggara
*e-mail address of corresponding author: yuliusbaki8@gmail.com

ABSTRACT

Moringa (*Moringa oleifera* Lamk) seed is a plant with the potentials of becoming anti-alopecia as it contains fatty acid and sterol[1,2]. This review article aims to examine the potentiality of moringa seed as an anti-alopecia. The data collected by studying national and international journal articles using several search engines, namely Google and Google Scholar websites, Research Gate, Sciencedirect, and Scimagojr. The keywords for this article include moringa seeds, fatty acids, sterol, and anti-alopecia. The result was tabulated in a table and described according to the mechanism of action of the active compounds found in moringa seed oil. The fitosterolic compounds (β-sitosterol, ergosterol, and campesterol) show the activities that obstruct the formation of the dihydrotestosterone (DHT) compound known to be the cause of alopecia[3]. The fatty acid compounds found in mringa seed oil (lauric acid, linoleic acid, palmitoleic acid, palmitic acid, and oleic acid) reinforce its potential to be an anti-alopecia. These compounds supported the growth of hair to be fertile and healthy[1].

Keywords: Moringa Seed Oil; Fatty Acids; Sterol; Anti-alopecia

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OP13

POTENTIAL ANTIDIABETIC ACTIVITIES OF FRACTIONS FROM PURIFIED EXTRACT OF *Lawsonia inermis* LEAVES IN ALLOXAN–INDUCED DIABETIC MICE

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

[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 Pharmaceutical Biology, Faculty of Pharmacy, Universitas Padjadjaran
[5]Departemen Of Pharmacy, Faculty of Science and Technology, Universitas Mandala Waluya, Southeast Sulawesi Indonesia
e-mail address of corresponding author: mus18001@mail.unpad.ac.id

ABSTRACT

Diabetes Mellitus (DM) is a type of chronic disease that is characterized by elevated blood sugar levels[1]. Although many drugs are commercially available for the treatment of DM, it is still difficult to control the patient's glucose levels due to the progressive decline in beta - cell function with some side effects due to long - term use of many drugs[2]. *L. inermis* leaves have been used traditionally in medicine in Indonesia to cure diabetes mellitus[3]. Phenols and flavonoids are the most commonly found active compounds[4]. This research was conducted to determine the potential antidiabetic activity fractions of purified extract *L. inermis* leaves in mice (*Mus musculus*) and identification of the compound. The method were including of maceration, purification using liquid-liquid extraction, fractionation using vacuum liquid chromatography, antidiabetic activity test of fractions at dose 100 mg/kg BW, and compound identification using Liquid Chromatography-Mass Spectrometry (LC-MS). The results showed that there were 7 of fractions (A-G) of *L. inermis* leaves from the purification step. While the antidiabetic activity of fractions shown by decreasing blood sugar level in mice were 64%, 75%, 73%, 73%, 57%, 45% and 67%, respectively. The identified compounds from each fraction were the ester groups namely 12-Hydroxy-methyl abietate, 9,12-Octadecadienoic acid (Z,Z)-(2,2-dimethyl-1,3-dioxolan-4-yl)methyl ester, dehydromorroniaglycone, and (E)- hexadecyl-ferulate; the steroid groups namely siraitic acid E, phenylpropanoid compounds such as umbelliferone and bletilol C, and the alkaloid groups namely moupinamide and valine. The presence of these compounds mostly contribute to antidiabetic activity.

Keywords: *Lawsonia inermis*, fractions, purified extract, antidiabetic, Mass Spectrometry.

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OP14

PHYTOCHEMICAL PROFILING, ANTIOXIDANT AND ANTIDIABETIC EFFECT OF *Garcinia mangostana* EXTRACTS

Sofa Fajriah[1]*, Aminah[2], Epi Rustiawati[2], Lia Meilawati[1], Rizna Triana Dewi[1]

[1]Research Center for Chemistry, Indonesian Institute of Sciences LIPI, Kawasan PUSPIPTEK Serpong Tangerang Selatan Banten 15314
[2]Nursing Study Program, Faculty of Teacher Training and Education, University of Sultan Ageng Tirtayasa, Serang Banten
e-mail address of corresponding author: sofafajriah@gmail.com

ABSTRACT

Many diseases correlate with antioxidant deficiencies. *Garcinia mangostana* L pericarp belongs to waste product, but it has many health benefits.[1-3] The aims of this study were phytochemical profiling using ESI-QTOF-MS, determine antioxidant and antidiabetic properties of ethanol extract (96% and 70%), water extract and xanthone using DPPH, and α-glucosidase inhibitory activity methods. Profiling using ESI-QTOF-MS resulted in mangostin being the major constituent in both ethanol extracts and xanthone, but in the water extract was isomaltose as the major compound. Bioactivity study on these extracts afforded ethanol extract 96% has the highest antioxidant activity with IC_{50} 14.42 μg/mL compared to 70% ethanol extract, water extract, and xanthone, but all extracts have IC_{50} value less than 200 μg/mL. All extracts also have potential as antidiabetic activity against α-glucosidase enzymes with IC_{50} less than 4 μg/mL. In conclusion, mangosteen pericarp extracts were promising antidiabetic agents due to its anti-hyperglycemic and antioxidant properties.

Keywords: antioxidant, antidiabetic, ESI-QTOF MS, *Garcinia mangostana*

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OP15

FORMULATION AND CHARACTERIZATION OF SERUM COLLAGEN OF SEA CUCUMBER EXTRACT *Stichopus horeens* AS AN ANTIOXIDANT

Sofi Nurmay Stiani*[1], Tarso Rudiana[2], Yusub Setiawan[3], Ety Setyowati[3], Sofian Ansori[4]

[1] Pharmacy Study Program, STIKes Salsabila , Jalan Raya Serang – Pandeglang KM 06, Curug Serang Banten 42211, Indonesia
[2]Chemistry Study Program Faculty of Science, Pharmacy and Health, Universitas Mathla'ul Anwar Banten, Jalan Raya Labuan KM 23, Saketi Pandeglang Banten 42273, Indonesia
[3]Pharmacy Study Program Faculty of Science, Pharmacy and health Universitas Mathla'ul Anwar Banten, Jalan Raya Labuan KM 23, Saketi Pandeglang Banten 42273, Indonesia
[4] Fish Residues and Medicine Laboratory Fish Disease and Environment Examination Center (LP2IL) Serang, Banten 42167 Indonesia
e-mail address of the corresponding author: sofia240586@gmail.com / tarso.rudiana@gmail.com

ABSTRACT

Sea cucumber (*Stichopus horeens*) is one of the marine biotas that is widely distributed in Indonesian ocean. *S. horeens* has a high protein content and known as sandfish have long been used for cosmetic, pharmaceutical, and food industries[1]**.** The study was aimed to extract, formulate, and characterize collagen extract of *S. horeens* into serum preparations and test its antioxidant activity in powders and serum preparations. The cleaned sea cucumber meat *S. horeens* was extracted with sodium hydroxide and hydrolyzed with acetic acid. The hydrolyzate was then separated by an extraction method using distilled water. The collagen extract was freeze-dried to obtain collagen powder. Collagen powder was characterized by high performance liquid chromatography and its antioxidant activity was determined using the DPPH method. Collagen powder is formulated with collagen extract variation of 0; 0.5 and 1%. Evaluation of serum preparations included examination of organoleptic, homogeneity, stability of pH and viscosity as well as antioxidant activity. The results showed that collagen powder had a % yield of 0.24% which consisted of the amino acids glycine, proline, alanine, and glutamic acid as the dominant amino acids. The % activity of antioxidant inhibition of collagen powder at a concentration of 5000 ppm was 63.23%. IC50 value is 4045,37 ppm. The stability test resulted in serum preparations not changing significantly at 4ºC ± 2ºC and 27ºC ± 2ºC storage temperatures. The measurement of the antioxidant activity of the highest serum preparation was at a 1% extract concentration of 2.4%. Collagen powder has a higher % antioxidant inhibition activity at a concentration of 5000 ppm at 63.23% when compared to serum preparations with an extract concentration of 1% at 2.4%.

Keywords: serum, collagen, *Sticophus horeens*, antioxidant

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OP17

TARGETED DRUG DELIVERY SYSTEM NANOPARTICLE BASED CHITOSAN/ALGINATE FOR CANCER THERAPY: A REVIEW

Ade Irma Suryani[1], Nasrul Wathoni[2], Muchtaridi Muchtaridi[3], I Made Joni[4]

[1] Master Program in Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia
[2] Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia
[3] Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia
[4] Departement of Physics, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Sumedang 45363, Indonesia
e-mail address of corresponding author: nasrul@unpad.ac.id

ABSTRACT

Nanoparticles are a nano-sized drug delivery system with a diameter 10 to 1000 nm[1] which has great potential in increasing the efficiency of cancer therapy[2,3]. Formulation of nanoparticles the selection of an appropriate polymer is a very important element and alginate is a polyanionic copolymer can regulate the encapsulation and release rate and when combined with cationic chitosan will form strong cross-links showing good mucoadhesive properties [4]. So, in this article, we will review the targeted delivery system for chitosan and alginate-based nanoparticles in cancer therapy and the development of their application to date which refers to several studies that have been carried out previously and published in Scopus, ScienceDirect, PubMed, and Google Scholar using the terms “Chitosan Alginate Targeted" "Drug Delivery for Cancer" “Nanoparticle Chitosan” and “Nanoparticle Alginate”. To improve cellular uptake, drug accumulation, cytotoxicity, and selectivity, we analyzed various types of modified Ch/Alg nanoparticles using enhanced permeability and retention (EPR) effect characteristics as precise parameters with targeting systems. Ch/Alg nanoparticles showed to significantly improve drug delivery into cancer cells by producing drug release triggered by various stimuli in response such as pH, temperature, magnetic, and multiple stimuli. These Ch/Alg-based nanoparticles offer great opportunities in the treatment of various types of cancer and is a promising technique in drug preparation to increase the efficacy, selectivity, and effectiveness of cancer treatment.

Keywords: Nanoparticles; Chitosan; Alginate; Cancer therapy; Targeted delivery; Polymer.

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OP18

PHOSPHORYLATION OF CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASE II (CaMKII) AND EXTRACELLULAR REGULATED KINASE (ERK) IN STRIATUM MEDIATE NICOTINE DEPENDENCE IN BALB/c MICE

Gofarana Wilar[1], Kohji Fukunaga[2]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl Raya Bandung-Sumedang KM 20,5 Desa Hegarmanah, Kecamatan Jatinangor, Sumedang, 45363 Indonesia
[2]Department of Pharmacology, Graduate School of Pharmaceutical Sciences, Tohoku University, 6-3 Aoba, Aramaki, Aoba-ku, Sendai—shi, 980-8579 Japan.

e-mail address of corresponding author: g.wilar@unpad.ac.id

ABSTRACT

Nicotine is an active compound in tobacco and has a rewarding effect in the central nervous system (CNS), which may leads to dependence. Although nicotine dependence is elucidated by brain mechanisms, synaptic molecular substrates underlying the dependence remain unclear. 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 signaling of dependence[1,2]. To investigate the roles of both CaMKII and ERK on nicotine dependence were assessed by conditioned place preference (CPP) methods followed dissection. One day after conditioning, preference scores were measured to evaluate the nicotine dependence. Mice were sacrificed and their striatum were dissected out for immunoblotting analyses of CaMKII and ERK phosphorylation.CaMKII and ERK phosphorylation significantly increased along with development of nicotine dependence. We should next apply pharmacological strategies to manipulate CaMKII and ERK signaling. In particular, disruption of reconsolidation by disrupting CaMKII and ERK signaling may propose an attractive therapeutic approach to inhibit nicotine dependence.

Keyword: Nicotine dependence, CaMKII, ERK, Conditioned place preference, Preference score

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OP19

POTENTIAL OF HERBAL MEDICINE IN ASIA FOR ORAL CANDIDIASIS THERAPY: A SYSTEMATIC REVIEW

Ani Megawati[1], Indah Suasani Wahyuni[2]

[1]Oral Medicine Specialist 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: ani19001@mail.unpad.ac.id

ABSTRACT

Oral candidiasis (OC) is a common opportunistic infection of the oral cavity, the main causative agent being *Candida albicans*.[1] Antifungal drug, in various formulations, is being used topically and systemically for the treatment of OC. However, recently the antifungal drugs begin to cause resistance and side effects, so alternative replacements are needed.[2] The use of herbal medicine began to be explored, especially in Asian countries, because it is thought to have fewer side effects.[3] The objective is to provide antifungal recommendations for OC derived from herbal medicine based on the research results of the last 5 years. This systematic review was carried out according to PRISMA guidelines using the databases of PubMed and Science Direct. Studies published between 2016 and 2021. The review was conducted on 12 *in vitro* studies and 1 clinical trial. A total of 41 species of plants have studied its antifungal effects on *Candida albicans*. The Minimum Inhibitory Concentration (MIC) and Minimum Fungicidal Concentration (MFC) varied in the range of 0.098 µL/mL to 125 µL/mL for different types of plants and *Candida* samples, while the inhibition zone ranged from 1.36±0.89 mm to 73.4±2.70 mm. The most recommended herbal medicine for the development of antifungal drugs as OC therapy were *Nigella sativa, Foeniculum vulgare, Lawsonia inermis,* and *Zingiber officinale*.

Keywords: herbal medicine, antifungal, oral candidiasis, *Candida albicans*

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OP20

EFFECTIVENESS OF THE NATURAL-BASED PRODUCTS AND MUCOADHESIVE FOR RECURRENT APTHOUS STOMATITIS THERAPY: A SYSTEMATIC REVIEW

Iin Heldayani[1], Indah Suasani Wahyuni[2]

[1]Oral Medicine Specialist 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: iin20001@mail.unpad.ac.id

ABSTRACT

Recurrent Aphthous Stomatitis (RAS) is the most common oral mucosal ulceration found in society, causing pain, recurrence, and can decrease the patient's quality of life.[1,2] The steroid has been established for RAS treatment, but sometimes causes side effects.[3] Natural-based product (NBP) was said to be potential for alternative therapies with minimal side effects, but RAS therapy required a suitable mucoadhesive vehicle that can support the penetration of the drug.[4] There have been no studies discussing the combination of NBP with mucoadhesive, which is effective in SAR therapy. This study was aimed to described and recommend the most effective combination of NBP and mucoadhesive for RAS treatment. This systematic review writing was based on PRISMA guidelines. The articles published in the last 10 years were selected using PubMed and Google Scholar database carried out during May 2021. The keywords were: natural-based product, mucoadhesive, and Recurrent Aphthous Stomatitis. The risk of bias was assessed using Oxford Quality Scoring System. Six articles of Randomized Controlled Trial were selected. The NBP were *Aloe vera*, Myrrh, *Curcuma longa*, propolis, ginger, *Punica granatum* flower, and sesame oil. The drug's formulation was: gel, film, and spray. The mucoadhesive polymers as vehicles were Hydroxy Propyl Ethyl Cellulose (HPEC), Hydroxy Propyl Methyl Cellulose (HPMC), benzocaine, tragacanth gum, carbomer 934, sodium CMC, and chitosan. *Curcuma longa* 10mg/g with HPMC was the most effective to relieve pain, while *Punica granatum* flower extract with carbomer 934 and sodium CMC was the most effective to reduce the ulcer size in RAS. Both of the formulations were in gel form.

Keywords: RAS, Natural-Based Product, Mucoadhesive

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OP21

DEVELOPMENT AND PSYCHOMETRIC TESTING OF KNOWLEDGE, ATTITUDE, AND PRACTICE ON COVID-19 OUTBREAK QUESTIONNAIRE (KAPCovQ) FOR GENERAL COMMUNITY

Hidayah Karuniawati[1*], Tri Yulianti[1], Listiana Masyita Dewi[2], Widyana Atma Maulida[1], Nur Laela[1], Sekar Melati Kusumaning Ayu[1]

[1] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy Universitas Muhammadiyah Surakarta, 57102 Sukoharjo, Indonesia
[2]Faculty of Medicine Universitas Muhammadiyah Surakarta, 57102 Sukoharjo, Indonesia
e-mail address of corresponding author: hk170@ums.ac.id

ABSTRACT

The number of positive cases and the death rate due to Covid-19 continues to increase[1-3]. It is necessary to assess the knowledge, attitudes, and practices of the public on Covid-19 to design interventions aimed at reducing Covid-19 transmission with a valid and reliable questionnaire. The purpose of this study was to develop a valid and reliable questionnaire about knowledge, attitudes, and practices towards Covid-19 (KAPCovQ) based on psychometric properties. This study consisted of item development, scale development, and scale evaluation. Item development was designed based on literature review and content validity by experts. Scale development was conducted by pre-testing ten respondents. Scale evaluation was assessed using 375 Indonesian respondents. Scale evaluation was done referring to construct validity with exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA) and reliability test with Cronbach's α, composite reliability, and test-retest reliability. The final KAPCovQ consisted of 3 domains with 31 items. Twelve items of the knowledge domain met the acceptable range for item analysis. Three factors of attitude domain and one factor of practice domain showed that 59.13% and 57.97% of the total variance respectively were identified in EFA. The result of the CFA for both attitude and practices domain indicated acceptable fit indices for the proposed model. The CFA model fit indices of attitude domain were $\chi 2$/df 2.05, p-value 0.01, GFI 0.92, RMSEA 0.07, TLI 0.90, CFI 0.92, and PNFI 0.64 and practices domain were $\chi 2$/df 1.18, p-value 0.28, GFI 0.98, RMSEA 0.03, TLI 0.98, CFI 0.99, and PNFI 0.54. Knowledge and all factors in the attitude and practice domain had an acceptable range in internal consistency reliability and test-retest reliability. The finding of this study demonstrates that KAPCovQ is valid and reliable for measuring the KAP on Covid-19 in the general community.

Keywords: Covid-19, attitude, practices, validity, psychometric properties.

