

2019 Book of Abstracts 10th International Conference on Green Technology 2019

Empowering the 4.0 Industrial Revolution Through

Green Science and Technology



Malang, October 2nd- 3rd, 2019

Organized by :



Sponsored by :



thermoscientific

GeneCraft Labs

PREFACE

THE DEAN OF FACULTY OF SCIENCE AND TECHNOLOGY

UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM MALANG

It is our pleasure to very warm welcome all participant to the 2019 10th International Conference on Green Technology (ICGT 2019) in Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang. The ICGT have started ten years ago and this year, the theme of the conference is "*Empowering the Fourth Industrial Revolution through Green Science and Technology*". Now, we are entering the fourth industrial revolution which will influence all aspect in the civilization of humankind. Thus, we hope through this conference we can contribute by the result of green science and Technology in Empowering the Fourth Industrial Revolution through Green Science we can contribute by the result of green science and Technology. And also, we hope this conference can bring academic scientists, engineers, industry researchers together to discuss, exchange and share their experiences and results about green technology.

We would like to thank:

- 1. Rector and Vice-Rector of Universitas Islam Negeri Maulana Malik Ibrahim for their assistance and support for 10th International Conference on Green Technology.
- 2. Academic board committee for work in abstract and paper review.
- 3. The event organizing committee for managing this conference.
- 4. All the keynote speaker who willingly attended this conference.
- 5. Special Thanks to IOP Conference Proceeding Series, Journal of Islamic Architecture, ALCHEMY Journal of Chemistry, NUTRINO Journal, CAUCHY, and MATICS.

We wish all participants of 10th ICGT an enjoyable scientific meeting in Malang, Indonesia. We look forward to seeing all of you next year at 11th ICGT

Dean of Faculty of Science and Technology UIN Maulana Malik Ibrahim Malang

Dr. Sri Harini

PREFACE

THE CHAIRPERSON

10TH INTERNATIONAL CONFERENCE ON GREEN TECHNOLOGY

Dear Colleagues and Friends,

We have the pleasure to welcome you in Malang, East Java Indonesia for the 10th International Conference on Green Technology. The conference is annually organized by Faculty of Science and Technology, State Islamic University (UIN) of Maulana Malik Ibrahim, which the main aim is to provide a forum to exchange and explore the issues, innovations and integrated perspectives towards environmental sustainability.

We proudly announce that over 200 participants from 5 countries will join the conference and share their experience through presentations offering their insights, pointing up the challenges and suggesting new solutions regarding the following conference topics:

- A. Environmental impact evaluation
- B. Environmental education
- C. Human ecology
- D. Sustainable environmental technology
- E. Green architecture and design
- F. Energy and ecological conservation
- G. Green smart technology and innovation

This booklet contains the abstracts of contributions which will be presented at the conference, either as a keynote and invited talks or oral poster presentations.

We wish all the participants and their accompanying persons a pleasant stay in the beautiful town of Malang and hope that you will find the conference stimulating and rewarding in many ways. Finally, I would like to thank the organizing team, our sponsor for financial support, and all people who helped in the organization of this conference.

Rachmawati Ningsih



ORGANIZED BY



FACULTY OF SCIENCE AND TECHNOLOGY

UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM MALANG



SPONSORED BY



CONFERENCE COMMITTEE

Scientific Committee (Editor):

Prof. Toshifumi Sakaguchi (Prefectural Univ. Of Hiroshima, Japan) Dr. Romaidi (UIN Maulana Malik Ibrahim, Indonesia) Dr. Anton Prasetyo (UIN Maulana Malik Ibrahim, Indonesia)

