



DAFTAR ISI

ISOLASI SENYAWA 2-GERANIL-2',3,4,4'-TETRAHIDROKSI DIHIDROKALKON DARI DAUN SUKUN (<i>Artocarpus altilis</i> (Park.) Fosberg) DENGAN FLASH COLUMN CHROMATOGRAPHY <i>Isolation of 2-Geranyl-2',3,4,4'-Tetrahydroxy Dihydrochalcone from Breadfruit Leaf (Artocarpus altilis (Park.) Fosberg) Using Flash Column Chromatography</i>	
Gharsina Ghaisani Yumni, Krisna Kharisma Pertiwi, Yuli Widiyastuti, Nanang Fakhrudin.....	1- 10
AKTIVITAS ANTIOKSIDAN FRAKSI AIR DAN FRAKSI ETER KOMBINASI EKSTRAK METANOL DAUN KOPI ARABIKA (<i>Coffea arabica</i> L.) DAN KULIT BATANG KAYU MANIS (<i>Cinnamomum burmannii</i> Nees ex BI.) <i>Antioxidant Activity of Water and Ether Fraction Combination of Arabica Coffee Leaves (Coffea arabica L.) Extract and Cinnamon burmanii Bark (Cinnamomum burmannii Nees Ex Bi.)</i>	
Yuni Retnaningtyas, Lestyo Wulandari, Fauzan Arrozi.....	11- 18
KARAKTERISTIK AKSESI KENCUR (<i>Kaempferia galanga</i> L.) BERDASARKAN KOMPONEN MINYAK ATSIRI PADA DUA LOKASI YANG BERBEDA <i>Characteristics of Galanga Accessions (Kaempferia galanga L.) Based on Essential Oil Components at Two Different Locations</i>	
Subaryanti, Triadiati, Yohana C. Sulistyarningsih, Dyah Iswantini Pradono.....	19- 29
STUDI EFEKTIVITAS NANOEMULSI EKSTRAK ETANOL PURWOCENG PADA PERBAIKAN FUNGSI REPRODUKSI TIKUS PUTIH JANTAN PASCA INDUKSI SLEEP DEPRIVATION <i>Study of the Effectiveness of Purwoceng Ethanol Extract Nanoemulsion on Improvement of the Reproductive Function of Male White Rats Post Sleep Deprivation Induction</i>	
Denok Tri Hardiningsih, Tuti Sri Suhesti, Dody Novrial, Fitranto Arjadi.....	30- 40



- AKTIVITAS ANTIBAKTERI EKSTRAK ETANOL DAUN TULAK (*Schefflera elliptica* (Blume) Harms) TERHADAP BAKTERI *Staphylococcus aureus* DAN *Escherichia coli*
Antibacterial Activity of Ethanol Extract of Tulak Leaves (Schefflera elliptica (Blume) Harms) Against Staphylococcus aureus and Escherichia coli
Ni Putu Saraswati Kristina, I Wayan Tanjung Aryasa, Desak Putu Risky Vidika Apriyanthi..... 41- 51
- EFEK PEMBERIAN KAPSUL EKSTRAK JAMU HIPERGLIKEMI TERHADAP KUALITAS HIDUP
The Effect of Hyperglycemic Herbal Extract Capsules on Quality of Life
Ulfa Fitriani, Agus Triyono, Danang Ardiyanto, Zuraida Zulkarnain, P.R. Widhi Astana, Ulfatun Nisa, Fajar Novianto, Enggar Wijayanti..... 52- 58
- PHENOLIC AND FLAVONOID PRODUCTION, PHYTOCHEMICAL PROFILE, AND ANTIOXIDANT CAPACITY OF *Adenostemma platyphyllum* AT DIFFERENT CONCENTRATIONS OF HYDROPONIC SOLUTIONS
Aqlia Hanna N Tamsin, Irmanida Batubara, Taopik Ridwan, Trivadila, Sandra Arifin Aziz..... 59- 70