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OP22

SINGLE-NUCLEOTIDE POLYMORPHISM OF *TNFSF4* (rs2205960) OF SYSTEMIC LUPUS ERYTHEMATOSUS PATIENTS IN WEST JAVA, INDONESIA

Angela Aprilia Karyadi[1], Erica Willy[1], Gabriel Kennardi[2], Laniyati Hamijoyo[2], Riezki Amalia[4], Melisa Intan Barliana[1,3]

[1]Department Biological Pharmacy, Faculty of Pharmacy, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
[2]Immunology Study Center, Faculty of Medicine, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
[3]Center of Excellence in Higher Education for Pharmaceutical Care Innovation, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
[4]Department of Pharmacology and Clinical Pharmacy, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
e-mail address of corresponding author: melisa.barliana@unpad.ac.id

ABSTRACT

Many studies have shown an association between polymorphisms of several genes and susceptibility to Systemic Lupus Erythematosus (SLE), one of which is the *TNFSF4* gene (tumor necrosis factor superfamily 4). The *TNFSF4* gene encodes the OX40L ligand for the OX40 receptor.[1] The single nucleotide polymorphism (SNP) of the *TNFSF4* gene at rs2205960 (G>T) causes an increase in OX40L expression, which influences the progression of SLE disease.[2-4] Studies on *TNFSF4* gene polymorphisms rs2205960 in SLE patients, especially in Indonesia, have not been reported. Therefore, this study aimed to determine the genotype distribution of the *TNFSF4* gene rs2205960 in SLE patients at Hasan Sadikin Hospital, West Java, Indonesia. This was a cross-sectional study; 84 genomic DNA samples were amplified, electrophoresed, then analyzed by DNA sequencing. The genotype distribution of the *TNFSF4* gene rs2205960 in SLE patients showed that from 84 DNA samples, 55 patients are GG (65.48%), 25 patients are GT (29.76%), and four patients are TT (4.76%). The results indicate that SLE patients in Hasan Sadikin Hospital have a genotype distribution of the *TNFSF4* rs2205960 gene that meets the Hardy-Weinberg principle.

Keywords: West Java, polymorphism, rs2205960, SLE, *TNFSF4*

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OP23

IN SILICO STUDIES OF (S)-2-AMINO-4-(3,5-DICHLOROPHENYL)BUTANOIC ACID AGAINST LAT1 AS A RADIOTHERANOSTIC AGENT OF CANCER

Faisal Maulana Ibrahim[1], Holis Abdul Holik[1], Abib Latifu Fatah[1], Arifudin Achmad[2], Achmad Hussein Sundawa Kartamihardja[2]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy/Universitas Padjadjaran, Sumedang- 45363, (West Java) Indonesia
[2]Department of Nuclear Medicine, Faculty of Medicine/Universitas Padjadjaran, Sumedang45363, (West Java) Indonesia
e-mail address of corresponding Author: holis@unpad.ac.id

ABSTRACT

Cancer is the second leading cause of death in the world.[1] One of the specific molecular targets for cancer therapy is the Large-type Amino Acid Transporter 1 (LAT1) which is overexpressed in cancer cells compared to the normal cells.[2,3] Therefore, the inhibition of LAT1 can be used as a strategy for cancer therapy.[4] This study aims to obtain a good activity of radiotheranostic kit for cancer which built by combining (S)-2-amino-4-(3,5-dichlorophenyl) butanoic acid (ADFB) with various bifunctional chelators. This study was conducted through in silico method that consists of molecular docking simulation using Autodock4 as well as ADMET prediction using vNN-ADMET and Pre-ADMET. Six bifunctional chelators (i.e. CTPA, DOTA, H2CB-TE2A, H2CB-DO2A, NOTA, and TETA) were conjugated with ADFB as a carrier molecule and further analyzed through molecular docking and ADMET prediction. The results showed that the ADPB-NOTA has the best affinity with the Gibbs free energy (ΔG) of -7.68 kcal/mol with an inhibition constant of 2.36 μM and able to bind with the gating residue of LAT1 (ASN258) through hydrogen interactions. Besides that, the ADPB-NOTA compound has a good ADME profile and is predicted to be safe for human use. This study showed that ADFB-NOTA is the most prospective candidate to be used as a radiotheranostic agent.

Keywords: Bifunctional Chelators, Cancer, LAT1, In Silico, Radiotheranostic.

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OP25

ANTIDIABETIC ACTIVITY OF NANOCHITOSAN KIRINYUH LEAVES EXTRACT IN RAT

Keni Idacahyati, Winda Trisna Wulandari, Firman Gustaman, Indra Indra

Department of Clinical Pharmacy and Pharmacology,
Bakti Tunas Husada Institute of Health Science, Tasikmalaya, Indonesia
Cilolohan Street No 36, Tasikmalaya 46115
e-mail address of corresponding author: keniida@stikes-bth.ac.id

ABSTRACT

Diabetes Mellitus is a type of degenerative disease that is increasing every year in countries around the world[1]. Diabetes Mellitus is a major cause of blindness, kidney failure, heart attacks, and stroke[2]. Nanochitosan kirinyuh leaves have potential as an antidiabetic because it contains chemical compounds that have antioxidant activity[3]. The purpose of this study was to determine activity of nanochitosan kirinyuh leaves as an antidiabetic. Wistar rats as many as 25 animals were divided into 5 groups, namely the normal control group, negative control (alloxan 600mg/BW rat), and nanochitosan kirinyuh leaves at a dose of 225 mg/Kg BW rat, 450 mg/Kg BW rat and 675 mg/Kg BW treatment was carried out for 10 days. Percent decrease of level glucose was evaluated along with histopathological investigation in various experimental groups of rats. Data analysis using the One Way Anova test and continued LSD test. Level of Glucose at a dose of 675 mg/Kg BW rats showed the highest levels of the negative group and other dose groups. Pancreas histopathology test results showed that the group with a dose of 450 mg/kg BW of rats had the lowest necrosis rate compared to the negative control group and other dose groups. Nanochitosan kirinyuh leaves can reduce level plasma glucose and necrosis in a histopathology test.

Keywords: Diabetes, nanochitosan, kirinyuh, leaves

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OP26

COMPARATIVE DISSOLUTION TEST OF GENERIC AND CREMOPHOR-EL SIMVASTATIN TABLETS

Firman Gustaman, Keni Idacahyati, Winda Trisna Wulandari, Fajar Setiawan

Pharmacy Department, Bakti Tunas Husada Institute of Health Science, Tasikmalaya,
Cilolohan Street No 36 Tasikmalaya, West Java, Indonesia 46115
e-mail of corresponding author: firmangustaman@stikes-bth.ac.id

ABSTRACT

Simvastatin is a drug used as a first line anticholesterol in the treatment of dyslipidemia[1]. Low solubility will affect its ability to penetrate the digestive tract membrane and will affect the amount of drug levels in the plasma. The use of Cremophor EL as a surfactant has been shown to inhibit the action of P-glycoprotein so that it can increase the bioavailability of a drug and can increase the effect of a drug[2]. The preparation of simvastatin tablets was carried out using the wet granulation method. The dissolution test used the paddle method, a speed of 50 rpm at a temperature of 37 ± 0.5^0 C with a phosphate buffer pH 7.0 as the dissolution medium The results showed that at 30 minutes the generic simvastatin tablets had 79.356% dissolution and the Simvastatin Tablets with Cremophor EL were 85.520%. Simvastatin cremophor-EL tablets are more dissolved than generic simvastatin at 30 minutes so that cremophor-EL simvastatin tablets have a better dissolution rate than generic simvastatin tablets.

Keywords: Simvastatin, Cremphor-EL, Generic, Cholesterol

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OP28

CARVEDILOL SOLUBILITY AND DISSOLUTION ENHANCEMENT BY MULTICOMPONENT CRYSTAL APPROACH

Dolih Gozali, Iyan Sopyan, Tazyinul Qoriah Alfauziah

Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Padjadjaran University Indonesia
e-mail address of corresponding author: dolih.gozali@unpad.ac.id

ABSTRACT

Carvedilol (CVD) is an antihypertensive drug, exhibits poor solubility and dissolution rate. Hence an attempt has been made to prepare the multicomponent crystal of carvedilol[1,2]. This study aimed to increase the solubility and dissolution rate of carvedilol. Methods: The multicomponent crystal of carvedilol were prepared using coformer such as nicotinamide (NIC), fumaric acid (FUM), tartaric acid (TAR), and succinic acid (SUC) by Solvent evaporation method. The prepared multicomponent crystal of carvedilol were evaluated for solubility, and dissolution rate. The multicomponent crystal of carvedilol were characterized by Scanning Electron Microscopy (SEM), FT-Infrared Spectroscopy (FTIR), Differential Scanning Calorimetry (DSC) and X-ray Diffractometry (XRD)[3-7]. SEM of pure carvedilol and the multicomponent morphology clearly showed the formation of a new solid phase with the coformers. The FT-IR spectra indicate the shifting of characteristic peaks in the multicomponent crystals but does not show any interaction between the coformer used. DSC data showed the change in the endotherm with the melting point of multicomponent crystals. XRD spectra indicate the notified difference in the 2θ and the intensity of the peaks. Solubility of CVD (0.26 ± 0.03 mg/25 mL, CVD-NIC multicomponent crystals (0.35 ± 0.05 mg/25 mL), CVD-FUM multicomponent crystals (12.64 ± 0.25 mg/25 mL), CVD-TAR multicomponent crystals (15.22 ± 0.88 mg/25 mL) and CVD-SUC multicomponent crystals (20.22 ±1.74 mg/25 mL) was markedly improved compared to pure Carvedilol (0.26 ± 0.03 mg/ 25 mL). Thus the increase in dissolution rate for CVD (38.75% ± 0.125), CVD-NIC multicomponent crystals (58.67% ± 0.207), CVD-FUM multicomponent crystals (47.77% ± 0.054), CVD-TAR multicomponent crystals (66.04% ± 0.007) and CVD-SUC (38.68% ± 0.017) multicomponent crystals compared to pure carvedilol within 60 Min. The carvedilol multicomponent crystal formation could be concluded to enhance the solubility and dissolution, and the multicomponent crystal approach could be used for CVD using FUM and NIC as the coformer in physicochemical properties improvement, especially solubility.

Keywords**: C**arvedilol, dissolution, multicomponent crystal, solubility

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OP29

SINGLE NUCLEOTIDE POLYMORPHISM OF *STAT4* (rs7574865) OF SYSTEMIC LUPUS ERYTHEMATOSUS PATIENTS IN WEST JAVA, INDONESIA

Erica Willy[1], Angela Aprilia Karyadi[1], Gabriel Kennardi[2], Laniyati Hamijoyo[2], Yuni Hadisaputri[1], Melisa Intan Barliana[1,3]

[1] Department of Biological Pharmacy, Faculty of Pharmacy, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
[2]Immunology Study Center, Faculty of Medicine, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
[3]Center of Excellence in Higher Education for Pharmaceutical Care and Innovation, Padjadjaran University, Jl. Raya Bandung - Sumedang KM 21, Jatinangor, 45363, Indonesia
e-mail address of corresponding author: melisa.barliana@unpad.ac.id

ABSTRACT

Lupus Erythematosus Systemic (SLE) is a chronic autoimmune disorder that affects many organ systems with a variety of clinical manifestations. Genetic factors play an important role in the pathophysiology and clinical output of SLE.[1] More than 30 genes have been proven to be associated with SLE, one of which is the Signal Transducer Activator Transcriptase 4 (*STAT4*). The *STAT4* gene encodes STAT4 protein, a central mediator in inducing inflammation during immune response occurred in immune-mediated diseases. Single nucleotide polymorphism (SNP) of *STAT4* rs7574865 (G>T) increases the expression of interferon gamma in inflammatory sites in SLE patients. [2-4] The purpose of this study was to identify the genotype distribution of the *STAT4* rs7574865 in SLE patients at RSUP Dr. Hasan Sadikin Bandung in West Java, Indonesia. 84 DNA samples were amplified using polymerase chain reaction (PCR) with specific primers and determined by direct sequencing. The genotype distribution of *STAT4* rs7574865 in SLE patients at RSUP Dr. Hasan Sadikin Bandung was 3.57% GG, 35.71% AG, 30.95% GT, and 29.76% AT. The results of this study indicate that SLE patients at RSUP Dr. Hasan Sadikin Bandung have a genotype distribution that does not meet the Hardy-Weinberg equilibrium.

Keywords: SLE, Polymorphism, *STAT4*, rs7574865

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OP30

CLINICAL EFFICACY AND SAFETY OF HERBAL MEDICINE THERAPY IN RECURRENT APHTHOUS STOMATITIS: A SYSTEMATIC REVIEW

Novia Tri Hasanah[1], Wahyu Hidayat[2]

[1] Oral Medicine Residency Program, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia, 40132
[2] Department of Oral Medicine, Faculty of Dentistry, Universitas Padjadjaran, Bandung, Indonesia, 40132
e-mail address of corresponding author: novia20002@mail.unpad.ac.id

ABSTRACT

Recurrent aphthous stomatitis is the most common oral mucous ulcerative lesion with challenging treatment.[1] Herbal medicine therapy can propose efficacy and safety due to their large biological activities.[2] This study aimed to evaluate the clinical efficacy and safety of herbal medicine therapy in recurrent aphthous stomatitis. A systematic study was conducted based on the PRISMA statement. The search was performed using four electronic databases namely PubMed, Cochrane, Science Direct, and Google Scholar for articles published from 2016 until 2021 using specific keywords. The search was limited to randomized controlled trials (RCTs), in English, full text, Scopus indexed, and study in humans. The main outcome is expected to be ulcer size, pain score, healing duration, and adverse effects. Quality assessment of selected articles was conducted using the Quality Appraisal of Randomized Trials Checklist (Cochrane Risk of Bias tool). The methodology quality of studies was evaluated using the Cochrane Handbook for Systematic Review of Interventions and Rev Man software. Five articles were eligible for analysis. The population of the sample study ranged from 34-70 patients of 15-65 years old. The herbs that used were Aloe vera, curcumin *(Curcuma longa)*, pomegranate *(Punica granatum* Linn.*)*, licorice *(Glycyrrhiza glabra)*, and *Nicotiana tabacum* L. Based on the review, pomegranate was effective in reducing ulcer size and improving healing duration, whereas licorice was effective in reducing pain score. All of these herbs had no adverse effects. This review showed that pomegranate was a clinically effective and safe herbal medicine in recurrent aphthous stomatitis therapy.

Keywords: herbal medicine, recurrent aphthous stomatitis, oral ulcer

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OP31

SERUM BRANCHED SHORT CHAIN FATTY ACIDS SIGNATURE IN DYSLIPIDEMIA AND THEIR ASSOCIATION WITH TYPE 2 DIABETES MELLITUS

Miftakh Nur Rahman[1,2], Ajeng Diantini[1,3], Miswar Fattah[2], Melisa I. Barliana[3,4]*

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21, Bandung, Indonesia
[2]Prodia Clinical Laboratory, Jl. Kramat Raya No. 150, Jakarta, Indonesia
[3]Center of Excellence in Higher Education for Pharmaceutical Care Innovation, Universitas Padjadjaran, Jatinangor, Indonesia
[4]Department of Biological Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Indonesia.
e-mail address of corresponding author: melisa.barliana@unpad.ac.id

ABSTRACT

Short Chain Fatty Acid (SCFA) are the main product of gut bacteria fermentation of carbohydrate and protein[1]. The role of SCFA is essential in the interaction between gut bacteria and its host particularly in metabolic diseases[1,2]. Branched Chain SCFA, mainly isobutyric and isovaleric, are produced less than another three major SCFAs[1]. Their fecal concentration had been proposed to have an implication to the lipid profile and type 2 diabetes (T2DM)[2-4]. In contrast, it is still limited information on how their interaction when measured in serum. The aim of this study was to investigate the association of serum branched chain SCFA with hyperlipidemia and T2DM. Serum level of isobutyric and isovaleric of 150 centrally obese subjects were measured using Gas Chromatography-Mass Spectrometry (GCMS). There was a positive correlation between isobutyric with LDL-Cholesterol ($R=0.21$, $p<0.01$), negative correlation with HDL-Cholesterol ($R=-0.293$, $p<0.01$). There was no correlation between isovaleric with both LDL-Cholesterol and HDL Cholesterol. Isobutyric and isovaleric showed a positive correlation with triglyceride ($R=0.257$, $p<0.01$ and $R=0.275$, $p<0.01$) respectively. Regarding their association with T2DM, both of branched chain SCFA are positively correlated with HbA1c ($R=0.242$, $p<0.01$ and $R=0.275$, $p<0.01$) respectively. It was concluded that branched chain SCFA showed a signature in dyslipidemia especially isobutyric and also both of isobutyric and isovaleric were associated with T2DM through particular mechanism.

Keywords: Branched Chain SCFA, Serum SCFA, Dyslipidemia, Metabolic Disease, T2DM

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OP32

SYNTHESIS OF α-MANGOSTIN DERIVATIVE COMPOUNDS WITH NUCLEOPHILIC ACYL SUBSTITUTION REACTION

Richa Mardianingrum[1,2], Muhammad Yusuf[3], Maywan Hariono[4], Muchtaridi Muchtaridi[1]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Indonesia-45363
[2]Department of Pharmacy, Universitas Perjuangan, Tasikmalaya, Indonesia-46115
[3]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor, Indonesia-45363
[4]Faculty of Pharmacy, Universitas Sanata Dharma, Yogyakarta, Indonesia-55281
e-mail address of corresponding author: richa14001@mail.unpad.ac.id

ABSTRACT

α-mangostin is isolated from mangosteen rind that is known to have an activity to inhibit the growth of breast cancer cells[1]. In this study, α-mangostin was modified by substituting –OH group at C6 using benzoyl derivatives through in silico study can then be predicted to have potent activities as ERa antagonists[2]. The study aimed to synthesize α-mangostin derivatives using the Schotten-Baumann acylation reaction between α-mangostin and benzoyl chloride derivatives (AMB-2). The structure of compounds was further analyzed by spectroscopy including MS (TOF MS ES^+), 1D NMR (^1H and ^{13}C), and 2D NMR (Dept-135, HMQC, HMBC, and ^1H-^1H COSY). The result of the synthesis, the compound AMB-2 in the form of brownish yellow powder yields 0.421 g (77%). α-mangostin derivative compounds synthesized with nucleophilic acyl substitution reaction.