Scientific Committee (Reviewers) Prof. Kunifumi Tagawa (Hiroshima University, Japan) Prof. Tatsuya Ueki (Hiroshima University, Japan) Prof. Kenji Mishima (Fukuoka University, Japan) Prof. Wolfgang Nellen (Bonn University, Germany) Prof. Sutiman B. Sumitro (Brawijaya University, Indonesia) Prof. Kaoru Nakasone (Kindai University, Japan) Prof. Winai Dahlan (Chulalongkorn University, Thailand) Prof. Takeshi Naganuma (Hiroshima University, Japan) Prof. Shinjiru Ogita (Prefectural University, Japan) Prof. Werasak Surareungchai (KMUTT, Thailand) Prof. Akira Kikuchi (Brawijaya University, Indonesia) Prof. Paitip Thiravetyan (KMUTT, Thailand) Dr. Wasilah Sihabuddin ST. MT, (UIN Alauddin Makassar) Yuniar Ponco Prananto, Ph.D (Brawijaya University, Indonesia) Zubaidah Ningsih, Ph.D (Brawijaya University, Indonesia) Dr. Bayyinatul Muchtaromah (UIN Maulana Malik Ibrahim, Indonesia) Dr. Evika Sandi Savitri (UIN Maulana Malik Ibrahim, Indonesia) Dr. Kiptiyah (UIN Maulana Malik Ibrahim, Indonesia) Dr. Akyunul Jannah (UIN Maulana Malik Ibrahim, Indonesia) Dr. Mashuri Masri (UIN Alaudin, Indonesia) Eriyanto Yusnawan, S.P., Ph.D (BALITKABI, Indonesia)

KEYNOTE SPEAKER



Prof. Fumihiro Morishita Graduate School of Science Hiroshima University



Prof. Kanokwan Poomputsa King Mongkut's University of Technology Thonburi, Thailand



Mohamad Saufi bin Rosmi Universiti Pendidikan Sultan Idris (UPSI) Malaysia



Dr. Akyunul Jannah S.Si, M.P UIN Maulana Malik Ibrahim Malang



Prof. Drs. Darsono, M.Sc Badan Tenaga Nuklir Nasional



Eriyanto Yusnawan, Ph.D Balai Penelitian Tanaman Aneka Kacang dan Umbi



Dr. Wasilah Sihabuddin ST. MT UIN Alauddin Makassar



Dr. Kiptiyah M.Si UIN Maulana Malik Ibrahim Malang



TABLE OF CONTENT

PREFACE THE DEAN OF FACULTY OF SCIENCE AND TECHNOLOGY UNIVERSITAS ISLAM NEGERI
MAULANA MALIK IBRAHIM MALANGi
PREFACE THE CHAIRPERSON 10 TH INTERNATIONAL CONFERENCE ON GREEN TECHNOLOGYii
ORGANIZED BY
SPUNSURED BYIII
KEYNOTE SPEAKER
TABLE OF CONTENT
ABSTRACT OF KEYNOTE SPEAKER
IDENTIFICATION OF NEUROPEPTIDES IN GASTROPOD MOLLUSKS CLASSICAL AND BRAND-NEW APPROACHES
Fumihiro Morishita ^{1*} , Toshio Takahashi ² , Takehiro Watanabe ² , Takuya Uto ³ , Kazuyoshi Ukena ⁴ , Megumi Furumitsu ⁴ , Toshihiro Horiguchi ⁵
CONSTRUCTION OF BIO-TEMPLATE C- DOPED g-C₃N₄-BASED HYBRID NANOCOMPOSITES WITH ENHANCED VISIBLE-LIGHT PHOTOCATALYTIC ACTIVITY
Mohamad Saufi Rosmi ^{1*} , Mohamad Azuwa Mohamed ² , Siti Munirah Sidik ¹ , Illyas Md Isa1, Suriani Abu Bakar ¹ and Mohammad Kassim ²
THE POTENCY OF 10-GINGEROL AS A PRIMARY CANDIDATE TO BECOME AN ANTI-CANCER AGENT: STUDY OF CUMULUS CELL
Dr. Kiptiyah, M.Si ^{1*}
BENEFICIAL ROLE OF TRICHODERMA IN AGRICULTURE: A STUDY IN LEGUMINOUS PLANTS
Eriyanto Yusnawan ^{1*} , Alfi Inayati ¹ , Yuliantoro Baliadi ¹
A GENETICALLY DEFINED VIRUS INOCULUM FOR PRODUCTION OF SPODOPTERA EXIGUA MULTIPLE NUCLEOPOLYHEDROVIRUS IN INSECT CELL CULTURE WITH ENHANCED INSECTICIDAL ACTIVITY
Kanokwan Poomputsa ¹
ENDOGLUCANASE ACTIVITY OF CELLULOLYTIC BACTERIA INDIGENOUS RICE BRAN BY IN VITRO AND IN SILICO
Akyunul Jannah ^{1*} , Aulanni'am², Tri Ardyati ³ , Suharjono ³
APPLICATION OF ELECTRON ACCELERATOR FOR FLUE GAS TREATMENT OF COAL POWER PLANT TO SUPPORT GREEN TECHNOLOGY
Darsono ^{1*}
THE IMPLEMENTATION OF BEHAVIORAL ARCHITECTURE IN THE DESIGNING OF SPECAIL-NEEDS SCHOOLS 8
Wasilah ^{1*}
ABSTRAC SCOPE A ENVIROMENTAL IMPACT EVALUATION
CONVERSION DAU CITRUS FARM TO ORGANIC: AN IMPROVEMENT DISCOURSE. A REVIEW
L Mufidah ^{1*} , S Widyaningsih ¹ , E Budiyati ¹