Isolation of 2-Geranyl-2',3,4,4'-Tetrahydroxy Dihydrochalcone from Breadfruit Leaf (*Artocarpus altilis* (Park.) Fosberg) Using Flash Column Chromatography

Gharsina Ghaisani Yumni^{1,5)}, Krisna Kharisma Pertiwi^{1,3)}, Yuli Widiyastuti⁴⁾, Nanang Fakhrudin^{2*)}

¹ Program Studi Magister Ilmu Farmasi, Fakultas Farmasi, Universitas Gadjah Mada, Sekip Utara, Yogyakarta, Indonesia

² Departemen Biologi Farmasi, Fakultas Farmasi, Universitas Gadjah Mada, Sekip Utara, Yogyakarta Indonesia

³ Fakultas Farmasi, Institut Ilmu Kesehatan Bhakti Wiyata, Kediri, Indonesia

⁴ Balai Besar Penelitian dan Pengembangan Tanaman Obat dan Obat Tradisional, Jl. Raya Lawu No. 11, Tawangmangu, Kalisoro, Karanganyar, Jawa Tengah, Indonesia

⁵ Fakultas Farmasi, Universitas Wahid Hasyim, Jl. Menoreh Tengah X No.22, Sampangan, Kec. Gajahmungkur, Kota Semarang, Jawa Tengah, Indonesia

*e-mail: nanangf@ugm.ac.id

ABSTRACT

Breadfruit is one of the Indonesian plants traditionally used in medication. The main active compound in breadfruit leaves is a geranylated flavonoid namely 2-geranyl-2',3,4,4'-tetrahydroxy dihydrochalcone (GTD). Previous study showed that the separation and isolation of GTD from sukun leaves is time consuming and laborious as it requires a long procedure (extraction, liquid-liquid partition, Vacuum Liquid Chromatography (VCC), Sephadex Column Chromatography (SCC), and preparative Thin Layer Chromatography (TLC). This process is ineffective and inefficient. Thus, the more effective and shorter method of isolation is needed. This study aimed to isolate GTD from breadfruit leaves utilizing flash column chromatography (FCC). The breadfruit leaves were extracted using ethanol and the extract was partitioned with the solvent n-hexane: ethyl acetate: methanol: water (3:1:3:1). The lower phase containing GTD was subjected to VCC and the fraction containing GTD was purified with FCC (using n-hexane, ethyl acetate, and methanol in a gradient polarity as mobile phases; and silica gel as a solid phase) to isolate GTD. The isolated GTD was analyzed by thin-layer chromatography (TLC) and purity was determined using high-performance liquid chromatography. This method

was able to produce 138 mg of GTD (purity of 88.49 %) from 15 g of breadfruit leaf extract (0.92% yield). This study demonstrated that GTD, a main bioactive compound of breadfruit leaves, could be effectively isolated by using FCC instead of SCC and preparative TLC.

Keywords: *Artocarpus communis, Separation, Active compound, Flavonoid*

Antioxidant Activity of Water and Ether Fraction Combination of Arabica Coffee Leaves (*Coffea arabica* L.) Extract and Cinnamon burmanii Bark (*Cinnamomum burmannii* Nees ex Bi.)

Yuni Retnaningtyas^{1*)}, Lestyo Wulandari¹⁾, Fauzan Arrozi¹⁾

¹Fakultas Farmasi, Universitas Jember, Indonesia
*email: yuniretnaningtyas@unej.ac.id

ABSTRACT

*Antioxidants are compounds that can inhibit an oxidation reaction, by binding to free radicals that play a role in the emergence of several degenerative diseases. Arabica coffee (*Coffea arabica*) and cinnamon (*Cinnamomum burmannii*) are plants that have antioxidant activity so that when combined they have the potential to produce a synergistic effect. The purpose of this study was to test the antioxidant effects of the combination of methanol extract of Arabica coffee leaves and cinnamon bark in both the water and ether fractions. Antioxidant activity was determined using the DPPH method, as a positive control vitamin C was used, and antioxidant activity was expressed in the form of IC_{50} . The results showed a synergistic effect of the two extracts where the antioxidant activity of both the water fraction and the ether fraction in the combined form was greater than the single form. The highest antioxidant activity was shown by the water fraction of the combination of methanol extract of Arabica coffee leaves and cinnamon bark in a ratio (1:2) with an IC_{50} value of 8.759 ± 0.050 g/mL. This antioxidant activity is lower than the antioxidant activity of vitamin C with an IC_{50} value of 3.267 ± 0.007 g/mL*