Keywords: α-mangostin, acylation reaction, synthesis

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OP33

COMMUNITY HEALTH CENTRES AS THE PHARMACEUTICAL SERVICES SUPPORT SYSTEM IN HEALTHY INDONESIA PROGRAM: AN OBSERVATIONAL STUDY IN WEST JAVA INDONESIA

Zaenal Komar[1], Keri Lestari[1], Anna Meiliana[1], Ali Gufron Mukti[2], Yana Irawati[3], Miftahudiniyah[3], Nurrani Mustika Dewi[4*]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran. Jl. Raya Bandung Sumedang KM.21, Hegarmanah, Jatinangor, Kabupaten Sumedang, Jawa Barat 45363.
[2]Ministry of Research, Technology and Higher Education of the Republic of Indonesia. Gedung D, Jalan Jenderal Sudirman, Pintu 1 Senayan, Jakarta Pusat 10270.
[3]Jakarta National Health Training Centre. Jl. Wijaya Kusuma No.45, RT.9/RW.4, Pd. Labu, Kec. Cilandak, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta 12430.
[4]Prodia Clinical Laboratory. Jl. Kramat Raya No. 150, Jakarta Pusat. 10430.
Tel: +62 813-1849-7917
e-mail address of corresponding author: nurranimustika@gmail.com

ABSTRACT

Pharmaceutical service is one of the essential components for the program implementation of the Healthy Indonesia Program with a family approach, including drug supply management, and clinical pharmacy. This study was aimed to evaluate the pharmaceutical services support in the Healthy Indonesia Program, in West Java Indonesia. This study was an observational, non-interventional cross-sectional survey on pharmaceutical services under the family approach program description. A self-completed questionnaire was distributed to 39 accredited community health centers (CHCs) in West Java, Indonesia. Several indicators of the Standard Pharmacy Services were assessed. Thirty-nine CHCs were involved in this study. Most of the CHCs were accredited as intermediate (59%) Almost all CHCs in West Java applied good pharmaceuticals and consumables inventory management. The online system and more training will give room for improvement. A big gap was found in human resources number and competencies [1,2], impact on clinical pharmacy standard services including counselling services (23.1%) and home visit (7.7%). The inventory management system in CHCs should be improved by applying an online system. The Implementation of the online system will increase the quality of the service of supply management [3]. The minimum requirement for human resources in number and competencies must be fulfilled to improve the quality in CHCs' clinical pharmacy standard services.

Keywords: clinical pharmacy, family approach, pharmaceutical management system.

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OP34

SYNTHESIS OF ENCAPSULATED *CHROMOLAENA ODORATA* LEAF EXTRACT IN CHITOSAN NANOPARTICLE BY USING IONIC GELATION METHOD AND ITS ANTIOXIDANT ACTIVITY

Winda Trisna Wulandari, Keni Idacahyati, Firman Gustaman and Indra Indra

Pharmacy Department, STIKes Bakti Tunas Husada, Jl. Cilolohan 36 Tasikmalaya, West Java, Indonesia 46115
e-mail address of corresponding author: windatrisna@stikes-bth.ac.id

ABSTRACT

Oxidative stress is one of the causes of degenerative diseases due to DNA damage[1]. Oxidative stress occurs because of an imbalance between reactive oxygen species and antioxidants[2]. *Chromolaena odorata* is a plant that has been empirically proven to cure several diseases due to its secondary metabolite content. The aim of this study is to determine antioxidant activity of *Chromolaena odorata*. Encapsulation of *Chromolaena odorata* leaf extract by nanochitosan was synthesized by using chitosan and NaTPP as the crosslinking agent[3]. The antioxidant activity was conducted by using DPPH method. Nanoparticle of *Chromolaena odorata* leaf extract has an average diameter of 675 ± 218 nm and +23.4 ± 7.14 mV of zeta potential. The antioxidant activity of its extract was 1 ppm while its nanoparticle has an antioxidant activity almost ten times better of 0.21 ppm

Keywords: nanoparticle, plant extract, *Chromolaena odorata*, antioxidant activity

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OP36

SYNTHESIS AND CHARACTERIZATION OF MOLECULARLY IMPRINTED POLYMER (MIP) EPHEDRINE FOR GAS CHROMATOGRAPHY ANALYSIS

Lina Nurfadhila[1,2], Benny Permana[2], Slamet I. Surantaatmadja[2]

[1]Department of Pharmacy, Perjuangan University, Jalan PETA 177, Kota Tasikmalaya, 46115, Indonesia
[2]School of Pharmacy, Bandung Institute of Technology, Jalan Ganesha 10, Bandung, 40132, Indonesia.
e-mail address of corresponding author: lina.nurfadhila@gmail.com

ABSTRACT

Molecularly Imprinted Polymer (MIP) is a polymer made by molecular imprinting techniques with a good affinity to the template molecule[1]. MIP is robust molecular recognition elements able to mimic natural recognition entities, such as antibodies and biological receptors, useful to separate and analyze complicated samples such as urine. Urine may cause interference in Gas Chromatography (GC) analysis, therefore sample-preparation methods with high selectivity are required[2]. Ephedrine belongs to the stimulant category of doping in the World Anti-Doping Agency (WADA) list. The stimulant effects of ephedrine are vulnerable to be potentially misused to improve athletic performance by athletes. However, the medical use of ephedrine at the therapeutic level is tolerated by WADA. Urine concentrations of more than 10 mg/mL are considered as doping[3]. The purpose of this study was to synthesize selective Molecularly Imprinted Polymer (MIP) for separation of ephedrine in urine and validation of the ephedrine analysis method using GC. Synthesis of MIP was prepared by using ephedrine as the molecular template, methacrylic Acid (MAA) as the functional monomer, ethylene glycol dimethacrylate (EGDMA) as a crosslinker, 2.2'-azobisisobutyronitrile (AIBN) as the initiator, and dichloromethane as the porogenic solvent. Imprinting Factor (IF) is calculated by comparing the area under the curve of ephedrine on the imprinted polymer with a comparable non-imprinted polymer (NIP). MIP synthesis using bulk polymerization with a ratio of template molecules, functional monomers, crosslinker (1: 4: 20) resulted in an IF of 2,129. MIP was characterized by Fourier Transform Infrared (FTIR) and evaluated using the equilibrium batch rebinding method. Selectivity test showed that MIP can be used for selective extraction of ephedrine. The recovery for urine samples spiked with ephedrine was 81,178% after pretreatment with Molecularly Imprinted Solid Phase Extraction (MISPE). Analysis method of ephedrine with GC gave the valid result, linearity with r^2 = 0,9993, accuracy with recovery of 99,85 – 100,78%, and precision with coefficient of variance 0,997%, detection limit of 3,001 ppm and limit of quantization 10,004 ppm.

Keywords: ephedrine, gas chromatography, molecularly imprinted polymer, urine.

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OP37

STANDARDIZATION OF BLACK BETEL LEAF (*Piper acre* Blume) ETHANOL EXTRACT ORIGIN IN 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

ABSTRACT

One of the medicinal plants that grows in East Kalimantan and can be used by the community as medicine is black betel (*Piper acre* Blume)[1]. Based on existing research, black betel leaf has antioxidant, antimicrobial, and cytotoxic activities[2]. Standardization of ethanol extract of black betel leaf (*Piper acre* Blume) was carried out based on general standard parameters of medicinal plant extracts. The results of the specific parameter test showed that the organoleptic extract was dark brown in color, had a distinctive odor, thick consistency and had a bitter taste, slightly spicy and distinctive, and the results of the piperenamide A compound content as a marker compound in the extract was 3.98%. The results of the non-specific parameter testing of the ethanolic extract of black betel leaf (*Piper acre* Blume) showed a total ash content of 7.47% and an acid insoluble ash content of 4.50%, drying loss 15.85%. Phytochemical screening showed that the ethanol extract of black betel leaf (*Piper acre* Blume) contains alkaloids, saponins, flavonoids, and tannins.

Keywords: Standardization, Specific, Non Specific, Ethanol Extract, Black Betel

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OP38

SECRETOME FOR DERMATOLOGY APPLICATION: A REVIEW

Restu Harisma Damayanti[1*], Taofik Rusdiana[1], Nasrul Wathoni[1]

Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang Km 21 Jatinagor 45363
e-mail address of corresponding author: restu19006@mail.unpad.ac.id

ABSTRACT

Secretome or known as conditioned medium is a secreted protein from stem cells that have a variety of biological activities that can be used in various treatment therapies, especially on the skin[1]. Various lack of conventional therapies make secretome a promising alternative therapy. The content of growth factors, cytokines, and extracellular vesicles in secretome has been widely reported which serves in improving the proliferation and migration of cells to help in skin regeneration[2-4]. Therefore, to be able to optimize the use of this secretome well needed special review related to the work of secretome in addressing various problems on the skin. So in this article will be discussed about the benefits and biological activity of secretome on the skin. This review is compiled based on the approval of several sites such as Scopus, PubMed, Science Direct, and Google Scholar with the terms "secretome for skin", "secretome dermatology", “secretome conditioned medium for skin”, "secretome conditioned medium for skin wound", "secretome conditioned medium for aging", "secretome conditioned medium for hair growth. Collected 206 articles for selection, and obtained 79 articles used. Based on the results can be concluded that secretome has a variety of useful activities to regenerate and repair tissue damage that has been used on the skin as a wound healer, photoprotector agent, and hair growth.

Keywords: secretome, conditioned medium, biological activity, skin application

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OP40

ROSMARINIC ACID PRODUCTION FROM CELL SUSPENSION CULTURE OF *Orthosiphon aristatus* Blume Miq WHITE-PURPLE VARIETY

Fahrauk Faramayuda [1,2*], Totik Sri Mariani[3], Elfahmi[1,4], Sukrasno[1]

[1]School of Pharmacy, Institut Teknologi Bandung (ITB), Bandung, West Java, Indonesia, 40132.
[2]Faculty of Pharmacy Universitas Jenderal Achmad Yani (UNJANI), Cimahi, West Java, Indonesia, 40532.
[3]School of Life Sciences and Technology, Institut Teknologi Bandung (ITB), Bandung, West Java, Indonesia, 40132.
[4]Biosceinces and Biotechnology Research Center, Institut Teknologi Bandung (ITB), Bandung, West Java, Indonesia, 40132.
e-mail address of corresponding author: ramayuda.f@gmail.com

ABSTRACT

Rosmarinic acid is the main compound in white-purple *O. aristatus*. Rosmarinic acid has potential as an antiviral, based on *in silico* studies it can inhibit COVID-19[1]. The yield of rosmarinic acid in *O. aristatus* plants is still small, so efforts are needed for the production of this compound using a plant tissue culture approach. The aim of this study was to obtain a sinensetin production protocol from a white-purple variety of *O. aristatus* cell suspension culture. Research begins with callus induction. White-purple variety of *O. aristatus* leaf explants were inoculated on Schenk and Hildebrandt (SH) media with 2,4-dichlorophenoxyacetic acid (2,4-D) 0.4 ppm. The callus formed was further developed at the stage of cell suspension culture which was modified by the addition of elicitor salicylic acid (14, 70, and 140 mg/L), Cu^{2+} (30, 40 and 50 µM), pectin (0.05; 0.1; 0,2% w/v) and $AgNO_3$ (80, 100, 120 mol/L), precursors of cinnamic acid, coumaric acid, caffeic acid, and ferulic acid with a concentration of 0.1; 0.5; and 1 mM. Qualitative and quantitative analysis of callus using HPLC showed the presence of rosmarinic acid compound with a concentration of 4.67% w/w. The highest levels of rosmarinic acid in cell suspension cultures of white-purple varieties were found in cultures with 1 mM of cinnamic acid added with a value of 10.22 mg/g dry weight. This research can be used as the basis for the production of rosmarinic acid by modifying the *in vitro* culture of white-purple variety *O. aristatus*.

Keywords: *O. aristatus*, plant tissue culture, in vitro culture modification, rosmarinic acid

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OP41

SYNTHESIS OF ^{131}I-ALPHA MANGOSTIN AS RADIOPHARMACEUTICAL CANDIDATE FOR DIAGNOSTIC AND THERAPY OF BREAST CANCER

Wiwit Nurhidayah[1], Isti Daruwati[2,3], Eva Maria Widyasari[3], Toto Subroto[1], Muchtaridi Muchtaridi[2]

[1]Department of Chemistry, Faculty of Mathematic and Natural Science, Universitas Padjadjaran, Jl Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia;
[2]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jl Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia;
[3]Center for Applied Nuclear Science and Technology, National Nuclear Energy Agency (BATAN), Jl Tamansari No. 71 Bandung 40132, Indonesia, isti19002@mail.unpad.ac.id
e-mail address of corresponding author: muchtaridi@unpad.ac.id

ABSTRACT

Alpha mangostin is a xanthone compound that was isolated from mangosteen peel[1] and known to have activity against breast cancer[2-4]. Alpha mangostin has potential in the synthesis of radiopharmaceutical candidates for breast cancer. One of the radioisotopes that are widely used is iodine-131 which emits beta and gamma so that ^{131}I-alpha mangostin can be applied in the diagnosis and therapy of cancer[5]. This study aimed to synthesize ^{131}I-alpha mangostin as a radiopharmaceutical candidate with high radiochemical purity. Synthesis was carried out by the radioiodination method using chloramine T as an oxidizing agent[6,7] and several optimizations were carried out including the temperature, reaction time, amount of alpha mangostin, and the amount of oxidizing agent. Radiochemical purity was determined by paper electrophoresis. The results showed that the optimum synthesis of ^{131}I-alpha mangostin occurred at 30 minutes and low temperature (2-4°C) with a radiochemical purity of 98.76 ± 0.47%. The results of this study suggest that ^{131}I-alpha mangostin can be synthesized as a radiopharmaceutical candidate for diagnostic and therapy breast cancer. Further research will be carried out in vitro and in vivo studies to prove the radiopharmaceutical capability as a radiopharmaceutical for breast cancer.

Keywords: Alpha mangostin, iodine-131, radiopharmaceutical, breast cancer.

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OP42

POTENCY OF HONJE HUTAN FLOWERS (*Etlingera hemisphareica* (Blume) R.M.Sm.) AS ALPHA-GLUCOSIDASE INHIBITOR

Soraya Riyanti, Nandi Agustian, Akhirul Kahfi Syam

Pharmaceutical Biology Research Group, Faculty of Pharmacy,
Universitas Jenderal Achmad Yani
Jl. Terusan Jenderal Sudirman PO.BOX. 148 Cimahi,, 40533
e-mail address of corresponding author: anti.piper81@gmail.com

ABSTRACT

Etlingera hemisphareica (Blume) R.M.Sm.) belongs to the Zingiberaceae family, known as forest honje. The Pangandaran people process honje flowers into fresh drinks that are consumed for health. The forest honje leaf extract provides antidiabetic activity at a dose of 0.39 mg/g BW can reduce blood glucose levels by 36.16% has been reported[1]. Based on this background and there was still little information on the use of forest honje plants in traditional medicine to lower blood glucose, it is necessary to do research on this plant, especially on the flower of forest honje as an alpha-glucosidase inhibitor and the study of its chemical content. The maceration process on forest honje flowers in 70% ethanol for 24 hours and the fractionation process was carried out by liquid-liquid extraction method with n-hexane, ethyl acetate and water as solvents. Testing the activity of alpha-glucosidase inhibitors colorimetrically using the chromogenic substrate p-nitrophenyl α-D-glucopyranoside, alpha-glucosidase enzymes derived from *Saccharomyces cerevisiae*, measurement of absorption at a maximum wavelength of 401.3 nm and acarbose used as a comparison drug alpha-glucosidase inhibitors. The results showed that the chemical content of forest honje flowers consisted of flavonoids, polyphenols, tannins, quinones, monoterpenoids, and sesquiterpenoids. IC50 values for 70% ethanol extract, n-hexane, ethyl acetate, water and acarbose fractions were 136.79 g/mL,; 307.18 g/mL; 277.12 g/mL; 66.18 g/mL; and 14.63 g/mL respectively. Although all samples gave a weaker IC50 value than acarbose, the water fraction had good potential to be developed as an alpha-glucosidase inhibitor.

Keywords: *Etlingera hemisphareica* (Blume) R.M.Sm, forest honje, alpha-glucosidase inhibitor.

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OP43

IN VITRO AND *IN SILICO* STUDIES ON THE CYTOTOXIC ACTIVITY OF *Acalypha indica* L. TARGETING CASPASE-3 IN PROSTATE CANCER CELLS

Ellin Febrina[1,2,*], Ryan Khunam Alamhari[3], Aiyi Asnawi[3], Rizky Abdulah[2], Keri Lestari[2], Jutti Levita[2], and Unang Supratman[1,4]

[1]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang Km. 21, Jatinangor, 45363, Indonesia.
[2]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang Km. 21, Jatinangor, 45363, Indonesia.
[3]Department of Pharmacochemistry, Faculty of Pharmacy, Universitas Bhakti Kencana, Jl. Soekarno-Hatta No. 754, Bandung, 40617, Indonesia.
[4]Central Laboratory, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang Km. 21, Jatinangor, 45363, Indonesia.
e-mail address of corresponding author: ellin.febrina@unpad.ac.id

ABSTRACT

Acalypha indica L. is a medicinal plant that has been known as a source of traditional medicine.[1] Previous studies have shown that *A. indica* extracts have potential antiproliferative activity in several cancer cell lines.[1-4] Furthermore, researchers have also succeeded in isolating the phytochemical constituents of this plant but progress in the discovery of its anticancer lead compounds is still limited[1]. Our work investigated the cytotoxic activity of *A. indica* against the human prostate cancer cell (DU145) and the structure-based molecular interactions between its phytochemical constituents with caspase-3. DU145 cells were treated with the extract and fractions of *A. indica* aerial parts *in vitro* for 24 hours. The cytotoxic activity was evaluated by WST-8 assays. The X-ray crystal structure of human caspase-3 was retrieved from https://www.rcsb.org/structure/. The molecular interactions were studied using the AutoDock 4.2 software and followed by molecular dynamics simulations using the AMBER 18 software. The results indicated that the *n*-hexane and ethyl acetate fractions showed higher cytotoxicity than the ethanolic extract and other fractions. It is also known that 25 phytochemicals constituents of *A. indica* have a better binding mode with higher free bond energy than the original ligand. Moreover, the bond stability of the four highest-scoring hits was evaluated by molecular dynamics. The H-bond formed in molecular dynamic simulations is quite different from the results of molecular docking due to a massive movement of receptors and ligands in molecular dynamic simulations. In conclusion, γ-sitosterol, β-sitosterol acetate, and γ-sitosterol acetate might be able to induce caspase-3 thereby activate apoptosis.