UNDERSTANDING THE REQUIREMENTS FOR WUDHU (ABLUTION) WATER VOLUME BASED ON CHANGES IN CHEMICAL OXYGEN DEMAND FOR SEVERAL DAYS1(
D Suhendar ^{1*} , G Giftia ¹ , Yunita ² , W Purnamasari ³ , H Sandi ¹ , S Ruhama ¹ , V Amalia ¹ , E P Hadisantoso ¹
UTILIZATION OF BAGLOG WASTE AS BOKASHI FERTILIZER WITH LOCAL MICROORGANISMS (MOL)11
D S Sunarya ^{1*} , Nisyawati ² , W Wardhana ³
MODELING AND OPTIMIZATION OF PALM OIL MOISTURE LOSS AS BIODIESEL PRETREATMENT
Y Hendrawan ¹ *, N S Maharani ¹ , B D Argo ¹ , Y Wibisono ¹
THE TECHNICAL AND FINANCIAL FEASIBILITY ANALYSIS ON THE ESTABLISHMENT OF A WASTE-PROCESSING UNIT FOR COCONUT SHELL (LIQUID SMOKE AND ACTIVATED CARBON)
A F Mulyadi ^{1,2*} , S Wijana ^{1,2} , I A Dewi ^{1,2} , R Andayani ^{1,2}
THE IMPACT OF AGRICULTURAL ACTIVITIES IN DRAWDOWN AREA ON SUSTAINABILITY OF DELINGAN RESERVOIR FUNCTION14
A A Muntiani ^{1*} , Suntoro ² , Sunarto ³
DEVELOPMENT OF ECOSYSTEM HEALTH INDEX IN RURAL AREAS OF JAVA ISLAND: PRELIMINARY RESULTS 15
A Yuwono ¹ , Y Wardiatno ^{1*} , R Widyastuti ¹ , D Wulandari ² , M Natali ¹
MOLECULAR IDENTIFICATION OF PHOSPHATE-SOLUBILIZING YEAST ISOLATE KR.1 BP.4 FROM CITATAH KARST AREA
A R Hafsari ^{1*} , F R Khoerunnissa ¹
CALLUS METABOLITES INDUCTION NONI (Morinda citrifolia L.) USING COMBINATION 2,4 - DICHLOROPHENOXY ACETIC ACID AND 6-BENZYLAMINOPURINE IN VITRO
M F Annas ^{1*} , R S Resmisari ¹ , I D A Indah C ¹
INFLUENCE OF CHITOSAN FOR ANATOMY STRUCTURE AND ANTRAQUINON CONTENT OF METABOLITES CALLUS NONI (Morinda citrofolia L.)18
M F Annas ^{1*} , N Alfiani ¹
POPULATION DENSITY, HUMAN DEVELOPMENT INDEX, PRIORITY WATERSHEDS AND VOLUNTARY DISCLOSURE OF POLLUTANT RELEASE DATA BY TEXTILE COMPANIES IN INDONESIA
A A Birry ^{1*} , S W Utomo ¹ , H Herdiansyah ¹
THE POTENCY OF MACROZOOBENTHOS DIVERSITY AT LEDOK AMPRONG RIVER AS PRACTICUM SOURCE FOR BIOLOGY STUDENT
S Habibi ¹ , A R Ubaid ² , Romaidi ^{2*}
SEARCHING FOR ANTIMALARIAL AGENT FROM INDONESIAN Euodia suaveolens
D K Pratoko ¹ , B Triatmoko ¹ , A N W Pratama ¹ , W N Rohmatillah ¹ , T A Laksono ¹ , A S Nugraha ^{1*}
THE EFFECT OF CRYSTALLIZATION TIME ON STRUCTURE, MICROSTRUCTURE, AND CATALYTIC ACTIVITY OF ZEOLITE-A SYNTHESIZED FROM RICE HUSK SILICA AND FOOD-GRADE ALUMINUM FOIL

