"Future Research and Technology on Herbal Medicine Application for Diabetes and Other Degenerative Disorder"

8-9th July 2021

PROGRAM BOOK & ABSTRACTS

International Seminar Traditional Herbal Medicine (ISTHM) Indonesian Medicinal Plants

ISTHM 2021
International Seminar on Traditional Herbal Medicine

POKJANAS

KEMENTERIAN KESEHATAN REPUBLIK INDONESIA

UNIVERSITAS LAMPUNG

PROGRAM BOOK & ABSTRACTS
International Seminar Traditional Herbal Medicine (ISTHM)
Indonesian Medicinal Plants
8-9th July 2021

"Future Research and Technology on Herbal Medicine Application for Diabetes and Other Degenerative Disorder"

PROGRAM DAY 1

International Seminar Traditional Herbal Medicine ISTHM 2021
Indonesian Medicinal Plants

8th July 2021			
Time	Duration	Activity	PIC
07.30 am	60 mins	Registration	
08.30 am	10 mins	Opening ceremony: Lampung Welcome Dance	MC
08.40 am	10 mins	Indonesian National Anthem	
08.50 am	10 mins	Report by Chairman of 59th TOI Seminar	Chairman
09.00 am	10 mins	Welcome speech 1 from TOI (KaB2P2TOOT)	
09.10 am	10 mins	Welcome speech and Official opening by Rector of University of Lampung	
09.20 am	5 mins	Do'a/prayer	
09.25 am	10 mins	Closing Remark and Photo session	MC
Plenary Session 1			
09.35 am	95 mins	Main speaker 1: Director of Yankestrad Kemenkes RI Keynote speaker 1: Prof. Taifo Mahmud, Ph. D. (Oregon State University - USA) Keynote spekaer 2: Prof. Dr. MT. Kamaluddin, MSc. (FK - Unsri)	Prof. Suwijiyo Pramono
11.10 am	75 mins	Keynote speaker 3: Prof. Dr. dr. Asep Sukohar, M.Sc. (Ketua IDI Lampung) Keynote speaker 4: Prof. Dr. Keri Lestari Dandan, M.Si., Apt. (FK UNPAD) Keynote speaker 5: Prof. Dr. Ir. Yuli Widyastuti, MP (POKJANAS TOT)	Prof. Sutopo Hadi
LUNCH BREAK (12.30-13.30)			
13.30 pm	210 mins	Parallel Oral Presentation & Poster Session	

PROGRAM DAY 2

International Seminar Traditional Herbal Medicine ISTHM 2021
Indonesian Medicinal Plants

9th July 2021			
Time	Duration	Activity	PIC
07.30 am	30 mins	Registration	
08.00 am	10 mins	Opening session	MC
Plenary Session 2			
08.10 m	100 mins	Keynote speaker 6: Prof. Takuya Sugahara (Japan) Keynote speaker 7: Prof. Yaya Rukayadi (UPM) Keynote speaker 8: Prof. Nor Hadiani Ismail (UiTM)	DR. Samsu H. Nurdin, MSc.
09.50 am	5 mins	Photo session	
09.55 am	75 mins	Keynote speaker 9: Prof. Yana Maolana Syah, M.S., Ph.D. (FMIPA ITB) Keynote speaker 10: Dr. Masteria Yunovilsa Putra (LON LIPI) Keynote speaker 11: Prof. Suharso, PhD. (FMIPA Unila)	Dr. Subeki
11.20	5 min	Photo session	MC
11.25 am	25 mins	Exhibitions on Herbal Products	
LUNCH BREAK (12.30-13.30)			
13.30 pm	135 mins	Parallel Oral Presentation & Poster Session	
15.45 pm	15 min	Closing Ceremony	MC

PARALLEL SESSION Day 1

International Seminar Traditional Herbal Medicine ISTHM 2021 Indonesian Medicinal Plants

Seminar Parallel Schedule

July 8th, 2021

ROOM I: Traditional and Complementary Medicine
MODERATOR : Dr. Ir. *Yaktiworo* Indriani, M,Sc.

TIME	AUTHOR	TITLE
13.30 - 14.05	Rini Handayani	Sambiloto (*Andrographis paniculata* Nees.) Leaf Fermented Using *Aspergillus oryzae* and Antibiofilm Assay Against Gram-Negative Bacteria
	Atur Puja Gusti	Acute Toxicity Test of Bangle (*Zingiber montanum*) Rhizome Essential Oil with Brine Shrimp Lethality Test (BSLT) Method
	Fahrauk Faramayuda	Production of Sinensetin from Cell Suspension Cultures of *Orthosiphon aristatus* Blume Miq. Purple Varieties
14.05 - 14.40	Abdi Firdaus Masdianto	In Silico Study Potential of Activated Compounds Extract of *Annona Muricata* Linn Leaves as A Hypoglicemia Agent Through The Activation of Peroxisome Proliferator Activator Receptor γ (PPARγ) and Glycogen Synthase
	Muhammad Iqbal Sugiharto	The Potency Of The Soursop, (*Annona muricata* Linn.) Leaves Active Compounds To Wards The Inhibition Of α-Glucosidase and a-Amylase by In Silico
	Ibnu Hajar	Tanaman Obat Tradisional untuk Persalinan Masyarakat Melayu Siak Propinsi Riau
14.40 - 15.15	Apt. Drs. Kosasih MSc	Cytotoxic activity of Cantigi [*Vaccinium varingiae* folium (Blume) Miq.] leaf extracts on T47D cells in vitro
	Gres Maretta, S.Si., M.Si	Local Community Ethnomedicin of Lampung Tribe in Pesisir Selatan District, Pesisir Barat Regency
	Dr. Noviany, M.Si	Metabolomics Approach for Understanding the Correlation Between Antioxidant Activity and Its Secondary Metabolites from Different Part of *Sesbania grandiflora*

POSTER

TIME	AUTHOR	TITLE
15-30 - 16.25	Tanti Tatang Irianti	Formulation of Temu Kunci (*Boesenbergia pandurata* (Roxb.) Schlecht) Rhizome Extract Sunscreen, Inhibition Activity of Tyrosine Photodegradation and Its Total Phenolic Compounds
	Ela Amelia POSTER	The Combination of Sugar Palm Midrib Extract (*Arenga pinnata* Merr.) and Nutgrass Extract *(Cyperus rotundus* L.) As Gel Formulation to Inhibit the Acne Bacterias (Propionibacterium acnes and Staphylococcus epidermidis)
	Rahmatul Qodriah	In Vitro Antioxidant and Anticholesterol of Salam (*Syzygium Polyanthum* Wight.) Leaf Extract In 96% Ethanol And Water Using Spectrophotometry Method
	Tina Rostinawati (POSTER	Activity of ethanol extract of *Aegle marmelos* (buah Maja) to clinical isolate of Escherichia coli causing urinary tract infection

ROOM II: Exploration on Potential Herbal Medicine

MODERATOR: Rochmah Agustrina, Ph.D.

TIME	AUTHOR	TITLE
13.30 - 14.05	Abigail Nyoto	In-Vitro Inhibitory Activity Combination of *Moringa oleifera* Leaf Extract and Bacteriocin *Bifidobacterium longum* against Salmonella typhimurium
	Fransiska Thea Setyaratri	Potential Moringa Leaf Extract (*Moringa oleifera*) as Prebiotics to Support *Bifidobacterium longum* growth
	Shadila Fira Asoka	Red ginger (*Zingiber officinale* var. Rubrum): its essential oil content and potential as an anti-Propionibacterium acnes by molecular docking
14.05 - 14.40	Ika Fitriya	The Effect of giving Kepok Banana (*Musa Acuminata* X Balbisiana) on The Skin of Mice (*Mus musculus*) Exposed to Ultraviolet Light
	apt. Indri Kusuma Dewi, M.Sc.	Determination of the SPF value of the extract and fraction gel corncob (*Zea mays* L.)
	Weni Puspita	Formulation and Sunscreen Activity Test of Lotion From Ethanolic Extract of Buas-Buas Leaf (*Premna Serratifolia* L.)
14.40 - 15.15	Sri Eka Rahmadany	Determination of Chemical Compounds Content and SPF Value of Nutmeg Oil with Tween 80-Ethanol Variation
	Rizky Aditio Saputra	Antioxidant and Sunscreen Activity of Nutmeg Oil Microemulsion
	Misbahul Munir	Potential of Nutmeg Oil In Microemulsion as Sunscreen with Variation Tween 80-PEG 400
15.15 - 15.50	Jeany Audina Suryaningkunti	A Review of Pharmacological Activity of Seaweeds *Sargassum* sp. and *Eucheuma cottonii*
	Silviana Hasanuddin	Aktivitas penghambatan, Identifikasi Senyawa, dan Prediksi In silico Fraksi Daun Peterseli (*Petrocelinum crispum* Mill) Sebagai Agen Antijamur *Malassezia furfur*
	Indriaty	Assessment Cytotoxic assay of Rhizophoraceae Plants Mangrove using Brine Shrimp (*Artemia salina* L) model

POSTER

TIME	AUTHOR	TITLE
15-50 - 16.25	apt. Dra. Liliek Nurhidayati, M.Si. (POSTER)	The potency of sulfated polysaccharide from *Sargassum aquifolium* (Turner) C. Agardh as antiplatelet agen
	Nazliniwaty (POSTER)	The Effect of Hydroalcohol Extract of *Artocarpus lacucha* Buch.Ham and *Anredera cordifolia* (Ten) Steenis. Leaves on Porphyromonas gingivalis ATCC 33277
	apt. Reymon, S.Si.,M.Si (POSTER)	Antimicrobial Activity of Ethanolic Extract of *Meistera chinensis* Rhizome by TLC-Direct Bioautography Method against Pathogenic Microorganisms

ROOM III: Herbal Pharmacotherapy & Pharmacological Study

MODERATOR: Ramadhan Triyandi, S.Farm., M.Si., Apt.

TIME	AUTHOR	TITLE
13.30 - 14.05	Rifki Febriansah	Culture Optimization of Streptomyces sp. GMY01 Bacteria as Anticancer Agent by Chemometric Analysis
	Nikeherpianti Lolok	Isolasi Senyawa Aktif Antidiabetes Buah Mengkudu (Morinda Citrifolia Linn) dan Uji Mekanisme Secara In Silico
	Wa Ode Yuliastri	Aktivitas Imunomodulator dan identifikasi senyawa kimia Fraksi Bunga Rosela (of Hibiscus sabdariffa L.)
14.05 - 14.40	Erna Sulistyowati	In vivo evaluation of *Centella asiatica*, *Justicia gendarussa* and *Imperata cylindrica* decoction in attenuation of hypertension-induced renal damage
	Tina Rostinawati	Activity of ethanol extract of *Aegle marmelos* (buah Maja) to clinical isolate of Escherichia coli causing urinary tract infection
	Joni Tandi	Uji Potensi Nefropati Diabetik Daun Sisik Naga (*Pyrrosia piloselloides* (L.) M.G Price) Terhadap Tikus Putih Jantan (*Rattus norvegicus*) Diinduksi Streptozotocin
14.40 - 15.15	Tien Wahyu Handayani	Uji Potensi Nefropati Diabetik Kulit Buah Pepaya (*Carica papaya* L.) Pada Tikus Putih Jantan (Rattus norvegicus) yang Diinduksi Streptozotocin
	Poppy Firzani Arifin	Safety evaluation of herbal hepatoprotector based *Curcuma xanthorrhiza* in the rat: subchronic 90 days toxicity with hematological and liver blood biochemistry as parameter
	Arista Wahyu Ningsih	Studi Formulasi dan Uji Antibakteri Ekstrak Buah Pisang Kayu Mentah
15.15 - 15.50	Dr. apt. Yuliet	Efficacy of the extract and active fraction of the leaves of *Hibiscus surattensis* L. in reducing levels of HbA1c and advanced glycation end products (AGEs) in diabetic type 2 model rat
	Dr. Apt. Yunahara	In Vitro Antioxidant And Anticholesterol of Salam (*Syzygium polyanthum* Wight.) Leaf Extract In 96% Ethanol and Water Using Spectrophotometry Method
	apt. Baiq Leny Nopitasari, M.Farm	Development of Sumbawa Honey as Tonic to Stimulate Stamina During the Covid-19 Pandemic in West Nusa Tenggara
15-50 - 16.25	Mus Ifaya	Antidiabetic potential of active Sub fractions obtained from Purified extract of *Lawsonia inermis* Leaves in Alloxan – Induced Diabetic Mice
	Finish	

ROOM IV: Biomolecular and Clinical Study on Herbal Medicine
MODERATOR : Dr. Yuli Ambarwati, S.Si., M.Si.

TIME	AUTHOR	TITLE
13.30 - 14.05	Ade Silvinia	Effects of Taurine and Ethanol Extract from *Sargassum* sp. to Cervical Cancer Cells (Hela) In Vitro
	Vidia Noviyanti	Chemopreventive Activity of Biduri Root (*Calotropis Gigantea* L.) Ethanol Fraction on MCF-7 Breast Cancer Cells and Vero Normal Cells In Vitro and In Silico
	Melany Ayu Octavia	Activity of Melinjo Seed (*Gnetum Gnemon* L.) Ethanol Fraction Against Colon Cancer Cell (Widr) as Co-Chemotherapy Agent
14.05 - 14.40	Marko Jeremia Kalalo	Antidiabetic potential and pharmacological evaluation of plants bioactive compounds : a computational approach
	Silvia Andriani	Anti-Cancer Effectiveness Test of Methanol Extract Api-Api (*Avicennia Marina*) And Taurin In Vitro in Hela Cervical Cancer Culture
	Ulfa Fitriani	Quality of Life of Patients with Scientifically Formulated Diabetes Herbal Extract Capsules
14.40 - 15.15	dr. Fajar Novianto	The Effect of Physical Fitness Herbal Formula on Quality of Life: Randomized Controlled Trial
	Sadri Haryanti	Cytotoxicity effects of *Hippeastrum puniceum* bulbous extract by modulating cell cycle arrest and apoptotic induction in T47Dyang Diinduksi Streptozotocin breast cancer cell lines
	Ika Yanti Marfuatush Sholikhah	In Vitro Anticancer Screening of Selected Indonesian Medicinal Plants
15.15 - 15.50	Danang Ardiyanto	Study on the Use of Herbal Medicine in the Treatment of Hyperglycemia at the “Hortus Medicus” Herbal Medicine Clinic in 2020
	Musdalifah	Sediaan Salep Bisul dari Ekstrak Daun Bungur
	Winnie Nirmala Santosa	Cardioprotective activity of *Nauclea subdita* (Korth.) Steud. Stem Bark Extract
15-50 - 16.25	Finish	

ROOM V: Functional Food and Bioinformation for biomedical Application

Moderator: Dr. Nuning Nurcahyani, M.Sc.

TIME	AUTHOR	TITLE
13.30 - 14.05	Sakina Yeti Kiptiyah	Antioxidant Activity and Microbial Contamination of *Kaempferia Galanga*.L Aqueous Extract Affected by Heat Treatment Process
	Solikah Ana Estikomah	Evaluation Antibacterial of different formulations of whey Beverages Fermented with Kefir Grains
	Kalidass A. and L. Murugan	Antimicrobial and Antispore Activities of Jambu Batu (*Psidium Guajava* L.) Leaves Extract Against Vegetative Cells and Spores of Bacillus s
14.05 - 14.40	Abdalrahman Mohammad Khamees Al-Zabt	Antibacterial and Antioxidant Activities of Jambu Bol [*Syzygium Malaccense* (L.) Merr. And Perry] Leaves Extract
	Risa Nursanty	Antimicrobial Activity of Guava (*Psidium guajava* Linn.) Against Foodborne Pathogens
	Subeki	Antidiabetic Activity of Siger Rice Made from Waxy Cassava (*Manihot esculenta* Crantz) on Streptozotocin Induced Diabetic Rats
14.40 - 15.15	Samsu Udayana Nurdin	Antidiabetic Activity of Beverage Containing Guava Leaf and Turmeric Mixt
	Dr. Erlintan Sinaga, M.Kes	Bioactivity compound Prediction of *Saurauia vulcani* as immunostimulant : An In Silico Approach
	Sutopo Hadi	The Potential Application of Diphenyltin (IV) Carboxylates as a Future Disinfectant

POSTER

TIME	AUTHOR	TITLE
15.30 - 16.25	Dona Suzana	Penambatan Molekul dan Prediksi Uji Toksisitas pada Senyawa Turunan Inhibitor GATA-2 Sebagai Peningkat Transkripsi Eritropoiesis
	Dini Sri Damayanti	Potency Of Butenedioic Acid Of Soursop Leaves (*Annona muricata*) Water Extract (SLWE) As DPP4 Inhibitor
	Fitri Yuniarti, M.Si (POSTER)	Skrining Aktivitas Antibakteri dan Identifikasi Molekuler Bakteri Asam Laktat (Bal) dari Fermentasi Kubis (*Brassica Oleracea* L.) terhadap Bakteri Patogen *Shigella Dysenteriae*
	Atina Hussaana, Dr. MSi., Apt.	Potensi Serbuk Jamur Tiram Putih (Pleurotusostreatus)-Kaya Vitamin D Terhadap Kadar Gula Darah, Vitamin D Dan Tnf-α Pada Tikus Diabetes

PARALLEL SESSION DAY 2

International Seminar Traditional Herbal Medicine ISTHM 2021 Indonesian Medicinal Plants

Seminar Parallel Schedule

July 9th, 2021

ROOM I: Traditional and Complementary Medicine
MODERATOR: Iqbal S.Farm., M.Sc., Apt.

TIME	AUTHOR	TITLE
13.30 - 14.05	Kartini	TLC-based Fingerprinting for *Centella asiatica* from Diverse Geographical Origins
	apt. Annisa Fatmawati, M.Farm	Histopathological Finding of Burn Healing Using Moringa Leaf (*Moringa oleifera* Lam.) extract Gel and Ethyl Acetate Fraction Gel on Rabbits
	apt. Anna Pradiningsih, M.Sc.	Aktivitas Antibakteri Gel Peeling Scrub Daun Turi (*Sesbania Grandiflora* (L.) Poir.) Sebagai Alternatif Kosmetik Pada Pandemi COVID-19
14.05 - 14.40	Elsa Yuniarti	Test of Vitamin C in Catechins Gambir (*Uncaria gambier* Roxb.) at different concentrations and doses
	Muhammad Alrazi Bin Ahmad Nor Komar	Effect Of Nutmeg (Myristica fragrans Houtt.) Extract On Microflora In Raw Chicken During Different Storage Temperatures And Exposure Times
	Nuning Rahmawati	The utilization of *Syzygium polyanthum* (Wight) Walp. and other plants for the treatment of hypercholesterolemia on Borneo Island of Indonesia
14.40 - 15.15	apt. Alvi Kusuma Wardani, M.Farm	Formulation of Peel-Off Mask Gel Containing *Moringa oleifera* Lam. Leaf Extract and Brightening Test
	Fanie Indrian Mustofa	The Role of Health Cadre to Increase Housewives Knowledge, Attitude and Intention in Using Jamu at Kedungjati, Grobogan
	Agus Triyono	Factors Associated with The Attitude of Herbs Utilization Among Diabetes Mellitus Patients
15.15 - 15.50	Zuraida Zulkarnain	The Effect Of Jamu Infusion Containing *Guazuma ulmifolia* (L), *Rheum officinale* (R), *Sonchus arvensis* (L) and *Murraya paniculata* (L) on Transaminase Enzymes, Blood Count and Clinical Symptoms Among Overweight and Obesity Patients
	Nikmat Ikhrom Eka Jayani	TLC-Fingerprinting and Chemometrics for Identification of Curcuma xanthorrhiza From Different Geographical Origins

ROOM II: Exploration on Potential Herbal Medicine
Moderator: Syaiful Bahri, S.Si., M.Si

TIME	AUTHOR	TITLE
13.30 - 14.05	Diah Ayu Putri Octariyanti	Eksplorasi dan Morfologi Daun Zingiberaceae yang Berpotensi Sebagai Tanaman Obat di Bandar Lampung
	Dian Kartikasari	Kuantifikasi Spektrometri Kandungan Total Flavonoid, Fenol, dan Alkaloid pada Daun Kesum (*Polygonum minus* Huds) dari Kalimantan Barat Dengan Beberapa Pelarut Berbeda
	Dyah Subositi	Genetic Diversity of Kelembak (*Rheum officinale* Baill.) Based on RAPD Molecular Markers
14.05 - 14.40	Peristiwan Ridha Widhi Astana	Potential medicinal plants in Sumatra for hemorrhoids treatment : ethnopharmacological study
	dr.Ulfatun Nisa, M.Biomed	Ethnopharmacological study of medicinal plants used to treat urination symptoms by traditional health practitioners in Eastern Indonesia
	Yuli Ambarwati	Analysis of Antioxidants on Face Mask Made of Seaweed (*Eucheuma cottonii*)
14.40 - 15.15	Tutie Djarwaningsih	Informasi Baru Tumbuhan yang Berpotensi Sebagai Obat Tradisional dari Cagar Alam Tangale, Provinsi Gorontalo-Sulawesi
	Lili Andriani	Wound-healing Activity of the Leaf Extract and Fractions of *Mikania micrantha*
	Yulianty	Variasi Anatomi Daun dan Kandungan Klorofil Tanaman Cincau Hijau yang Berpotensi Sebagai Tanaman Obat
15.15 - 15.50	Harwoko	Antihyperuricemic Effect of Flavonoid-rich Fraction of *Tinospora crispa* Stem in Hyperuricemic Mice
	Rochmah Agustrina	Kitolod (*Laurentia longiflora*) as a Promising Medicinal Plant and Widely Available in Nature
	Ardi Ardiansyah	Study on Mass Spectrometry-based Metabolomics Approach and Cytotoxic Activity of Methanolic Extracts of Sea Cucumbers
15-50 - 16.25	Emrizal	Isolation and Antibacterial Activity Test of Pure Compounds From Ethyl Acetate Fraction of Kemlaka Fruit (*Phyllanthus emblica* L.)
	Santi Perawati	The Effectiveness of Burning Cream From The Extract Of Sembung Rambat Leaves (*Mikania Micrantha* Kunth)
	Nuning Nurcahyani	Study On The Potential Of Jeruju (*Acanthus ilicifolius*) Leaf Extract As An Antifertility Agent In Mice (Mus musculus L)

ROOM III: **Herbal Pharmacotherapy & Pharmacological Study**

Finish

ROOM IV: Biomolecular and Clinical Study on Herbal Medicine

Finish

ROOM V: Exploration on Potential Herbal Medicine

Moderator: Dr. Noviany, M.Si.