Keywords**:** *Acalypha Indica* L., Apoptosis, Caspase-3, DU145, Molecular docking, Molecular dynamic.

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PP01

IN VITRO DRUG RELEASE STUDY OF CHLORAMPHENICOL *IN SITU* GEL WITH BASES MIXTURE OF POLOXAMER 407 AND HPMC BY OPTIMIZATION WITH FACTORIAL DESIGN

Insan Sunan Kurniawansyah[1], Taofik Rusdiana[1], Huriyatus Tsaniyah[1], Handrian Ramoko[1], Habibah A. Wahab[2], Anas Subarnas[3]

[1] Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia
[2] School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia
[3] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java, Indonesia
e-mail address of corresponding author: insan.sunan.kurniawansyah@unpad.ac.id

ABSTRACT

Active substances from conventional ophthalmic preparations have to deal with their limitations such as low bioavailability, short retention time, and rapid elimination of the drug.[1-4] To overcome this, *in situ* gel drug delivery assists several advantages by prolonging the retention time of drugs, which makes the production process easier, and lower the manufacturing cost of the ophthalmic product.[5] The *in vitro* diffusion of chloramphenicol *in situ* gel study was carried out using Franz diffusion cells to know the effect of the Critical Process Parameters (CPPs) as independent variables (poloxamer 407 and hydroxypropyl methylcellulose (HPMC)) on the Critical Quality Attribute (CQA) as dependent variable (cumulative amount of drug release) with 2^2 factorial design. 2^2 factorial design of chloramphenicol *in situ* gel yielded 4 variations of poloxamer 407 and HPMC bases component in %w/v as follows, F1 (5:0.45), F2 (10:0.45) F3 (5:1) and F4 (10:1). The amount of drug release results from *in vitro* dissolution assay were F1 (30.60%), F2 (45.64%), F3 (58.30%), and F4 (22.50%). Formula 3 (F3) was considered as the best formula component in terms of *in vitro* assay of chloramphenicol *in situ* gel with a desirability value of 0.58.

Keywords: chloramphenicol; *in situ* gel; *in vitro* diffusion; poloxamer 407; HPMC; Franz diffusion.

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PP03

FORMULA DEVELOPMENT AND CHARACTERIZATION OF *PEG-8 BEESWAX* IN FORMULA NANOSTRUCTURED LIPID CARRIERS (NLC)

Garnadi Jafar [1,2], Marline Abdassah [1], Taofik Rusdiana [1]

[1.] Department of Pharmaceutics and Pharmaceutical Technology, Padjadjaran University Jatinangor Sumedang West Java, Indonesia, Indonesia
[2.] 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: marline.abdassah@unpad.ac.id

ABSTRACT

Adapalene is an active ingredient that can be used for acne treatment. Adapalene has lipophilic properties and low solubility in water which has the potential to be degraded[1]. To improve the solubility and stability of Adapalene, a new modified drug delivery system is needed, one of which is Nanostructured Lipid Carriers (NLC)[2-3]. One of the components of NLC is a solid lipid that serves to encapsulate the active ingredient. In addition, it can provide better skin hydration and occlusivity of the skin[4]. To formulate and characterize Adapalene loaded NLC. The preparation of NLC Adapalene makes using heat the homogenization method followed by ultrasonication with an amplitude of 55% and a vibration delay of 10 seconds for 15 minutes. The NLC formulations are using PEG-8 Beeswax with a concentration range of 2-6%, Myritol 1-2%, Plantacare 0.5-2%, and Adapalene 0.1%. Furthermore, characterization of particle size, polydispersity index, zeta potential, efficiency entrapment was carried out. NLC formula has good stability in room temperature storage for one month with particle size characterization < 300 nm ($p > 0.05$), polydispersion index < 0.5 ($p > 0.05$), zeta potential > -20 mV ($p > 0.05$), and entrapment efficiency > 90%. The best formula for NLC is the formula with a concentration of PEG-8 Beeswax, Myritol, and Plantacare (2:2:1) which result in particle size of 95.6 ± 4.17 nm, PDI 0.28 ± 0.03, potential zeta -36.53±1.15 and percent of efficiency entrapment 98.63±0.47%.

Keywords: Adapalene, PEG-8 Beeswax, *Nanostructured Lipid Carriers* (NLC)

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PP04

ANTIDIARRHEAL EFFECTIVENESS TEST OF ETHANOL EXTRACT OF WHITE POMEGRANATE PEEL (*PUNICA GRANATUM L*) IN MALE WHITE MICE USING THE INTESTINAL TRANSIT METHOD

Nur Rahayuningsih, Roffy Oktavian, Tita Nofianti

Sekolah Tinggi Ilmu Kesehatan Bakti Tunas Husada Tasikmalaya,
Jl. Cilolohan No. 36 Kel. Kahuripan Tawang, Jawa Barat 46115
e-mail address of corresponding author: nur.rahayuridwan@gmail.com

ABSTRACT

Diarrheal disease and its complications remain a major cause of morbidity and mortality in children, especially in developing countries[1]. It is usually a symptom of an infection in the intestinal tract, which can be caused by a variety of bacterial, viral, and parasitic or organisms[2]. The purpose of this study was to determine the activity and dose of white pomegranate peel (*Punica granatum* L.) ethanol extract as an antidiarrheal in white male mice using the intestinal transit method. Mice were grouped into 5 groups: negative control (Na CMC 1%), positive control (loperamide HCl 0.0104 mg/20 g mice BW), and pomegranate peel ethanol extract test group with a dose of 16, 32, and 64 mg/20 g mice BW. The length of the intestine that the ink marker traversed from the pylorus to the end (which is black) was measured using a ruler. The results showed that dose 16, 32, and 64 mg 20 g mice BW were had antidiarrheal activity, which means that there was a significant difference with negative control ($p<0.05$). The parameters of marker trajectory ratio showed no significant difference between groups of 16 mg / 20 g mice BW and positive control (p> 0, 05), with a ratio percentage decrease of 29.53%.

Keywords: White pomegranate, Antidiarrheal, Intestinal transit method

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PP05

PATCHES FOR ACNE TREATMENT: AN UPDATE ON THE FORMULATION AND STABILITY TEST

Taqiyyah Qothrunnadaa, Aliya Nur Hasanah

Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21.5, Sumedang 45363, Indonesia
e-mail address of corresponding author: taqiyyah18001@mail.unpad.ac.id

ABSTRACT

Acne vulgaris is an inflammatory disorder that occurs in pilosebaceous unit. Acne is a chronic inflammatory skin disease that mostly affects teenagers, so many scientists are exploring various formulas for acne treatment[1]. There is a new invention for topical acne treatment called acne patches. Based on the type of acne, acne patches are divided into several types, namely microneedle patches, acne medicine patches, and hydrocolloid patches. A microneedle patch is a topical transdermal drug delivery system made of micrometer-sized needles. The hydrocolloid patch can absorb the liquid on the pimple and even out the pimple. Hydrocolloid patches are non-medicated acne patches for treating acne, can provide skin hydration and improves the skin barrier, has a moisturizing effect, and heal the acne[2]. The transdermal patch stability test was performed using an accelerated stability test for 6 months according to the ICH guidelines under the following conditions: temperature 40±2 °C and relative humidity (RH) 75±5%. The method used is literature review with the conclusion that the most commonly used patch to treat acne is a hydrogel patch, because of its waterproof property to protect acne from secondary infection, can absorb liquid inside and flatten acne, and cheaper compares to microneedle. The hydrogel patch is also stable at a temperature of 40±2 °C and a relative humidity (RH) of 75±5% for 6 months of storage[3].

Keywords: Acne vulgaris, Acne patches, Microneedle patches, Hydrogel patches, Hydrocolloid patches, Stability

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PP06

IN VITRO ANTI-NEUROINFLAMMATORY EFFECT OF GENISTEIN (4',5,7-TRIHYDROXYISOFLAVONE) ON MICROGLIA HMC3 CELL LINE, AND IN SILICO EVALUATION OF ITS INTERACTION WITH ER-β

Burhan Ma'arif[1], Faisal A. Muslikh[2], Wirda Anggraini[1], Maximus M. Taek[3], Hening Laswati[4], Mangestuti Agil[5]

[1] Department of Pharmacy, Faculty of Medical and Health Science, Maulana Malik Ibrahim State Islamic University, Locari Street, Tlekung, Junrejo, 65151, Malang, Indonesia
[2] Master Program of Pharmaceutical Science, Faculty of Pharmacy, Universitas Airlangga, Dr. Ir. H. Soekarno Street, Mulyorejo, 60115, Surabaya, Indonesia
[3] Department of Chemistry, Widya Mandira Catholic University, Jend. Achmad Yani Street, 85211, Kupang, Indonesia
[4] Department of Physical Medicine and Rehabilitation, Faculty of Medicine, Universitas Airlangga, Mayjen Prof. Dr. Moestopo Street, Tambaksari, 60132, Surabaya, Indonesia
[5] Department of Pharmaceutical Science, Faculty of Pharmacy, Universitas Airlangga, Dr. Ir. H. Soekarno Street, Mulyorejo, 60115, Surabaya, Indonesia
*e-mail address of corresponding author: burhan.maarif@farmasi.uin-malang.ac.id

ABSTRACT

Neuroinflammatory is one of the main causes of neurodegenerative diseases in postmenopausal women, who experience estrogen deficiency[1-3]. Phytoestrogens, such as genistein, are an alternative treatment for estrogen deficiency-induced neuroinflammatory[4]. The objectives of this study were to determine the anti-neuroinflammatory effect of genistein through measurement of MHC II and Arg1 expression on microglia HMC3 cell line, as well as to know that the effect occurs in ER-dependent manner, through the measurement of free-ERβ expression. The cells were cultured in 24-well microplates and induced with IFN-γ 10 ng for 24 h to activate cell to M1 phenotype which have pro-inflammatory characteristics[5-7]. Genistein with concentration of 50 μM was added to the cells. The expression of MHC II, Arg1, and free-ERβ as markers was tested using immunocytochemistry method and CLSM instrument. In silico approach was also conducted to determine the interaction between genistein and ERβ, compared to 17β-estradiol. Genistein can decrease MHC II expression and increase Arg1 expression in microglia HMC3 cells compared to negative controls ($p<0.005$), with expression value of 472.577±26.701 AU and 114.299±6.578 AU. But, genistein cannot decrease the free-ERβ expression in cells ($p<0.005$). The results of in silico analysis showed that genistein is an ERβ agonist. So, genistein shows anti-neuroinflammatory effects by decrease the MHC II expression and increase Arg1 expression in microglia HMC3 cell line. However, the effect does not occur through the binding of genistein to ERβ, but it is likely to occur through the binding of genistein with other types of ER.

Keywords: Genistein; Anti-Neuroinflammatory; Microglia HMC3 Cell Line; Phytoestrogens

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PP07

INTERLEUKIN AS BIOMARKER IN RECURRENT APHTHOUS STOMATITIS (RAS): A SYSTEMATIC REVIEW

Indah Damayanti[1], Nanan Nur'aeny[2], Indah Suasani Wahyuni[2]

[1]Undergraduate Program of Dentistry, Faculty of Dentistry, Universitas Padjadjaran,
Jl. Raya Bandung-Sumedang km 21, Jatinangor, Sumedang, West Java, Indonesia 45363
[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: indah.wahyuni@fkg.unpad.ac.id

ABSTRACT

Recurrent Aphthous Stomatitis (RAS) is a recurrent oral disease that causes pain and interferes with daily oral function.[1] The etiology of RAS is not yet known, but its predisposition factors include immunity disorders and genetic variations.[2,3] Overproduction of interleukin (IL) and polymorphism of the interleukin gene affect the recurrences and is found more in SAR patients.[4] This review aims to describe the interleukins and interleukin gene polymorphisms related to and recommended as a RAS biomarker. Articles were searched through *PubMed*, *ScienceDirect*, and *Cochrane Library* databases, using the keywords of "*Interleukin*" AND "*Recurrent Aphthous Stomatitis*". The Risk of Bias Assessment tool for *Non-randomized Studies* (*RoBANS*) was used, and the writing of this review refers to the *Preferred Reporting Items for Systematic Review and Meta-analysis* (PRISMA) guidelines. A total of 8 articles met the criteria and showed a low risk of bias assessment. The level of IL-2, IL-6, IL-8, and IL-18 in the acute clinical phase of RAS were higher than in the recovery phase, but IL-10 levels showed decreased. IL-2, IL-6, IL-10 gene polymorphisms were found to be more frequent in RAS patients compared to controls, while IL-12 gene polymorphisms were found to be less associated with RAS pathogenesis. Interleukins at the proteomic level that recommended as a pro-inflammatory biomarker are IL-2, IL-6, IL-8, IL-12, and IL-18, while an anti-inflammatory is IL-10. Only IL-2 can be recommended as a biomarker at the genomic level, as other interleukins still require other supporting data.

Keywords**:** Interleukin, recurrent aphthous stomatitis, biomarker, gene polymorphism.

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PP08

REVIEW: THE FORMULATING AND EFFECTIVENESS OF THE COVID-19 VACCINE THAT HAVE BEEN CIRCULATED

Hisa Faadhilah, Karina O Wiseva, Frida Widyastuti and Nasrul Wathoni

Bachelor Program in Pharmacy, Faculty of Pharmacy
Department of Pharmacy and Pharmaceutical Technology
e-mail address of corresponding author: nasrul@unpad.ac.id

ABSTRACT

Covid-19 which has been running for more than a year, still hasn't subsided. This disease is contagious and can infect humans quickly which causes various symptoms that vary in individuals who experience it[1]. Several Covid-19 vaccines were found and developed, such as Moderna, Pfizer, and AstraZeneca. Some of these vaccines will work by providing the immune system defenses needed to recognize and form a defense against the microorganism itself[2]. Vaccines work as distinctive molecular markers known as antigens that are injected into the body from attenuated vaccines. These antigens can cause disease, but they can still activate the immune system and the cells can form antibodies. If someone makes contact with a person who has the original pathogen, then that person already has antibodies formed from the immune system which are given through the vaccine quickly because they have been sensitized by the vaccination[3]. This review is aimed at looking at the Covid-19 vaccine, formula and comparison of the three vaccines (Moderna, Pfizer, and AstraZeneca) that have been circulating in terms of administration, effectiveness, safety, side effects, contraindications, and in terms of price. This review was conducted by taking some literature from a database that focuses on the Covid vaccine, development of the Covid vaccine, the Moderna vaccine, the Pfizer vaccine, and the AstraZeneca vaccine. From three vaccines, two were mRNA-based vaccines (Moderna and Pfizer) and AstraZeneca, was based on adenovirus vectors. All three vaccines have their own advantages and disadvantages. When viewed from several aspects, such as administration which has different doses. Then seen from the effectiveness of the three vaccines have a sufficient value because they are above 80%. For safety, it has passed clinical trials in humans, but there are still shortcomings in each vaccine of course. Moderna vaccine is the most expensive.

Keywords: vaccine, Covid-19, effectiveness vaccine.

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PP09

REVIEW: NANOEMULSION FORMULATION OF COSMETIC WITH PLANT EXTRACTS AS THE ACTIVE INGREDIENT

Karina O Wiseva, Frida Widyastuti, Hisa Faadhilah, and Nasrul Wathoni*

[1]Bachelor Program in Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia
[2]Department of Pharmacy and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, Indonesia
e-mail address of corresponding author: nasrul@unpad.ac.id

ABSTRACT

Nanoemulsion is a thermodynamically stable, transparent dispersion of oil and water stabilized by the interfacial film of surfactant and co-surfactant molecules and has a droplet size of about 100 nm - 500 nm[1]. This emulsion system has been widely applied in various industrial sectors, such as the food, cosmetics, and pharmaceutical industries. In the cosmetic field, nanoemulsions are used as lotions, creams and moisturizers[2]. This review conducted to compare the difference of the formulation of nanoemulsion cosmetics by plant extracts between *Centella asiatica*, seed oil from *Rubus idaeus*, *Phyllanthus urinaria*, *Garcinia mangostana* L., *Vellozia sauamata*, and *Cordyceps militaris* extract. Materials and methods are taken from several literarture in valid databases that focuses on current status of the formulation of nanoemulsion and its characteristics, nanoemulsion cosmetics, and formulation of nanoemulsion cosmetics that are made by plant extract as the active ingredient. Comparison of the formulas above can be seen from various aspects. Referring to each article, 4 out of 6 formulas use high energy techniques and the rest use low energy techniques. Formula 1, 3, 6 use high energy technique with high pressure homogenization, and formula 4 uses ultrasonication, which is still a high energy technique. Formulas 2 and 5 use low energy techniques, namely formula 2 using phase inversion composition (PIC) and formula 5 using phase inversion temperature (PIT). HPH is the most widely used for the manufacture of nanoemulsions. In terms of formula, the use of components such as surfactant, cosurfactant, oil phase, and water phase is also different from the 6 formulas presented. Even though all of the six formulas are different, the active ingredients in the form of nanoemulsions need to be tested until finally the goal of the cosmetic product is achieved.