W Simanjuntak^{1*}, K D Pandiangan¹, Z Sembiring¹, G G Pangesti¹, A Simanjuntak¹

COMPARATIVE STUDY OF CO2 CORROSION INHIBITION OF MILD STEEL IN BRINE SOLUTION BY THE OLIGOMERS OF 2-VINYLPYRIDINE AND 4-VINYLPYRIDINE	23
Ilim ^{1*} , S Bahri ¹ , R Marjunus ² , W Simanjuntak ¹ , M Rilyanti ¹	
CROPPING PATTERNS AND PLANTS DIVERSITY IN AGROFORESTS IN WRINGIN VILLAGE SUBDISTRICT OF WRINGINBONDOWOSO EAST JAVA	24
Solikin ^{1*} , S A Nugroho ¹	
THE RESPONSE OF SEVERAL GROUNDNUT CULTIVARS ON FERTILIZATION IN DRY LANDS WITH DRY CLIMATE	25
A Wijanarko ^{1*}	
KENAF PLANT RESISTANCE ON THE ROOT GALL NEMATODES (Meliodogyne incognita)	26
P Parnidi ^{1*}	
UHPLC ANALYSIS OF THE 1,4 NAPHTHOQUINONE IN THE INDONESIAN MEDICINAL PLANT Eleutherine palmifolia (L) MERR	27
R Annisa ^{1*}	
LARVICIDES EFFECTS OF EXTRACT ETHYL ACETATE Aglaia glabrata LEAVES AND ITS FRACTINATION TO Aedes aegypti LARVAE	28
A Supriadin ^{1*}	
SYNTHESIS OF Fe₂O₃ NANOPARTICLE FROM BATTERY WASTE FOR PHOTOCATALYTIC TREATMENT OF METHYLENE BLUE	29
E P Hadisantoso ^{1*} , F Rahmawati ¹ , V Amalia	
PRODUCTIVITY OF SOYBEAN UNDER PALM OIL PLANTATION ON TIDAL SWAMPS DUE TO SEVERAL PACKAGES OF TECHNOLOGY	30
A Harsono ^{1*}	
MOLECULAR IDENTIFICATION OF PHOSPHATE SOULBILIZING BACTERIA ISOLATE 1 BP. 2 WITH 16S RRNA GENES FROM KARS CITATAH AREA	31
A F Hafsari ^{1*}	
RESPONSE OF GROUNDNUT PROMISING LINES TO VARIOUS ENVIRONMENTS	32
J Purnomo ^{1*}	
POD YIELD AND HAULM WEIGHT PEANUT CULTIVARS GROWN IN DY LANDS WITH DRY CLIMATE	33
A A Rahmianna ^{1*}	
PREPARATION OF ZEOLITE-Y FROM RICE HUSK SILICA AND FOOD GRADE ALUMINUM FOIL AS CATALYST FOR CO-PYROLYSIS OF MIXED CASSAVA TUBER AND PALM OIL	34
S Sascori ^{1*} , W Simanjuntak ¹ , K D Pandiangan ¹	
MODIFICATION OF CORN STALK USING CITRIC ACID AS BIOSORBENT FOR METHYLENE BLUE	35
E Yulianti ^{1*} , S N Khalifah ¹ , A Prasetyo ¹ , A S Irviyanti ¹ , G P Yudisputra ¹	