TIME	AUTHOR	TITLE
13.30 - 14.05	Surti Kurniasih	The Diversity of Medicinal Plants In Curug Ciwalen Gunung Gede Pangrango National Park
	Dzul Fithria Mumtazah	Analysis of the effect of health culture, health awareness, and product perception of consumption of herbal medicine in patients with vascular diseases in Bandar Lampung
	Dr. Risky Hadi Wibowo M.Si	Antibacterial activity of fraction ethyl acetate of M*ikania micrantha* Kunth. Leaves from, Bengkulu Province
14.05 - 14.40	Endah Setyaningrum	Collection of Medicinal Plants as Antimalarial in Liwa Botanical Garden
	Sadeeya Khan	Serai Kayu [*Syzygium polyanthum* (WIGHT) WALP.] Leaves Extract Mediated Green Synthesis of Silver Nanoparticles (SK-AgNPs) and Its Enhanced Antimicrobial Properties
	Yulianis	Potential of Sweet Orange Peel (*Citrus sinensis* (L.) Osbeck) and Ambon Banana Peel (*Musa paradisiaca* L.) as Sunscreen
14.40 - 15.15	Mudyawati Kamaruddin	Anti-Cancer of *Vernonia amygdalina* Delile with Cytotoxic Activities on WiDr Cell Lines
	Endang L Widyastuti	Anticancer Potency of Seagrass (*Enhalus acoroides*) Methanol Extraction in Hela Cell Line
	Effendy De Lux Putra	Antioxidant Activity of Water Extract of *Vernonia amygdalina* Delile. Leaves
15.15 - 15.50	Dr. Finna Setiawan, S.Farm, M.Si.	α-Amylase and α-Glucosidase Inhibition Effect of Several Indonesian Plants Exctract
	Jessika Ilham	Antibacterial Activity of *Salmonella typhi* in A Combination of *Curcuma xanthorrhiza* Ethanol Extract and Bacteriocin Produced by Bifidobacterium longum in Vitro
	Diky Setya Diningrat	Antiviral potential of *Syzigium cumin*i essential oil
15.50 -16.25	I Made Wisnu Adhi Putra	Antioxidant Synergistic Effect of The Combination of Standardized *Coccinia grandis* (L.) Voigt and *Blumea balsamifera* (L.) DC. Leaf Extracts
	Emantis Rosa	Inventarisasi Jenis – Jenis Tanaman Yang Berpotensi Sebagai Penolak Nyamuk di Sekitar Pekarangan Rumah
	Dadang Supriatna	The Effect of VCO Processing Method on Blood Glucose, Cholesterol and Pancreatic Profile of Diabetic Mellitus Rats (*Sprague dawley*)

Keynote Speakers Abstracts

International Seminar Traditional Herbal Medicine ISTHM 2021
Indonesian Medicinal Plants

The Use of Medicinal Plants to Control Noncommunicable Diseases in Indonesia

Dr. I Gede Made Wirabrata, S.Si., Apt., M.Kes., M.M., M.H.
Direktur Pelananan Kesetan Tradisional
Kementrian Kesehatan RI

In supporting the vision of Indonesia Onward 2045 and realizing exellent human resources and achieving the 2030 SDGs target, several health efforts have been carried out, including focusing on reducing maternal mortality, reducing infant mortality, reducing stunting, and reducing non-communicable diseases.

Traditional medicine from plants is a cultural wealth from generation to generation (empirical based medicine). All this history can be seen in the reliefs of Borobudur temple since 800-900 M, and writings on ancient literature, both in temples and in writings on palm leaves. Currently being developed with research-based services based on Minister of Health Regulation No. 003/2010 About Saintification Of Jamu Based Research Health Services.

Basic Health Research in 2018 (RISKESDAS 2018) showed an increase in people using traditional health services from 30.4% in 2013 to 44.3%. Types of traditional health efforts that are used by the community are in the form of ready-made traditional herbal medicine by 48%, homemade traditional herbal medicine 31.8%. For the utilization of manual skills by 65.3%, mind intervention 1.9% and transfer of energy 2.1%.

The magnitude of the public's interest and need for traditional health services can be a potential and opportunity for health service providers that are safety, efficacy and quality so that they can improve the health status of the Indonesian people

Principles of using Traditional Medicine are referring to the best interest of the patient, informed consent, the health facility leader determine the type of traditional medicine, to be used prioritized as promotive and preventive, must be safe, nutritious, and quality, traditional medicine sourced from animals must have a halal certificate, not in the form of simplicia (except in the context of service-based research), cannot be used in an emergency.

The National Agency of Drug and Food Control (Badan Pengawas Obat dan Makanan/BPOM) have several products like herbal medicine (>11,000 products), Standardized Herbal Medicine (Obat Herbal Terstandar/OHT) (75 products) and Phytofarm (25 products)

Directorate of Traditional Health Service has issued a policy of Ministry of Health Regulation as guidelines in the use of traditional medicines, including: Ministry of Health Regulation No. 6/2016 concerning Formulary of Original Indonesian Herbal Medicines (Formularium Obat Herbal Asli Indonesia/FOHAI), Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/MENKES/187/2017 concerning the Formulary of Indonesian Traditional Medicines (Formularium Ramuan Obat Tradisional Indonesia/FROTI), Handbook of Practical Instructions for Independent Care for the Use of TOGA and Acupressure.

Directorate of Prevention and Control of Non-Communicable Diseases (P2PTM) - Ministry of Health has issued a policy of Ministry of Health Regulation No.71/2015 regarding

Noncommunicable Diseases Management, with various efforts, namely health promotion, early detection, special protection and case finding, in collaboration with multisectors. The intervention strategy are health promotion in healthy, at-risk populations, people with Noncommunicable Diseases, and people with controlled Noncommunicable Diseases

One of the benefits of using traditional health is the use of family herb plants (Toga) and acupuncture in populations with comorbidities including hypertension, diabetes mellitus, and other non-communicable diseases, including maintaining health and fitness so as to increase endurance, overcome health problems mild cases, and reduce the risk of other diseases. One of the efforts to promote herbal medicine is the National Movement of Bude Jamu in several existing health facilitie

Review of Fennel (*Foeniculum vulgare* Mill.): Botany, Cultivation, Phytochemistry and Pharmacology

Yuli Widiyastuti
Medicinal Plant and Traditional Medicine Research and Development Center
National Institute of Health Research and Development, Ministry of Health

Foeniculum vulgare Mill. or fennel (Apiaceae Family) is a medicinal plant commonly found in Meditterania coast and it has been naturalized in many part of the world. Fennel seeds were used mostly as spices and flavoring agent in food and beverages mixtures. Traditionally, fennel used in many different countries for treatment of a wide variety of health ailments such as carminative, digestive, lactagogue and diuretic and in treating respiratory and gastrointestinal disorders. *F. vulgare* is well known for its essential oil. The major components of *F. vulgare* seed essential oil have been reported to be trans-anethole, fenchone, estragol (methyl chavicol), and a-phellandrene. There has been considerable progress in the research of fennel, hence this review aim to provide an overview of *Foeniculum vulgare* Mill included botany, distribution, cultivation, phytochemistry, and pharmacology as well as biological activity. This data compiled illustrate the potency of fennel as natural source for the development of novel therapeutic agent, spices, herbal and nutraceutical product.

Key words: Fennel, Foeniculum vulgare, Botany, Pharmacology

Herbal Medicine for Treating Diabetes and Other Degenerative Diseases

Muhammad Totong Kamaluddin
Department of Pharmacology, Medical Faculty, Sriwijaya University, Palembang

Some plants have been investigated to interfere pathophysiology and pathogenesis of Diabetes Mellitus (DM) and other Degenerative diseases clinically, in the basis of its molecular pathogenesis. The result might obviously make the normal physiology and correct its pathogeneses. Therefore it academically open perspective researchers all over the world to explore any plants considered based on valuable experiences of ancient people or traditional healers empirically having certain effects for human diseases such as DM and other Degenerative disorders.

Pokjanas TOI in Indonesia (National Work Team for Indonesian Medicinal Plants) have worked to explore Indonesian several plants that is funded by the goverment to evaluate their unknown pharmacological effects.

Defect in metabolic disorders characterized by hyperglycaemia, polyuria and weight loss known as DM due to disorder of insulin secretion and its function or both, so such disease might be divided into four types ; Insulin-dependent DM (IDDM – type 1), Non-insulin dependent DM (NIDDM – type 2), Gestational diabetes (GDM) and other types of diabetes including genetic defect of β-cell function, chemical dan drug induced diabetes, diseases of exocrine panreatic, genetic syndrome and other endocrinopathies. Therefore herbal medicines solely or in combination restoring β-cell function and increase insulin secretion, regulate and reduce insulin resistance, Islet cell protection and increase receptor signaling could treat DM and reduce its complications.

Finding traditional Chinese medicinal herbs recently related to β-amyloid 1-42 in regulating genes BCAM and APOE by ingredients of resveratrol and kainic acid have opened view the ability of medicinal herbs to involve in treating at least three types of neurodegenerative disorders; late-onset of Alzheimer's, late-onset of Parkinson's and Huntington diseases. Resveratrol is able to clean β-amyloid in Alzheimer's brain probably through LRP1 protein. This a new insight indicating how medicinal herbs could treat AD and certain neurodegenerative disorders in the future.

Anticariogenic Activity Of *Piper cubeba* L. Berries Extract

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Dental caries is a noticeable infection in human. Even though rarely a life threatening, dental caries is still become a major hassle for health provider companies. *Piper cubeba* L. with potential in elimination of dental caries has been studied. The aim of this study was to determine the effects of different solvent extractions, liquid-liquid partition, concentrations of extracts and fractions on the anticariogenic activity against *Streptococcus mutans* KCCM3309, *S. sobrinus* ATCC33478 and *Actinomyces viscosus* ATCC15987. The potentially active anticariogenic metabolites were identified by mean of proton nuclear magnetic resonance (^{1}H NMR) via multivariate data analysis (MVDA). Minimum inhibitory concentrations (MIC) of *P. cubeba* L. extracts ranged from 0.10 mg/mL to 3.15 mg/mL have inhibited 99% bacterial growth. The minimum bactericidal concentrations (MBC) ranged of 0.20 mg/mL to 3.80 mg/mL through time-kill curve assay of *P. cubeba* L. extracts at concentration of 0× MIC, 1/2× MIC, 1× MIC, 2× MIC and 4× MIC. MTT cell proliferation assay, the percentage of RAW 264.7 the extract was not toxic at the concentration of ≤ 62.5 µg/mL. Anti-inflammatory properties of the extracts were evaluated by nitric oxide (NO) production in stimulated RAW 264.7 cells by lipopolysaccharide (LPS). The lowest NO production observed in methanol extract was at concentration 62.5 µg/mL with 22.98 µg/mL NO production, suggesting that methanol extract might be a suitable candidate for the anti-inflammatory agent. Twelve metabolites have been identified based on the ^{1}H NMR, which were cubebin, yatein, hinokinin, dihydrocubebin, dihydroclusin, cubebinin, magnosalin, *p*-cymene, piperidine, cubebol, D-germacrene and ledol. The metabolites that contributed to separation in PCA between hexane and other extracts were detected as cubebol, ledol, D-germacrene and piperidine. Meanwhile cubebol, ledol, D-germacrene and *p*-cymene caused separation of hexane fraction from ethyl acetate and aqueous methanol fractions. The PLS model showed that higher biological activity was related more to the polar solvents, despite the active metabolites also present in the non-polar solvents. The metabolites that related to the MBC were identified as cubebol, D-germacrene and ledol. *p*-cymene, cubebol and ledol were observed to contribute to the activity for anti-inflammatory in stimulated RAW 264.7 cells by LPS. In summary, *P. cubeba* L. extracts and fractions exhibited antibacterial and anti-inflammatory activity and have potential to be developed as anticariogenic agent.

Keywords: anticariogenic, anti-inflammatory, dental caries, multivariate data analysis, toxicity

Anti-allergy Function of Spices

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Cuminum cyminum L. (cumin) is a plant of Apiaceae family, and its seed has a strong aroma and is used for various dishes such as curry. In addition, it has been reported to have many health functions such as anti-inflammatory, antioxidant, and antibacterial action. In this seminar, I would like to introduce anti-allergy and immunostimulatory activities of cumin seed aqueous extract *in vitro* and *in vivo*.

Allergies, also known as allergic diseases, are caused by hypersensitivity of the immune system to harmless substances in the environment. Allergic symptoms are mainly divided into four types based on the difference in their mechanisms to generate immune responses. Type I is a group of immediate allergy, in which immunoglobulin E (IgE) is involved. The typical diseases caused by type I allergic reaction are atopic bronchial asthma, allergic rhinitis, urticaria, allergic conjunctivitis, atopic dermatitis, anaphylactic shock, and others. Although several functions of the components in cumin seed have been reported, the anti-allergic effect of the water-soluble component in cumin seed has not been reported yet. In this study, we focused on the suppressive effect of cumin seed aqueous extract on degranulation in order to reveal the anti-allergic effect of cumin. Ultra-filtrated cumin seed aqueous extract (UCAE) significantly suppressed the antigen-induced degranulation of rat basophilic leukemia cell line RBL-2H3 cells in a dose-dependent manner without cytotoxicity. UCAE also inhibited the elevation of the intracellular calcium ion concentration induced by antigen. Immunoblot analysis revealed that UCAE suppresses phosphorylation of phosphatidylinositol 3-kinase (PI3K), Bruton's tyrosine kinase (Btk), phospholipase C-γ1 and γ2 (PLCγ1 and PLCγ1), and Akt in the signaling pathways activated by antigen induction via FcεRI. Furthermore, UCAE suppressed microtubule formation induced by antigen.

Cumin seed has a potential for not only traditional and complementary medicine, but also functional food stuff for anti-allergy.

Probing the Chemistry of Antidiabetic Plant using Metabolomics Approach

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Managing diabetes using medicinal plants is common practice. Even so evidence based science is necessary to safely bring this alternative into the mainstream diabetic management. In Malaysia, medicinal plants such as *Centella asiatica*, *Andrographis paniculata*, *Phyllanthus niruri*, *Momordica charantia* and several others are well known antidiabetic plants. Of our group's particular interest is *Ficus deltoidea*. Combining powerful analytical tools, high resolution liquid chromatography mass spectrometry (LCMS) and nuclear magnetic resonance spectroscopy (NMR), with multivariate analysis, we applied metabolomics approach to probe the chemistry of seven varieties of *F. deltoidea*, simultaneously detecting various metabolites for discrimination among the varieties. High potential varieties were identified upon exploration of the bioactive compounds using *in vitro* enzyme inhibitory assay. The effect of *F. deltoidea* extracts on urine metabolites of diabetic rats were also investigated. Our findings showed that treatment with certain *F. deltoidea* extracts were able to ameliorate the metabolic disorders of obese diabetic rats and make improvements towards the normal state.

Natural Products Compounds as Antidiabetic Agents

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Diabetes Mellitus (DM) is one of the degenerative diseases that has been a major health problem in the world, including in Indonesia. In this country, the number of people with this disease, mostly type-2 DM (T2DM), has reached more than 10 million people. The disease is characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves. There are at least three targets of biological pathway in the handling of T2DM, namely activating insulin production (releasing) from b-pancreatic cells, modulating insulin signalling pathway within the cells, and stimulating nuclear PPAR-γ. Synthetic drugs are available to target these pathways. In line with this, many natural products compounds have also been sought to handle the problem of T2DM. In this presentation, the role of natural product compounds having antidiabetic properties is briefly discussed.

Keywords: Diabetes mellitus type-2, insulin, β-pancreatic cells, PPARγ, natural compounds.

Oral Presenters Abstracts

International Seminar Traditional Herbal Medicine ISTHM 2021
Indonesian Medicinal Plants

Formulation And Sunscreen Activity Test Of Lotion From Ethanolic Extract Of Buas-Buas Leaf (*Premna serratifolia* L.)

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The ethanol extract of buas-buas (*Premna serratifolia L.*) leaves has very high sunscreen activity and antioxidant activity. The study aims to formulate and determine the sunscreen activity of the lotion of ethanol extract *Premna serratifolia* L. leaves. The formulation ethanol extract of *Premna serratifolia* L. leaves in lotions with various concentrations (F1: 1%, F2: 2%, F3: 3%). Lotion was evaluated the physical properties of lotion preparation with parameters organoleptic, viscosity, pH, spreadability, adhesivity, homogeneity, and type of lotion. The test of sunscreen activity was using the UV-Vis spectrophotometer method with a wavelength of 290-320 nm. The data obtained were analyzed statistically with One Way Anova the confidence level of 95% to know a significant difference between treatment groups. The results showed that the ethanol extract of *Premna serratifolia* L. could be formulation into a lotion. The three lotion formulas produce colored preparations brownish-green, smells typical of oleum citri, semi-solid, homogeneous, emulsion type O/W, meets the requirements of pH, viscosity, spreadability and adhesivity. SPF value of the preparation there was a significant difference ($p<0.05$) with the highest SPF value of 34.60±0.73 in Formula 3, which is included in the ultra protection category.

Kuantifikasi Spektrometri Kandungan Total Flavonoid, Fenol, Dan Alkaloid Pada Daun Kesum (*Polygonum minus* Huds) Dari Kalimantan Barat Dengan Beberapa Pelarut Berbeda

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Kesum (*Polygonum minus* Huds) is one of the typical plants that grows in West Kalimantan. The Kesum leaves is the part which mostly used. Kesum leaves contain a lot of phytochemical compounds. This study aims to determine the total of alkaloid content, phenol, and flavonoid from extract with methanol, 96% ethanol, 70% ethanol, and 50% ethanol in leaves (*Polygonum minus* Huds) which obtained from Pontianak City, West Kalimantan. The samples were extracted by maceration. The content was determined by using UV-Vis spectrophotometer. Based on the assay result, the methanol extract contained total of phenolic 49.351±0.430 ppmEAG (equivalent to gallic acid); total of flavonoids 44.128±0.116ppmEQ (quercetin equivalent); total of alkaloids 356,798±1,004ppmEP (piperine equivalent). The 96% ethanol extract contained total of phenol 46,196±0.329ppmEAG; total of flavonoids 34,969±0.116ppmEQ; total of alkaloids 183.525±0.766ppmEP. The 70% ethanol extract contained total of phenol 64.189+0.215ppmEAG; total of flavonoids 27.834±0.158ppmEQ; total of alkaloids 432,947±1,533ppmEP. The ethanol extract 50% contained total of phenol 67,343±0.164ppmEAG; total of flavonoids 26.063±0.158ppmEQ; total of alkaloids 679,142±2,525ppmEP. All of the results are preliminary data for further research, especially for the isolation of compounds with specific targets or for the purpose of utilization as main ingredients for traditional medicine.

Factors Associated With The Attitude Of Herbs Utilization Among Diabetes Mellitus Patients

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Abstract. The use of herbs for chronic diseases, including diabetes mellitus (DM), has increased. Many factors are associated with the positive attitude of DM patients to the use of herbs, including demographic factors, knowledge of herbs, family support and characteristics of DM disease. The research used a cross sectional study, conducted in Tawangmangu from March to May 2020. Subjects were 170 diabetes mellitus patients, aged 15-60 years who were examined at the Hortus Medicus Clinic or Community Health Center Tawangmangu. The sample used purposive sampling. Collecting data using a questionnaire and then analyzed by univariate, bivariate and multivariate with SPSS 25. Attitudes towards the use of herbs were associated with high knowledge of herbs (OR = 3.78; 95% CI = 1.6 - 8.87; p = 0.002), duration of DM desease ≥ 5 years (OR = 3.41; 95% CI = 1.70 - 8.99; p = 0.001), high education (OR = 1.26; 95% CI = 0.51 - 3.10; p = 0.617) and employment status (OR = 0.54; 95% CI = 0.21 - 1.38; p = 0.200). Knowledge of herbs and duration of DM disease were significantly related to the attitudes towards herbal.

Keyword: Influencing factors. attitudes towards the use of herbs.

Genetic Diversity of Kelembak (*Rheum officinale* Baill.) Based on RAPD Molecular Markers
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Kelembak (*Rheum officinale* Baill.) is native to mainland Central China and reported as an endangered medicinal plant. This plant in Indonesia distributed in mountainous areas; The center of rhubarb cultivation is in the Dieng Plateau. Mainly this plant is grown for the roots as herbal medicine material (kelembak Jamu) and in the industry for cigarette ingredients (kelembak Jawa). The objective of this study was to assess the genetic diversity of 9 accessions of R. officinale. Six selected RAPD primers were used to amplify the samples and produced 33 DNA fragments ranging from 270-2.710 bp. The Genetic similarity was ranged from 74.58% to 100% using Dice similarity index. The dendrogram divided R. officinale into 2 main clusters separated between kelembak Jamu and kelembak Jawa. Cluster analysis revealed that Mangli Accession (Kelembak jamu) had a closer similarity to Kelembak Jawa. The narrow genetic diversity of Kelembak is important information for future conservation and management programs in the cultivation of this species.

The Role of Health Cadre to Increase Housewives Knowledge, Attitude and Intention in Using Jamu at Kedungjati, Grobogan

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Jamu has broad dimensions of benefits, including health, economy and socio-culture. The use of medicinal plants by the Indonesian people has been carried out by generations. They applied local wisdom in utilizing available natural resources. However, so far there are still many inappropriate uses of jamu that harmful to health. The communities need correct information about the safety, efficacy and quality of jamu. The purpose of this study was to analyze the role of health cadres on the increasing of knowledge, attitude, and intention of housewives in using jamu for family health efforts. A quasi experimental with a pre-test and post-test design and a control group design was conducted to obtain characteristic of demography, knowledge, attitude and intention data. This research involved 36 cadres and 120 participants from 12 villages in Kedungjati, Grobogan that selected by purposive sampling method. Comparative analysis of counseling time carried out by repeated Anova and Friedman, and of groups by Wilcoxon and paired t-test. Each groups reported a significant differences of knowledge between before, a month and three months after intervention (p intervention group=0,01; p non-intervention; α=0,05). However, only the intervention group showed significant difference of intention among three evaluation time (p=0,01; α=0,05). Participant's knowledge reported to have a significant difference between the intervention and the non-intervention groups (p=0,03; α=0,05). Cadres play a role in increasing knowledge of house wives in their surroundings. They also helped increase participant's intention in three-months evaluation.

Keyword: cadre, jamu, knowledge, attitude, intention, grobogan

The Effect Of Jamu Infusion Containing *Guazuma ulmifolia* (L), *Rheum officinale* (R), *Sonchus arvensis* (L) And *Murraya paniculata* (L) On Transaminase Enzymes, Blood Count And Clinical Symptoms Among Overweight And Obesity Patients

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This is a clinical study to determine the effect of jamu infusion (JIF) containing *Guazuma ulmifolia* (L), Rheum officinale (R), *Sonchus arvensis* (L) and *Murraya paniculata* (L) powders on liver (transaminase enzymes levels), complete blood count (CBC) and clinical symptoms compared to the decoction form of the same formula (JDF) that considered safe based on the prior study. This study was conducted at "Rumah Riset Jamu" (RRJ) Hortus Medicus Tawangmangu. The number of subjects each group was 30 patients with BMI> 23. The primary outcome parameter was Alanine Transaminase (ALT) while the secondary outcome parameters were Aspartate Aminotransaminase (AST), CBC and clinical symptoms. The results showed that the mean values of all parameters were within normal in both groups before and after the intervention. The percentages of clinical symptoms were nausea, increased frequency of defecation, dizziness, vomit and abdominal pain respectively in JIF 30%, 10%, 0, 6,67% and 0; JDF 33,33%, 36,67%, 6,67%, 0 and 30%. The clinical symptoms occurred at the beginning of the intervention and disappeared before the intervention ended. Jamu infusion and decoction have the comparable safe effect on liver and CBC with mild clinical symptoms on 56 days of administration.