Keywords: Nanoemulsion, cosmetics, plants, extracts

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PP10

SCREENING MECHANISM IN VIVO OF ANTI-DIABETIC ACTIVITY OF *Archidendron bubalium* SEEDS

Hesti Riasari[12], Novi Irwan Fauzi[2], Kusnandar Anggadiredja[1], Rika Hartati[1], Sukrasno[1]

[1] Department of Pharmaceutical Biology, School of Pharmacy, Institut Teknologi Bandung, Jl Ganesha 10, Bandung 40132, West Java, Indonesia.
[2]Indonesian School of Pharmacy. Jl. Soekarno Hatta 354, Bandung 40266 West Java, Indonesia
e-mail address of corresponding author : hestiriasari@stfi.ac.id

ABSTRACT

The high number of people with diabetes mellitus in Indonesia has prompted efforts to develop antidiabetic drugs, one of which comes from plants used as traditional medicine, kabau (*Archidendron bubalinum* (Jack) I.C Nielsen) is one of the plants used for such a purpose[1]. The aim of this study, to see the potential antidiabetic activity of kabau seed extract, in the first stage of activity screening using three variations of doses on the three extracts using the glucose test tolerance method, then the alloxan induction and high fat feed induction testing methods using selected doses. The results of screening for antidiabetic activity on the three extracts using the glucose test tolerance method showed that the ethanol extract at a dose of 250 mg/kg BW can reduce blood sugar levels by looking at the AUC $_{0\text{-}150}$ of 54161 had the potential to lower blood glucose levels. The three extracts with a dose of 250 mg/Kg BW were then screened for the next mechanism using the alloxan induction method and high fat feed induction by looking at the test parameters such as increasing husk weight, drinking water volume, decreasing blood glucose levels using the GOD PAP enzyme and decreasing MDA levels and increased levels of the enzyme SOD in the blood showed that the ethanol extract with dose 250 mg/Kg BW. The results of the test using the MDA method did not show a significant decrease, but based on the data with the SOD enzyme, the ethanol extract gave a good antioxidant effect compared to the n-hexane and ethyl acetate extracts. The parameters of drinking water volume and husk weight showed a significant decrease in the ethanol extract, the decrease in blood sugar levels by the GOD-PAP method showed a good decrease in the ethanol extract by 202.94 ± 2, but in the MDA method, the three extracts showed good less significant, whereas in the SOD enzyme method, the ethanol extract gave a good value such as the positive control value.

Keywords: Antidiabetic, *Archidendron bubalinum*, MDA, SOD enzyme, Ethanol Extract

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PP11

DECOCTION OF POMEGRANATE (*Punica granatum* L.) PEEL AS AN ANTELMINTIC AGAINST *Taenia saginata*

Nyi Mekar Saptarini, Resmi Mustarichie

Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jl Raya Bandung Sumedang km 21, Jatinangor, West Java, Indonesia 45363
e-mail address of corresponding author: nyi.mekar@unpad.ac.id

ABSTRACT

Human helminthic infections affecting a large proportion of the world's population. In developing countries, they contribute to the prevalence of anemia, malnutrition, eosinophilia, and pneumonia.[1] Indonesian people use pomegranate (*Punica granatum* L.) as anthelmintic.[2] The purpose of this study was to investigate the anthelmintic activity of pomegranate peel decoction against *Taenia saginata*. The *in vitro* assay was conducted by observing the motility of *T. saginata*, which is isolated from cattle's gastrointestinal tract, in various concentrations of pomegranate peel decoction with albendazole as a positive control. The results showed that the anthelmintic activity was dependent on decoction concentration and the duration of contact between decoction and nematode. Decoction at moderate concentration cause paralysis, while high concentration cause death. It was concluded that pomegranate peel decoction has anthelmintic activity.

Keywords: albendazole, isolated *Taenia saginata,* motility assay, dose-dependent

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PP12

DETERMINATION OF QUERCETIN IN SHALLOT (*Allium cepa* L.) ETHANOL EXTRACT AND ETHYL ACETATE FRACTION USING HPLC-MS METHOD

Heru Nurcahyo, Sri Adi Sumiwi, Eli Halimah, Gofarana Wilar
Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor 45363, Indonesia
e-mail address of corresponding author: heru19002@mail.unpad.ac.id

ABSTRACT

A simple and fast high-performance liquid chromatography-mass spectrometry (HPLC-MS) method was developed for the determination of quercetin in shallot (Allium cepa L.)1-3. For this purpose, flow rate of mobile phase, injection volume, and flow time were optimized. The mobile phase was methanol: distilled water: phosphoric acid (54:45:1), injection time: 20 µL, flow time: 1 ml/min using the stationary phase on column C18 with UV wavelength 370 nm1. The optimized method was successfully applied to the determination of quercetin in the shallot plant samples after extraction with ethanol and fractionation with ethyl acetate as solvent4-,8. Rf for standard quercetin, ethanol extract and ethyl acetate fraction from shallots were 18.378, 18.737 and 18.623. The presented study describes a simple and optimized HPLC-MS analytical method for the determination of quercetin in shallot. For achieving a good separation, column and mobile phase was chosen as is methanol: distilled water: phosphoric acid (54:45:1), injection time: 20 µL, flow time: 1 ml/min using the stationary phase on column C18.

Keywords: HPLC-MS, Quercetin, Flavonoids, *Allium cepa* L.

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PP13

THE DETERMINATION OF ETHYL p-METHOXY CINNAMATE IN KAEMPFERIA GALANGA L. RHIZOME EXTRACT HARVESTED IN RAINY AND DRY SEASONS

Indah Suasani Wahyuni[1,2], Irna Sufiawati[2], Wipawee Nittayananta[3], and Jutti Levita[1]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung-Sumedang km 21, Jatinangor, Sumedang, West Java, Indonesia 45363
[2]Department of Oral Medicine, Faculty of Dentistry, Universitas Padjadjaran, Jl. Sekeloa Selatan no 1, Bandung, West Java, Indonesia 40132
[3]Faculty of Dentistry, Thammasat University, Rangsit Campus, No. 95, Village 8, Khlong Nueng Subdistrict, Khlong Luang, Pathum Thani, Thailand
e-mail address of corresponding author: indah.wahyuni@fkg.unpad.ac.id

ABSTRACT

Kaempferia galanga L. rhizome (KGR), has been empirically used in Indonesia, particularly by Javanese, to cure inflammation.[1,2] KGR contains various secondary metabolites which explain its pharmacology activities, among them is ethyl p-methoxycinnamate (EPMC).[3,4] However, due to the different seasons of our country, the yield of extraction is often unalike. In this work, we determined the percentage of yield (w/w), the water content (thermogravimetric method), and the concentration of EPMC in the Ethanol extract of *Kaempferia galanga L*. Rhizome (EEKG) harvested from the rainy (EEKG-R) and dry seasons (EEKG-D). The sun-dried rhizomes were cold macerated for 3x24 hours with 70% ethanol, filtered, and the solvent was evaporated at 40-45ºC until a viscous extract was obtained. The determination of EPMC in the extract was carried out using the RP-HPLC standard addition method. Detection was set at 308 nm; injection volume 20 µL; flow rate 1.0 mL/min. The column used is C18 (length 250 mm, internal diameter 4.6 mm, particle size 5 µm). It could be concluded that the EEKG-R (harvested in the rainy season) revealed a better quality (yield = 14.56% w/w, water content = 4.37%, EPMC = 0.01%) compared to that of EEKG-D (harvested in the dry season) (yield = 5.79% w/w, water content = 18.76%, EPMC = 0.001%).

Keywords: anti-inflammation, ethyl p-methoxycinnamate, herbal medicine, *Kaempferia galanga L*.

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PP14

A REVIEW: NATURAL PRODUCT DRUG DELIVERY SYSTEM FOR CANCER TREATMENT DOSAGE FORM AND EVALUATION

Rizka Khoirunnisa Guntina[2], Iyan Sopyan[1,2], Ade Zuhrotun[3]

[1]Center of Drug Development, Faculty of Pharmacy, Padjadjaran University, Jatinangor, Indonesia 45363
[2]Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Padjadjaran University, Jatinangor, Indonesia 45363
[3]Department of Biological Pharmacy, Faculty of Pharmacy, Padjadjaran University, Jatinangor, Indonesia 45363
e-mail address of corresponding author: rizka14005@mail.unpad.ac.id

ABSTRACT

Drug delivery system is a system in which a drug is released from a pharmaceutical dosage form to achieve the desired pharmacological effect. The system consists of conventional and new drug delivery systems.[1] In the new drug delivery system, polymers are used as a matrix. Cancer is a non-infectious disease that is marked by the presence of abnormal cells or tissues that are malignant, rapidly and uncontrollably grows and can spread to other places in the human body.[2] The aim of this article was to find out and understand the delivery system of natural ingredients that have anticancer activity and the basis for developing these dosages. Journal search in this review came from primary data sources on the internet. Journal search were carried out using a search engine such as Google Scholar, NCBI, Sciencedirect, Researchgate, MDPI, Dove Press, and Springer Link with keywords of “Formulation”, "Drug Delivery System", "Herbs", "Natural Products", "Extract”, and "Cancer". In recent years, natural products, such as extract, fraction, and isolates, are being used to treat cancer. Because of their low solubility and bioavailability, their effectiveness tends to be lower than synthetic drugs. Therefore, a dosage form with a new drug delivery system was made to overcome the problem. The dosage forms commonly made are patch, suspension, powder, and emulsion with new drug delivery systems. To ensure the product that has been made met the requirements, they need to be evaluated with various methods like In Vitro studies, morphology study, particle size study, and others. In conclusion, cancer treatment using natural products can be delivered through several dosage forms like patch, suspension, powder, and emulsion then evaluated using several evaluation methods.

Keywords: Drug delivery system, Extract, Evaluation, Matrix

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PP15

QUANTIFICATION OF RICIN PROTEIN FROM RICINUS COMMUNIS ORIGINATED FROM NGANJUK, EAST JAVA, INDONESIA

Irma Erika Herawati[1,2], Ronny Lesmana[3,4], Jutti Levita[1] and Anas Subarnas[1]

[1]Department of Pharmacology and Clinical Pharmacy,
Universitas Padjadjaran, Sumedang-45363, West Java, Indonesia
[2]Department of Pharmacy,
Universitas Al Ghifari, Bandung-40293, West Java, Indonesia
[3]Physiology Molecular Laboratory,
Universitas Padjadjaran, Sumedang-45363, West Java, Indonesia
[4]Department of Medical Basic Sciences,
Universitas Padjadjaran, Sumedang-45363, West Java, Indonesia
e-mail address of corresponding author: irma.erika.h@gmail.com

ABSTRACT

Proteins found in all biological systems, from prokaryotes to eukaryotes.[1] Ricin, one of the most toxic substances known isolated from *Ricinus communis* L. seeds, is a heterodimeric two-domain polypeptide protein that includes chain A (30 kDa) and chain B (35 kDa) linked by a disulfide bond.[2] Ricin binds to cells by the B chain and is then internalized.[3] Ricin has been reported as a potential chemical for cancer treatment.[4] The measurement of protein concentration in an aqueous sample is an important assay in biochemistry research.[1] However, so far, the quantification of ricin protein is not much reported. In this study, the quantification of ricin protein extracted from *R. communis* L. seeds originated from Nganjuk, East Java, Indonesia. The techniques used column liquid chromatography (CLC) and fast protein liquid chromatography (FPLC), followed by quantification of protein content using Bradford method. Results showed that all techniques positively confirm the presence of ricin protein. Ricin protein content were 0.171±0.021 mg/mL and 0.382±0.023 mg/mL using CLC and FPLC respectively. This study might contribute to understanding the biological and chemical properties of the ricin protein of *R. communis* L. seeds. Ricin protein content measured with FPLC were higher than CLC.

Keywords: Ricin, *Ricinus communis,* CLC, FPLC

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PP17

ACUTE TOXICITY OF β-KITIN EXTRACTED FROM THE SHELL OF BLUE SWIMMING CRAB (*Portunus pelagicus* Linn.)

Renny Amelia[1,2], Nyi Mekar Saptarini[3], Jutti Levita[2], Sri Adi Sumiwi[2]

[1]Department of Pharmacology, School of Pharmacy Muhammadiyah Cirebon, Cirebon-45153, (West Java) Indonesia
[2]Department of Pharmacology and Clinical Pharmacy, Universitas Padjadjaran, Sumedang-45363, (West Java) Indonesia
[3]Department of Pharmaceutical Analysis and Medicinal Chemistry, Universitas Padjadjaran, Sumedang-45363, (West Java) Indonesia
e-mail address of corresponding author: r3nny3m@gmail.com

ABSTRACT

Apart from its natural abundance, chitin, a polysaccharide compound, has been proven to have many biological activities [1,2,3,4]. Moreover, chitin is widely used in combinations with other substances, and can be changed into nano chitin form [5,6]. Up to this point, chitin is considered a safe substance[7], however, to further guarantee its safety, a toxicity assay should be done. No such study has been carried out, especially of the β form of chitin. This work aimed to study the acute toxicity of β-chitin extracted from crab shells in Balb/c mice. The acute toxicity test was performed by following the OECD guidelines. Female mice were given single or divided doses of β-chitin (maximum 24 hours) with doses of 500, 1000, 2000, 4000, and 6000 mg/kg of BW. Observations were made for 14 days, including behaviour, body weight, organ weight, and histopathology of vital organs (stomach, heart, liver, kidney, and lung). During 14 days, no deaths and no abnormalities in behaviour, bodyweight or organ weight were observed. Histopathological examination of vital organs found damage including a decrease in the number of normal cells, an increase in cell necrosis and apoptosis, especially at a dose of 6000 mg/kg of BW. Histopathological examination showed that the highest dose (6000 mg/kg of BW) showed a significant difference compared to the normal group. It concluded that β-chitin up to a dose of 6000 mg/kg of BW confirms safety as proved by the normal behaviour, body weight, and vital organ weight of the animals. However, the highest dose (6000 mg/kg of BW) might induce abnormalities in the mice's vital organs.

Keywords: β-chitin, acute toxicity, histopathology.

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PP18

FORMULATION OF LOZENGES FROM EXTRACT ETHANOL OF BLACK GARLIC (*Allium sativum* L.) WITH WET GRANULATION METHOD AS ANTIOXIDANT SUPPLEMENT

Norisca Aliza Putriana[1], Efri Mardawati[2], Yoga Windu Wardhana[1], Ismiatun[1]

[1]Department of Pharmaceutical and Formulation Technology, Faculty of Pharmacy, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
[2]Faculty of Agricultural Industrial Technology, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
e-mail address of corresponding author: norisca@unpad.ac.id

ABSTRACT

Free radicals are naturally produced from the body's metabolic processes, but excessive amounts of free radicals can interfere with health because it will cause oxidative stress. Therefore we need antioxidant compounds that can counteract free radicals. One of the natural sources that have the potential as antioxidant compounds is black garlic (*Allium Sativum* L.)[1]. This study aimed to obtain the best formula from the preparation of black garlic extract lozenges using the wet granulation method and to test the antioxidant activity of the extract and black garlic tablets. This research method is an experimental laboratory, namely formula optimization using the Design Expert application with a two-level factorial method. The results obtained were that the evaluation of the black garlic extract granules met the requirements with a moisture content value of 2.04%, a very good flow rate of 18.3 g/s, and good compressibility of 9%. The evaluation results of lozenges for size uniformity test met the requirements with a weight uniformity test value that met the requirements, namely 3%, hardness of 9.1 kg and disintegration time of 11.28 minutes, and desirability value of 0.922. The best formula obtained was formula 2 (F2) with a ratio of gum arabic and starch pregelatinized (3:5). The antioxidant activity of the extract was 263 g/mL and the antioxidant activity of the lozenges was 323.9 µg/mL.

Keywords: black garlic, lozenges tablets, wet granulation, antioxidant

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PP19

MEDICINAL HERBS USED IN MANAGEMENT OF MALARIA IN PAMOTAN VILLAGE COMMUNITY, KALIPUCANG DISTRICT, PANGANDARAN REGENCY, WEST JAVA PROVINCE, INDONESIA

Ami Tjitraresmi, Moelyono Moektiwardoyo, and Yasmiwar Susilawati

Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang Km 21, Jatinangor, Sumedang 45363
e-mail address of corresponding author: ami.tjitraresmi@unpad.ac.id

ABSTRACT

Malaria is a type of tropical disease caused by *Plasmodium sp*. Malaria remains a serious health problem globally, especially in tropical countries such as Indonesia[1]. Plasmodium resistance malarial drugs and even to artemisinin, which is new generation drugs recommendations from the WHO[2,3], and the spread of resistance has encouraged researchers to look for more effective antimalarial drugs especially from plants. The aim of this study was to investigate medicinal plants used to treat malaria by a society in Pamotan village, Kalipucang district, Pangandaran resident, Indonesia. The research was conducted using the Participatory Rural Appraisal (PRA) method, which is an assessment process-oriented to active community involvement, in the form of direct interview activities. Information was collected by interviewing respondents using a semi-structured questionnaire. Interviews were directed to the plants used to prevent and overcome malaria by referring to the list of questions (semi-structured questionnaire) which included the local name of the plant, the part used, and the method of preparation and administration. A total of 77 respondents were interviewed of which 43% were females and 57% males. Results indicated that thirteen species of plants belonging to eleven families were used to treat malaria by the villagers of Pamotan. The five plants that have the highest citation frequency are bitter herbs (*Andrographis paniculata* Ness.) 35.71%, papaya leaves (*Carica papaya* L.) 21.43%, cutleaf ground-cherry leaves (*Physalis angulata* L.) 21.43%, mahogany seeds (*Swietenia mahagoni* Jacq.) 19.05% and angled luffa seeds (*Luffa acutangula* L.) 16.67%. The most common preparation method is decoction and the route of administration is oral. The results of this study are expected to contribute to the recording of empirical knowledge about medicinal plants as a malarial drug by people in malaria endemic areas, but scientific validation is still needed on the antimalarial activity of these plants.

Keywords: Ethnopharmacology, Pamotan village, antimalarial herbs

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PP20

COMPARISON OF THREE EXTRACTION METHODS OF ALLOPURINOL IN URIC ACID HERBAL MEDICINE WITH HIGH PERFORMANCE LIQUID CHROMATOGRAPHY QUANTIFICATION

Rimadani Pratiwi, Raspati Dewi Mulyaningsih, Nyi Mekar Saptarini

Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Indonesia
Jl. Raya Bandung – Sumedang KM. 21 Sumedang, 45363
e-mail address of corresponding author: rimadani.pratiwi@unpad

ABSTRACT

Herbal medicine (Indonesia: *jamu*) is a traditional product that has been widely consumed by Indonesians. According to Public Warning issued by Food and Drug Administration in Indonesia, a number of herbal products were proven to contain synthetic medicinal chemicals that can harm consumers, one of which is allopurinol[1]. Several methods have succeeded in extracting allopurinol from herbal medicine for analytical purposes, including dissolving-filtering method[2], liquid-liquid extraction[3], and solid-phase extraction with mixed-mode cation exchanger (SPE-MCX)[4]. The study was aimed to understand and determine the effectiveness of allopurinol extraction in herbal medicine from the three methods based on parameter of accuracy and precision. The dissolution-filtering method was carried out with NaOH and HCl solvents, liquid-liquid extraction using methanol, HCl, and ethyl acetate, and SPE-MCX using NH4OH elution solvent. The results showed that extraction effectiveness based on accuracy level, was the dissolving-filtering method > SPE-MCX > liquid-liquid extraction with % recovery ± SD of 91.314±2.903%, 87.533±4.950%, and 54.549±3.517%, respectively. The precision level was the dissolution-filtering method > SPE-MCX > liquid-liquid extraction based on % relative standard deviations (RSD) of 3.18%, 5.226%, and 6.446%, respectively. It can be concluded that allopurinol extraction method with the highest effectiveness based on accuracy and precision parameters in herbal medicine is the dissolving-filtering method.