Keywords: *Antioxidant, Free radicals, Arabica coffee leaves, Cinnamon burmanii Bark, Synergistic effect, DPPH*



Characteristics of Galanga Accessions (Kaempferia galanga L.) Based on Essential Oil Components at Two Different Locations

**Subaryanti ^{1*)}, Triadiati ²⁾, Yohana C.
Sulistyaningsih ²⁾, Dyah Iswantini
Pradono ³⁾**

1 Program Studi Farmasi, Fakultas Farmasi, ISTN
Jakarta Indonesia

2 Departemen Biologi, FMIPA, IPB Kampus
Darmaga Bogor Indonesia

3 Departemen Kimia, FMIPA, IPB Kampus
Darmaga Bogor Indonesia

*e-mail: subaryanti@istn.ac.id

ABSTRACT

Rhizome with high productivity and content of bioactive ingredients is the hope to be achieved from the cultivation of galanga (Kaempferia galanga L.). Galanga is used traditionally as a medicine for stomach ulcers, colds, headaches, coughs, diarrhea, facilitating menstruation, skin diseases, and rheumatism. Production of secondary metabolites is influenced by environmental factors and the place of growth. This study aims to determine the effect of the growing environment from two different locations on the essential oil content and its constituent components from the rhizome of the galanga accessions. The samples observed were nine accessions of galanga harvested at 6 months which were planted in the Bogor, namely Darmaga (L1) and Cisarua (L2) with a altitudes of 214 m asl and 780 m asl with different agro-climatic conditions. The accessions tested included Purbalingga (PBG), Cilacap (CLP), Purworejo (PWJ), Karanganyar (KRA), Pacitan (PCT), Madiun (MAD), Galesia 1 (GAL 1), Galesia 2 (GAL 2), and Galesia 3 (GAL 3). GAL 1, GAL 2, and GAL 3 are high yielding varieties of galanga that have been released by the Minister of Agriculture of the Republic of Indonesia and used as comparisons based on their essential oil content. Observations were made on the levels of essential oils and their constituent compounds using GC-MS (Gas Chromatography-Mass Spectroscopy). Differences in growing places affect the content of essential oils and their constituent components from the rhizome of the galanga accession. Environmental factors that influence are sunlight and water availability. The highest essential oil content (3.78%) was obtained from the MAD accession planted in Cisarua (L2) and the highest EPMS compound (34.74%) was obtained

from the PCT accession planted in Darmaga (L1). There were 73 compounds detected with four main components, namely delta-3-carene, pentadecane, ethyl cinnamate, and ethyl p-methoxy cinnamate (EPMS).

Keywords: EPMC, Essential oils, Kaempferia galanga L.

Study of the Effectiveness of Purwoceng Ethanol Extract Nanoemulsion on Improvement of the Reproductive Function of Male White Rats Post Sleep Deprivation Induction

**Denok Tri Hardiningsih¹, Tuti Sri
Suhesti², Dody Novrial³, Fitranto Arjadi⁴**

¹Program Studi Magister Biomedis, Fakultas
Kedokteran, Universitas Jenderal Soedirman, Jl.
Dr. Gumbreg No. 1 Purwokerto, Indonesia

²Departemen Teknologi Farmasetika, Jurusan
Farmasi, Fakultas Ilmu-Ilmu Kesehatan,
Universitas Jenderal Soedirman, Jl. Dr. Soeparno
Kampus Karangwangkal, Purwokerto,
Banyumas, Jawa Tengah, Indonesia

³Departemen Patologi Anatomi, Fakultas
Kedokteran, Universitas Jenderal Soedirman, Jl.
Dr. Gumbreg No. 1 Purwokerto, Indonesia