Quality of Life of Patients with Scientifically Formulated Diabetes Herbal Extract Capsules

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Diabetes mellitus is a chronic disease that threatens global health. Quality of Life (QoL) is an important health care outcome. There are few studies where QoL has been analyzed in diabetes patients who take herbal extracts capsules. The study aimed to examine the effect of giving scientifically formulated diabetes herbal extract capsules on the QoL of hyperglycemic patients at Rumah Riset Jamu (RRJ) Hortus Medicus. The method used was pre and post-test design with quasi-experimental. A total of 30 patients were given capsules extract containing Salam leaves, Sambiloto herbs, cinnamon and Temulawak for 28 days and drunk 2 capsules 2 times a day. Before this study and on day 28th, the patients have examined the QoL using the short form-36 (SF-36). The data were analyzed using the Wilcoxon test. The results showed that there was a significant increase in quality of life between before and after taking extract capsules, especially for the dimensions of physical function and general health. The conclusion is scientifically formulated diabetes herbal extract capsules can improve the QoL the hyperglycemic patients.

The Effect of Physical Fitness Herbal Formula on Quality of Life: Randomized Controlled Trial

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The herbal ingredients consisting of temulawak, turmeric and meniran have been used to improve physical fitness. However, the effect of these herbs on the quality of life is not yet known. This study aims to assess the effect of physical fitness herbal formula on quality of life. This study used a randomized controlled trial design. A total of 100 subjects were given herbal formula and 101 subjects were given a placebo. The herbs and placebo were taken twice a day for 42 days. Before the study and on day 42th, subjects were examined for their quality of life using the Sort Form 36 (SF-36) questionnaire. The results showed that there were no significant changes in the total mean of SF-36, the dimensions of physical function, the role of emotions, energy, mental health, social function, and general health. However, in the dimensions of physical role and pain, there was a significant increase in the quality of life ($p = 0.005$; $p = 0.017$). In conclusion, the physical fitness herbal formula can improve the quality of life, especially the dimensions of physical roles and pain.

The Utilization Of *Syzygium Polyanthum* (Wight) Walp. And Other Plants For The Treatment Of Hypercholesterolemia On Borneo Island Of Indonesia

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The use of medicinal plants for various health purposes has been widely reported. This study aimed to inventory knowledge related to the use of medicinal plants, in particular, to treat hypercholesterolemia in the community by traditional healers on Borneo island, Indonesia. The data collection was based on purposive random sampling using a semi-structured questionnaire among selected traditional healers. The study results exhibited that *Syzygium polyanthum* was recognized as the most cited plant (UV=0.22) by traditional healers in the treatment of hypercholesterolemia, mostly for internal administration route (93.33%) either in a single compound (66.67%) or in combination (33.33%) with other medicinal plants. Leaves were determined as the most explored and utilized plant part (66.67%) compared to other parts. Most of the medicinal plants were collected from the home yard (60.00%), however, only 37.5 percent was cultivated. In conclusion, this study revealed the important roles of medicinal plants as well as traditional healers in maintaining community health, especially for the treatment of hypercholesterolemia on Borneo island.

Potential Medicinal Plants In Sumatra For Hemorrhoids Treatment : Ethnopharmacological Study

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Indonesia is known as a country who has numerous medicinal plants used for helping the treatment of disease. Hemorrhoid is known as one of non-communicable diseases which are often treated using traditional medicine. Primary data were acquired from local traditional healers who being observed for 3 month. According to the result of ethopharmacology study in Sumatra island, there were several formulas used by traditional healers to treat hemorrhoid. The aim of this study is to find potential medicinal plants and formulas in Sumatra for hemorrhoid treatment. The most frequently used medicinal plants was defined using frequency of citation (FC) and use value (UV). We conducted literature review about its benefit and toxicity evidences using the electronic search engines Pubmed, DOAJ, Scopus and Google Scholar both in english or indonesian resources. There were 49 species of plants in 27 families used in herbal formula for hemorrhoid. Based on FC, UV and literature review, *Cocos nucifera* L., *Vitex pinnata* L., *Psidium guajava* L., *Areca catechu* L.., *Curcuma longa* L., and *Kaempferia galanga* L. were confirmed to have enough scientific evidences. Accordingly, the herbal formulas which had those plants as ingredients are potential to be further developed.

Cytotoxicity Effects Of *Hippeastrum Puniceum* Bulbous Extract By Modulating Cell Cycle Arrest And Apoptotic Induction In T47D Breast Cancer Cell Lines

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Breast cancer remains a serious health problem, and the second leading cause of cancer death among women. *Hippeastrum puniceum* is a bulbous perennial herbaceous plant, with limited relevant scientific information. This study aimed to evaluate the cytotoxic effect of *Hippeastrum puniceum* bulbous extract and the mechanisms of action in T47D cell lines. The bulbous powder was macerated with ethanol 96% for 5x24 hours, filtered, and dried in oven 50°C. The cytotoxic effect was done by MTT assay. The cell cycle profile and apoptosis induction was examined with flow cytometry. The extract revealed a selectively cytotoxic effect in cancer and normal cell. The extract inhibited T47D proliferation with IC50 value 46.06+9.68 µg/mL, while toward Vero cell of 121.36+9.09 µg/mL with the selectivity index value 2.63. The extract 50 µg/mL markedly induced G0/G1 arrest, while at the higher concentration (100 µg/mL) stimulated G2/M arrest. These were associated with the increased level of subG1 cells. The disruption of the cell cycle was then followed by the induction of apoptosis. This study demonstrates the potential effects of *Hippeastrum puniceum* ethanolic extract for breast cancer treatment.

In Vitro Anticancer Screening of Selected Indonesian Medicinal Plants

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Cancer is the second most common disease causing death in the world. The development of proper cancer treatment management is still a challenge today. The discovery of an abundance and variety of anti-cancer bioactive compounds from Indonesian plants is one of the potential strategies to be implemented. This research was conducted on RISTOJA's research plants. The cytotoxic activity test of the extract was carried out on the HeLa cervical cancer cell model, WiDr colon cancer cell, and T47D breast cancer cell using the MTT assay method. The IC50 value was determined based on the percentage of cell viability after dichormethane and methanol extract treatment. The extract concentrations used were 15, 30, 60, 120, 240, and 480 µg/mL. The test results showed that 6 dichlormetan extracts had strong potential (IC50 <100 µg / mL) against 3 types of cancer cells.

Antiviral Potential Of *Syzigium Cumini* Essential Oil

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The disease threat from viral strains has increased in recent years. This includes COVID-19. Many attempts have been made to develop antiviral alternatives. Jamblang (*Syzigium cumini*) is one of Indonesia's native plants which has many benefits, including as an antiviral. Eugenol compounds, tannins, saponins, flavonoids, and alkaloids in jamblang play an active role in bioactivity as an antiviral. In order to obtain the medicinal properties of the jamblang plant, a strategy was carried out to extract its secondary metabolites by extracting essential oils from jamblang seeds. The method used to make jamblang essential oil is steam distillation. Secondary metabolite content testing was carried out using the GCMS method and bioinformatics analysis. The results of this analysis indicate the high potential of jamblang essential oil as an antiviral. Conclusion Jamblang essential oil has potential as an antiviral with a specific mechanism of action.

Ethnopharmacological Study Of Medicinal Plants Used To Treat Urination Symptoms By Traditional Health Practitioners In Eastern Indonesia

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RISTOJA is a study ethnopharmacology in Indonesia. Wallace's region is Australia type of flora in eastern Indonesia. Some of these areas have a diversity of medicinal plants used by traditional healers to treat several urination symptoms. The study aims to asses the use of medicinal plants for various urination symptoms in eastern Indonesia including of their efficacy and safety based on literature review. The data were collected from traditional health practitioners in eastern Indonesia. Subsequently, the review study to evaluate the efficacy and toxicity of the most cited plants. The data were analyzed using quantitative tool such as Frequency of citation, the use value and Choice value. The data of 222 plants species belonging to 78 families were identified for treatment of various urination symptoms in east Indonesia. The most prevalent of these was euphorbiaceae family. The species which had the highest value were Orthosiphon aristatus (FC 12.52%, UV 0.31), Sericocalyx crispus (FC 7.80%, UV 0.19) Phyllanthus niruri (FC 6.35%, UV 0.16) were the vast majority commonly used plant species in treatment of urination symptoms. The most common parts used was leaves (44,87%) and herbs (10,66%). The ethnomedicinal flora in east Indonesia are quite diverse for treating urinary symptoms.

Kitolod (*Laurentia longiflora*) as a Promising Medicinal Plant and Widely Available in Nature

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Kitolod is commonly known as a weed with various regional names such as daun tolod, korejat (Sunda) kendali, sangkobak (Java) Bungong Bintang (Aceh). As a weed, kitolod is easy to find in vegetable gardens, rice fields, riverbanks or roadsides, even in abandoned buildings. The scientific name of kitolod, *Laurentia longifora* (L.) Peterm also has several synonyms, including: *Isotoma longifora* (L.) C. Presl, *Lobelia longiflora* L., and *Rapuntium longiflora* (L.) Mill. In the community, kitolod flowers are widely known as eye drops. Various studies have shown that all parts of the kitolod plant contain secondary metabolites from the phenolic, alkaloid, flavonoid, and terpenoid groups which are reported to have many pharmacological effects including: anti-inflammatory, antioxidant, anticancer, antidiabetic, antibacterial, antimalarial, antitumor, antimicrobial, antifungal, antiinsecticide, and antiseptic.

Keyword: kitolod, tanaman obat, senyawa metabolit sekunder

In Vivo Evaluation Of *Centella Asiatica*, *Justicia Gendarussa* And *Imperata Cylindrica* Decoction In Attenuation Of Hypertension-Induced Renal Damage

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Centella asiatica, *Justicia gendarussa* and *Imperata cylindrica* decoction (CJID) has been determined to be important in the prevention of systemic organ damage induced by hypertension. This study aimed to identify whether CJID protect hypertension-induced renal injury in spontaneously hypertensive rats (SHRs). Therefore, we evaluated the alterations of renal-related structure and function through the in vivo study. Thirty 8-weeks-old SHRs and normotensive-WKY rats were randomly divided into 4 groups: the control groups (WKY and SHR) and two CJID's groups (WKY and SHR). All rats were monitored for 5 weeks after 1 week acclimatization. Ureum and creatinine serum were measured to evaluate renal function. Hematoxylline and eosin staining was established to determine both glomerular and tubular changes. Kidney superoxide dismustase (SOD) was also investigated. CJID improved renal function in SHRs compared with control group. CJID treatment attenuated the infltration of inflammatory cells and oedema/atrophy of renal tubules. Furthermore, CJID alleviated glomerular damage in SHRs compared with control group. Kidney SOD was decreased in SHRs-treated with CJID. In conclusion, CJID diminished hypertension-related renal damage. The mechanism by which CJID prevent hypertension-related kidney injury, might be particularly due to the radical scavenging.

Keywords: *Centella asiatica*, *Justicia gendarussa*, *Imperata cylindrica*, renal damage, hypertension

The Effect of Hydroalcohol Extract of *Artocarpus lacucha* Buch.Ham and *Anredera cordifolia* (Ten) Steenis. Leaves on *Porphyromonas gingivalis* ATCC 33277

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Periodontal disease is teeth and mouth diseases, where there is inflammation of the dental supporting tissue. *Prophyromonas gingivalis* is an aerobic bacteria obligat Gram Negative that becames the cause of periodontitis disease. *Prophyromonas gingivalis* by increasing bacterial colonization and bacterial invasion into host cells, it can damage the host cell by producing endotoxins, fibrinolysis, protease enzym and induction of inflammatory mediators. Treatment of periodontitis is giving antibacterial agent teraphy. Plant have antibacterial effect are *Artocarpus lacucha* Buch.Ham and *Anredera cordifolia* (Ten) Steenis. leaves. The aim of this study was to determine antibacterial activities of *Artocarpus lacucha* Buch.Ham and *Anredera cordifolia* (Ten) Steenis. leaves. Extract was prepared using hydroalcohol 100% with macerstion method. Antibacterial activity was determined using disc diffusion method towards *Porphytomonas gingivalis* ATCC 33277. Antibacterial activity of hydroalcohol extract of *Artocarpus lacucha* Buch.Ham and *Anredera cordifolia* (Ten) Steenis. towards *Porphytomonas gingivalis* ATCC 33277 at concentration 200mg/mL were showed inhibitory zone 8,00 ± 0.00 mm and 12,00 ± 0.00 mm. The result reveal that hydroalcohol extract of *Artocarpus lacucha* Buch.Ham and *Anredera cordifolia* (Ten) Steenis. leaves has antibacterial potential.

Activity Of Ethanol Extract Of *Aegle Marmelos* (Buah Maja) To Clinical Isolate Of Escherichia Coli Causing Urinary Tract Infection

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The increase in resistance of Escherichia coli bacteria that caused urinary tract infections to antibiotics narrows the selection of effective treatments, which encourages the development of treatment therapies using natural ingredients. Maja fruit (*Aegle marmelos* (L.) Correa) is a plant that has been shown antibacterial activity against gram-negative bacteria, one of which is *Escherichia coli*. This study aimed to determine the antibacterial activity of fruit Maja extract, minimum inhibition concentration (MIC) and the minimum bacteridal concentration (MBC) of fruit Maja extract and the comparative value of gentamycin against Escherichia coli resistance isolated from patients urinary tract infection. The methods are extraction of maja fruit by using 96% ethanol, agar diffusion method with paper disc and determination of MIC and MBC using microdilution method. The results showed that the ethanol extract of Maja fruit has weak antibacterial activity with value of MIC50 is 1400-1500 µg/ml, the value of MIC90 is 1600 µg/ml and the value of MBC are in the range concentration of 1700-2000 µg/ml against bacterial isolate I and against bacterial isolates II value of MIC50 is in concentration 2900 µg/ml, MIC90 is in concentrations 3000 µg/ml and the value of the MBC are in range 3150-3500 µg/ml. The comparative values of the antibacterial activity of gentamycin on fruit maja extract is 1:5,871 x 103.

Keywords: Antibiotic Resistance, Maja Fruit, Clinical Isolate Bacteria, Urinary Tract Infections and Paper Discs

In Vitro Antioxidant And Anticholesterol Of Salam (*Syzygium Polyanthum* Wight.) Leaf Extract In 96% Ethanol And Water Using Spectrophotometry Method

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Salam (*Syzygium polyanthum* Wight.) is a plant that has been widely used as traditional medicine. Salam leaves contain flavonoid compounds which have been known in previous studies to have antioxidant and anticholesterol activity. Salam contain several useful compounds such as tannins. gallocatechin. flavonoids. saponins. and essential oils (sesquiterpenes). Flavonoids are polyphenolic compounds that have antioxidant benefits. The purpose of this study was to determine the antioxidant and anticholesterol activity of Salam leaf extract 96% Ethanol and water. Antioxidant activity by DPPH Radical Scavenging method. was measured at a wavelength of 515.5 nm with compare to reference standard ascorbic acid. Anticholesterol by Liebermann-Burchard reagent. analysis using the UV-Vis spectrophotometric with wavelength of 670 nm. The results of the research on the antioxidant activity of 96% ethanol and water extract obtained IC50 values of 79.30 ± 0.66 ppm and 89.48 ± ppm. The results of anti-cholesterol activity obtained IC50 values of 96% ethanol and water extract of 471.40 ± 0.40 ppm and 768.95 ± 0.38 ppm. Based on the results it can be concluded that 96% ethanol and water extract of Salam leaves have antioxidant activity and anticholesterol activity.

TLC-based Fingerprinting for Centella asiatica from Diverse Geographical Origins

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Local Community Ethnomedicin Of Lampung Tribe In Pesisir Selatan District, Pesisir Barat Regency

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This study aims to explore the local ethnomedicine knowledge of the indigenous Lampung tribe in Pesisir Selatan District, Pesisir Barat Regency. Researchers used the snowball sampling method, namely the selection of key respondents based on the recommendations of previous respondents. Data were collected by interview and direct observation methods. The results show that there are 13 native Lampung tribes who carry out traditional medicine by utilizing medicinal plants with various types of ingredients such as boiled, squeezed, pounded, soaked, grated, burned and pressed and the way of presentation shows high local ethnic knowledge about medicinal ingredients. such as being drunk, taped or rubbed, bathed, and eaten. The results of the study indicated that there were 55 species with 33 plant families in these villages that were used as ingredients for medicinal herbs used for plant parts such as leaves, stems, fruit, tubers, rhizomes, roots, flowers or whole plants. The plants they use as medicinal ingredients they get directly from the forest, buy them in markets, gardens and home yards.

Antidiabetic Activity of Beverage Containing Guava Leaf and Turmeric Mixture

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This study aimed to evaluate the effect of proportion of guava leaf and turmeric in a mixture of herbal beverage in inhibiting α-amylase and α-glucosidase enzymes activities. Herbal beverages containing mixture of guava leaf and turmeric (0%:100% (C1), 20%:80% (C2), 40%:60% (C3), 60%:40% (C4), 80%: 20% (C5), 100%:0% (C6) were evaluated their total phenolic content, inhibition α-amylase and α-glucosidase enzymes activities. The results showed that decreasing of turmeric proportion by 40% or more in a mixture of herbal beverage decreased inhibitory activity against α-amylase enzyme significantly. The proportion of guava leaf up to 20% in a mixture of herbal beverage increased the inhibition of α-glucosidase enzymes by 38.49%, but addition of proportion of guava leaf subsequently did not give a significant effect on the increasing inhibitory activity against the enzyme. The herbal beverage formulation containing 40% guava leaf and 60% turmeric was considered as the optimal combination with inhibition activities against α-amylase and α-glucosidase were 64,15% and 68,58%, respectively.

Antidiabetic Activity of Siger Rice Made from Waxy Cassava (*Manihot esculenta* Crantz) on Streptozotocin Induced Diabetic Rats

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The effect of consumption siger rice made from waxy cassava (*Manihot esculenta* Crants) on diabetes was studied in streptozotocin-induced diabetes rats. The results showed that diabetic rats fed the siger rice diet increased body weight 101.2 g and decreased water intake 72.66% compared to diabetic rats. Siger rice consumption to diabetic rats can reduce urine volume and sugar content 74.19% and 99.39% respectively at 4 weeks after treatment. Siger rice was able to reduce blood glucose levels of diabetic rats to a normal condition of 68.83% at 4 weeks after treatment. MDA levels of diabetic rats fed the siger rice diet decreased 84.18% compared to diabetic rats. The FRAP value of diabetic rats given siger rice increased 271.43% compared to diabetic rats. Consumption of siger rice was able to improve blood glucose levels and antioxidant status of diabetic rats.

Antidiabetic Activity of Siger Rice Made from Waxy Cassava (*Manihot esculenta* Crantz) on Streptozotocin Induced Diabetic Rats

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Exploration of potential flora investigation was carried out in the Tangale Nature Reserve (TNR). Geographically, TNR is between 0° 35' – 0° 36' North and 122° 45' – 122° 47' East. It is tropical lowland forest with low diversity. There are many trees with diameter over 50 cm. Data and information on plant species riches in TNR, especially those that are still potentially very low, while forest destruction is increasing (with theft/logging rattan, bamboo and others), which will threaten the sustainability of plants in the area. The purpose of this study was to determine the diversity of plant species that have the potential, especially as traditional medicine, increase the collection of herbarium specimens, add basic information in the health sector which can then be used as a basis for applied research, development and management. Based on those exploration, there are found 25 species potentially as a new information for traditional medicine. The potentially medicine are as: wound, diarrhea, fever, malaria etc. Twenty three species are consist new record including: seven species are not publication yet as traditional medicinal, 16 species had new information as kind of uses, and 2 species are noted as new information about uses of part of plants organ. The potential, distribution and ecology of those plants are presented in this paper.

Study on the Use of Herbal Medicine in the Treatment of Hyperglycemia at the "*Hortus Medicus*" Herbal Medicine Clinic in 2020

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Hyperglycemia is a condition where there is an increase in blood glucose level that exceeds normal limits. Hyperglycemia is found in people with Diabetes Mellitus, whose prevalence is increasing and becoming one of the major health problems worldwide. The use of medicinal herbs in the treatment of hyperglycemia requires scientific evidence so that it can be used in health services. The "*Hortus Medicus*" herbal clinic in Tawangmangu has several formulas for treating hyperglycemia. This study aims to determine the description of medicinal plants for hyperglycemia that are most widely used and the percentage of efficacy of hyperglycemia therapy using medicinal plants at the "*Hortus Medicus*" herbal medicine Clinic in 2020. This study was a retrospective cross-sectional study using purposive sampling. The total sample was 150 medical records and prescriptions for hyperglycemia patients at *Hortus Medicus* for the period July-December 2020. The results showed that there were 3 hyperglycemia herbal formula used in RRJ *Hortus Medicus*. The first herbal concoction consisting of *Andrographis paniculata* herb, *Syzygium polyanthum* leaves and *Curcuma xanthorriza* rhizome with 90 recipes (60 %). The second herbal ingredients consisting of *Tinospora crispa*, *Cinnamomum burmannii* bark and *Centella asiatica* herb with 52 recipes (34,6 %), and the third herbal ingredients consisting of with *Momordica charantia* and *Sonchus arvensis* with 8 recipes (5,4 %). The therapeutic efficacy of herbal concoctions 1st, 2nd and 3rd were 80%; 60%; 50%. Conclusion: The first herbs formula was the most widely used herbal remedy for hyperglycemia and has the highest percentage of therapeutic efficacy.

Antihyperuricemic Effect of Flavonoid-rich Fraction of *Tinospora crispa* Stem in Hyperuricemic Mice

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Tinospora crispa is traditionally used to treat gout, rheumatoid arthritis, and internal inflammation. Brotowali, a local name of *T. crispa*, reported to exhibit antioxidant, antinociceptive, and antiinflammatory activities. This study aimed to assess antihyperuricemic effect of two fractions obtained from *T. crispa* stem in an acute hyperuricemic mice model induced by potassium oxonate. The stem of *T. crispa* was extracted with 70% ethanol, then the extract was sequentially partitioned with n-hexane, chloroform, and ethyl acetate. Phytochemical analysis was performed by thin layer chromatography method. Serum uric acid level was determined by enzymatic-colorimetric method using spectrophotometer. We have early reported that the crude extract and n-hexane insoluble fraction (PETS) of *T. crispa* stem possessed high flavonoid content. However, flavonoids were neither detected in chloroform fraction (CFTS), were they present in ethyl acetate fraction (EFTS). In the previous study, the crude extract and PETS 100 mg/kg revealed an equal antihyperuricemic effect compared to allopurinol 10 mg/kg. Treatment of hyperuricemic mice with CFTS and EFTS at dose 100 mg/kg showed the uric acid–lowering effects by 39% and 52%, respectively. In summary, *T. crispa* stem extract or fraction rich in flavonoids may have a potential for treating hyperuricemia.