Keywords: allopurinol, herbal medicine, extraction

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PP21

REVIEW: APPLICATION OF MAGNETIC SOLID-PHASE EXTRACTION (MSPE) IN VARIOUS TYPES OF SAMPLES

Ike Susanti, 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

Solid-phase extraction (SPE) is one of the extraction methods often used in the separation process. However, SPE has weaknesses due to adsorbent packings, such as blockage of the sorbent and high pressure. Therefore, magnetic solid-phase extraction (MSPE) was developed to overcome these drawbacks[1]. MSPE uses a sorbent that has a magnetic nanoparticle (magnetic part) and facilitates the isolation of the analyte from the sample solution under a magnetic field. In general, the MSPE method consists of extraction, separation using an external magnet, desorption, separation[2]. This review aims to inform about the magnetic nanoparticle functionalization and an application of solid magnetic phase extraction to separate analytes in various types of samples. This review was conducted by analysing several articles obtained through search engines, such as ScienceDirect, Google Scholar and PubMed using the keyword "magnetic phase extraction", "magnetic nanoparticle". The magnetic nanoparticle can be functionalized with organic, inorganic, and metal-organic framework compounds to obtain good selectivity and extraction capability[3-5]. The MSPE can be used in various samples such as biological, food, and environmental samples resulting in high enrichment factor value and good recovery[4-7].

Keyword: Adsorbent, magnetic nanoparticle, magnetic solid-phase extraction

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PP22

DEVELOPMENT OF PAPER-BASED ANALYTICAL DEVICE FOR DETECTING DIAZEPAM IN URINE

Rimadani Pratiwi, Nisa Amalia, Aliya Nur Hasanah

Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Indonesia
Jl. Raya Bandung – Sumedang KM. 21 Sumedang, 45363
e-mail address of corresponding author: rimadani.pratiwi@unpad.ac.id

ABSTRACT

Drug abuse is a serious issue in Indonesia[1] that can lead to addiction[2]. Diazepam is one of the drugs that has a potential to cause addiction[3]. An onsite analysis is needed as a screening method to assure diazepam abuse. The aim of this study was to develop Paper-based Analytical Devices (PADs) with colorimetric method for detecting diazepam in urine. PADs are made from Whatman Chromatography Paper No. 1 with wax printing method. Four colorimetric reagents (Zimmermann, hydrochloric acid, Marquis, and Vitalin-Morin) were tested with diazepam standard, and Zimmermann gave the best result. Out of the four reagents, Zimmermann gave the most obvious color change from colorless to purple-red color. The Zimmermann reagent was added to the PAD and then a urine sample with spiked diazepam was added. The intensity of developed color was measured by ImageJ for semiquantitative analysis. The result of the study shows that PAD is selective to the diazepam when tested with hydromorphone and codeine. PAD has great sensitivity with a cut-off concentration based on visual detection at 100 ppm. PAD can detect diazepam spiked in urine with the highest recovery percent at 92.8% ± 4,6. It can be concluded that PAD is quite selective and sensitive to detect diazepam in urine and can be done easily and fast for onsite analysis.

Keywords: Paper-based Analytical Devices, Diazepam, Colorimetric, Detection Method

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PP23

ANTIFUNGAL ACTIVITY OF FERMENTED JACKFRUIT *(Artocarpus heterophyllus* LAM) SEED BY-PRODUCT AGAINST FOODBORNE FUNGI

Sri Agung Fitri Kusuma[1]*, Yulia Wardati[2], Yati Hayati[2]

[1]Department of Biology Pharmacy, Faculty of Pharmacy, Padjadjaran University, Jl. Raya Bandung-Sumedang KM 21 Jatinangor, Sumedang 45363
[2]Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Al-Ghifari University, Bandung, West Java, Indonesia.
e-mail address of corresponding author**:** s.a.f.kusuma@unpad.ac.id

ABSTRACT

Jackfruit seeds showed antimicrobial activity, which inhibits foodborne pathogens due to the content of aromatic compounds and sulfur and its derivatives, which are responsible for its antimicrobial action.[1,2] The present study was purposed to determine the concentration of total alcohol produced and to assess the antifungal activity of fermentation by-product of Jackfruit *(Artocarpus heterophyllus* Lam) seed against foodborne fungi. The foodborne fungal was isolated from spoiled rice and re-cultured onto the sabouraud dextrose agar (SDA) medium. After the pasteurization process, Jackfruit seeds were fermented by *Saccharomyces cerevisiae* for 3 d and the resulting product was evaluated for its ethanol production using the titration method and the antifungal activity against foodborne fungal using the agar diffusion method. The fermentation process of jackfruit seed by *S. cerevisiae* produced 8.43 % ethanol. The antifungal activity of the fermented product exhibited inhibition activity at the minimum concentration of 60 % w/v. The antifungal potent of fermented jackfruit was not very potential to be developed as a food preservative.

Keywords: Jackfruit, seed, *Artocarpus heterophyllus* Lam, fermentation, *Saccharomyces cerevisiae*, spoiled rice.

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PP24

SYNTHESIS AND CHARACTERIZATION OF MIP (Molecularly Imprinted Polymers) OF THEOPHYLLINE WITH MONOMER METHACRYLATE ACID AND POROGEN CHLOROFORM-METHANOL

Shendi Suryana, Dang soni, Nurhany

Pharmacy Department, Faculty of Mathematics and Natural Sciences, Universitas Garut,
Jl. Jati No.42B, Tarogong, Garut, 44151, Indonesia
e-mail address of corresponding author: shendi@uniga.ac.id

ABSTRACT

Theophylline is a bronchodilator drug that has a narrow therapeutic index, which ranges from 10-20 mg/L blood[1]. Theophylline separation efficiency is required for monitoring drug levels in the blood to ensure the effectiveness of the drug[2]. Solid Phase Extraction (SPE) is widely used as sample preparation method because of its shorter processing time[3]. SPE has a weakness in terms of selectivity[4]. The Molecularly Imprinted Polymer (MIP) technique can increase the selectivity of conventional SPE[5]. This research aims to determine synthesis MIP, template extraction, physical characteristic of MIP with FTIR, evaluation of ability and adsorption capacity, and selectivity determination. In this research, synthesis of MIP theophylline began with methacrylate acid as a functional monomer in chloroform-methanol as a porogen by the bulk polymerization method. The results showed that MIP has a good adsorption capability in chloroform-methanol with % adsorption MIP 73,356% and NIP 8,432%, MIP affinity 0,3330 mg/g. MIP theophylline provides good selectivity with IF values of 3,9403. Physical characterization with FTIR showed that polymerization was completed and produced hydrogen bonds by providing lower and wider frequency absorption. The character of analytical performance and physical character obtained from this study showed that the MIP synthesized with the composition can be used for the extraction of theophylline from urine and blood serum samples.

Keywords: Methacrylate Acid, Molecularly Imprinted Polymers, Theophylline

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PP25

FILM PATCH WATER SOLUBLE CHITOSAN CONTAINING LIPOSOME-COATED HUMAN EPIDERMAL GROWTH FACTOR FOR WOUND HEALING

Ameilia, Abd. Kakhar Umar, Sriwidodo*

Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy, Universitas Padjadjaran, Indonesia.
e-mail address of corresponding author: sriwidodo@unpad.ac.id

ABSTRACT

In the wound healing process, human Epidermal Growth Factor (hEGF) can stimulate fibroblast cell proliferation to increase collagen levels and accelerates the wound healing process[1]. However, hEGF has low *in vivo* stability due to rapid clearance by endocytosis mediated receptor or protease degradation, so it requires a coating system such as liposome nanocarriers to prevent the recognition of enzymes[2]. Besides, a controlled release system can also provide a continuous optimal dose of hEGF for effective wound healing. This system can be achieved by using chitosan as the film patch matrix[3]. Therefore, this study aimed to formulate film patch water soluble chitosan containing liposome-coated hEGF and evaluate its physicochemical characteristics and effectiveness in healing mice wound. Liposome coating was achieved using thin film hydration method and film patch of water soluble chitosan was made using isonic gelation method. The charaterization test showed that film patch water soluble chitosan has a good characteristics with a weight uniformity of 0.3336 ± 0.0263 g, thickness uniformity of 0.0211 ± 0.0038 cm, drying shrink of 7.4314 ± 0.430 %, and moisture of 6.3473 ± 0.1243 %. Based on the *in vivo* test, the hEGF dose of 100 µL has the optimal wound healing activity with a complete wound closure that occured on day 10th. Histopathology test showed that film patch of liposome-coated hEGF induced excellent epithelization, fibroblast proliferation, and collagenization. Based on the findings, it can be concluded that film patch water soluble chitosan and liposome coating system can be used to deliver hEGF and increase its effectiveness in wound healing by preventing enzymatic recognition and controlled release.

Keywords: Human Epidermal Growth Factor (hEGF), chitosan, Film Patch

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PP26

THE INVERSE CORRELATION BETWEEN FECAL PROPIONATE AND SERUM ADMA IN TYPE 2 DIABETIC PATIENTS

Rina Triana[1,2], Indriyanti Rafi Sukmawati[1,2], Mas Rizky A.A Syamsunarno[3] , Keri Lestari[1,2]

[1]Faculty of Pharmacy, Universitas Padjadjaran, Jl. Eijkman No.38, Bandung, Indonesia
[2]Prodia Clinical Laboratories, Jl. Kramat Raya No.150, Jakarta, Indonesia
[3]Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Jl. Eijkman No.38, Bandung, Indonesia
e-mail address of corresponding author: rina15008@mail.unpad.ac.id

ABSTRACT

Asymmetric dimethylarginine (ADMA) is a competitive inhibitor of nitric oxide synthase, and elevated ADMA levels are associated with vascular disease in people with diabetes.[1,2] Short-chain fatty acids (SCFAs) has been reported to protect endothelial function and thus exert anti-atherosclerotic action.[3] However, the correlation of SCFAs and ADMA in diabetic patients is unknown yet. The study aimed to determine the correlation SCFA and ADMA. The study design was an observational study with cross sectional approach. Subjects were 115 men (control and diabetic patients), aged 30-50 years old, and fulfilled inclusion criteria. Serum ADMA was quantified by Liquid Chromatography–mass spectrometry (LCMS/MS). Fecal SCFAs were quantified by Gas Chromatography-MS (GCMS/MS). The serum ADMA concentration was higher in diabetic patients compared to control (71.27 ± 10.75 ng/ml; 67.56 ± 8.04; p=<0.05). Further analysis with SCFAs data showed propionate inversely correlated with ADMA (r=-0.550 and p=0.000) while other SCFAs were not correlated with serum ADMA (acetate r=-0.155, p=0.098; butirate r=-0.136, p=0.147; valerate r=0.027, p=0.779). This finding show that fecal propionate is inversely correlated with serum ADMA in type 2 diabetic patient.

Keywords: ADMA, Short-chain fatty acid, Diabetes

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PP27

MELOXICAM SELF-NANOEMULSIFYING DRUG DELIVERY SYSTEM: FORMULATION AND RELEASE KINETICS ANALYSIS

Salma Aulia[1], Lina Winarti[1*], Yudi Wicaksono[1]

[1]Department of Pharmaceutics, Faculty of Pharmacy, University of Jember, Jember, Indonesia
Jln Kalimantan No. 37 Jember 68121
e-mail address of corresponding author: lina.winarti@unej.ac.id

ABSTRACT

SNEDDS (Self-Nanoemulsifying Drug Delivery System) is a lipid-based drug delivery for increasing the solubility and dissolution rate of drugs[1]. Dissolution is a process of releasing the drug from dissolved substances into the solvents. Dissolution is closely related to absorption and bioavailability[2]. Therefore, the need for kinetics and drug release mechanisms is essential. This study aimed to find the best SNEDDS meloxicam (MLX) formula and to analyze the release kinetics of MLX SNEDDS and MLX non-SNEDDS using DDSolver. MLX SNEDDS was prepared using sunflower seed oil as an oil, Cremophor RH 40 as a surfactant, and PEG 400 as a co-surfactant. The best formula obtained subjected to the in vitro dissolution study analyzed using DDSolver. The study shows one selected formula consists of 10% sunflower seed oil, 70% Cremophor RH 40, and 20% PEG 400 with a 20.5 ± 12 nm droplet size. The dissolution study showed that SNEDDS could significantly increase the MLX release compared to the non-SNEDDS formulation. The kinetics of MLX release from SNEDDS formulations follow the Weibull release model ($\beta = 1.00$). This study concluded that SNEDDS best prepared in sunflower seeds oil: Chremophor RH 40: PEG 400 ratio of 1: 7: 2 and has the potency to increase the solubility and dissolution of MLX.

Keywords: MLX, SNEDDS, the release kinetics, DDsolver.

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PP28

EFFECTIVENESS OF INTEGRATED PROTEIN PURIFICATION SYSTEM FOR QUANTITATIVE PROTEOMICS APPLICATION

Siska Darmayanti[1,2] , Ronny Lesmana[3,4] , Anna Meiliana[1,2], Rizky Abdulah[1,4]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM 21, Jatinangor, Indonesia
[2]Prodia Clinical Laboratory, Jl. Kramat Raya No. 150, Jakarta, Indonesia
[3]Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Jatinangor, Indonesia
[4]Center of Excellence in Higher Education for Pharmaceutical Care Innovation, Universitas Padjadjaran, Jatinangor, Indonesia.
e-mail address of corresponding Author: siska.darmayanti@gmail.com

ABSTRACT

Clinical proteomics aim is to characterize the protein profiles of a plethora of diseases to be able to find specific biomarkers that are valuable for prediction, early diagnosis, and represent key molecules suitable for elucidating pathogenic mechanisms[1,2,3]. Blood or urine samples are sources of clinical proteomics, but due to their high complexity, they must be extracted, where direct analysis is unachievable[1,4]. Protein purification is traditionally a long process with many steps that use many devices, often resulting in protein degradation and loss, and is time-consuming[1]. The aim of this study was to test a new protocol for protein purification with an integrated system. This integrated protein purification system uses the Amicon Pro Purification System with the Amicon Ultra-0.5 Device filter 3kDa. This device combines affinity-based spin column purification with downstream sample concentration and buffer exchange. Featuring a large reservoir that accommodates various sample volumes, this device reduces the need for multiple centrifugation steps. The result obtained after this process is pure protein in the range (0.5-20 g/µl) with a correlation coefficient of 0.99 to the standard curve. In addition to saving more time, this system is able to purify proteins below 10KDa which cannot be done by the gel electrophoresis method. The conclusion in this study is that the use of this system in a new effective procedure for protein purification is faster and easier.

Keywords: protein, purification, proteomics

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BEYOND USE DATE DRY SYRUP PREPARATION AZITROMISIN AGAINST BACTERIA *Staphylococcus aureus* AND *Escherichia coli*

Ahmad Sodikin, Ilham Alifiar, Yedi Purwandi

Bakti Tunas Husada School of Health Sciences, JL. Cilolohan No.36. Village. Kahuripan, District. Tawang, Postal Code 346113, Tasikmalaya City, Indonesia
e-mail address of corresponding author: sodikinahmad@gmail.com

ABSTRACT

Giving information about drug storage or time limits for usage must be maintained, so that the stability and effectiveness of the drug is maintained. But in reality, most people don't know about "Beyond Use Date". Beyond Use Date is the time limit for using the drug after the drug is mixed or opened from its primary packaging. In addition, information of the "Beyond Use Date" is not always included in the container or secondary packaging of the drug[1]. The purpose of this research was to know the effectiveness and effect of reconstitution time on the effectiveness of azithromycin dry syrup preparations. In this research, the effectiveness of azithromycin dry syrup was tested by the well's method about *Staphylococcus aureus* and *Escherichia coli* bacteria with various concentrations of 40, 20, 10, 5 mg and time intervals of 1, 7, 14, 21, 28, 58, and 88 days. The results of the effectiveness research were evidenced by the presence of a clear zone formed and then statistical analysis was carried out which showed the good effectiveness of azithromycin dry syrup preparations against *Escherichia coli* and *Staphylococcus aureus* bacteria on day 1 and day 7. And the time of reconstitution affects the effectiveness of azithromycin dry syrup preparations marked by a decreasing value or clear zone starting from days 14 to 88. Based on that, the use of azithromycin antibiotics should not be more than 7 days.

Keywords: Beyond use date, azithromycin, effectiveness

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PP30

PRELIMINARY STUDY OF TMEPAI (TRANSMEMBRANE PROSTATE ANDROGEN-INDUCED) PROTEIN STRUCTURE MODELLING ISOFORM A, B, C1, C2, AND D USING I-TASSER, RAPTOR X, AND ROBETTA SERVERS

Shidqi Fajri Romadhon[1]*, Bagas Adi Prasetya Nugraha[1], Imam Adi Wicaksono[2], Riezki Amalia[2]

[1] Undergraduate Program, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang, West Java 45363, Indonesia
[2] Department of Pharmacology and Clinical Pharmacy, Universitas Padjadjaran, Sumedang, West Java 45363, Indonesia
e-mail address of corresponding author : shidqi17002@unpad.ac.id

ABSTRACT

Cancer is a group of diseases characterized by uncontrolled cell growth in body tissues and mutations and changes in biochemical structure[1]. One of the proteins that have been widely studied for its mechanism and role as a target for cancer therapy is the TMEPAI protein (Transmembrane Prostate Androgen-Induced protein). TMEPAI is a type 1b transmembrane protein consisting of 287 amino acids and is highly expressed in several types of cancer, such as lung, breast, colon, pancreatic, and renal cancers[2]. However, the structure of the TMEPAI protein is still unknown. The structure or prediction of the structure of TMEPAI can provide information and understanding about the characterization, mechanism, and interaction of TMEPAI with other proteins. One method that can be used to predict protein structure is a computational approach[3]. In this study, a preliminary study of protein structure modeling of TMEPAI isoforms A, B, C, and D was conducted using the online server I-Tasser, RaptorX, and Robetta. The prediction results showed that the Robetta server gives good results based on the Ramachandran Plot validation value for Isoform A and isoform B. The prediction with Robetta server also showed good results in QMEAN server for Isoform A, isoform B, isoform C, and isoform D. And the prediction with Raptor X server showed good results in ProSA server for isoform C and isoform D.