⁴Departemen Anatomi, Fakultas Kedokteran,
Universitas Jenderal Soedirman, Jl. Dr. Gumbreg
No. 1 Purwokerto, Indonesia

*Corresponding author:
fitranto.arjadi@unsoed.ac.id

ABSTRACT

Paradoxical sleep deprivation (PSD) or sleep disorders can affect sexual function and potentially reduce fertility rates. The active substance of purwoceng (Pimpinella pruatjan Molk.), namely flavonoid and tannin compounds can improve the quality of function. Drug nanoemulsion is expected to increase the therapeutic effect and reduce toxicity. This study aims to determine the effect of purwoceng nanoemulsion on serum testosterone levels, testicular volume and testicular histopathology of male wistar rats after stress induction of



paradoxical sleep deprivation for 96 hours. This research is an experimental study with a post-test only design with a control group. A total of 24 rats were divided into 6 treatment groups. Group A was given PSD, group B was given PSD and sleep recovery, group C was given PSD and purwoceng extract 25 mg/300 gBW/day, group D was given PSD and purwoceng nanoemulsion 25 mg/300 gBW/day, group E was given PSD and purwoceng nanoemulsion. 50 mg/300 gBW/day, and group F was given PSD and purwoceng nanoemulsion 75 mg/300 gBW/day. Serum testosterone levels were measured by the ELISA method, testicular volume and histopathology determined using Image J software and data were analyzed by One Way ANOVA test and followed by Post Hoc Bonferroni test. Statistical analysis showed that there were significant differences in serum testosterone levels, testicular volume and testicular histopathology ($p < 0.005$). Administration of purwoceng nanoemulsion affects serum testosterone levels, testicular volume, and thickness of the seminiferous tubule seminiferous after PSD induction

Keywords : Purwoceng nanoemulsion, Reproductive function, Sleep deprivation

Antibacterial Activity of Ethanol Extract of Tulak Leaves (*Schefflera elliptica* (Blume) Harms) Against *Staphylococcus aureus* and *Escherichia coli*

Ni Putu Saraswati Kristina^{1*}, I Wayan Tanjung Aryasa^{1*}, Desak Putu Risky Vidika Apriyanthi¹

1 Universitas Bali Internasional, Jl. Seroja, Gang Jeruk No. 9A, Denpasar Timur, Bali, Indonesia

*e-mail: saraswaticristina@gmail.com
tanjung.aryasa@gmail.com

ABSTRACT

*Tulak plant is a type of plant that commonly used as a traditional ceremonies and traditional medicine. The purpose of this study was to determine the content of secondary metabolites in tulak leaves (*Schefflera elliptica* (Blume) Harms) and antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*. The extraction method used is the maceration method.*

*Phytochemical tests were carried out to determine the content of flavonoids, tannins, saponins, steroids and triterpenoids. Testing antibacterial activity using well diffusion agar method. The results of the phytochemical screening test on tulak leaves contain saponins, tannins, phenols and alkaloids. The results of the antibacterial activity test against *Staphylococcus aureus* at concentrations of 1 (0,25 g/ml), 2 (0,50 g/ml), 3 (0,75 g/ml) and 4 (1,00 g/ml) respectively had inhibition zones of 6.10 ± 0.05 mm, 7.15 ± 0.03 mm, 8.12 ± 0.04 mm, and 9.07 ± 0.05 mm which are categorized as moderate. The results of the antibacterial activity test against *Escherichia coli* at concentrations of 1 (0,25 g/ml), 2 (0,50 g/ml), 3 (0,75 g/ml) and 4 (1,00 g/ml) respectively did not show the formation of an inhibition zone so value was 0.00 ± 0.00 mm. The conclusion from this study is that tulak leaves (*Schefflera elliptica* (Blume) Harms) have antibacterial activity against *Staphylococcus aureus* but do not have antibacterial activity against *Escherichia coli*.*

Keywords: Antibacterial, *Escherichia coli*, *Staphylococcus aureus*, Kayu tulak leaves.