Antimicrobial Activity of Ethanolic Extract of *Meistera chinensis* Rhizome by TLC-Direct Bioautography Method Against Pathogenic Microorganisms

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M. chinensis is a local plant in Southeast Sulawesi has secondary metabolites that are active as antibacterial, antioxidant, anticancer, antifungal. Based on the antibacterial properties of *M. chinensis* fruit, this research was conducted to explore investigation on other parts such as rhizomes. This study aimed to carry out chemical constituents of *M.chinensis* rhizome extract against pathogenic microorganism: Escherichia coli ACTT 35218, Staphylococcus aureus ACTT 25023, Streptococcus mutans ACTT 25675, and the fungus Candida albicans by TLC-direct bioautography. Extraction was carried out by maceration method with 96% ethanol as solvent. The chemical constituents of metabolites rhizome extracts was carried out by Thin Layer Chromatography and colorimetric. Antibacterial activity by the method of TLC-direct bioautography. This method separates the adsorbent layer with an antimicrobial agent that diffuses from the TLC plate into the agar, which has been inoculated with the test microbe. The results showed that chemical constituents of *M. chinensis* rhizome extract contained secondary metabolites such as alkaloids, phenolics, steroids, flavonoids and saponins. The bioautaography method showed that the rhizome extract had zones of inhibition on the test microbes and fungus were 7.0±0.06 mm, 7.4±0.12 mm, 8.1±0.22 mm and 8.0±0.33mm, respectively. The results of the identification of the active compound showed the presence of alkaloid compounds on the plate. These results indicate that the rhizome of *M. chinensis* is efficacious against pathogenic microorganism

Study on Mass Spectrometry-based Metabolomics Approach and Cytotoxic Activity of Methanolic Extracts of Sea Cucumbers

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Sea cucumbers are marine invertebrate that have interesting biological activities with high economic value. They have diverse biological activities, such as antifungal, antibacterial, antimicrobial, anti-fouling, anti-inflammatory and antitumor. Sea cucumber's saponins are known to have potential natural anticancer sources against human cancer cells. This study was conducted on sea cucumber methanol extract from genus *Actinopyga, Bohadscia, Holothuria, Stichopus, Pseudocolochirus,* and *Thelenota* from Lampung, Makassar, and Lombok to screen cytotoxic activity of sea cucumber using four human tumor cell lines; i.e. human breast adenocarcinoma MDA-MB-231, human lung carcinoma A-549, human colorectal adenocarcinoma HT-29, human pancreatic adenocarcinoma PSN1. Screening for cytotoxic activity was conducted by using sulforhodamine B (SRB) colorimetric method. The active fraction was further purified by using HPLC. Mass spectrometry-based metabolomic approach used to get information of metabolites contained in biological samples based on UHPLC-DAD-TOFMS spectrometry continue with NMR. Based on data measurement of HPLC separation, MS and NMR, two pure saponins were successfully isolated from methanolic fraction of *Bohadscia similis* extract which are Arguside C and Bivittoside D. Meanwhile, the active fraction of S. noctivagus contained triterpenoid glycoside (Variegatuside F) and saponins (Stichloroside B1). Methanolic fraction of H. scabra contained sulfated triterpenoid oligoglycoside (Holothurin A).

Uji Potensi Nefropati Diabetik Daun Sisik Naga (*Pyrrosia Piloselloides* (L.) M.G Price) Terhadap Tikus Putih Jantan (*Rattus Norvegicus*) Diinduksi Streptozotocin

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This study aims to determine the types of secondary metabolic compounds contained in the ethanol extract of the leaves of the dragon scales (*Pyrrosia piloselloides* (L.) M.G Price), as well as knowing the effect of ethanol extract of dragon scales leaves on blood glucose levels, and knowing the effective dose in regenerating pancreatic β cells in male white rats (*Rattus norvegicus*) The study wasa experimental laboratory with involving group were a control group (group I: normal control, group II: negative control, group III: positive control) and the experimental group (groups IV, V, and VI,) where the experimental group was given dragon's scalefern leaf extract while the control group was not given extract.The results showed that the ethanol extract of the leaves contained secondary metabolite compounds namely alkaloids, flavonoids, saponins, polyphenols, and tannins and has an effect on reducing blood glucose levels at a dose of 200 mg / kg body weight in male white rats induced by streptozotocin with an average value of 81.8 mg / dL. Ethanol extract of dragon scales leaves at a dose of 200 mg / kg BW is effective in regenerating pancreatic β cells with an average damage value of 1.

Uji Potensi Nefropati Diabetik Kulit Buah Pepaya (*Carica Papaya* L.) Pada Tikus Putih Jantan (*Rattus Norvegicus*) Yang Diinduksi Streptozotocin

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This study aims to examine the content of secondary metabolites, the effect of extract papaya peel and the effective dose to decrease blood glucose levels that have been induced by streptozotocin. This research was a laboratory experimental study using 30 male white rats which were divided into 6 groups and each group consisted of 5 rats with group details namely group I (normal control), group II (pain control) was given Na-CMC suspension 0,5% w/v, group III (positive control) was given glibenclamide dose 0.45 mg/kg body weight, groups IV, V, and VI as the experimental group were given doses of 100, 200, and 400 mg/kg body weight per oral for 21 consecutive days. Blood glucose levels were measured with glucometer on days 14, 21 and 28. The results showed that there were secondary metabolite compounds in ethanol extract of papaya peel, namely alkaloids, flavonoids, and saponins and had a blood glucose reduction effect in rats induced by streptozotocin with an effection dose 100 mg/kg body weight with each reduction 105 mg/dL and Ethanol extract of papaya rind at a dose of 400 mg/kg BW, effective in reducing creatinine with each reduction 0,69 mg/dL and urea levels reduction 24,26 mg/dL.

Isolation and Antibacterial Activity Test of Pure Compounds From Ethyl Acetate Fraction of Kemlaka Fruit (*Phyllanthus emblica* L.)

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Research on isolation and antibacterial activity of pure compounds has been carried out from ethyl acetate fraction of kemlaka fruit (*Phyllanthus emblica* L.). The isolation stage includes extraction by maceration method using methanol solvent followed by fractionation based on the polarity of solvents. Ethyl acetate fraction was separated by column chromatography method and produced 10 combined fractions. The purification of the 3rd fraction from ethyl acetate fraction yielded by a pure isolate compound labeled as NDS as much as 2 grams, in the form of white crystals, with a melting point of 161-163oC, insoluble in n-hexane, soluble in ethyl acetate and methanol solvents. Identification of NDS compound by giving FeCl3 gives a dark blue color. Identification of this NDS compound also carried out spectroscopically such as UV-Vis, IR, 1H and 13C NMR. Based on spectroscopic data and chemical reactions with FeCl3 reagents it can be concluded that NDS compound is compound containing aromatic benzene groups. Evaluation of antibacterial activity showed that methanol extract and ethyl acetate fraction active as antibacterial and pure NDS compounds were not active as antibacterial agent.

The Effectiveness of Burning Cream From The Extract Of Sembung Rambat Leaves (*Mikania Micrantha* Kunth)

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Plants are widely used as medicinal plants, one of the plants that can have medicinal properties, namely the sembung rambat (*Mikania micrantha* Kunth) which is a plant that has many benefits. It can be seen from the phytochemical screening of previous studies that the leaves of sembung rambat have chemical content of alkaloids, flavonoids, terpenoids and tannins. From these ingredients, it can be used as antibacterial, anti-inflammatory, and antioxidant. Wounds are synonymous with bacteria that can cause infection. This study aims to determine whether the leaves of sembung rambat can be formulated in a cream dosage form and at wich concentration is optimal in treating burns in mice. Phytochemical screening contained alkaloids, flavonoids, steroids and tannins. Cream preparations were made with F0 (base only), FI (base + extract 20%), FII (base + extract 25%), FIII (base + extract 30%). The leaf extract of sembung rambat has an effect on the healing process of burns in mice. The optimal concentration in healing burns was 30%, the average healing rate was 74.6%. Sembung rambat leaf extract can be formulated in the form of a cream and the optimal concentration in healing burns against mice is at a concentration of 30%.

Key words: cream, burns, leaf extract, *Mikania micrantha* Kunth.

Wound-healing Activity of the Leaf Extract and Fractions of *Mikania micrantha*

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The leaf of the sembung rambat (*Mikania micrantha* Kunth) is a type of weed that is very easy to grow and spread. The SAD Jambi in utilizing the leaves of sembung rambat as a natural wound medicine. This study aims to determine whether the extract and fraction of the leaves of sembung rambat can have the potential to treat cuts in male mice.This research was conducted by extracting the leaves of sembung rambat using ethanol as a solvent. Then the results from the extract and fraction are used as wound healing in male mice. The results showed that the extract with a concentration of 50% had the fastest cure rate in mice, and a concentration of 35% for the fraction. Therefore, it can be concluded that the extract and fraction of sembung rambat has activity as an wound healing in male mice.

Safety Evaluation Of Herbal Hepatoprotector Based *Curcuma Xanthorrhiza* In The Rat: Subchronic 90 Days Toxicity With Hematological And Liver Blood Biochemistry As Parameter

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This study aims to determine the safety level of herbal products made of curcuma for 90 days of use in the hematology of Wistar rats. Hematological and blood chemistry testing is needed to help diagnose and monitor the toxicity that occurs in experimental animals to provide information on the effect caused by the test compound on blood and blood-forming tissue. This study used experimental animal, consisting of male (n = 50) and female (n = 50) Wistar rats. The tested animals were divided into four groups: control group with doses of 235, 470, 940 mg/kg BW, and two satellite groups (n = 5), i.e., control group with a dose of 940 mg/kg BW. The test preparation was administered orally over and over for 90 days. Examination of clinical symptoms of toxic effects and food and drink intake was carried out every day. Bodyweight was calculated every 5 days, and the average increase in body weight per day was calculated. At the beginning and the end of the test, hematology, blood chemistry, and urinalysis were examined. Qualitative data were analyzed descriptively, and quantitative data were analyzed using ANOVA. The analysis results show that repeated oral administration of curcuma-based herbal products for 90 days did not cause toxic clinical symptoms; did not affect changes in body weight, food intake, and drink intake in female and male rats. Administration of this product also did not affect the hematological profile (the number of hemoglobin, leukocytes, erythrocytes, hematocrit, platelets, MCV, MCH, and MCHC), liver blood chemistry (urea nitrogen, creatinine, GOT, and GPT) in female and male Wistar rats.

Keywords : Curcuma xanthorrhiza ,hematology, blood biochemistry, GOT, GPT

Introduction

Potential of Sweet Orange Peel (*Citrus sinensis* (L.) Osbeck) and Ambon Banana Peel (*Musa paradisiaca* L.) as Sunscreen

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Sweet orange peel (*Citrus sinensis* (L.) Osbeck) and ambon banana peels (*Musa x paradisiaca* L.) contain flavonoid compounds and vitamin C which have potential as sunscreens. This study aims to determine the potential of sunscreen from the extracts and fractions of each sweet orange peel and ambon banana peel based on the SPF value. This research was carried out by extracting and fractionating each sweet orange peel and ambon banana peel. Extract and fraction of each sample were tested for sunscreen activity on UV-Vis spectrophotometry by measuring the absorption of UV-B rays at 290-320 nm and calculated SPF value. Each sample from thick ethanol extract, n-hexane fraction, ethyl acetate fraction, n-butanol fraction and water fraction from sweet orange peel obtained SPF values of respectively, 31.29; 4.77; 38.52; 10,30; and 3.8536, while Ambon banana peel it was 3.50; 0.20; 17.23; 2.93; and 0.66, each with a concentration of 250 ppm. The comparison benzofenon obtained an SPF value of 35.34, at a concentration of 50 ppm. Sweet orange peel (*Citrus sinensis* (L.) Osbeck) and ambon banana peels (*Musa x paradisiaca* L.) have sunscreen activity with ethyl acetate fraction which has the highest SPF value and belongs to the ultra category.

Studi Formulasi dan Uji Antibakteri Ekstrak Buah Pisang Kayu Mentah

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Didaerah Desa Senduro, Lumajang, Jawa Timur. Pisang kayu digunakan untuk mengatasi diare. Terdapat senyawa aktif yang digunakan sebagai antidiare pada bauh pisang kayu, maka dari itu perlu diinovasi untuk menjadi sediaan baru dari senyawa tersebut, salah satunya eliksir. Tujuan penelitian ini untuk memformulasikan dan uji antibakteri sedian eliksir ekstrak etanol buah pisang kayu mentah. Metode yang digunakan untuk uji antibakteri adalah metode difusi cakram. Pembuatan eliksir dilakukan dengan metode pencampuran dan dilakukan uji stabilitas meliputi uji organoleptis, pH, berat jenis dan viskositas sediaan. Hasil ekstraksi dari 1000 gram simplisia didapatkan nilai rendemen 6,51%. skrining fitokimia esktrak etanol buah pisang kayu teridentifikasi alkaloid, flavonoid, saponin, tanin dan polifenol. Stabiltitas fisik sediian eliksir pada 3 formulasi menunjukkan hasil organolpetis berbau khas pisang, warna kuning kecoklatan, terdapat endapan amilum, dan rasa manis sepat. pH diukur dengan pH universal dan konstan pada pH 4. Bj sediaan yang diperoleh dibawah syarat 1.21-1.23 g/cm3. Viskositas sediaan secara berurut rata-rata (FI= 1.00 mPa.s), (FII=1.00 mPa.s) dan (FIII = 2.00 mPa.s). pada sediaan eliksir yang dibuat menunjukkan hasil tidak jernih dikarenakan ada suatu endapan. Endapan tersebut berupa pati yang dihasilkan dari ekstrak kental yang dimana pada buah pisang memiliki kandungan pati yang tinggi. Ketiga formula tersebut dilakukan pengujian antibakteri metode difusi cakram pada bakteri Escherichia coli. Kesimpulan penelitian ini uji organoleptis tidak sesuai karena masih ada endapan yang terbentuk dan BJ kurang dari persyaratan. pada pH, dan Viskositas sediaan sudah memenuhi kriteria. Zona hambat terbesar yang didapatkan pada ketiga formula tersebut yaitu formula 3 sebesar 6 mm.

Efficacy Of The Extract And Active Fraction Of The Leaves Of *Hibiscus Surattensis* L. In Reducing Levels Of Hba1c And Advanced Glycation End Products (Ages) In Diabetic Type 2 Model Rat

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Hibiscus surattensis L. is a traditional medicinal plant often used for diabetes treatment by people in Indonesia, especially in Central Sulawesi. The leaves of this plant contain mainly kaempferol, morine, and trifolin; they have a variety of pharmacological effects, including high antioxidant properties and increasing insulin secretion. This study aims to investigate the efficacy of the extract and active fraction of the leaves of *Hibiscus surattensis* L. (HSL) on reducing levels of HbA1c and AGEs in rat model of type 2 diabetes mellitus; using high fat-diet and fructose 1.8 g/kg BW (HFD/HF) for 8 weeks. Thirty male rats were randomly assigned into six groups: (1) Group normal control diet with standard rat chow; (2) Group positive control with HFD/HF diet; (3) Treatment group with metformin 100 mg/kg BW as standard; (4) treatment group given HSL leaves extract 50 mg/kg BW; (5) treatment group given ethyl acetate fraction (EAF) 50 mg/kg BW; (6) treatment group given water fraction (WF) 50 mg/kg BW. All treatments were given orally for twenty-one days. The data obtained were analyzed by ANOVA and Duncan Post Hoc test by using SPSS 16.0. HFD/HF induction caused an increase in HbA1c and AGEs levels 3.5 times and 1.88 times, respectively, greater than the normal control group. Treatment of extract and active fraction in rats showed significantly reduced ($p< 0.05$) HbA1c and AGEs levels compared with the control positive rats on day 21. Blood HbA1C levels decreased by 49.2%; 56.4%, and 48.6% in extract 50, EAF and WF 50 mg/kg BW, while AGEs levels reduced by 30.9%; 54.7%, and 38.3%, respectively. The most significant reduction was observed at EAF 50 mg/kg BW. This study indicates that the administration of HSL has an antidiabetic effect by reducing the levels of HbA1C and AGEs in type 2 diabetic rats.

Formulation of Temu Kunci (*Boesenbergia pandurata* (Roxb.) Schlecht) Rhizome Extract Sunscreen, Inhibition Activity of Tyrosine Photodegradation and Its Total Phenolic Compounds

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Indonesia is a tropical country with high intensity of sunlight that can give negative impact on human skin. Photoprotector material which absorb or block sunlight from entering the skin is important to prevent damage due to sunlight. Ethanolic extract of temu kunci (*Boesenbergia pandurata* (Roxb.) Schlecht) rhizome contains flavonoid which known to have activity as photoprotectors. This study aims to determine ethanolic extract of temu kunci rhizome's effect in sunscreen preparations containing oxybenson active ingredient as photoprotector; knowing the tyrosine photodegradation activity and its total phenolic content. This research was conducted by testing eight formulas. Determination of photoprotection ability based on the value of erythema transmission and pigmentation transmission. The photodegradation inhibition assay was carried out using six groups of tyrosine and Rhetoflam compositions. The total phenolic concentration determination was carried out using the Folin-Ciocalteu method. The measurement results are interpolated into the raw curve of gallic acid. The addition of ethanolic extract of temu kunci rhizomes was able to reduce erythema transmission from 0.72 to 0.76 times and decrease in pigmentation transmission 0.57-0.61 times from sunscreen preparations. The amount of 6% temu kunci rhizome extract was not affected whether by reducing the transmission of erythema or decreasing the transmission of pigmentation. Whereas the total phenolic content of temu kunci rhizome ethanolic extract was 7.11 ± 0.15% EAG with the inhibitory activity of tyrosine photodegradation 2.06 times greater than vitamin C at the same level, which was 0.15%. This shows that temu kunci rhizome ethanolic extract can be used as an active ingredient of photoprotector in cosmetic preparations.

Keywords: Temu Kunci; Photoprotection; Photodegradation; Sun Protection

Analysis Of The Effect Of Health Culture, Health Awareness, And Product Perception Of Consumption Of Herbal Medicine In Patients With Vascular Diseases In Bandar Lampung

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Vascular disease is a condition that affects the arteries or veins. Vascular disease occurs when blood vessels are weakened, blocked, or damaged. Other organs and structures of the body may be damaged by vascular disease as a result of reduced blood flow to the organs. In Lampung, patients with heart and the vascular disease reached 13.000 people. Meanwhile, herbal medicine is an alternative medicine that is commonly consumed by people to reduce the severity of the disease they suffer, including vascular disease. This study was conducted to determine the effect of individual health culture, their health awareness, and their perception of herbal products consumption to relieve and treat vascular disease. This research is quantitative. Data collected in this study is based on a questionnaire that provides the thoughts of the respondents. The result shows that health culture and health awareness do not always affect the consumption of herbal medicines. But the perception they have affects their decision in consuming herbal medicines. The herbal medicine that is top of mind for patients with vascular disease in Bandar Lampung to relieve vascular disease is garlic. Steps a product marketer of herbal medicines for heart and vascular medicines should take is a positive perception in various circles, in Indonesia, especially in Bandar Lampung.

Histopathological Finding of Burn Healing Using Moringa Leaf (*Moringa oleifera* Lam.) extract Gel and Ethyl Acetate Fraction Gel on Rabbits

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Quercetin is a flavonoid that plays a role in the skin regeneration process with an antioxidant mechanism. The leaves of Moringa (*Moringa oleifera* Lam.) Contain quercetin compounds with an antioxidant mechanism that can help the wound healing process. Moringa leaf ethanol extract is also known to have anti-inflammatory, antifungal and antibacterial activity. This study aims to determine the effect of Moringa leaf ethanol extract gel (MLEE) and Moringa leaf ethyl acetate fraction gel (EFML) on the healing time of second degree burns in male New Zealand White rabbits. This study was experimental with a completely randomized design with the subject, using ten male rabbits for burn healing tests, and each rabbit's back was divided into six groups: healthy control (no treatment), positive control (Bioplacenton), control. negative HPMC (base), and MLEE Gel with 2%, 4% and 6%, and EFML Gel 1%, 2% and 4% in gel basis (w / w). ± 0.3 grams of gel applied to the rabbit's back with use once a day for 21 days. The results showed that, the area of burns on day 21, the positive control group was 0.03 cm2; negative control 1.63 cm2; MLEE 2% gel: 0.07cm2; MLEE 4% gel: 0.03 cm2; MLEE 6% gel: 0.02 cm2; EFML 1% gel: 0.19 cm2; 2% EFML Gel: 0.10 cm2 and 4% EFML Gel: 0.07 cm2. MLEE Gel and EFML Gel were able to improve the skin structure due to burn intervention based on burn area ($P < 0.05$) and epithelialization observation on hematoxylin-eosin histopathology.

Antibacterial activity of fraction ethyl acetate of *Mikania micrantha* Kunth. Leaves from, Bengkulu Province

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Mikania micrantha Kunth. is an invasive plant that lives in Indonesia. *M. micrantha* leaves are thought to have several phytochemical compounds such as alkaloids, flavonoids, steroids and tannins that can be used to inhibit the growth of pathogenic bacteria in humans Bacillus subtilis, *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*. The purpose of this study was to determine the most optimal concentration of the antibacterial activity of the ethyl acetate fraction of *M. micrantha* leaves. Preparation of the ethyl acetate fraction using the maceration ratio 1:10 method, the initial test for determining the MIC and the antibacterial activity test using the disc diffusion method. The results showed that in the antibacterial activity test, the most optimal concentration of antibacterial activity was *B. subtilis* 45% with an inhibition zone of 10.02 mm, *E. coli* 35% with an inhibition zone of 10.7 mm, *P. aeruginosa* 35% with an inhibition zone of 10.89 mm and *S. aureus* 55% with an inhibition zone of 7.48 mm. Phytochemical test results showed that the ethyl acetate fraction of *M. micrantha* leaves contained tannin compounds. It can be concluded that the ethyl acetate extract of the leaves of *M. micrantha* has potential as an antibacterial.