Keywords: TMEPAI, Structure Prediction, I-Tasser, RaptorX, Robetta

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PP31

OPTIMIZATION OF STIRRING SPEED AND STIRRING TIME IN THE PREPARATION OF DILTIAZEM HYDROCHLORIDE NANOPARTICLES

Lina Winarti, Lusia Oktora Ruma Kumalasari, Eka Deddy Irawan, Dwi Nurahmanto, Viddy Aguatian Rosyidi, Kuni Zuaimah Barikah, Lidya Ameliana, Regita Ardhia Ayu Anjarani

Department of Pharmaceutics, Faculty of Pharmacy, University of Jember, Jember, Indonesia
Jln Kalimantan No. 37 Jember 68121
e-mail address of corresponding author: lina.winarti@unej.ac.id

ABSTRACT

Diltiazem HCl is widely used in the treatment of hypertension, angina pectoris, and arrhythmias. The drug has a short half-life (3-4 hours) and undergoes a first-pass metabolism with oral bioavailability of 40%[1]. To solve these problems nanoparticle formulation was used. The purpose of this study was to determine the optimum formula of nanoparticles and to evaluate their release kinetics. The method used to prepare the nanoparticles is an ionic gelation. The results showed that the optimum formula stirring speed was 1200 rpm and the stirring time was 2 hours. The entrapment efficiency was 71.10%, the particle size was 110.2 nm, and the polydispersity index was 0.268. The optimum formula of diltiazem HCl nanoparticles in the powder form has a drug loading of 66.14±1.71% and a yield of 34.07±0.73%. The FT-IR analysis showed no interaction between diltiazem HCl with chitosan and TPP during preparation, while the SEM analysis showed particle size of 150 μm, spherical shape, and rough surface morphology. This study concluded that the speed and stirring time could influence the entrapment efficiency, the particle size, and the polydispersity index, while the dissolution study showed that the kinetics of diltiazem HCl release from nanoparticles formulations follow the Korsmesyer Peppas.

Keywords: Diltiazem hydrochloride, ionic gelation, nanoparticles, optimization

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PP32

FORMULATION AND EVALUATION OF PEEL-OFF GEL FACIAL MASK FROM ARABICA COFFEE FRUIT PEEL EXTRACT *(Coffea arabica* L.*)*

Yenni Puspita Tanjung, Andi Ika Julianti, Irni Isnayanti

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

ABSTRACT

Arabica coffee rind waste *(Coffea arabica* L.*)* is waste from processing Arabica coffee cherries which has not been utilized optimally. The rind waste of Arabica coffee contains polyphenols which are secondary metabolites that function as antioxidants.[1] This study aimed to obtain a peel-off gel facial mask preparation from Arabica coffee fruit peel extract that meets the requirements and to determine the antioxidant activity of Arabica coffee fruit peel extract and peel-off gel facial mask preparation from coffee fruit peel extract. In this study, three formulations of *peel-off* gel facial mask were made with 3 variations in the concentration of coffee fruit peel extract, namely F1 (1%), F2 (2%), and F3 (3%). Furthermore, the preparation was evaluated for 28 days of storage at room temperature (15 -30 ° C) and cold temperature (8 ° C) which included organoleptic, pH, dispersibility, homogeneity, viscosity, dry time, and antioxidant activity tests. The results of the evaluation showed that F1, F2, and F3 met the requirements which included organoleptic, pH, dispersibility, homogeneity, viscosity, and dry time. The antioxidant activity of the coffee fruit peel extract was very strong (IC_{50} 17.36 µg/mL). The antioxidant activity in the peel-off gel facial mask sample of formula F1 (IC_{50} 75.63 µg/mL) and formula F2 (IC_{50} 50.71 µg/mL) was strong, and for formula F3 was very strong (IC_{50} 21.44 µg/mL). The conclusion is that the best peel off gel facial mask formula is F3 which meets the requirements for the evaluation and has very strong antioxidant activity.

Keywords: Arabica coffee fruit peel extract (*Coffea arabica* L.), peel-off gel facial mask , antioxidant, DPPH.

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PP33

MOLECULAR DOCKING AND ADMET PREDICTION OF MODIFIED JPH203 AS A POTENTIAL RADIOPHARMACEUTICAL KIT FOR MOLECULAR IMAGING OF CANCER

Holis Abdul Holik[1], Faisal Maulana Ibrahim[1], Elisha Wianatalie[1], Arifudin Achmad[2], Achmad Hussein Sundawa Kartamihardja[2]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy/Universitas Padjadjaran, Sumedang- 45363, (West Java) Indonesia
[2]Department of Nuclear Medicine, Faculty of Medicine/Universitas Padjadjaran, Sumedang45363, (West Java) Indonesia
e-mail address of corresponding Author: holis@unpad.ac.id

ABSTRACT

JPH203 has been known to have anti-cancer activity by inhibiting Large Neutral Amino Acid Transporter type-1 (LAT-1) which is highly expressed in cancer cells, makes it become a valid target molecule in the development of anti-cancer drugs.[1-2] Various types of pharmacokinetic modifying linkers and chelators are combined with JPH203 to obtain the best-docked molecule for prospective radiopharmaceutical kits using molecular docking simulation and ADMET prediction of the ligands. The result of this study showed that JPH203-linker K-NOTA has the best affinity with a docking score of about -10.7 kcal/mol and shows interaction with Tyr259 which acts as the role key residue of the active site. Based on the results, JPH203-linker K-NOTA has good potential as a radiopharmaceutical kit of anti-cancer.

Keywords: JPH203, LAT-1, Molecular Docking, ADMET, In Silico.

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MOLECULAR DOCKING AND ADMET PREDICTION OF 5-BENZYLOXYTRYPTOPHAN AS A POTENTIAL RADIOPHARMACEUTICAL KIT FOR MOLECULAR IMAGING OF CANCER

Faisal Maulana Ibrahim[1], Holis Abdul Holik[1,*], Ghifari Farhan Hasibuan[1], Arifudin Achmad[2], Achmad Hussein Sundawa Kartamihardja[2]

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

ABSTRACT

Cancer is the second-highest cause of death in the world, an estimated 9.6 million people died from cancer in 2018. One of the specific molecular targets in cancer therapy is the L-type amino transporter 1(LAT1) which is overexpressed in cancer cells but slightly in normal cells. LAT1 has become a valid target molecule in the development of cancer theranostic compounds. LAT1 function is to provide nutrition to cancer cells to proliferate massively, so that the inhibition of LAT1 can be used as an alternative cancer therapy.[1-2] Several researches have shown that prominent inhibitor of LAT1 is 2-Amino-2-norbornanecarboxylic acid (BCH). A Study in 2018 stated that 5-benzyloxytryptophan (5-BOTP) is four times more potent than BCH, this result showed that 5-BOTP has a potential to be a radiopharmaceutical carrier. This in-silico study aims to determine the inhibition effectiveness of 5-BOTP with various bifunctional chelating agents (BFCA); NOTA, DOTA, TETA, CTPA, H2CB-DO2A, H2CBTE2A against the antiporter site of the LAT1. The research method consisted of the binding mode of 5-BOTP and its derivatives with LAT1, the docking score, the analysis of preADMET, and the overview of Ro5 compatibility. The results showed that 5-BOTP-NOTA and 5-BOTP-DOTA had interactions with the gating residue (Phe252, Trp257, Asn258, and Tyr259) on the antiporter site of LAT1. 5-BOTP-NOTA and 5-BOTP-DOTA affinity are around -11.50 and -9.14 kcal/mol, respectively. Based on this study, 5-BOTP-NOTA and 5-BOTP-DOTA are the new compouns that have the potential as a theranostic agent of cancer by inhibiting LAT1.

Keywords: 5-Benzyloxytryptophan, ADMET, bifunctional chelating agents, LAT1, molecular docking.

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PP35

MOLECULAR DYNAMIC SIMULATION OF ACRYLAMIDE AS MONOMER FOR ALPHA MANGOSTIN MOLECULAR IMPRINTED POLYMER

Winasih Rachmawati[1,2], Muchtaridi[1], Aliya Nur Hasanah[1] and Fauzan Zein Muttaqin[2]

[1]Faculty of Pharmacy, Universitas Padjadjaran, Jl. Raya Bandung Sumedang KM.21, Sumedang, Indonesia-45363
[2] Faculty of Pharmacy, Universitas Bhakti Kencana, Jl. Soekarno Hatta 754, Bandung, Indonesia-40614
e-mail address of corresponding author: winasih12@gmail.com

ABSTRACT

Alpha mangostin is a biologically active compound from *Garcinia mangostana* pericarp[1]. An extraction method is carried out to obtain this compound. Selectivity was needed in the extraction process in the separation of alpha mangostin from complex matrices. Molecular Imprinted Polymer (MIP) has a selective adsorption approach, where alpha mangostin fits the MIP physically and chemically. Computational design is an alternative approach to the preparation of molecularly imprinted materials[2]. This study aimed to simulate the affinity of selective MIP able to specifically bind the alpha mangostin as a template molecule with acrylamide as a monomer(s) in polymerization solvents. We have performed a series of molecular dynamics (MD) simulations of different mixtures to understand the mechanisms occurring during the process of molecularly imprinted polymers[3]. The simulations were performed using the AMBER 18. The radial distribution function (RDF) analysis was used to evaluate the affinity of the alpha mangostin as the template in the MIP[4,5]. The results showed the affinity of alpha mangosteen and acrylamide in the MIP system was stable during the molecular imprinting process. This study investigates the relationship between MIP and selective binding of alpha mangosteen through hydrogen bonding acrylamide monomers in the system.

Keywords: alpha mangostin, acrylamide, molecular imprinted, molecular dynamic, RDF

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PP36

VIABILITY ASSAY OF CISPLATIN COMBINATION WITH POLYETHYLENEIMINE (PEI) MW 600.000, MW 750.000, AND PEI-g-PEG IN TRIPLE-NEGATIVE BREAST CANCER MDA-MB-231 CELL LINE

Riezki Amalia[1,2], Alistia Ilmiah Fahira[3], Amilia Shafa[3], Rizky Abdulah[1,2]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran
[2]Center of Excellence in Higher education for Pharmaceutical Care Innovation, Universitas Padjadjaran
[3]Bachelor Program in Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran
e-mail address of corresponding author: riezki.amalia@unpad.ac.id

ABSTRACT

Breast cancer is the most frequently diagnosed cancer in women worldwide and is a heterogeneous disease with different histopathological, molecular, and clinical characteristics that require different therapeutic strategies for effective treatments. The first-line treatment of surgery in combination with radiation and pharmacotherapy (e.g. hormonal therapy and/or chemotherapy) has limited success in the triple-negative breast cancer (TNBC) subtype, an aggressive, easily metastasized subtype with a unique receptor profile[1,2]. Therefore, combining the chemotherapy agent with other compounds or drug carrier development may increase the effectiveness of TNBC therapy[3]. Recently, our group developed a co-delivery system for TNBC chemotherapy and a gene silencing system using polyethylenimine (PEI), a cationic polymer usually used as a transfection reagent. Therefore, the aim of this study was to preliminary examine the viability of PEI in combination with cisplatin in the TNBC cell line. As results, the ratio of cisplatin/PEI MW 600,000, cisplatin/PEI MW 750,000, and cisplatin/PEI-g PEG with the lowest number of viable cells was 30:40 (1.46% ± 0.15), 20:50 (12,41% ± 2,37%), and 20:500 (4,07% ± 2,71), with significantly different to single treatment of cisplatin ($p < 0.05$). These results indicated that combination cisplatin with PEI MW 600.000, 7500.000, and PEI-g-PEI decreases the viable number of the MDA-MB-231 cell.

Keywords: breast cancer, TNBC, cisplatin, PEI, MDA-MB-231

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PP37

FORMULATION AND EVALUATION OF MICROEMULSION AND EMULGEL ITRACONAZOLE AS ANTIFUNGAL INFECTIONS

Ade Yeni Aprillia, Lusi Nurdianti, Fajar Setiawan

Pharmacy Department, STIKes Bakti Tunas Husada, Jl. Cilolohan 36 Tasikmalaya, West Java, Indonesia
Cilolohan Street No. 36, Tasikmalaya,4611
e-mail address of corresponding author: yeni06aprillia.@gmail.com

ABSTRACT

Itraconazole is a triazole derivative systemic antifungal that is closely related to ketoconazole[2]. Itraconazole has had a broad spectrum of antifungal activity[2]. It is having certain oral side effects like nausea, vomiting, dizziness, leg edema, and loss of libido[3]. Itraconazole is a relatively well-permeable drug, and it has low solubility and a low dissolution rate, which are limiting factors for its absorption rate (class II)[3]. This will be a problem and one solution is to make itraconazole emulgel from itraconazole microemulsion with a particle size of 10-200 nm[1]. The objective of the study was to prepare and develop a gel preparation containing itraconazole microemulsion as an antifungal[1]. The results of optimal characterization of itraconazole microemulsion will be developed in the form of an emulgel preparation[1]. Formulations of Itraconazole emulgel were prepared using tree formulas with different concentrations of Itraconazole as antifungal 10 – 20%. The prepared formulations were evaluated for their physical appearance, stability, skin irritation study, and antifungal activity using *Candida albicans*[4]. All the prepared emulgel showed acceptable physical properties concerning color, homogeneity, rheology, and pH value during a storage time of 28 days[4]. The dispersion test showed semi-stiff type results in the range of 3-5 cm. while the centrifugation test showed that the emulgel preparation was centrifuged at a speed of 5000 rpm for 20 minutes, indicating that for all formulas there was no separation. A skin irritation study was performed and shows no skin irritation effect on rat skin[2]. The antifungal activity showed all formulations of itraconazole emulgel preparations have greater antifungal activity compared to the positive standard[4]. It can be concluded that all itraconazole emulgel formulations have antifungal activity.

Keywords: Emulgel, Antifungal, Itraconazole, *Candida albicans* Microemulsion

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PP38

ASSOCIATION BETWEEN USUAL VITAMIN K INTAKE AND ANTICOAGULATION IN PATIENTS WARFARIN THERAPY

Norisca Aliza Putriana[1], Taofik Rusdiana[1], Tina Rostinawati[2], Mohammad Rizki Akbar[3], Dika Pramita Destiani[4], Syifa Salsabila[1]

[1]Department of Pharmaceutical and Formulation 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, Indonesia3
[3] Department of Cardiovascular, Faculty of Medicine, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
[4]Department of Pharmacology and Clinical Pharmacy, Faculty of Medicine, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
e-mail address of corresponding author: norisca@unpad.ac.id

ABSTRACT

Oral anticoagulants have been used for more than 50 years to prevent thromboembolism in several cardiovascular conditions. One type of oral anticoagulant is a vitamin K antagonist (VKA). Warfarin is one of the most widely used VKA anticoagulants worldwide. Warfarin produces an anticoagulant effect by inhibiting the regeneration of vitamin K hydroquinone from vitamin K epoxide and reductase enzymes in the vitamin K cycle[1]. Vitamin K is one of the fat-soluble vitamins sourced from dark green vegetables, spices and vegetable oils[2]. The purpose of this study was to determine the relationship between vitamin K intake from food and prothrombin time-international normalized ratio (PT-INR) values in patients treated with warfarin. The study was conducted from March to early June 2021 at Hasan Sadikin Hospital. The method in this study is Cross-sectional with observational data collection using an observation sheet for vitamin K intake. Based on the results, the number of patients who met the inclusion criteria was 76 patients. Vitamin K intake was divided into 3 groups with low category (<126.5 g/day) of 26 patients (34.2%), moderate category (126.5 g/day – 195.7 g/day) of 17 patients (22.4%) and high category (>195.7 g/day) of 33 patients (43.4%). PT-INR values were grouped into 3 categories consisting of low category (<2.0) of 29 patients (38.1%), normal category (2.0-3.0) of 36 patients (47.4%) and high category (> 3.0) of 11 patients (14.5%). The results of statistical analysis of the significant value in the Chi-square test between vitamin K intake and PT-INR was 0.768 where the significance value was greater than 0.05. In the linear regression test conducted between independent variables such as gender, age, BMI, warfarin indication, warfarin dose, drug interactions, and comorbidities on PT-INR, the significant variable was the drug interaction simvastatin with a p-value of 0.020 where simvastatin can affect PT-INR. The conclusion of this study was that vitamin K intake is not significantly correlated to PT-INR.

Keywords: Warfarin, vitamin K intake, PT-INR

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EVALUATION OF ADVERSE DRUG REACTION IN PATIENTS WARFARIN THERAPY

Norisca Aliza Putriana[1], Taofik Rusdiana[1], Tina Rostinawati[2], Mohammad Rizki Akbar[3], Dika Pramita Destiani[4], Adila Resca Harda[4]

[1]Department of Pharmaceutical and Formulation 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
[4] Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jalan Raya Bandung-Sumedang KM 21, Jatinangor 45363, Indonesia
e-mail address of corresponding author: norisca@unpad.ac.id

ABSTRACT

Warfarin is a class of anticoagulants that have been used widely to inhibit several blood clotting factors. The main problem with the use of warfarin is the high variation in response between individuals which then results in many cases of Adverse Drug Reaction (ADR) which have emerged as the main cause of morbidity and mortality[1,2]. This research aimed to know the ADR in heart disease outpatients who received warfarin at Bandung city hospital. The research was conducted with a Cross-sectional design with observational data collection that included 74 patients who met the inclusion criteria. The causality assessment was done by the Naranjo Algorithm and the incidence of bleeding was classified according to Bleedscore. The result showed that ADR occurred were nausea, dizziness, stomach ache, ecchymosis, petechiae, bleeding when brushing teeth, bleeding in the mouth, melena, nosebleed, and bleeding in the genitals. INR (International Normalized Ratio) value was the most significant factor in the incidence of ADR ($p = 0.001$) OR (95% CI) 6.445 (2.120–19.594), patients with an INR value not achieved at risk of 6.4 higher than patients with an achieved INR value. In addition, other factors related to the incidence of ADR were comorbidities with a p-value of 0.037. The most bleeding events that occurred based on the Bleedscore™ classification were superficial bleeding (63%) in 27 patients, internal bleeding (47%) in 20 patients and no alarming bleeding events.