The Effect of Hyperglycemic Herbal Extract Capsules on Quality of Life

Ulfa Fitriani¹, Agus Triyono¹, Danang Ardiyanto¹, Zuraida Zulkarnain¹, P.R. Widhi Astana¹, Ulfatun Nisa¹, Fajar Novianto¹, dan Enggar Wijayanti¹

¹ Balai Besar Penelitian dan Pengembangan Tanaman Obat dan Obat Tradisional, Jl Raya Lawu No 11, Tawangmangu, Karanganyar, Jawa Tengah

*e-mail: drulfa05@gmail.com

ABSTRACT

Quality of Life (QoL) in diabetes mellitus (DM) has become highly emphasized in recent years as health care outcome. Hyperglycemic herbs potio, one of scientific herbs, has been proven to be safe and efficacious. The use of extract capsules as an innovative form of herbal medicine continues to be developed. The study aimed to examine the effect of giving hyperglycemic 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 60 patients followed the study during



September-November 2019. The hyperglycemic herbs formula consisting of 5 grams daun Salam, 5 grams sambiloto, 7 grams kayu manis and 10 grams temulawak which converted to the one extract capsule. For the daily doses are two capsules twice a day. The Metformin 500 mg single dose as a control of the study. Before this study and on day 28th, the patients had been examined the QoL using the short form-36 (SF-36). The data were analyzed using the Wilcoxon and Mann Whitney test. The results showed that there was a significant increase in total score of SF-36 ($p=0,000$) between before and after taking extract capsules, especially for the general health domain ($p=0,002$). The total score of SF-36 between extract capsules and Metformin groups was not significantly difference ($p=0,323$). Hyperglycemic herbal extract capsules improved the QoL of the hyperglycemic patients.

Keywords: Quality of life, Hyperglycemic herbal extract capsules, Diabetes mellitus

Phenolic and Flavonoid Production, Phytochemical Profile, and Antioxidant Capacity of Adenostemma platyphyllum at Different Concentrations of Hydroponic Solutions

**Aqlia Hanna N Tamsin¹⁾, Irmanida
Batubara^{2,3*)}, Taopik Ridwan²⁾, Trivadila³⁾,
Sandra Arifin Aziz⁴⁾**

¹ Magister in Chemistry Study Program,
Department of Chemistry, Faculty of
Mathematics and Natural Science, IPB
University, Bogor, West Java, Indonesia

² Tropical Biopharmaca Research Center, IPB
University, Bogor, West Java, Indonesia

³ Department of Chemistry, Faculty of
Mathematics and Natural Science, IPB
University, Bogor, West Java, Indonesia

⁴ Department of Agronomy and Horticulture,
Faculty of Agriculture, IPB University, Bogor,
West Java, Indonesia

*e-mail: ime@apps.ipb.ac.id

ABSTRACT

Adenostemma platyphyllum is considered a weed with various benefits but has not been widely cultivated. This work aims to obtain the optimum

concentration of a nutrient solution (AB-mix) to produce optimum phenolic and flavonoid levels, antioxidant capacity and metabolite profiling in *A. platyphyllum* using a hydroponic wick system. Different AB-mix nutrient solution concentrations were employed in a one-factor randomized block design. The highest total phenolic, flavonoid concentrations and antioxidant capacity were found in plants without additional nutrient solutions. However, the highest phenolic and flavonoid productivity was found in plants with a nutrient solution concentration of 1100 mg/L. The phenolic/flavonoid group compounds were successfully identified by separating the components using thin-layer chromatography. The intensity of the bands produced from each treatment was quite varied. The untreated plant produced thicker phenolic/flavonoid bands than the other treatments. This was supported by the heatmap pattern produced by the untreated ones, which had high color intensity. Therefore, the optimum concentration of nutrient solution to produce optimum phenolic, flavonoid levels, and antioxidant capacity in *A. platyphyllum* cultivation by hydroponic wick system was the concentration of 1100 mg/L.

Keywords: *Adenostemma platyphyllum*, Antioxidant capacity, Flavonoid, Hydroponic, Phenolic