Penambatan Molekul dan Prediksi Uji Toksisitas pada Senyawa Turunan Inhibitor GATA-2 Sebagai Peningkat Transkripsi Eritropoiesis

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Anemia adalah suatu kondisi dimana jumlah sel darah merah atau jumlah hemoglobin, suatu protein yang bertanggung jawab dalam mengangkut oksigen keseluruh tubuh, berada dibawah normal. Kondisi penyakit ginjal kronis menyebabkan menurunya kadar hemoglobin dalam tubuh sehingga berpengaruh terhadap proliferasi sel dalarah merah. Dilakukan pencarian senyawa untuk merangsang proses proliferasi sel darah merah tanpa melibatkan eritropoietin. senyawa pyrrotiogatain dipercaya dapat meningkatkan proliferasi sel darah merah, tetapi dilaporkan memiliki toksisitas yang cukupo serius. Kemudian dilakukan modifikasi molekul untuk mencari efekticvitas yang memiliki toksisitas yang lebih rendah. dihasilkan beberapa turunan piritiogartain yang efektif dengan penambatan mokul dan penentuan toksisitas prodiktif.

Sediaan Salep Bisul dari Ekstrak Daun Bungur

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Staphylococcus aureus adalah kuman flora normal pada kulit dan selaput lendir pada manusia, dapat menjadi penyebab infeksi manusia berupa bisul. Salah satu contoh antimikroba yang dapat di peroleh dari alam adalah tanaman bungur karena mengandung zak aktif yaitu saponin, flavonoid, dan tanin. Untuk meningkatkan efektivitas dan kenyamanan penggunaan daun bungur, maka perlu di formulasi dalam bentuk yang lebih praktis digunakan seperti sediaan. Penelitian ini bertujuan untuk mengidentifikasi fraksi aktif dari ekstrak daun bungur (*Lagerstroemia speciosa* L. Pers) pada sediaan salep bisul terhadap bakteri *Staphylococcus aureus*. Metode ekstraksi yang digunakan adalah metode maserasi, yang dilanjutkan dengan pembuatan formulasi pada sediaan salep bisul, kemudian dilakukan pengujian terhadap bakteri Staphylococcus aureus. Diameter hambatan yang terbentuk diukur dan dianalisis secara statistik menggunakan metode Rancangan Acak Lengkap (RAL). Hasil penelitian menunjukkan diameter hambatan rata-rata salep daun bungur 1% sebesar 11,5 mm, 5% sebesar 12,7 mm, 10% sebesar 15,8 mm, dan kontrol positif sebesar 16,5 mm. Disimpulkan bahwa konsentrasi yang efektif ekstrak daun bungur dalam sediaan salep dalam menghambat pertumbuhan *Staphylococcus aureus* adalah 1%.

Kata kunci: Bungur; Salep; *Staphylococcus aureus*

Potency Of Butenedioic Acid Of Soursop Leaves (*Annona muricata*) Water Extract (SLWE) As DPP4 Inhibitor

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Introduction.The aim of the study was to prove the potential of SLWE content as DPP4 inhibitor using in silico method. Method.The extraction process of soursop leaves uses water solvent with the infusion method. Withdrawal of the active compounds using acetone solvent. Identification using the GCMS method. Molecular docking of SLWE active compounds , Linagliptin as a control and DPP4 protein target using Autodoc Vina application, visualization using Drug Discovery Studio. Data analysis used descriptive analytic by comparing the measurement results of free binding energy, the number of bonds to the target protein amino acid residues, the similarity of bond positions compared to controls. Physicochemistry, ADMET using admetSAR 2.0. Result. SWLE active compound are benzene 1.2.3.4 tetramethyl; 2-Oxazolidinone, 3,3'-ethylidenebis[5-methyl ; Ethane, 1-bromo-2-fluoro-, 2 ; Butenedioic acid ; 2-(((carbobenzyloxy) amino) methyl)-4-benzyl-5-((carbomethoxy)-amino) oxazole and Ditridecyl Ester Phthalic Acid. . Butenedioic acid has affinity to DPP4 close to control. Butenedioic acid has ΔG of . -7 kcal / mol, binds 53% of amino acid residues of DPP4 and has 58% the same bond potition with the amino acid residue of DPP4 compare linagliptin and has one hydrogen bond. Butenoic acid has the potential to be developed as DPP4 inhibitor drugs which is administered orally and non toxic effect. Conclusion. Butenedioic acid active compounds of SLWE have save and potential as DPP4 inhibitors.

Keywords: soursop leaves, Butenedioic Acid . DPP4 inhibitor, insilico

Collection of Medicinal Plants as Antimalarial in Liwa Botanical Garden

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Liwa Botanical Gardens (KRL) is a conservation area that has various collections of plants, some of which have potential as antimalarial. Inventory of collections of plant species that have the potential as drugs, has been carried out through literature studies and searching data on plant collections in KRL. 110 types of plants from 55 familie in KRLare known to have medicinal properties. Of the 55 families of medicinal plants that have the potential to have antimalarial activity as many as 10 families, including Asteraceae, Malvaceae, Lauraceae, Moraceae, Apocynaceae, Rutaceae, Myrtaceae, Fabaceae, Euphorbiaceae, and Rubiaceae. Parts of the plant that produces antimalarial substances comes from extracts of roots, stems, bark and leaves. Based on the results of various studies, there are several plants in KRL are known to antimalarial effects, including Papaya (*Carica papaya*), Sambiloto (*Andrographis paniculata* Nees), Johar (*C. siamea* Lamk), Pasak bumi (*Eurycoma longifolia* Jack), Cocor duck (*Kalanchoe blossfeldiana* Poelln), and *Eucalyptus* sp.

Keyword: Antimalarial, Liwa Botanical Garden, Medicinal Plants

Variasi Anatomi Daun Dan Kandungan Klorofil Tanaman Cincau Hijau Yang Berpotensi Sebagai Tanaman Obat

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Tanaman cincau merupakan salah satu tanaman yang banyak tumbuh di Indonesia. Tanaman cincau memiliki banyak manfaatnya, sehingga berpotensi untuk dikembangkan sebagai tanaman obat. Bagian daun dari tanaman cincau yang umum digunakan adalah sebagai minuman segar. Variasi daun tanaman cincau hijau memiliki ciri khas tersendiri. Anatomi merupakan salah satu cara untuk membedakan jenis suatu tanaman. Selain itu kandungan klorofil tanaman cincau hijau perlu diukur untuk mengetahui besarnya kandungan klorofil yang terdapat pada tanaman tersebut. Penelitian ini dilaksanakan pada bulan April sampai bulan Mei 2021. Jenis-jenis tanaman cincau hijau yang diamati adalah *Cocculus orbiculatus* , *Cyclea barbata*, dan *Premna oblongifolia* Pengamatan anatomi dilakukan pada permukaan atas dan bawah daun dengan menggunakan metode utuh (whole mount). Kandungan klorofil diukur dengan menggunakan metode spektrofotometri. Hasil penelitian menunjukkan bahwa stomata pada tanaman cincau hijau ditemukan hanya pada permukaan bawah daun, bentuk sel epidermis ada yang bergelombang yang terdapat pada *Cyclea barbata* dan *Cocculus orbiculatus*, sedangkan yang rata terdapat pada *Premna oblongifolia*. Bentuk stomata anisositik terdapat pada *Cyclea barbata* dan *Premna oblongifolia*, sedangkan bentuk stomata pada *Cocculus orbiculatus* adalah anomositik. Ada perbedaan kandungan klorofil a, b, dan total. Klorofil a, b, dan total yang tertinggi terdapat pada *Cyclea barbata*, sedangkan kandungan klorofil a, dan total yang terendah terdapat pada *Premna oblongifolia*.

Aktivitas Antibakteri Gel Peeling Scrub Daun Turi (*Sesbania Grandiflora* (L.) Poir.) Sebagai Alternatif Kosmetik Pada Pandemi Covid-19

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Formulasi gel peeling scrub merupakan alternatif kosmetik antibakteri yang dapat mencegah infeksi dan timbul acne pada wajah. Scrub yang terkandung dalam formulasi ini berfungsi untuk membersihkan pori-pori kulit dan mengangkat sel-sel mati. Zat aktif yang digunakan pada formulasi ini merupakan bahan alam yang memiliki kandungan senyawa antibakteri. Daun Turi memiliki senyawa metabolit sekunder yang berfungsi sebagai antibakteri antara lain saponin, glikosida, tanin dan steroid. Penelitian ini merupakan penelitian eksperimental dengan variabel bebas merupakan formulasi gel peeling scrub Daun Turi dengan variasi konsnetrasi 5%, 7,5% dan 10%. Variabel terikat merupakan aktivitas antibakteri dari formulasi gel peeling scrub Daun Turi. Variabel kontrol merupakan Clindamycin disk dan basis gel. Pengujian antibakteri menggunakan metode difusi sumuran dengan masa inkubasi 24 jam. Bakteri yang digunakan merupakan Propionibacterium acne yang disuspensikan dengan standar Mc. Farland 0,5. Data yang dihasilkan berupa diameter zona hambat dan dianalisa menggunakan Uji Anova satu arah pada aplikasi SPSS 20.0. Esktrak yang dihasilkan sebanyak 94,44 g dan rendemen ekstrak sebesar 20,98 %. Pengujian fitokimia mengidentifikasi adanya senyawa metabolit sekunder berupa saponin, glikosida, tanin dan steroid. Rata-rata diameter zona hambat yang dihasilkan dari uji aktivitas variasi konsentrasi 5%, 7,5% dan 10% berturut-turut adalah 12,67 mm, 13,67 mm dan 15,67 mm. Hasil diameter zona hambat dianalisa menggunakan uji parametric yang telah melalui persyaratn uji normalitas dan uji homogenitas. Uji Anova satu arah menghasilkan nilai siginfikansi sebesar 0,533. Hal ini dapat disimpulkan bahwa pada ketiga variasi konsentrasi tidak memiliki perbedaan diameter zona hambat yang bermakna.

Skrining Aktivitas Antibakteri Dan Identifikasi Molekuler Bakteri Asam Laktat (Bal) Dari Fermentasi Kubis (*Brassica Oleracea* L.) Terhadap Bakteri Patogen Shigella Dysenteria

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The development of cancer treatment with natural ingredients has recently increased. This is because many of the active compounds present in nature are capable of inhibiting the growth of cancer cells. One of the natural ingredients which has activity as a cancer chemoprevention agent is *Vernonia amygdalina* Delile, known in Indonesia as African leaf. Colorectal cancer (CRC) is the incidence of cancer in parts of the large intestine that is prevalent in the aging population. This research investigated the effect of *Vernonia amygdalina*, through cytotoxic activities on a human colon cancer cells (WiDr). The simplicia of the African leaf was extracted separately using 96% ethanol solvent by maceration method. The African leaf ethanol extract was then analyzed for toxicity test using 3-(4,5-Dimethylthiazol-2-Yl)-diphenytetrazolium bromide-2,5 (MTT) in WiDr cells. The findings showed that African leaf contained cytotoxic activity with an IC50 value of 26.92µg/ml which suggested the activity of African leaf extract as moderate antioxidants. These values indicate the potential for anti-colorectal cancer activity in African leaf.

Key words: African Leaf, Cytotoxic activity, Anti cancer, WiDr Cell Lines

Anti-Cancer of *Vernonia amygdalina* Delile with Cytotoxic Activities on WiDr Cell Lines

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The development of cancer treatment with natural ingredients has recently increased. This is because many of the active compounds present in nature are capable of inhibiting the growth of cancer cells. One of the natural ingredients which has activity as a cancer chemoprevention agent is *Vernonia amygdalina* Delile, known in Indonesia as African leaf. Colorectal cancer (CRC) is the incidence of cancer in parts of the large intestine that is prevalent in the aging population. This research investigated the effect of *Vernonia amygdalina*, through cytotoxic activities on a human colon cancer cells (WiDr). The simplicia of the African leaf was extracted separately using 96% ethanol solvent by maceration method. The African leaf ethanol extract was then analyzed for toxicity test using 3-(4,5-Dimethylthiazol-2-Yl)-diphenytetrazolium bromide-2,5 (MTT) in WiDr cells. The findings showed that African leaf contained cytotoxic activity with an IC50 value of 26.92µg/ml which suggested the activity of African leaf extract as moderate antioxidants. These values indicate the potential for anti-colorectal cancer activity in African leaf.

Key words: African Leaf, Cytotoxic activity, Anti cancer, WiDr Cell Lines

Test Of Vitamin C In Catechins Gambir (*Uncaria Gambier* Roxb.) At Different Concentrations And Doses

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Gambir (*Uncaria gambir* Roxb) is a plant that is widely cultivated in West Sumatra, with the main component of gambier which act as antimicrobial and antioxidant compounds. Vitamin C is one of antioxidants which have the main function of inhibiting an oxidation reaction and inhibiting a free radical. This study aims to determine the levels of vitamin c in catechin Gambir with different concentrations and doses. This research is an experiment with a Factorial Completely Randomized Design where Factor A (concentration) and Factor B (dose), conducted at the Laboratory of Biological FMIPA UNP. The method used in this research is UV spectrophotometry. Data were analyzed using ANOVA followed by the DMRT test with a significant of 5%. The results showed that concentrations and dosage used Gambir catechins affect the levels of vitamin C where the Sig <0.005% with concentration of 95% and dose of 200 mg.

The Diversity Of Medicinal Plants In Curug Ciwalen Gunung Gede Pangrango National Park

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Indonesia is one of the country in the world that has the largest variety of flora and fauna. Many of the flora of Indonesia are medicinal plants. Medicinal plants are natural ingredients that have been traditionally used for treatment based on experience. This study aims to determine the diversity index and evenness index of medicinal plants in Curug Ciwalen, Gunung Gede Pangrango National Park. The method of the research is exploration with the roaming method. This research was conducted on February until June 2020 at Curug Ciwalen Gunung Gede Pangrango National Park (TNGGP). The results showed the Shannon Weiner Diversity Index is 3.83 and the Ludwig & Reynold Evenness Index is 0.93. The Asteraceae, Urticaceae and Solanaceae families are the most common in the area. Habitus percentage showed that the most common is herbal habitus. The percentage then showed the part of the plant that is mostly used is the leaf. And finally, the percentage is resulted that most of medicinal plants is growing wild instead of being cultivated.

Keywords: Medicinal plants, diversity index, evenness index.

In Vitro Antioxidant And Anticholesterol Of Salam (*Syzygium Polyanthum* Wight.) Leaf Extract In 96% Ethanol And Water Using Spectrophotometry Method

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Salam (*Syzygium polyanthum* Wight.) is a plant that has been widely used as traditional medicine. Salam leaves contain flavonoid compounds which have been known in previous studies to have antioxidant and anti-cholesterol activity. Salam contain several useful compounds such as tannins, Gallocatechin, flavonoids, saponins, and essential oils (sesquiterpenes). Flavonoids are polyphenolic compounds that have antioxidant benefits. The purpose of this study was to determine the antioxidant and anti-cholesterol activity of Salam leaf extract 96% ethanol and water. Antioxidant activity by DPPH Radical Scavenging method. was measured at a wavelength of 515.5 nm with compare to reference standard ascorbic acid. Anti-cholesterol by Liebermann-Burchard reagent. analysis using the UV-Vis spectrophotometric with wavelength of 670 nm. The results of the research on the antioxidant activity of 96% ethanol and water extract obtained IC50 values of 79.30 ± 0.66 ppm and 89.48 ±1.55 ppm. The results of anti-cholesterol activity obtained IC50 values of 96% ethanol and water extract of 471.40 ± 0.40 ppm and 768.95 ± 0.38 ppm. Based on the results it can be concluded that 96% ethanol and water extract of Salam leaves have antioxidant activity and anti-cholesterol activity.

Antioxidant Activity of Water Extract of *Vernonia amygdalina* Delile. Leaves

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The uncontrolled production of oxygen free radicals and the unbalanced mechanism of antioxidant protection results in the onset of many diseases, such as cancer, diabetes, Alzheimer's, heart diseases, and aging. *Vernonia amygdalina* Delile (Nan Chao Wei), a member of the family Asteraceae, is a small shrubbery that grows throughout tropical Africa. It is called "bitter leaf" due to its bitter taste. Its leaf is served as a vegetable and culinary herb in soup. This study aimed to determine antioxidant activity, total flavonoid, and total phenolic content of *Vernonia amygdalina* Delile. Leaves. The extract was prepared using water with the maceration method. The antioxidant activity was determined with the 1,1-diphenyl-2-picrylhydrazyl (DPPH) method. Total flavonoid and total phenolic content were determined with colorimetric methods. Antioxidant activity from DPPH assay measured as IC50 was 48.23 ± 0.46 µg/mL. The extract was found to contain high levels of total phenolic (79.87 ± 0.39 mg GAE/g) and total flavonoid (9.65 ± 0.03 mg QE/g). The results reveal that hydroalcoholic extract of *Vernonia amygdalina* Delile. Leaves have antioxidant potential.

Bioactivity compound Prediction of *Saurauia vulcani* as immunostimulant : An In Silico Approach

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Immunostimulatory effect of Pirdot (*Saurauia vulcani*) has been reported previously. However, molecular interactions tend to be involved in mechanism of immunostimulatory activity has not been clarified. Our previous study indicated that ethanol extract of Pirdot leaves affected significantly the number of erythrocyte and spleen histological structure. Therefore, the purpose of the present study was to elucidate molecular bioactivity interaction of bioactive compound Pirdot with protein induced immunostimulant function through in silico approach. As a result, there were three bioactive compounds of Pirdot to interact with immunotherapeutic agents in protein-protein interaction pathway, such as ursolic acid, stigmasterol, and genistein. Moreover, its bioactive compound bound to active site of IL-8 and IL-6 that ursolic acid has the highest value than stigmasterol and genistein, respectively.

α-Amylase And A-Glucosidase Inhibition Effect Of Several Indonesian Plants Exctract

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The aim of this research was to determine the inhibition activity of nine Indonesian plant extracts, i.e. turmeric (*Curcuma longa*), Javanese turmeric (*Curcuma xanthorrhiza*), sappan wood's (*Caesalpinia sappan*), meniran (*Phyllanthus niruri*), cat whiskers (*Orthosiphon stamineus*), celery (*Apium graveolens*), tempuyung (*Sonchus arvensis*), kepel (*Stelecocarpus burahol*), and pegagan (*Centella asiatica*) against α-amylase and α-glucosidase enzymes. All of crude drugs were extracted with soxhlet apparatus using 80% ethanol. α-amylase and α-glucosidase inhibition assays were done in vitro using Sigma Aldrich method with several modifications. The result showed that meniran, sappan wood's, Javanese turmeric, turmeric, kepel, cat whiskers, celery, pegagan, and tempuyung extracts could inhibit the activity of α-glucosidase enzyme with IC50 values <20, 37.36, 222.24, 285.94, 291.25, 354.61, 835.72, >1000, and > 1000 µg/ml, respectively. Moreover, IC50 value of sappan wood's and meniran extracts on α-amylase enzyme were 317.31 and 496.71 µg/ml, respectively. At the other hand, turmeric, Javanese turmeric, tempuyung, kepel, cat whiskers, and pegagan extracts exhibited same IC50 value on this enzyme, i.e. >1000 µg/ml. In Conclusion, meniran has the best inhibition activity of an α-glucosidase enzyme. At the same time, sappan wood's has the best inhibition activity of an α-amylase enzyme.

Serai Kayu (*Syzygium Polyanthum* (Wight) Walp.) Leaves Extract Mediated Green Synthesis Of Silver Nanoparticles (Sk-Agnps) And Its Enhanced Antimicrobial Properties

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Foodborne pathogens and food spoilage are a major cause of concern to safety and quality. Thus, to improve food safety and quality, antimicrobials are used. Recently, the antimicrobial agents of plant extracts have received much attention, but their antimicrobial activity is relatively mild. To increase the antimicrobial activity of plant extracts, green nanoparticle technology is widely used such as silver nanoparticles (Ag-NPs). The aim of this study was to synthesize serai kayu (*Syzygium polyanthum* (WIGHT) WALP.) silver nanoparticles (SK-AgNPs), to determine the antimicrobial activities of SK- AgNPs. The SK-AgNPs were synthesized via a green cost-effective method by mixing 1mM AgNO3 solution with serai kayu (*Syzygium polyanthum* (WIGHT) WALP.) leaves extract. The antimicrobial activity of the SK- AgNPs extract was determined in terms of well diffusion assay (WDA), minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC), and minimum fungicidal concentration (MFC) as described by Clinical and Laboratory Standards Institute (CLSI) reference methods. The results indicated that the formation of SK-AgNPs by visually observing the change in color from light yellow to dark brown upon mixing 1% serai kayu leaves extract and silver nitrate solution. The susceptibility tests of SK-AgNPs showed antimicrobial activities against all the tested foodborne pathogens with inhibition zone values ranging from 10.16 to 13.16 mm. The MIC values of the SK-AgNPs ranged from 0.08 to 0.62 mg/mL and MBC value ranged from 0.08 to 1.25 mg/mL. The growth of all fungi strains showed inhibition zone ranged from 9.25 to 11.50 mm, with MIC and MBC values ranged from 0.04 to 0.31 mg/mL and 0.08 -0.62 mg/mL, respectively. The antimicrobial activities of SK-AgNPS were higher than those of the serai-kayu (*Syzygium polyanthum* (WIGHT) WALP.) leaves extract only. It can be concluded that green silver nanoparticles can enhance antimicrobial activity.

Effect Of Nutmeg (Myristica fragrans Houtt.) Extract On Microflora In Raw Chicken During Different Storage Temperatures And Exposure Times

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Nutmeg (*Myristica fragrans* Houtt.) is traditionally recognized as flavouring ingredient in various types of foods. Scientifically, this spice has been reported with various valuable nutritional and pharmacological properties including antibacterial potencies. The objective of this study was to determine the antibacterial activity of ethanolic nutmeg extract against foodborne pathogens during storage of raw chicken. The methods of susceptibility testing and stability analyses of extracts were also tested at different pH and temperatures. The effect of the extract at different concentrations; 0.00%, 0.05%, 0.50% and 5.00% and different temperatures; 25.0 ± 2.0oC (room temperature), 4.0 ± 2.0oC (chiller) and -18.0 ± 2.0oC (freezer) on microflora population of chicken were evaluated up to 21 days. The results showed that disc diffusion assay produced inhibition zone of the extracts from 9.75 ± 0.35 to 13.50 ± 0.00 mm. The extract inhibited the growth and killed all tested bacteria with MIC and MBC values ranged from 6.25 mg/mL to 25.00 mg/mL and 25.00 mg/mL to >50.00 mg/mL, respectively. The extract generally displayed a quite similar result of antibacterial activity based on the average diameter of inhibition zone after treated with different pHs and temperatures indicating that the extract was stable. Furthermore, chicken treated with concentration of 5.00% extract exposed to chiller (4.0 ± 2.0oC) and freezer (-18.0 ± 2.0oC) temperatures reduced the microbial growth up to total inhibition action against all treated bacteria including total plate count. Therefore, the kernel extract of *M. fragrans* H. could be used as a potential natural alternative preservative due to its effectiveness of antibacterial action.