Keywords: Adverse Drug Reaction (ADR), Warfarin

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PP41

FORMULATION, CHARACTERIZATION, AND DETERMINATION OF THE DIFFUSION RATE STUDY OF ANTIOXIDANT SERUM CONTAINING ASTAXANTHIN NANOEMULSION

Lusi Nurdianti, Risna Clara, Hendy Suhendy, Fajar Setiawan, Keni Idacahyati

Department of Pharmacy, Bakti Tunas Husada Institute of Health Science, Tasikmalaya, Indonesia
Cilolohan Street No. 36, Tasikmalaya,46115
e-mail address of corresponding author: lusinurdianti83@gmail.com

ABSTRACT

The present study was developed to formulate and characterize the antioxidant serum containing astaxanthin nanoemulsion[1]. The diffusion rate studies using diffusion Franz method[2]. Astaxanthin nanoemulsion (As-NE) was prepared by using the self-nanoemulsifying method, followed by incorporation into serum preparation with carbomer as a gelling agent[2]. Evaluation of serum As-NE was performed by physical, mechanical characterizations and diffusion assay[3]. Stability study was carried out in both accelerated (temperature of 40±2ºC/75±5%RH) and non-accelerated (at ambient temperature) conditions[4]. Antioxidant serum As-NE had good physical and mechanical characteristics that were suitable for topical administration. For the study of diffusion and stability under different storage conditions, it was proven that antioxidant serum As-NE form was packed in a carbomer as a gelling agent that could enhance the stability and diffusion rate of the astaxanthin.

Keywords: astaxanthin, nanoemulsion, antioxidant serum, diffusion rate, stability studies

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FORMULATION AND EFFECTIVITY OF THE ANTIOXIDANT GEL PREPARATION CONTAINING ZEAXANTHIN AS ANTI AGING FOR TOPICAL ADMINISTRATION

Fajar Setiawan, Lusi Nurdianti, Neng Sri

Department of Pharmacy, Bakti Tunas Husada Institute of Health Science, Tasikmalaya, Indonesia
Cilolohan Street No. 36, Tasikmalaya,46115
e-mail address of corresponding author: fajarsetiawan@stikes-bth.ac.id

ABSTRACT

Premature aging is the process of skin aging that occurs faster than the time it should, especially in Indonesia with a tropical climate. Factors that can cause aging are divided into two types: intrinsic (age, race, genetics, hormones, and chronic disease) and extrinsic (ultraviolet light, lifestyle, and free radicals)[1]. These free radicals are one of the factors that cause aging that can be prevented by the presence of antioxidants[2]. One of the substances that has the potential as an antioxidant is zeaxanthin, where zeaxanthin is one of the carotenoids belonging to the xanthophyll pigment family derived from marigold flowers or gemintir flowers[3]. This study was conducted to determine the effectiveness of zeaxanthin gel as an anti-aging on the skin. This gel preparation was made using zeaxanthin as the active substance with concentrations of 5%, 7.5%, and 10%. The tests carried out were organoleptic test, homogeneity test, pH, spreadability, viscosity for 1 month, irritation test, and cycling test. Test the effectiveness of zeaxanthin gel preparations on the backhand of volunteers who were divided into 4 groups where each group consisted of 5 volunteers with different concentrations of zeaxanthin, and 1 test group without zeaxanthin. The test was carried out for 28 days. All gel preparations obtained were homogeneous. The pH was in the 5-6 range, the dispersion test was in the 5-7 cm range, the viscosity test was in the 2000-40000 cPs range, did not irritate the skin, and only formulas 2 and 3 were stable in the cycling test for 6 cycles. The results of testing the effectiveness of zeaxanthin gel preparations on the backhand of volunteers' hands showed an increase in humidity with an average increase of 33.17%±11.67 and a decrease in wrinkles with an average decrease of 47.46%±7.15.

Keywords: zeaxanthin, Anti-aging, gel

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PP43

ANTIHYPERLIPIDEMIC EFFECT OF THE ETHANOL EXTRACT FRACTION FROM MULBERRY *(Morus australis* Poir.) LEAVES ON RATS INDUCED HIGH FAT-DIET AND PTU

Priska Ernestina Tenda[1], **Eleonora Maryeta Toyo**[2]

[1]Pharmacy Study Program, Health Polytechnic of Ministry of Health in Kupang, Jl. Piet A. Tallo, Liliba, Kupang-East Nusa Tenggara, Indonesia, 85111
[2]Nusaputera College of Pharmacy, Jl.Lamongan Raya No.11, Semarang, Central Java, Indonesia, 50162
*e-mail address of corresponding author: priskafarmasikupang@gmail.com

ABSTRACT

Ethanol extract of mulberry leaves has been known to inhibit the formation of aortic wall foam cells[1]. This study investigated the effects of the ethanol extract fraction (*n*-hexane, ethyl acetate, and water) from mulberry *(Morus australis* Poir.) reduce trigliserida and total cholesterol level on rats induced high fat-diet fed and PTU. This study also identified the active compounds in mulberry leaves as antihyperlipidemic with thin layer chromatography (TLC). Leaves of mulberry *(Morus australis* Poir.) were extracted with ethanol and fractionated with n-hexane, ethyl acetate, and water. Further, the active compound of the extract and fraction was identified using thin layer chromatography. The antihyperlipidemic effects of the extract and fractions of leaves mulberry *(Morus australis* Poir.) were studied in high-fat diet (HFD) and PTU induced obese rats. Triglycerida rates were measured using GPO-PAP method and CHOD-PAP method for total cholesterol[2]. This study used 40 male wistar rats. One group was given the normal diet and seven groups were given rats high fat diet and PTU for a month. Treatment given for 14 days. Group I as normal control given Confeed PAR-S, diet group II as negative control given HFD and CMC Na 0.5%, group III as positive control given HFD and simvastatin 0,9 mg/kg bw, group IV as positive control given HFD and gemfibrozil 0,9 mg/Kg BW, group V given HFD and ethanol extract of mulberry leaf with a dose 500 mg/kg BW, group VI given HFD and 60 mg/kg BW dose of n-hexane fraction, group VII given HFD and ethyl acetate fraction dose 40 mg/kg BW, and group VIII given HFD and fraction of water dose 400 mg/kg BW. All rats were measured triglyceride and cholesterol rate from day 0^{th}, 28^{th}, 35^{th}, and 42^{th}. Identification by TLC showed that mulberry leaves contain flavonoids, alkaloids and polyphenols that act as antihyperlipidemic[3]. At the 42^{th} day, ethyl acetate fraction most significant reduction in triglyceride level in the leaves mulberry *(Morus australis* Poir.) treated as compared to the rats fed with high-fat diet and PTU at the 0^{th} day were: triglyceride 104,89 ± 2,70 mg/dL vs 64,76 ± 1,97 mg/dL, total cholesterol 96,70 ± 2,45 vs 88,02 ± 1,38 mg/dL. Ethyl acetate fraction comparable to simvastatin in lowering total cholesterol. Ethyl acetate fraction of mulberry leaves *(Morus australis* Poir.) have the potency to be developed as a natural cholesterol-lowering agent.

Keyword: Antihyperlipidemic; Ethanol Extract Fraction; Mulberry *(Morus australis* Poir.) Leaves

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PP44

HYPOGLYCEMIC ACTIVITY OF ETHYL ACETATE FRACTION COMBINATION OF MORINDA FRUIT AND CINNAMON BARK USING GLUCOSE-INDUCED IN MICE

Ida Musfiroh[1], Nurfadilah Yusuf[2]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran
[2]Graduate Program of Faculty of Pharmacy, Universitas Padjadjaran
Jl. Raya Bandung – Sumedang KM. 21 Sumedang, 45363
e-mail address of corresponding author: ida.musfiroh@unpad.ac.id

ABSTRACT

Noni fruit (*Morinda citrifolia* L) and cinnamon bark (*Cinnamomum burmanni*) are plants that have many benefits, one of which is the hypoglycemic effect which is known to have a hypoglycemic effect on the ethyl acetate fraction[1]. The purpose of this study was to determine the hypoglycemic activity of the combination of ethyl acetate fraction (FEM) and cinnamon bark (FEC) in glucose-induced mice, and to determine the dose of the combination of ethyl acetate fraction of noni fruit and cinnamon which could have a hypoglycemic effect. The methods used include liquid-liquid fractionation, identification by TLC, and assay of hypoglycemic activity in mice induced by oral glucose for a moment. The results showed that the randomness of the ethyl acetate fraction of noni fruit extract and cinnamon bark was 5.25% and 8.05%. Identification of compounds by TLC showed that there were 4 spots on FEM and 3 spots on FEC. While the results of the activity test at a combined dose of FEM 175 mg/kg BW and FEC 150 mg/kg BW resulted in a decrease in blood glucose levels in the 30th, 60th, 90th and 120th minutes, was 29.57%, 44.94%, 43.40%, and 40.55%, respectively. Statistically, each group gave a significant difference in the decrease in blood glucose levels in glucose-induced mice when compared to the negative control group at each observation time with a 95% confidence level (α). Thus, the combination of the ethyl acetate fraction of noni fruit and cinnamon bark in glucose-induced mice gave a hypoglycemic effect in mice.

Keywords: Hypoglycemic, noni fruit, cinnamon bark, ethyl acetate fraction, combination dose.

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PP45

CYCLOARTANE TRITERPENOIDS FROM THE FRUIT PEEL OF MUSA BALBISIANA COLLA, ITS MOLECULAR DOCKING AS ANTIDIABETIC

Tita Nofianti[1,3], Ahmad Muhtadi[1], Sri Adi Sumiwi[1], Irda Fidrianny[2], Ruswanto[3], Supriatno Salam[4,5]

[1]Department of Pharmacology, Faculty of Pharmacy, Padjadjaran University, Bandung, Indonesia,
[2]Department of Pharmaceutical Biology, School of Pharmacy, Bandung Institute of Technology, Indonesia,
[3]Department of Pharmacology, Institute of Health Science of Bakti Tunas Husada Tasikmalaya, West Java, Indonesia
[4]Faculty of Pharmacy, Universitas Mulawarman, Samarinda 75123, Kalimantan Timur, Indonesia;
[5]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Padjadjaran University, Bandung, Indonesia,
e-mail address of corresponding author: titanofianti.wamsu@gmail.com

ABSTRACT

Many experiments have recorded high levels of essential bioactive compounds in banana peel than pulp that could be used as a functional source of food against many chronic diseases like diabetes mellitus.[1-3] The research objective is the interaction study of the bioactive as antidiabetic candidate. Two triterpenoids cycloartane-type, named cyclolaudenone (**1**) and 28-norcyclolaudenone (**2**), isolated from the ethyl acetate subfraction of the fruit peel of *Musa balbisiana* Colla through gradient and isocratic method. The chemical structures of (**1-2**), were elucidated based on 1D- and 2D-NMR spectra as well as high resolution of mass spectra. The molecular docking and molecular dynamic were performed to study the interaction of the compound-enzyme complex. Compounds **1-2** were evaluated for their molecular docking as antidiabetic. cyclolaudenone (**1**) has an effect on aldose reductase (1Z89) and 28-norcyclolaudenone (**2**) on SIRT (4ZZJ).

Keywords: *Musa balbisiana* Colla, cycloartane, antidiabetic, aldose reductase (1Z89), SIRT (4ZZJ).

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PP46

THE EFFECT OF APIGENIN ON THE PROFILE OF HEMATOLOGICAL OF MICE INFECTED WITH *Plasmodium berghei* ANKA

Faizal Hermanto[1,2], Anas Subarnas[1], Afifah B. Sutjiatmo[2], Afiat Berbudi[3]

[1]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, West Java, Indonesia 45363
[2]Department of Pharmacology and Toxicology, Faculty of Pharmacy, Universitas Jenderal Achmad Yani, West Java, Indonesia 40531
[3]Department of Biomedical Sciences, Parasitology Division, Faculty of Medicine, Universitas Padjadjaran, West Java, Indonesia 45363
e-mail address of corresponding author: faizal19002@mail.unpad.ac.id

ABSTRACT

Malaria is an infectious disease caused by Plasmodium through the bite of a female Anopheles mosquito. Changes in blood parameters are a frequent occurrence from complications of malaria[1]. Apigenin is a flavonoid that has antimalarial activity[2]. The study aimed to determine the effect of apigenin on the blood profile of mice infected with *Plasmodium berghei* ANKA. Swiss Webster mice that had been inoculated with *Plasmodium bergei* ANKA as much as $1x10^7$ intraperitoneally. Mice were grouped randomly (5 mice each group), the negative control group was given 0.5% CMC Na, the positive control group was given chloroquine at a dose of 20 mg/kg BW, the test group was given apigenin doses of 50 mg/kg BW; 75 mg/kg BW; 100 mg/kg BW; 125 mg/kg BW; and 150 mg/kg BW given orally for 4 days. Blood specimens were taken from the tail to determine blood parameters including white blood cells, red blood cells, hemoglobin, hematocrit, and platelets. The mean value of white blood cells, red blood cells, hemoglobin, hematocrit, and platelets from mice given apigenin was significantly different than the negative control group ($P<0.05$). Apigenin affects the blood profile of mice infected with *P. berghei* and its associated with antimalarial activity.

Keywords: Apigenin, Malaria, *Plasmodium berghei.*

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PP47

3D-PHARMACOPHORE MODELLING OF OMEGA-3 DERIVATIVES WITH PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR GAMMA AS AN ANTI-OBESITY AGENT

Ida Musfiroh[1]; Ginna Megawati[2]; Dewi Marheni Diah Herawati[2]; Agus Rusdin[3]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor 45363, Indonesia
[2]Department of Public Health, Division of Medical Nutrition, Faculty of Medicine, Universitas Padjadjaran, Bandung 40161, Indonesia
[3]Department of Pharmacy, Bandung Polytechnic of Health, Ministry of Health, Bandung 40161, Indonesia.
*e-mail address of corresponding author: ida.musfiroh@unpad.ac.id

ABSTRACT

Obesity is a complex condition characterized by an increase in adipose tissue mass and drastic changes in its distribution throughout the body, involving excessive amounts of body fat due to lipid metabolism and catalysis by the PPARγ receptor.[1] Synthetic medications have been used to treat obesity management in the past, although they have a lot of adverse effects. In addition the drugs which target the PPARγ receptor have been linked to cardiovascular problems. Omega-3 derivative chemicals were chosen because of their important role in morphological, biochemical, and molecular brain development, as well as their ability to control body weight by reducing body fat deposition.[2,3] The aim of this work was to study the pharmacophore model of omega-3 derivatives with the PPARγreceptor using LigandScout 4.4 to investigate the important chemical interactions of complex structure. The result of the research showed that the omega-3 derivatives docosahexaenoic acid (DHA), heneicosapentaenoic acid (HPA), and docosapentaenoic acid (DPA) have the best pharmacophore fit values of 35.23; 35.23; and 35.16, respectively. According to the results of the pharmcophore study, the carbonyl and hydroxyl of the carboxylate functional groups become the active functional groups that exhibit hydrogen bonding interactions. The alkyl chain (ethyl and methyl groups) were the portion that can be modified to increase its activity. Omega-3 derivatives could be used as a lead drug for the powerful PPARγ receptor in the prevention and treatment of obesity.

Key words: 3D-Pharmacophore Modelling, Omega-3 Derivatives, PPARγ, obesity

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PP48

IN SILICO STUDY OF DITERPENOID LACTONES FROM *Andrographis paniculate* TO INTERLEUKIN-6 (IL-6) PROTEIN TARGET

Sandra Megantara[1], Ida Musfiroh[1], Dwintha Lestari[2]

[1]Department of Pharmaceutical Analysis and Medicinal Chemistry, Faculty of Pharmacy, Universitas Padjadjaran, Sumedang 45363, West Java, Indonesia
[2]Department of Oral Biology, Faculty of Dentistry, Universitas Padjadjaran, Sumedang 45363, West Java, Indonesia
e-mail address of corresponding author: s.megantara@unpad.ac.id

ABSTRACT

Interleukin-6 (IL-6) is a type of cytokine that is most often produced when there is inflammation of the respiratory system. Andrographolide, a diterpenoid lactone has been shown to inhibit the amount of IL-6 by binding to IL-6 receptors on human cells. This research was conducted to determine the other potential of diterpenoid lactones from *Andrographis paniculate* in IL-6 inhibition. The hexameric human IL-6 complex (1P9M) crystal structure downloaded from the Protein Data Bank. The test compounds were built using MarvinSketch of ChemAxon and were subjected to energy minimization using the MMFF94 force field partial charges in the LigandScout software. Molecular Docking and Pharmacophore Screening carried out on autodock algorithm that embedded on LigandScout. The result showed that andrographolide has the best interaction with the IL-6 receptor with binding affinity (Ei = -9,8 kcal/mol and inhibition constant Ki = 0.07 μM. Pharmacophore modeling of andrographolide in the IL-6 active site was validated against the training set active ligands and decoys. The Pharmacophore features show the hydroxyl group on the C-14 atom acts as a hydrogen bond acceptor with Arg179. The hydroxyl group on the C-19 atom acts as a hydrogen bond donor with Arg182. Hydrophobic functional groups interact with Leu33 and Leu178. From the results of the study, it was concluded that andrographolide interacts well with the active site of IL-6, and has the potential to act as an IL-6 inhibitor that can prevent the release of cytokines that may be useful in the treatment of COVID-19.

Keywords: Andrographolide, COVID-19, molecular docking, pharmacophore screening, interleukin-6

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