Formulation Of Peel-Off Mask Gel Containing *Moringa Oleifera* Lam. Leaf Extract And Brightening Test

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Moringa oleifera is a type of tropical plant that is easy to grow in tropical regions such as Indonesia. Moringa leaves are one part of the Moringa plants that have been widely studied in terms of nutrition and usefulness. Moringa leaves contain antioxidants such as flavonoids and are very rich in nutrients, including calcium, iron, protein, vitamin A, vitamin B and vitamin C. Objectives: This study aimed to formulate a peel-off gel mask containing Moringa leaf extract and see its activity to brighten the skin. Methods: There are 4 dosage formulas in this study which are marked with formula 1 (F1), formula 2 (F2), formula 3 (F3) and formula 4 (F4). Each formula was then tested for the characteristics of the formulation and the brightening test on the rats using Draize method. Results: This study showed that the percentage of the gel constituent ingredients of the four formulas can affect the spreadability, adhesion and drying time. The effect of the brightening test showed that the F1 formula with 25% Moringa leaf extract concentration has the highest brightening effect with an increase in brightening scale of 1 tone-up from the initial skin color compared by other formulas and positive control. Counclusion: Moringa peel-off mask gel has an ability to brighten the skin.

Cardioprotective activity of *Nauclea subdita* (Korth.) Steud. Stem Bark Extract

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Coronary Heart Disease (CHD) has a high mortality rate in Indonesia. One type of coronary heart disease is myocardial infarction. Myocardial infarction occurs because of large amounts of free radicals to trigger an increase in oxidative stress. This study aimed to evaluate cardioprotective activity of aqueous extract of Taya stem bark (*Nauclea subdita*) by isoprenaline induction in wistar male rats (*Rattus novergicus*). Rats were administered an aqueous extract of N.subdita as prevention therapy for one, two, and three weeks in doses 100 mg/kgbw. In the previous study, the animal was induced by isoprenaline 300 mg/kgbw intraperitoneally. In this study, we observed heart weight, a severe score of heart, and histopathology analysis followed by hematoxylin-eosin staining. There are decreasing in heart weight in the treatment group compared to the induction group. We also find reduced a severe heart score in all therapy especially significant in three weeks therapy. This score indicated that aqueous water of *N. Subdita* could prevent the heart from damaged because of isoprenaline induced. Histopathology analysis showed that all treatment showed lower infarc area compared to induction. In conclusion, an aqueous extract of Taya stem bark potentially as prevention in myocardial infarction.

Development of Sumbawa Honey as Tonic to Stimulate Stamina During the Covid-19 Pandemic in West Nusa Tenggara

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Covid-19 is a disease caused by infection with a new type of coronavirus called SARS-CoV-2. Like other types of coronavirus infections, this new coronavirus is transmitted to humans through animals. The positive cases of Covid-19 are increasing day by day, both in the world, in Indonesia, and in the West Nusa Tenggara region. Covid-19 is a self-limiting disease, which can heal by itself as long as the human body's power is sufficient to fight the infectious agent. One of way to increase human immunity is to maintain the stamina. Substances that can increase stamina are commonly called tonics. Sumbawa honey is one type of honey that is very popular inside and outside the island of Sumbawa even to foreign countries. Sumbawa honey has been used for generations by the community from ancient times until now as a stamina enhancer in the West Nusa Tenggara area. This study aimed to examine the ability of Sumbawa honey as a tonic. This research was a true experimental model with natatory exhaustion method (Swimming Endurance Method). The parameter measured was the fatigue time of the test animals. The longer the fatigue time, the higher the tonic effect produced, conversely the faster the fatigue time, the lower the tonic effect produced. The results showed that the average fatigue time indicated by the negative control group, group I, group II, group III, and positive control were 47 seconds, 107 seconds, 152 seconds, 213 seconds and 69 seconds, respectively. In conclusion, Group III which was given Sumbawa honey at a concentration of 75 g/70 kgBW had a higher tonic effect than the positive control.

Metabolomics Approach for Understanding the Correlation Between Antioxidant Activity and Its Secondary Metabolites from Different Part of *Sesbania grandiflora*

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Sesbania grandiflora, one of the flowering plants with great potential as a source of natural antioxidants due to its chemical contents such as tannin, phenolic, and flavonoid compound types. This study aims to investigate the correlation between antioxidant activity and its secondary metabolites from three different parts (leaves, stem barks and roots) of S. grandiflora using Fourier-transform infrared spectroscopy (FTIR) based metabolomics approach. The FTIR profiling enabled identifying the functional groups present in the mixtures, while parallel antioxidant assays allowed the selection of three different extracts of plants based on their potent antioxidant activity.

Cardioprotective Activity Of *Nauclea Subdita* (Korth.) Steud. Stem Bark Extract

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Coronary Heart Disease (CHD) has a high mortality rate in Indonesia. One type of coronary heart disease is myocardial infarction. Myocardial infarction occurs because of large amounts of free radicals to trigger an increase in oxidative stress. This study aimed to evaluate cardioprotective activity of aqueous extract of Taya stem bark *(Nauclea subdita*) by isoprenaline induction in wistar male rats *(Rattus novergicus*). Rats were administered an aqueous extract of *N. subdita* as prevention therapy for one, two, and three weeks in doses 100 mg/kgbw. In the previous study, the animal was induced by isoprenaline 300 mg/kgbw intraperitoneally. In this study, we observed heart weight, a severe score of heart, and histopathology analysis followed by hematoxylin-eosin staining. There are decreasing in heart weight in the treatment group compared to the induction group. We also find reduced a severe heart score in all therapy especially significant in three weeks therapy. This score indicated that aqueous water of *N. Subdita* could prevent the heart from damaged because of isoprenaline induced. Histopathology analysis showed that all treatment showed lower infarc area compared to induction. In conclusion, an aqueous extract of Taya stem bark potentially as prevention in myocardial infarction.

Inventarisasi Jenis – Jenis Tanaman Yang Berpotensi Sebagai Penolak Nyamuk di sekitar pekarangan rumah

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Nyamuk termasuk serangga yang aktivitas dan kehidupannya dekat dengan manusia, dari sekian banyak jenis serangga nyamuk termasuk serangga yang banyak perperan sebagai vektor penyakit seperti malaria, Demam Berdarah Dengue (DBD), Cikungunya, kaki gajah dan lain sebagainya. Untuk itu dalam upaya pengendalian serangga, nyamuk termasuk salah satu serangga yang menjadi fokus dalam pengendalian. Pengendalian selain bertujuan untuk membunuh agar populasi berkurang ada juga yang untuk menghindari dari gigitan nya, untuk menghundari terjadinya kontak antara nyamuk dengan manusia. Untuk dilakukan survei ini yang bertujuan untuk mengetahui jenis-jenis tanaman yang berpotensi sebagai penolak nyamuk karena aroma yang dikeluarkan di pekarangan rumah dan sekitarnya. Hasil survei dianalisis secara diskriptif dan ditabulasikan, dari hasil pengamatan ditemukan tujuh jenis tanaman yang berpotensi sebagai penolak nyamuk. Jenis-jenis tanaman tersebut adalah: Zodia (*Euvodia graveolens*); Marigold (*Tagetes erecta*); Daun Pepaya (*Carica papaya*): Serai wangi (*Cymbopogon nardus*); Cengkeh (*Zysigium aromaticum*); Tembelekan *(Lantana Camara*) serta Daun pandan (*Pandanus* sp).

Kata kunci: Pengendalian, Penolak nyamuk, Zodia, Marigold, Serai dan Tembelekan.

Potensi Serbuk Jamur Tiram Putih (*Pleurotusostreatus*)-Kaya Vitamin D Terhadap Kadar Gula Darah, Vitamin D Dan Tnf-A Pada Tikus Diabetes

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Latar Belakang: Hiperglikemi pada diabetes mellitus menyebabkan pembentukan ekspresi Tumor Necrosis Factor-α (TNF-α). Jamur tiram putih (Pleurotus ostreatus) kaya vitamin D apabila terparar sinar UV-B. Vitamin D menekan ROS. Tujuan: Potensi jamur tiram putih-kaya vitamin D terhadap kadar gula darah, vitamin D dan TNF- α pada tikus diabetes mellitus tipe 2 belum diselidiki secara menyeluruh. Bahan dan Metode: Penelitian eksperimental ini, menggunakan 25 tikus, berusia 2-3 bulan, dengan berat 200-300g, dibagi menjadi 5 kelompok. Grup A berfungsi sebagai kontrol negative dengan induksi STZ, Kelompok B, C, D diberi induksi STZ diberi perlakuan jamur tiram putih dengan dosis 200IU, 4000IU, 8000IU selama 28 hari. Kelompok E sebagai kelompok normal. Semua kelompok perlakuan menerima diet standar pada saat yang sama. Sampel darah diambil dan dilakukan pengukuran kadar gula darah puasa menggunakan metode GOD-PAP dan sampel darah serum untuk pengukuran kadar vitamin D dan TNF-α menggunakan metode ELISA. Hasil: Jamur tiram putih-kaya vitamin D secara signifikan menurunkan kadar gula darah, meningkatkan kadar vitamin D dan meningkatkan kadar TNF-α. Kesimpulan: Jamur tiram putih-kaya vitamin D menurunkan kadar kadar gula darah, meningkatkan kadar vitamin D dan meningkatkan kadar TNF-α pada tikus diabetes.

Study On The Potential Of Jeruju (*Acanthus ilicifolius*) Leaf Extract As An Antifertility Agent In Mice (*Mus musculus* L)

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Jeruju (*Acanthus ilicifolius*) is a plant that lives in the mangroves area, and very rarely on land. The jeruju plant contains secondary metabolites such as glucoside compounds, alkaloids, flavonoids, steroids, lignans, phenolic components and terpenoids. Compound content of metabolites in jeruju leaves are considered to be antiestrogenic because they have chemical that resembles the structure of estrogen in the body so that it is used as an antifertility. This research aims to determine the potential of jeruju leaf extract as an antifertility agent. The parameter used to determine the effect of antifertility is follicular development in the ovary of mice. Adult female mice were used in this study which are given the extract of jeruju leaves orally and their effect on folliculogenesis in ovaries. The study was carried out using a completely randomized design method with 1 control group (K) was given 0.3 ml aquabides/30 g body weight, and 3 treatment groups, P1 was given 3.75 mg/30 g bw in 0.3 ml aquabides, P2 was given 7.5 mg/30 g bw in 0.3 ml aquabides, P3 was given 15 mg/30 g bw in 0.3 ml aquabides for 14 days. Data were analyzed using One Way Anova followed by LSD at 5% of significant level. The results showed that jeruju leaf extract reduced the number of primary, secondary, tertiary and de Graff follicles, also decreased the respective diameters follicles. In addition, after administration of jeruju leaf extract, the follicular development stops until the follicular stage tertiary because many follicles are artesian . A decrease in the number and diameter of follicles indicates that in jeruju there are antifertility agents

Keywords: jeruju plant, Acanthus ilicifolius, antifertility, antiestrogen, ovaries, folliculogenesis

The Potential Application of Diphenyltin(IV) Carboxylates as a Future Disinfectant

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The organotin(IV) carboxylates and their derivatives continues to attract interest to many chemists as these compounds are very active and having strong biological activity. These compounds have previously been tested as anticancer, antimalarial, antibacterial, antifungi, and antioxidants and almost all of them have shown to be very active. Previously, some works on the synthesis and activity studies of some organotin(IV) benzoates and their derivative were reported by our group. In this work, we reported the potential applications of some diphenyltin(IV) carboxylates as disinfectant. Two bacteria, a Gram-positive Staphylococcus aereus and a Gram-negative Salmonella sp. were used in vitro in the disinfectant test with concentration variations of 5x10-3, 1x10-3 and 5x10-4 M and contact time of 5, 10 and 15 min. were performed using a control positive of a strong and common commercial disinfectant available in the market. The disinfectant activity was determined by measuring their optical density using UV-Vis spectrophotometer at λ max. 600 nm. The results indicated that the two diphenyltin(IV) benzoate derivatives synthesized showed much stronger disinfectant activity compared to the control positive as shown by a bigger decrease of their absorbance's in the UV-Vis. Therefore, these two diphenyltin(IV) benzoate derivatives are potential to be used as future disinfectant.

ANTICANCER POTENCY OF SEAGRASS (*Enhalus acoroides*) METHANOL EXTRACTION IN HeLa CELL LINE

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Anticancer potential of methanol extracts of seagrass was proven through cytotoxic and antiproliferation tests by MTT method (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) on HeLa cervical cancer cell culture. The results showed that the methanol extract of seagrass had a cytotoxic activity with IC50 values were 122 ppm. While the doubling time value in the antiproliferation test by methanol extracts of seagrass showed higher values than control group (72.19 hours).

Analysis Of Antioxidants On Face Mask Made Of Seaweed (*Eucheuma cottonii*)

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Face masks with various well-known brands are now easy to get, but not a few of them cause skin problems, this is due to the excessive content of certain chemicals or chemicals that are harmful to the body. In this study, a face mask was made using seaweed as a base material with the addition of several natural ingredients such as coffee powder, rice flour and turmeric powder, then tested the antioxidant content of each face mask. The types of face masks made are powder masks, cream masks, and gel masks. The steps taken include sample preparation, making seaweed powder, making rice flour, making coffee powder, making turmeric powder, making masks, and analytical tests (organoleptic, irritation, pH, drying time, and antioxidants). Facial masks that have very strong antioxidant activity are cream 2 with an IC50 value of 8.31 ppm, cream 2 masks have very strong antioxidant activity because they have an IC50 value below 10 ppm while powder mask 1 has a lower antioxidant activity value than other masks, which is 31.98 ppm. The results showed the use of seaweed, rice, turmeric, coffee, and honey to be a good alternative to reduce the use of harmful chemicals in the manufacture of face masks.

Bioactivity compound Prediction of Saurauia vulcani as immunostimulant : An In Silico Approach

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Immunostimulatory effect of Pirdot (Saurauia vulcani) has been reported previously. However, molecular interactions tend to be involved in mechanism of immunostimulatory activity has not been clarified. Our previous study indicated that ethanol extract of Pirdot leaves affected significantly the number of erythrocyte and spleen histological structure. Therefore, the purpose of the present study was to elucidate molecular bioactivity interaction of bioactive compound Pirdot with protein induced immunostimulant function through in silico approach. As a result, there were three bioactive compounds of Pirdot to interact with immunotherapeutic agents in protein-protein interaction pathway, such as ursolic acid, stigmasterol, and genistein. Moreover, its bioactive compound bound to active site of IL-8 and IL-6 that ursolic acid has the highest value than stigmasterol and genistein, respectively.

In-Vitro Inhibitory Activity Combination Of *Moringa Oleifera* Leaf Extract And Bacteriocin *Bifidobacterium Longum* Against *Salmonella Typhimurium*

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This study aimed to test the in-vitro inhibitory activity combination of *Moringa oleifera* leaves extract and bacteriocin from *Bifidobacterium longum* FNCC 0210 against *Salmonella typhimurium* ATCC 14028. Moringa leaves extract was obtained by maceration with 96% ethanol solvent for 3 days and phytochemical screening was carried out. The bacteriocin was obtained from *B. longum* as cell-free culture supernatant (CFCS) in MRS broth which was neutralized at pH 6.5 with 1 N NaOH and the supernatant was heated at 100°C for 10 minutes. The antibacterial activity of each agent was tested by broth microdilution test and Minimum Bactericidal Concentration (MBC) test. Moringa leaves ethanol extract contained flavonoids, alkaloids, and phenols, with a total phenolic content (TPC) of 25.76 mg GAE/g extract. The MIC and MBC that inhibits *S. typhimurium* ATCC 14028 was 50% (v/v) for each agent. The combination was designed based on the ratio of volume and concentration of each agent with broth microdilution method and MBC tests. The combination of Moringa leaves ethanolic extract and bacteriocin *B. longum* FNCC 0210 1:1 (100:50) and 1:3 (50:50) (%) (v/v) were significantly inhibited *S. typhimurium* ATCC 14028 compared to extract and bacteriocin individually.

Potential Moringa Leaf Extract (*Moringa Oleifera*) As Prebiotics To Support Bifidobacterium Longum Growth

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In the human body naturally there are probiotics that play a role to improve body health. One of most abundant types of probiotics in the lower digestion tract is *Bifidobacterium longum*. Utilization of herbal plants such as moringa (*Moringa oleifera*) especially leaves as prebiotics candidate is expected to be able to support growth of *B. longum*. Methods in this study include extraction using maceration with 96% ethanol solvent, effect of ethanol extract on probiotics (micro-dilution test and total plate count test), proximate, resistance to amylase and pH. The ethanol extract sample has a carbohydrate content of 14,68% using by different method. The carbohydrate content has resistance to amylase enzyme and pH. The most optimal concentration of ethanol extract is 15% that can support bacteria growth with an absorbance value of 0,609 and a colony number of 9,628×10^2 CFU/mL.

Antibacterial Activity of Salmonella typhi in A Combination of *Curcuma xanthorrhiza* Ethanol Extract and Bacteriocin Produced by *Bifidobacterium longum* in Vitro

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The aim of this research is to obtain the antibacterial compounds of Curcuma ethanol extract and bacteriocins produced by *Bifidobacterium longum* then assay the antibacterial and assay the antibacterial from combined extract and bacteriocin against *Salmonella typhi*. The first step of this research is the screening test of phytochemical compounds in Curcuma extract, isolation Cell-Free-Culture-Supernatant from *Bifidobacterium longum* bacteria, a disk diffusion test, Minimum Inhibitory Concentration test, and Minimum Bactericidal Concentration test. An antibacterial assay of *Salmonella typh*i was shown from antibacterial activities of Curcuma ethanol extracts, a bacteriocin produced by *Bifidobacterium longum*, and combined. As a result, Curcuma ethanol extract had alkaloid, saponin, flavonoid, terpenoid, and phenolic as antibacterial compounds. 12,5% Curcuma ethanol extract is the minimal concentration that high inhibitory of the Salmonella typhi. 50% bacteriocin is the minimal concentration that high inhibitory of the *Salmonella typhi*. The high inhibitory in a combination of Curcuma extract and bacteriocin came from the comparison of concentration 50% and 100% in the comparison of volume 1:1 and 2:1 (extract: bacteriocin (v/v)). In this research, has been proven that the combination more effective to inhibit the growth of Salmonella typhi than Curcuma extract and bacteriocin alone.

Culture Optimization of *Streptomyces* sp. GMY01 Bacteria as Anticancer Agent by Chemometric Analysis

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Breast cancer is still a major health problem in the world because of its high morbidity and mortality. The main problem in cancer treatment is the resistance to anticancer and the emergence of serious side effects due to chemotherapy. The need for sensitive anticancer with a specific mechanism of action is urgently needed. One of the potential producers of new anticancer molecules to be developed is secondary metabolites produced by Actinomycetes. Previous research related to Actinomycetes proved that the cultured methanol extract of Streptomyces sp. GMY01 from the coast of Krakal, Gunung Kidul has very strong cytotoxic activity on breast cancer cells MCF-7 and T47D with IC50 values of 0.6 and 1.3 ug / mL. This research will study about the culture method optimization of *Streptomyces* sp. GMY01 to determine the best method for the culture of these bacteria using chemometric analysis. The variation of the culture methods covers culture medium (SNB and TSB medium), culture container (erlenmeyer and buffled erlenmeyer), part of the extract (pellet and supernatant) and duration of culture harvest (3 and 5 days). The results of the optimization of the culture method based on chemometric analysis showed that the culture method using Starch Nitrate Broth (SNB) media, an Erlenmeyer container and a culture time of 5 days showed the best results and cytotoxic activity compared to other culture methods. The results of this study concluded that chemometric analysis can be used to study about the correlation of several variation of culture treatment with the potency of the anticancer form Streptomyces sp.GMY01 bacteria.

The Effect Of Giving Kepok Banana (*Musa Acuminata X Balbisiana*) On The Skin Of Mice (*Mus Musculus*) Exposed To Ultraviolet Light

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Skin damage can occur due to ultraviolet rays. The effects of ultraviolet rays, which are a source of free radicals, can be prevented by antioxidants. Kepok banana peels are plants that contain flavonoid compounds that can work as antioxidants that provide a protective effect against ultraviolet radiation. Research on the improvement of the skin of mice (*Mus musculus*) exposed to ultraviolet light for 15 days at a dose of 1 hour per day and smeared with 1.5% Kepok banana peel gel in the P1 group, smeared with 5% Kepok banana peel gel in the P2 group, Smeared with 10% Kepok banana peel gel in the P3 group, smeared with 1.5% propolis gel in the positive control group (k +). Whereas in the negative control group (K-) only exposed to ultraviolet light. The observation of the changes in the skin of the mice was carried out by using the histological method, namely observing the structure of the mice's skin microscopically. The results of the observations proved that the skin damage with the thickest epidermal layer was in the negative control group, while the treatment group with the thinnest epidermal layer was in the P1 group, namely the application of 1.5% Kepok banana peel gel which was not much different from the results with positive control. The Kruskall-Wallis test values in the results of the study were 105.3583 at P1 (thin), 128.0500 at P2 (medium), 199.7750 at P3 (very thick), 100.8500 at K + (thinnest), and 218.4667 at K- (very thick). There were significant differences between the treatment group and the control group. The comparison between the P1 and K + groups and the P3 and K- groups did not differ significantly in the improvement of the skin of the mice.

Key words: ultraviolet, flavonoids, histopathology, skin, epidermis.

Red Ginger (*Zingiber Officinale* Var. Rubrum): Its Essential Oil Content And Potential As An Anti-Propionibacterium Acnes By Molecular Docking

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Red ginger (*Zingiber officinale* var. Rubrum) is one of the popular ginger varieties in Indonesia. Compounds contained in the essential oil of red ginger rhizomes were thought to have antibacterial activity against Propionibacterium acnes. These bacteria will cause acne if their growth is not controlled. This study aimed to identify compounds and obtain potential compounds in red ginger rhizomes as antibacterial against P. acnes using molecular docking in silico. Red ginger rhizomes were distilled using steam distillation and yielded 0,03% essential oils. The essential oils obtained were analyzed using GC-MS and yielded 13 compounds (91,9%) with camphene (27.3%) and zingiberene (15.4%) as the major components. Molecular docking was assisted by ADT and Lig+ software. The target proteins used were lipase, exo-β-1,4-mannosidase, and KAS III of P. acnes. The control ligand used was benzoyl peroxide. Compounds with lower affinity energy than control, %BSS >50%, and passing the admetSAR test are compounds with the potential as anti-P.acnes. The β-bisabolene is a compound that may act as an anti-P.acnes with the mechanism of inhibiting the action of all target protein enzymes.

Sambiloto (*Andrographis paniculata* Nees.) Leaf Fermented Using *Aspergillus oryzae* and Antibiofilm Assay Against Gram-Negative Bacteria

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Sambiloto (*Andrographis paniculata* Nees.) is widely used as traditional medicine in many countries and has shown antibacterial and anti-quorum sensing activity. Andrographolide is the main bioactive compound of this plant. Meanwhile, fermentation using *Aspergillus* has been shown to increase the concentration of bioactive compounds in several medicinal plants. In this study, the leaves of *A. paniculata* were fermented using *Aspergillus oryzae* K1A isolate. Incubation was carried out on an incubation orbital shaker and sampling was carried out on the 7th day. The sample was added with 20 mL of ethyl acetate and incubated for 24 hours to extract the compound. The extracts were characterized by thin-layer chromatography (TLC). An Antibiofilm test was carried out on ethyl acetate extract from fermented and non-fermented *A. paniculata* leaf samples to determine the inhibitory activity against Gram-negative bacteria (N1, N2 & N5) by the agar well diffusion method and calculation using MIC. The results showed that the fermented ethyl acetate extract of *A. paniculata* leaves had the potential to inhibit the growth of N2 Gram-negative bacteria 60,61% for fermented extract, and 17,41 % for non-fermented extract and MIC of all Gram negative bacteria is 1024 ppm.

Acute Toxicity Test Of Bangle (*Zingiber Montanum*) Rhizome Essential Oil With Brine Shrimp Lethality Test (Bslt) Method

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Bangle (*Zingiber montanum*) is one of medicinal plants easily found in most parts of Indonesia. Bangle rhizome is known to contain various compounds which have potential as active ingredients in essential oils. Bangle rhizome has triquinacene 1,4-bis(methoxy), (Z)-ocimene, and terpinene-4-ol. This research aims to measure the Lethal Concentration 50 (LC50¬) of bangle (*Zingiber montanum*) rhizome essential oil perform by Brine Shrimp Lethality Test (BSLT) method. This research is a pure laboratory experiment with Posttest-Only Control Group design used 4 groups of bangle (*Zingiber montanum*) rhizome essential oils with the concentration level of 1 µg/ml, 10 µg/ml, 100 µg/ml and 1.000 µg/ml, and 2 control groups of sea water and DMSO 5% with three repetitions. This research used 10 *Artemia salina* larvae that were picked with simple random sampling method in every tube. Mortality rate of *Artemia salina* larvae was 0% in 1 µg/ml concentration, 6.7% in 10 µg/ml concentration, 20% in 100 µg/ml concentration, and 100% in 1,000 µg/ml concentration. Probit regression analysis with SPSS software was performed, resulting in LC50 value of 187.355. This indicates that bangle (*Zingiber montanum*) rhizome essential oil is toxic and not safe for *Artemia salina* larvae.

Keyword: Bangle, *Zingiber montanum*, Brine Shrimp Lethality Test (BSLT), Essential Oil, Lethal Concentration 50 (LC50).

The Potency Of Sulfated Polysaccharide From *Sargassum Aquifolium* (Turner) C. Agardh As Antiplatelet Agent

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Fucoidan is a sulfate polysaccharide compound consisting of L-fucose and sulfate esters found in brown seaweed that has many biological activity. The aim on this study is to characterize and evaluate the inhibition of platelet aggregation activity of sulfated polysaccharide extracted from *Sargassum aquifolium* (Turner) C. Agardh. In this study the dry seaweed powder was extracted using 0.1M of HCl solution. Alginate was separated by adding of 1% CaCl2 solution, and the crude fucoidan was precipitated with 70% of ethanol, then dried by freeze drying. Spectrophotometric methods was used to determine the total carbohydrate and sulfate content. Antiplatelet assay was performed using adenosine diphosphate induced of platelet rich plasma method. The yield of crude fucoidan was 1.23% from dried powder with carbohydrate and sulfate content were 55.88% and 11.39%. The results of FT-IR analysis showed the presence of sulfate groups with the absorption band at a wave number of 820.0 cm-1. The crude extract and clopidogrel showed the platelet inhibition percentation of 71.445% and 76.44% at the same concentration. *Sargassum aquifolium* (Turner) C. Agardh was potentially as a source of antiplatelet raw materials.

Determination Of The Spf Value Of The Extract And Fraction Gel Corncob (*Zea Mays* L.)

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The climate in Indonesia, which tends to be hot due to sunburn, can cause various skin problems. Although sunlight can be beneficial in the synthesis of vitamin D for the body, its adverse effects can also cause atrophy, pigment changes, wrinkles, sunburn, and malignancy (cancer), so the use of sunscreen is essential. The development of cosmetics now leads to natural ingredients, one of which is corn cobs. Corn cobs contain phenolic compounds that have been proven to have the ability as antioxidants that play a role in preventing the adverse effects of sunlight. This study aimed to determine the extract and water fraction SPF value and corncob chloroform originating from the Klaten area. This research was conducted in-vitro using UV-Vis spectrophotometry to assess the SPF of the test material. The results showed that the average SPF of the extracted gel, chloroform fraction gel, and corncob water fraction gel were 9.92; 9.56; 9.08, which means that corn cobs have sunscreen with a maximum SPF value category (SPF between 8-15).

Production of Sinensetin from Cell Suspension Cultures of *Orthosiphon aristatus* Blume Miq. Purple Varieties

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Sinensetin is the main secondary metabolite compound in purple *O. aristatus*. Sinensetin has many pharmacological activities such as anticancer, antidiabetic, and antiviral. The levels and yield of sinensetin in *O. aristatus* are still small. Therefore, efforts are needed to produce sinensetin, one of which is by in vitro culture. The stage of cell suspension culture using SH + 2,4-D 0.4 mg/L liquid media added with elicitors of salicylic acid (14, 70, and 140 mg/L), Cu2+ (30, 40, and 50 M), pectin (0.05; 0.1; 0.2% w/v) and AgNO3 (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. In suspension cultures with cinnamic acid 1mM (S3) and C2 (Cu2+ 40 M), sinensetin were detected on day 1 to day 20. On the 19th day, the levels of sinensetin S3 were 22.5 mg/g dry weight and C2 15.8 mg/g dry weight. The addition of 40 M Cu2+ elicitor and 1 mM cinnamic acid precursor to cell suspension culture containing 0.4 mg/L SH + 2,4-D media could increase the levels of sinensetin in purple varieties of *O. aristatus*. The results of this study are the first reports on the production of sinensetin from cell suspension cultures of purple *O. aristatus* and can be used as the basis for developing sinensetin production on a larger scale (bioreactor).

Antioxidant Activity And Microbial Contamination Of *Kaempferia Galanga*.L Aqueous Extract Affected By Heat Treatment Process

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Kaempferia galanga L. is one of a native plant in Indonesia. It is used for herbal medicine since it has bioactive compound that is beneficial for people to stay healthy. *K. galanga* is the main ingredient of jamu beras kencur, a traditional Indonesian herbal drink as functional drink. The problem of jamu beras kencur is high microbial contamination. The use of heat treatment in the processing can reduce microbial contamination, but heat treatment can decrease the amount of antioxidant activity. The aim of this study is to evaluate the heat treatment process at temperature of 60°C and 80°C of the *K. galanga* aqueous extract on microbial contamination and antioxidant activity. The extract was blanched (90°C, 5 min) followed by sonication extraction, and analyzed the total phenolic and flavonoids compounds, total plate count, and antioxidant activity The results showed that the *K. galanga* aqueous extract temperature 60°C can reduce the amount of microbial contamination. Meanwhile, the bioactive compound remains high. Furthermore, while the temperature 80°C, there is a decrease in antioxidant activity of *K. galanga* aqueous extract. This study concludes that. The heat treatment processing at 60°C effectively reduce the number of microbial contamination and maintain the bioactive compounds.

Evaluation Antibacterial of different formulations of whey Beverages Fermented with Kefir Grains

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The development of different products that confer health benefits on the population is a challenge for those who work with food. The aim of this study was to determine the acidity (pH) and lactic acid levels of kefir drink from cheese whey and determine the kefir drink formulation from cheese whey, which has the most significant antibacterial activity on the growth of *E. coli*. This research is a quantitative descriptive study using a completely randomized design method using 5 formulations with different starter concentrations, as: F1, F2, F3, F4, F5, respectively: 1%, 2%, 3%, 4%, 5%. The results showed that a starter's addition affected on pH, lactic acid levels, and antibacterial activities test of kefir drink from cheese whey. The first formulation with a 1% starter has the highest pH with the pH value of 4.91 and the lowest lactic acid content with a value of 0.51%. In comparison, the fifth formulation with a starter 5% concentration has the lowest pH with the pH value is 4.6, and the highest lactic acid content is 0.76%., The most extensive antibacterial activity was shown by fifth formulation with an inhibition zone of 5.3275 mm and the slightest activity shown by the first formulation with an inhibition zone area of 1.97 mm.

Antioxidant Synergistic Effect of The Combination of Standardized *Coccinia grandis* (L.) Voigt and *Blumea balsamifera* (L.) DC. Leaf Extracts

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The combination of extracts can increase the antioxidant activity of an herbal medicine. The synergistic effect produced by the combination increases the efficacy of the drug and reduces the dose administration. In this study, the combination of *Coccinia grandis* (L.) Voigt and *Blumea balsamifera* (L.) DC. leaf extracts was investigated for its antioxidant properties. The synergistic effect of the combination of the two plants was also evaluated. The simplicia of *C. grandis* and *B. balsamifera* leaves were extracted (maceration) using ethanol (70%) for 24 hours. The extract is then evaporated by the solvent using a rotary evaporator until a very thick extract is obtained. Physical and chemical characteristics of the extracts were determined according to Farmakope Herbal Indonesia (FHI). The total antioxidant capacity of single and combined extracts was measured using the phosphomolybdenum method and the ferric reducing antioxidant power (FRAP) method. The ability to scavenge single and combined extract free radicals was measured using the DPPH and ABTS methods. The synergistic effect of the combination of the two extracts was calculated using the combination index (CI) equation.

Key words: antioxidant, *C. grandis* and *B. balsamifera*, combination, synergistic

In Silico Study Potential Of Activated Compounds Extract Of *Annona Muricata* Linn Leaves As A Hypoglicemia Agent Through The Activation Of Peroxisome Proliferator Activator Receptor Γ (Pparγ) And Glycogen Synthase

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Annona muricata Linn leaves has a hypoglycemic effect, but the mechanism is unknown. This study aims to determine how the mechanism of the active compound in *Annona muricata* Linn leaves reduce blood glucose through the activation of PPARγ and glycogen synthase using in silico method. The in silico study was conducted on the active compound leaves of *Annona muricata* Linn obtained from literature studies. The control drug used pioglitazone and the target proteins used were PPARγ and glycogen synthase. 3D structures of active compounds download from Pubchem and drug control from UniProt. Homology using the swiss model http://swissmodel.expasy.org. The docking process uses the molecular docking method using the web http://www.dockingserver.com. Analysis of the affinity of ligand compounds to target proteins by comparing free energy, surface interactions, and amino acid residues with pyoglitazone control. This is visualized by the docking server. Analysis of ADME and toxicity preparations with pKCSM of *Annona muricata* Linn leaf active compound and pioglitazone control. The affinity analysis showed that 4 compounds that bind strongly to PPARγ and glycogen synthase are quercetin 3-O-neohesperidoside, kaempferol 3-O-Routoside, routine, and roseoside. The physicochemical results predict that the active compound roseoside has as similar as pioglitazone. The active compounds roseoside has the effect of hypoglycemic and has physicocemical as similar as pioglitazone.

The Potency Of The Soursop, (*Annona muricata* Linn.) Leaves Active Compounds To Wards The Inhibition Of α-Glucosidase and a-Amylase by In Silico

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Introduction: Soursop leaf (*Annona muricata* Linn.) is known to have anti-diabetic effects by inhibiting the activity of the α-Glucosidase and α-Amylase enzymes, but the active compounds that act as inhibitors of these two enzymes are still unknown. The study aims to measure the affinity of the *Annona muricata* Linn leaves active compounds to α-Glucosidase and α -Amylase using in silico study. Method: In Silico test will be done with 27 active compounds from 200 comounds identified in the previous studies. The affinity measurement of the soursop leaf's active compounds in inhibiting α-glucosidase and α-Amylase uses molecular docking computational modeling. By the parameter of free energy value, inhibition contants, surface interaction, and amino acid residue compared with Acarbose control. Visualization molecular docking using drug discovery studio. Physicochemistry, ADME, and toxicity using PKCSM. Result: By the result of molecular docking according to the four criterias, it has found five active compounds predicted to have high affinity to α-glucosidase and α-Amylase enzyme are Rutin, Quercetin 3-O-neohesperidoside, Kaempferol 3-O Rutinoside, Coclaurine dan Roseoside. Whilst, in phyficohemistry, Kaempferol 3-O-Rutinoside compound is not toxic and has physicochemical as similar as acarbose. Conclusion: The active compounds of soursop leaves are Rutin, Quercetin 3-O-neohesperidoside, Kaemferol 3-O-Rutinoside and Roseoside has a lower physicochemical properties and potency in inhibiting α-Glucosidase and α-Amylase compared to Acarbose

Tanaman Obat Tradisional untuk Persalinan Masyarakat Melayu Siak Propinsi Riau

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Masyarakat melayu merupakan salah satu dari delapan masyarakat etnis budaya asli yang ada di Provinsi Riau. Walaupun terdapat beberapa perbedaan dalam bentuk corak adat istiadat serta kebiasaan di antara delapan rumpun masyarakat Riau itu, namun terdapat persamaan dalam hal-hal mendasar yang universal, yaitu menggunakan landasan dan azas agama Islam sebagai pedoman dalam kehidupan. Untuk melestarikan tentang pengobatan kepada generasi muda tentang ramuan tradisional untuk bersalin pada masyarakat Siak Provinsi Riau dilakukan penelitian. Tujuan penelitian ini untuk mengetahui dan menginventarisir jenis-jenis tanaman yang digunakan untuk ramuan bersalin pada masarakat tradisional Siak. Penelitian dengan menggunakan model survei. Untuk mendapatkan data dilakukan wawancara pada dukun beranak di Kabupaten Siak Riau. Hasil penelitian menemukan tanaman yang digunakan dalam bentuk ramuan untuk jamu cair, jamu bubuk yang digunakan.

Effects Of Taurine And Ethanol Extract From *Sargassum* Sp. To Cervical Cancer Cells (Hela) In Vitro

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Cervical cancer is the second leading cause of cancer death in women in developing countries. Various ways of treating cervical cancer continue to be developed, one of which is the discovery of cytotoxic agents. *Sargassum* sp. are marine plants that has a potential as a chemopreventive agents because of the secondary metabolites produced that contains antioxidant, antihyperglycemic, and anticancer activities. This study aims to determine the effect of taurine extracted from *Sargassum* sp. on cytotoxic activity and antiproliferation of HeLa cervical cancer cells. In this study, phytochemical testing was carried out to determine the content of secondary metabolites in the extracts used. The concentration of taurine and ethanol extract of *Sargassum* sp. used was 625 ppm, 1250 ppm, 2500 ppm and 5000 ppm, respectively. Evaluation of cell viability using IC50 values was determined by 3-(4,5-Dimetiltiazol-2-il)-2,5-Diphenyl Tetrazolium Bromide (MTT Assay) method. The anti-proliferation test was determined by the doubling time value. Data were analyzed by One Way ANOVA using SPSS at the 95% confidence level, and followed by the Least Significant Difference (LSD) test. The results showed that taurine did not have an IC50 value. The ethanol extract of *Sargassum* sp. respectively, showed a cytotoxic effect with IC50 values of 1915 ppm. The doubling time value of taurine, respectively, from a concentration of 625-5000 ppm is 161, 154, 148, 124 hours longer than the control cell, while the ethanol extracts of *Sargassum* sp. wes 106 hours respectively at a concentration of 625 ppm, whereas at concentrations above 1250 ppm, there is no doubling time value, because HeLa cells have experienced death. Based on the results of this study, it can be concluded that taurine and ethanol extracts of *Sargassum* sp. have the potential to be developed as anticancer agents in HeLa cervical cancer treatment.

Eksplorasi dan Morfologi Daun Zingiberaceae yang Berpotensi Sebagai Tanaman Obat di Bandar Lampung

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Zingiberaceae adalah suku tumbuhan yang dikenal dengan istilah empon-empon. Jamu yang berasal dari empon-empon menjadi salah satu hal yang viral semenjak pandemi Covid-19 dan banyak diminati masyarakat karena diketahui dapat menjaga daya tahan tubuh. Daun menjadi salah satu organ yang diamati pada pengamatan morfologi dari suatu tumbuhan. Secara kasat mata, daun dari beberapa anggota suku Zingiberaceae sulit dibedakan satu dengan yang lainnya. Oleh sebab itu, perlu adanya informasi tentang perbedaan karakteristik morfologi dari Zingiberaceae, khususnya bagian daun agar masyarakat awam bisa mengetahui perbedaan jenis satu dan lainnya. Penelitian ini dilakukan pada bulan Januari sampai dengan Maret 2021 di Laboratorium Botani Jurusan Biologi Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Lampung. Pengambilan sampel daun Zingiberaceae dalam penelitian ini dilakukan dengan metode sampling acak sederhana. Pengamatan morfologi dilakukan dengan mengamati daun yang tampak utuh dan tidak terserang penyakit. Hasil penelitian menunjukkan bahwa ditemukan 16 jenis Zingiberaceae di Bandar Lampung yang terbagi ke dalam 5 marga. Selain itu, ditemukan tiga variasi bentuk daun, pertulangan daun, dan duduk daun.

A Review of Pharmacological Activity of Seaweeds *Sargassum* sp. and *Eucheuma cottonii*

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Sargassum sp. and *Eucheuma cottonii* are two type of seaweeds that can be utilized as medicinal. Seaweeds primary producers which is a source of many nutrients and it has high protein content. They show pharmacological properties that aid in the development of biological activities. Furthermore, seaweeds have been reported to be a rich source of natural bioactive chemicals that have been shown to have anti-diabetic, anti-inflammatory, antiviral, antioxidant, antibacterial, and antiplasmodial properties. They generate new secondary metabolites with biological activity and the potential to be used as medicinal agents. Macroalgae compounds that have biological activity have been frequently used in biomedical research. The present review is focusing on the following topics: potential of *Sargassum* sp. and *Eucheuma cottonii* for pharmacological and research applications.

Keyword: pharmacological, seaweeds, bioactive, potential

Chemopreventive Activity of Biduri Root (*Calotropis Gigantea* L.) Ethanol Fraction on MCF-7 Breast Cancer Cells and Vero Normal Cells In Vitro and In Silico

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Breast cancer is the second deadliest disease after lung cancer. Based on previous research, the cardiac glycoside compounds in the root of biduri (*Calotropis gigantea* L.) have potential as an anticancer. This study aims to determine the potential content of cardiac glycoside compounds, namely calotropin in the biduri root of ethanol fraction (BREF) as a chemopreventive agent against MCF-7 breast cancer cells. This research began with meceration using 70% ethanol and continued with fractionation by the liquid-liquid partition using ethyl acetate as a solvent. The in silico test used molecular docking on calotropin compound with Bcl-2 as the target protein. The in vitro test used the MTT Assay method on MCF-7 breast cancer cells and normal Vero cells, followed by selectivity test. The in silico test results obtained the best interaction between calotropin and Bcl-2 with a docking score of -9.3 kcal/mol. Based on the cytotoxic test on MCF-7 cells, the IC50 value: 159.797 µg/mL, while in Vero cells it was 2703.614 µg/mL. BREF is quite toxic and selective in MCF-7 cancer cells and non-toxic to normal cells, so that it has the potential to be developed as a chemoptreventive agent in breast cancer cells with SI value: 16.91

Activity Of Melinjo Seed (*Gnetum Gnemon* L.) Ethanol Fraction Against Colon Cancer Cell (Widr) As Co-Chemotherapy Agent

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The incidence of colorectal cancer in Indonesia ranks 4th. Resistance of cancer cells to chemotherapy agents and serious side effect in cancer sufferers is the failure of chemotherapy treatment. Therefore it is have to research that uses plants. Melinjo seeds (*Gnetum gnemon* L.) contain stilbenoid compounds which can inhibit the proliferation of WiDr colon cancer cells. This study aims was to determine the potential of Melinjo Seed Ethanol Fraction (MSEF) as a co-chemotherapy agent for colon cancer. Melinjo seed powder was extracted using 70% ethanol and fractionated with ethanol. In vitro test used MTT Assay method to see cytotoxic activity on WiDr cells and their combination with 5 -FU chemotherapy agents. In silico test used molecular docking in modeling the active compound gnetin C on MSEF in inhibiting IKK and COX-2 proteins with 5-FU. The results showed MSEF has weak cytotoxic activity on WiDr cells with an IC50 681 µg/mL, and has synergistic combined activity with 5-FU with an CI 0,08. In docking molecular, gnetin C has a strong binding affinity with IKK and COX-2 proteins of -12.2 kcal/mol and -9.6 kcal/mol. This study shows that MSEF inhibits cancer development, particularly colon cancer cell WiDr.

Aktivitas penghambatan, Identifikasi Senyawa, dan Prediksi In silico Fraksi Daun Peterseli (*Petrocelinum crispum* Mill) Sebagai Agen Antijamur *Malassezia furfur*

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Malassezia furfur adalah mikroba alami dalam tubuh manusia yang dianggap sebagai salah satu penyebab pitiriasis versikolor dan folikulitis *Malassezia*, yang berhubungan dengan dermatitis seboroik/ketombe. Daun Peterseli (*Petroselinum crispum* Mill.) dalam banyak laporan telah menunjukkan aktivitas antimikroba, tetapi aktivitas melawan *Malassezia furfur* tidak ditemukan. Dalam penelitian ini, kami menguji aktivitas penghambatan fraksi daun Parsley terhadap *Malassezia furfur* dengan metode kertas difusi cakram, menentukan kandungan metabolit dengan LC-MS, dan memprediksi aktivitas biologis dan toksisitas dengan Prediksi PASS in silico. Aktivitas penghambatan fraksi etil asetat dan heksana memberikan penghambatan sedang pada konsentrasi masing-masing 0,15 g/ml dan 0,3 g/ml. Kandungan metabolit diidentifikasi dan dikenal sebagai 1,3-Dihidroksi-2-hidroksimetilantrakuinon-3-O-β-D-xylopyranose (1 6) -β-D-glucopyranoside, stigmastan-3,6-dione, aviprin, xanthotoxin dan kandidat massa C54H78O9, kandidat massa C54H78O10 dan kandidat massa C34H40O9, dan prediksi PASS menunjukkan bahwa senyawa metabolit yang diidentifikasi memiliki aktivitas biologis yang baik dan senyawa xanthotoxin telah menunjukkan efek non-toksik pada permukaan kulit. Dapat disimpulkan bahwa fraksi etil asetat daun peterseli menunjukkan daya hambat yang lebih baik terhadap pertumbuhan *Malassezia furfur* dengan kategori sedang. Metabolit stigmastan-3,6-dione dan aviprin dianggap sebagai metabolit terpenting pada aktivitas penghambatan yang diprediksi oleh prediksi PASS, dan xanthotoxin juga dianggap penting karena efek non-toksiknya.

Isolasi Senyawa Aktif Antidiabetes Buah Mengkudu (*Morinda Citrifolia* Linn) Dan Uji Mekanisme Secara In Silico

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Penyakit Diabetes mellitus (DM) menjadi masalah yang patut diperhatikan karena prevalensinya yang tiap tahun mengalami kenaikan. Prevalensi DM berdasarkan WHO pada tahun 2030 diprediksi mencapai 366 penderita. Secara epidemiologi, diperkirakan bahwa pada tahun 2030 prevalensi DM di Indonesia mencapai 21,3 juta orang. Penelitian ini bertujuan untuk mendapatkan senyawa aktif dari buah mengkudu sebagai antidiabetes yang dapat dibuktikan dengan pendekatan mekanisme secara in silico. Penelitian ini dilakukan dengan memperoleh ekstrak etanol buah mengkudu sebanyak 3,064 kg selanjutnya dilakukan pemurnian dari senyawa makro seperti glikosida dengan metode partisi cair-cair menggunakan pelarut etil asetat hingga diperoleh lapisan glikosida dan etil asetat. Lapisan etil asetat dipekatkan dan dilanjutkan dengan proses fraksinasi dengan metode KVC sehingga diperoleh 7 subfraksi etil asetat yang selanjutnya di lakukan pengujian farmakologi secara in vivo dengan metode induksi streptozotocin dan TTGO. Dari hasil uji tersebut diperoleh 3 subfraksi yang paling aktif berdasarkan penurunan kadar glukosa darah yakni fraksi G (48.10%), fraksi C (43.08%), fraksi E (41.26%). Subfraksi yang paling aktif tersebut kemudian dianalisis dengan metode LCMS/MS dan dimurnikan dengan menggunakan kromatografi radial selanjutnya dikarakterisasi dengan menggunakan metode NMR. Senyawa yang diperoleh ditelaah mode ikatannya secara in silico terhadap reseptor alpha amilase, alpha glucosidase,DPP IV dan PPAR gamma.

Aktivitas Imunomodulator Dan Identifikasi Senyawa Kimia Fraksi Bunga Rosela (Of *Hibiscus Sabdariffa* L.)

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Imunomodulator merupakan senyawa yang dapat meningkatkan sistem Imun. Penelitian ini bertujuan untuk menguji aktivitas imunomodulator Fraksi Bunga Rosela (*Hibiscus sabdariffa* L.) dan mengidentifikasi senyawa kimianya. Ekstrak Etil asetat Bunga Hibiscus sabdariffa L. difraksinasi menggunakan metode Kromatografi Cair Vakum sehingga didapatkan 7 Fraksi yaitu Fraksi A,B,C,D,E,F,dan G. Pengujian aktivitas immunomodulator dilakukan dengan metode aktivitas fagositosis dan identifikasi senyawa kimia dengan LC-MS. Hasil pengujian menunjukkan Fraksi A,B,C,D,F, dan G memperlihatkan perbedaan signifikan dengan kontrol negatif NaCMC. Fraksi A memperlihatkan aktivitas yang paling baik. Hasil identifikasi senyawa kimia memperlihatkan fraksi Bunga *Hibiscus sabdariffa* L memperlihatkan beberapa jenis senyawa yang berpotensi sebagai senyawa aktif immunomodulator.

Antidiabetic Potential Of Active Sub Fractions Obtained From Purified Extract Of *Lawsonia Inermis* Leaves In Alloxan – Induced Diabetic Mice

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Diabetes mellitus is a long-term condition in which there is an increase in blood glucose levels because the body cannot produce sufficient insulin hormone or does not effectively use the insulin produced by the pancreas. 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, thus increasing drug interactions and patient non-adherence. Many patients then look for other alternative treatments such as using medicinal plants. The leaves of *Lawsonia inermis* L contain the main active compounds such as flavonoids, phenols, alkaloids, glycosides, saponins, tannins, and essential oils. Phenols and flavonoids are the most commonly found active compounds. This research was conducted to determine the potential antidiabetic active sub fractions of purified extract *Lawsonia inermis* Leaves in mice (*Mus musculus*) and the effectiveness of each test group compared to the positive group. Initially, mice were given intraperitoneal injection of alloxan to induce diabetes, followed by administration of the active sub fraction obtained from thepurified extract for 15 consecutive days. Acarbose (25 mg/kg) was used as a positive control. Based on the results obtained, the active sub-fraction at a dose of 10 mg/kg body weight showed significant antihyperglycemic activity, as evidenced by the decrease in blood glucose levels, respectively, SFD5 73 percent, SFD1 70 percent and SFD4 66 percent. The active fraction also showed an improvement in the profile of pancreatic cell regeneration in diabetic mice. Concomitant histopathological studies strengthened the effect of the active sub- fraction in pancreatic healing, thus confirming the possible mechanism of its antidiabetic activity. Conclusions The results showed that the Sub fractions of *Lawsonia inermis* leaves at a dose of 10 mg/kg bw had activity in lowering blood sugar levels and the best activity for the D5 sub-fraction (SFD5) with a 73 percent decrease in blood sugar.

Keywords: *Lawsonia inermis* Linn, Sub fractions, antidiabetic , mice , Alloxan.

Cytotoxic activity of Cantigi (*Vaccinium varingiaefolium* (Blume) Miq.) leaf extracts on T47D cells in vitro

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The Combination of Sugar Palm Midrib Extract (*Arenga pinnata* Merr.) and Nutgrass Extract (*Cyperus rotundus* L.) As Gel Formulation to Inhibit the Acne Bacterias (*Propionibacterium acnes* and *Staphylococcus epidermidis*)

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This study aims to obtain a gel preparation from extracts of Sugar Palm midrib and rhizome of Nutgrass which can effectively inhibit acne-causing bacteria *Propionibacterium acnes* and *Staphylococcus epidermidis*. This study used experimental methods by using ethanol extracts and tested their minimum inhibitory concentrations. Then a single extract gel and the combination formula were made, then tested the anti-bacterial activity. Furthermore, the stability and effectiveness test were carried out. The results showed that the minimum inhibitory concentration of palm frond extract against *Propionibacterium acnes* and *Staphylococcus epidermidis* was 40% w/v with inhibition diameter of 11.54 ± 0.73 mm and 11.10 ± 0.07 mm. The minimum inhibitory concentration of Teki Grass rhizome extract against *Propionibacterium acnes* is 25% w/v with an inhibitory diameter of 12.06 ± 0.01 mm and for *Staphylococcus epidermidis* is 12.5% w/v with an inhibitory diameter of 11.15 ± 0. 07mm. The results of gel formula showed that F2 formula gel is the best formula, with an average inhibitory diameter for *Propionibacterium acnes* of 30.02 ± 0.01mm and for *Staphylococcus epidermidis* of 24.05 ± 0.02 mm. 2-way ANOVA analysis data obtained a sig. value of 0.000<0.05. The F2 formula gel was then tested for stability and safety.

Antidiabetic Potential And Pharmacological Evaluation Of Plants Bioactive Compounds : A Computational Approach

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Diabetes mellitus is characterized by a deficiency in insulin secretion, insulin action, or both, resulting in a chronic hyperglycemic condition. Recent studies showed that bioactive compounds from plants possess great antidiabetic activity with less unfavorable side effects. Therefore, our study aims to evaluate several bioactive compounds from Indonesian plants and other plants' secondary metabolites against alpha-amylase and aldose reductase using a molecular docking approach and their pharmacological properties. We used GC-MS to identified bioactive compounds from several Indonesian plants. Identified bioactive compounds along with bioactive compounds from the literature search were used as ligands targetting alpha-amylase and aldose reductase as protein targets using Pyrx. The pharmacological evaluations were performed with SwissADME, ADMETlab, and PASS online. We found that ligands used in this study vary in pharmacological properties and had binding energy ranging from -3.7 kcal/mol to -10.8 kcal/mol and -4.5 kJ/mol to -11.3 kJ/mol against alpha-amylase and aldose reductase, respectively. Bioactive compounds from plants have great antidiabetic potential due to their pharmacological properties and binding energy and interactions against alpha-amylase and aldose reductase.

Assessment Cytotoxic assay of Rhizophoraceae Plants Mangrove using Brine Shrimp (*Artemia salina* L) model

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Rhizophoraceae is the main family of mangroves as a source of bioactive compounds originating from the coast. Ethnophamacologically Rhizophoraceae has been used in various traditional medicine. Natural sources as anticancer from the Rhizophoraceae family are interesting to know. This study aimed to determine the cytotoxic bioactivity of methanolic extracts of roots, bark, leaves, and fruit/hypocotyl from five species of Rhizophoraceae (*Bruguieria cylindrica, B. gymnorrhiza, Ceriops tagal, Rhizophora apiculata*, and *R. mucronata*) from the Langsa mangrove forest, Aceh. The method used in this study was the Brine Shrimp Lethality Test (BSLT) bioassay using *Artemia salina* Leach at extract concentrations of 1, 10, 100, 500, and 1000 µg/ml. Samples were extracted using the maceration method and methanol as the solvent.The cytotoxic activity of 20 Rhizophoraceae methanol extracts showed that 12 extracts were toxic with an LC50 range of 31.5 - 934.9 µg/ml (based on LC50 ≤ 1000 µg/ml). The two extracts of which the closest to highly toxic (based on LC50 ≤ 30 µg/ml) were *C. tagal* bark showed LC50 of 31.5 µg/ml, and *R. mucronata* bark showed LC50 31.8 µg/ml. This shows that Rhizophoraceae extract has potential as a natural anticancer agent.

Determination of Chemical Compounds Content and SPF Value of Nutmeg Oil with Tween 80-Ethanol Variation

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Nutmeg oil has potential as a sunscreen. Nutmeg oil is less stable in light and air so it is formulated in the form of a microemulsion. This study aims to determine theSPF value by in vitro and irritation index from nutmeg oil microemulsion with tween 80-ethanol as surfactant and cosurfactan. Microemulsions were made with 6.4 ml of nutmeg oil and tween 80-ethanol as surfactants-cosurfactants (1: 1) with concentrations of 45% (F1), 50% (F2), 55% (F3). The nutmeg oil microemulsion was determined of chemical compounds content using Gas Chromatography-Mass Spectrometry (GC – MS) and SPF value by in vitro with spectrophotometer UV. The irritation test was carried out by using the patch test technique on rabbit skin with 4 treatment groups namely F1, F2, F3 and negative control. The patch test is observated at 24, 48 and 72 hours. Determination of chemical compounds content data, SPF value data and irritation test data are described descriptively. The results of the GC-MS analysis of nutmeg seed oil microemulsions in the three formulas contained the main components of nutmeg seed oil, namely α-pinene, β-phellandrene, and α-terpinolene. SPF value on nutmeg oil obtained the SPF F1, F2 and F3 values respectively, is 8,9±0,3; 9,5±0,07; 9,3±0,45. This SPF value falls into the maximum protection category. The primary irritation index values for F1, F2, F3 and negative control were 0,1±1; 0,3±2,5; 0,1±0; 0 so it can be concluded that the nutmeg oil microemulsion preparation is very mildly irritating.

Antioxidant And Sunscreen Activity Of Nutmeg Oil Microemulsion

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Nutmeg seed oil contains myristicin which has the potential as a sunscreen. Microemulsion preparations can increase the effectiveness of sunscreen. The purpose of this study was to determine antioxidant and sunscreen activity, also irritation of nutmeg oil microemulsion. Nutmeg seed oil microemulsion was prepared using 6,4% nutmeg seed oil and tween 80 propylene glycol as surfactants-cosurfactants (2:1) with varying concentrations of 57% (F1), 60% (F2), 63% (F3). Antioxidant test using DPPH method and read at wavelength of 516 nm. Determination of the SPF value in vitro by UV spectrophotometry at a wavelength of 290 nm-320 nm. The irritation test was carried out using the patch test method. Erythema and edema were observed at 1, 24, 48, and 72 hours. SPF values and scores were described descriptively. The results of the antioxidant stability test showed that range of percent inhibition in all formulas was 65-67% so that the microemulsion of nutmeg seed oil had strong antioxidant activity. The SPF value produced from the preparation of nutmeg oil microemulsion with various surfactants and cosurfactants had an average SPF value of F1 (9.245 ± 0.565), F2 (8.665 ± 0.342) F3 (8.875 ± 0.756). The SPF value is included in the maximum protection category. The primary irritation index values obtained from each formulation were F1 (0.2 ± 1.732), F2 (0.3 ± 2.309), F3 (0.3 ± 0.577). The primary irritation index values for preparations F1, F2 and F3 were included in the very slightly irritating category.

Potential of Nutmeg Oil In Microemulsion As Sunscreen With Variation Tween 80-PEG 400

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Nutmeg oil contains myristicin compounds which is potential to develop as sunscreens. The application of essential oils directly to the skin can irritate, so that essential oils can be formulated in microemulsions. The purpose of this study was to determine the potential nutmeg oil as sunscreen and the irritation effect of the microemulsion with variation tween 80 and PEG 400 nutmeg oil as surfactants and cosurfactants. Microemulsion was prepared with a nutmeg oil content of 6.4% with ratio various concentrations of tween 80-PEG 400 FI (7:6) FII (8:6) FIII (9:6). The evaluation of nutmeg oil microemulsion included the determination of the SPF value in vitro with UV spectrophotometry at a wavelength of 290nm-320nm. The irritation test was done by patch test method. Erythema and edema were observed at 24, 48, and 72 hours. SPF value and irritation scores were analyzed descriptively. Results of the sunscreen activity test of microemulsion nutmeg seed oil with variations of tween 80-PEG 400 resulted in the maximum value of Sun Protection Factor (SPF) at (FI) 10.3 ± 0.14, (FII) 11.8 ± 0 .57, (FIII), 10.2 ±0.38. The results showed that all formula did not irritate (negligible) at (FI) 0.1 ± 1.7, (FII) 0.3 ± 1.2, (FIII) 0.3 ±1.2.

Antimicrobial And Antispore Activities Of Jambu Batu (*Psidium Guajava* L.) Leaves Extract Against Vegetative Cells And Spores Of *Bacillus* Sp.

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Spore forming bacteria become the main concern to the food industry for their ability to survive processing and various steps designed to kill their vegetative cells and spores. A previous study has shown that crude extracts of jambu batu (*Psidium guajava*) leaves have potential antimicrobial activities against some of foodborne pathogens. The present study aims to analyse the antibacterial and antispore activities of *P. guajava* leaves extracts on the vegetative cells and spores of *Bacillus cereus* ATCC33019, *B. subtilis* ATCC6633, *B. pumilus* ATCC14884 and *B. megaterium* ATCC14581. The results showed that tested *Bacillus* spp. were susceptible to *P.guajava* leaves extract, with the range of inhibition zone between 13.75 ± 0.95mm to 16.25 ± 0.95 mm. *P. guajava* leaves extract inhibited the growth of *B. cereus* and *B. subtilis* with MIC of 0.390 mg/ml. MIC of the extract against *B. megaterium* was 0.195 mg/ml, while *B. pumilus* was 0.781 mg/mL. The tested Bacillus spp. can be killed completely at MBC value 0.781 mg/mL. Time-kill curve assay demonstrated that tested Bacillus spp. can be killed by *P. guajava* leaves extract at 4.0×MIC for 4 hours, 4×MIC for 2 hours, 1×MIC for 4 hours and 4×MIC for 2 hours respectively. *P. guajava* leaves extract at a concentration of 1.0% inactivated more than 3-Log10 (90.99%) of *Bacillus* sp. spores and killed all the spores after an incubation period of four hours at a concentration of >2.51%. The antimicrobial activity of *P. guajava* leaves extract against 4 *Bacillus* spp. foodborne pathogens and spoilage microorganisms at different pH (3, 5, 7 and 11) and temperatures (10 ˚C, 30˚C, 50˚C and 80˚C) was not significantly affected. In conclusion, *P. guajava* leaves extract exhibits antimicrobial and antispore activities against tested *Bacillus* spp. and has potential anti-*Bacillus* activity making it possible to use as anti-*Bacillus* agent in food.

Antimicrobial Activity of Guava (*Psidium guajava* Linn.) Against Foodborne Pathogens

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The aim of this study are to determine antimicrobial activity of ethanolic *P. guajava* L. leaves extract and its stability at different pHs and temperatures using Clinical and Laboratory Standards Institute (CLSI) methods. The results showed that the extracts exhibited antimicrobial activity with inhibition zone range 7.00 - 12.75 mm for bacteria strains and 7.00 – 8.50 mm for fungi strains. The extract can inhibit the growth of bacteria strains with MICs ranged 0.01 -1.25 mg/ml and 0.31 – 2.50 mg/ml for fungi, respectively. The extract can kill the bacteria with MBCs ranged 0.01 - >5 mg/ml and MFCs ranged 5 - >5 mg/ml for fungi strains. Antimicrobial activities of extract were not affected by different pHs and temperatures. In conclusion ethanolic *P. guava* L. leaves extract had antimicrobial activity against foodborne pathogens.

Antibacterial And Antioxidant Activities Of Jambu Bol (*Syzygium Malaccense* (L.) Merr. And Perry Leaves Extract

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Synthetic food preservatives have been reported to have side-effects and could threat human health. Plant extract-base preservatives are more desired nowadays. Jambu bol (*Syzygium malaccense* (L.) Merr. And Perry) leaves extract was reported to have antibacterial activity. The aims of this study were to determine the antibacterial and antioxidants activities of ethanolic jambu bol leaves extract. The antibacterial activity of extract was tested against selected foodborne pathogens using CLSI methods. The antioxidants activity was performed using TPC, FRAP, DPPH and ABTS• radical scavenging activity assays. The results showed that the extract exhibited antibacterial activity with inhibition zone ranged 7.83 – 16.00 mm. The extract can inhibit the bacterial tested with MIC values ranged 0.31 – 5.00 mg/mL and the extract can kill all bacterial tested with MBC values ranged 0.62 – 5.00 mg/mL. The time-kill curves analysis showed that the extract can reduce the bacterial population ≥ 3Log10 with concentration of 4× MIC for 4.0 h. The total phenolic content of the extract was determined to contain 44.10 ± 0.06 mg GAE/g and the ferric reducing power was 1013.50 ± 0.07 mM Fe2+ /g. The IC50 scavenging activity of DPPH and ABTS• were 0.0334 mg Ascorbic acid E/g and 0.1352 mg TE/g, respectively. In conclusion, ethanolic *S. malaccense* leaves extract has antibacterial and antioxidant activities, thus the extract might be developed as food preservative or food sanitizer prior to cook.

Anti-Cancer Effectiveness Test Of Methanol Extract Api-Api (*Avicennia Marina*) And Taurin In Vitro In Hela Cervical Cancer Culture

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The anticancer potential of the methanol extract of api-api seeds and taurine was proven through in vitro cytotoxic and anti-proliferation tests with the MTT method (3- (4, 5-dimethylthiazol-2-yl) - 2, 5-diphenyltetrazolium bromide) on cervical cancer cell cultures. The results showed that the methanol extract of api-api seeds and taurine had cytotoxic activity with IC50 (Inhibitory Concentration) values of 208 ppm and 603 ppm. Antiproliferative properties evidenced by the doubling time of the treated cells, the api-api seed extract concentration of 75 ppm is 9284 hours and taurine concentration of 100 ppm is 852 hours which is longer than the doubling time of the cells without treatment (cell control) is 72, 19 hours and was able to increase p53 gene expression as evidenced by an increase in the p53 gene expression value of api-api seed extract with a concentration of 50 ppm, namely 0.86% and taurine with a concentration of 100 ppm, namely 6.7% compared to control cells, namely 0.49%.

The Effect of VCO Processing Method on Blood Glucose, Cholesterol and Pancreatic Profile of Diabetic Mellitus Rats (*Sprague dawley*)

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Virgin Coconut Oil (VCO) can be produced by different methods related to health function. The objective was to study the efficacy of VCO processing method in reducing blood glucose level, cholesterol profile and pancreatic tissue profile of diabetic mellitus (DM) *Sprague dawley* rats. Four rat groups from five rat groups were injected using alloxan to induce the diabetic condition, while the rest was negative control. VCO-A produced without heat and VCO-B produced with controlled-heat treatment and Coconut Cooking Oil (RBD-CNO) produced with the application of severe heating and chemical (MG) were fed respectively to three rat groups, while the other two rat groups were fed by water and used as negative control (healthy rats) and positive control (DM rats). During 28 days observation, all of the rats blood glucose level were assessed, and at the end of the observation day the rats were terminated to assess the cholesterol and pancreatic tissues profile. VCO-A significantly positive reduced blood glucose level than the others. VCO did not influence DM rats cholesterol profile and all VCO inhibits the rate of pancreatic β cells damage. On 28 days observation all VCO treatments suppressed blood glucose level of DM rats.

Keywords: processing method, virgin coconut oil, diabetes mellitus, blood glucose, pancreatic tissues

TLC-Fingerprinting and Chemometrics for Identification of *Curcuma xanthorrhiza* From Different Geographical Origins

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Geographical origin was an important parameter that influences the quality of herbal medicine. The fingerprint of herbal medicine would be described as the chemical compound related to the quality. Curcuma xanthorrhiza (Zingiberaceae) which popular as Java Turmeric was widely used in Indonesian traditional medicine. This study was to validated and developed a TLC (Thin Layer Chromatography) fingerprint of Java Turmeric. Chemometric techniques were done to classified the quality of Java Turmeric from 15 regions in Indonesia. The methods refer to TLC fingerprint, validity test (stability and precision), and chemometric analysis with PCA (Principal Component Analysis) and CA (Clustering analysis). TLC-fingerprints of Java Turmeric resulted in 5 zones under chromatographic conditions (TLC plate of Silica gel F254, mobile phase: DCM, CHCL3, and EtOH (10: 10: 1), detection with vanillin-sulfuric acid reagent). Chromatogram was stable both on the TLC plate and in the solution, stable during the chromatography process (2D chromatogram), and stable within 60 minutes (after derivatization). The chromatogram meets intraday precision, on the other hand, does not meet inter-day precision. Chemometric analysis with PCA and CA showed the sample were divided into 5 clusters, namely cluster 1 (Tawangmangu, Bangkalan, Kediri and Surabaya); Cluster 2 (Batu, Sragen, Tulungagung, Pasuruan, Blitar, and Central Lombok); Cluster 3 (Ngawi); Group 4 (Gresik); and Cluster 5 (Bojonegoro, Banyuwangi, and Palangkaraya). Conclusion: Java Turmerics from 15 regions in Indonesia were divided into 5 clusters based on the similarity of the chemical compounds. The TLC fingerprint-chemometric methods on Java Turmeric were useful for quality control based on geographic origin and identified the authenticity.

Keyword: Java Turmeric, TLC-fingerprint, Chemometric, PCA, quality of herbal medicine