FARMACOLOGY POTENCY OF THIN LAYER CHROMATHOGRAPHY STEROID ISOLATES OF CHLORELLA Sp CHLOROFORM AND ETHYL ACETATE FRACTION
D S Megawati ^{1*} , A G Fasya ² , A R Dinasti ² , M Syofiyah ² , R A Pratiwi ² , Nurul Maghfiroh ²
POTENTIAL USE OF COMPOUNDS FROM NEEM LEAF (Azaradirachta indica juss) AS PPRG AND ESRA INHIBITORS TO CONTROL BREAST CANCER CELL GROWTH
Supriyanto ^{1,2*} , M Rifa'i ⁴ , Yunianta ³ , S B Widjanarko ⁴
RESPONSE OF DATE PALM SEEDS (Phoenix dactylifera L. var. Mozafati) USING VARIOUS SCARIFICATIONS THROUGH IN VITRO CULTURE
S R N Effendi ^{1*} , N Alfiani ¹ , R S Resmisari ¹
ETHNOBOTANICAL RESEARCH OF PLANTS FOR TRADITIONAL CEREMONY MITONI USED BY COMMUNITY OF MOJOSARI, MOJOKERTO
D L Rahmawati ^{1*} , S Felinda ¹ , R S Resmisari ¹ , E B Minarno ¹
ISOLATION OF LOW DENSITY POLYETHYLENE (LDPE) DEGRADING-BACTERIA FROM SUPITURANG LANDFILL, MALANG REGENCY
D P A Wardani ¹ , R Solicha ¹ , D W Al Ikhsani ¹ , Romaidi ^{1*} , T Sakaguchi ²
ANALYSIS CONTAMINATION OF MICROPLASTIC IN BOTTLED WATER BASED ON FTIR AND E-TONGUE USING LDA AND PCA METHOD
S N Margareta ^{1*} , W Y Setyandita ¹ , H Muttamaqin ¹
STUDY OF FOCAL MECHANISM AND PEAK GROUND INTENSITY TO FIND OUT THE FAULT TYPES AND THE EXTENT OF PHYSICAL DAMAGE FOR LOMBOK EARTHQUAKES IN 2018
D A Pamungkas ^{1*} , E Susanti ¹ , R Amelia ¹
THE INCREASED YIELD OF RICE DUE APPLICATION OF HIGH-POTASSIUM-NPK FERTILIZER TO LOW- POTASSIUM-SOIL CONTENT
N Istiqomah ^{1*} , T Sudaryono ¹ , C Tafakresnanto ¹
ABSTRACT SCOPE B ENVIROMENTAL EDUCATION
DIGITAL WORKPLACE : DIGITAL TRANSFORMATION FOR ENVIRONMENTAL SUSTAINABILITY
N Yalina ^{1*} , I S Rozas ¹
HOW TO DESIGN INFORMATION TECHNOLOGY BY ERGONOMIC ASPECT AT UNIVERSITY LIBRARY
F S Bahtiar ^{1*} , F J Pamungkas ¹ , G Chandra P ¹
THE APPLICATION OF THE GREEN ARCHITECTURE PRINCIPLES OF TRI HARSONO KARYONO TO DESIGN NATURAL TOURISM IN PASURUAN
A Krisnawangseh ^{1*} , E Mutiara ¹ , A Bahar ¹
GREEN TECHNIQUE FOR THE EXTRACTION OF BASA FISH (Pangasianodon hypopthalmus)
A L Pradana ^{1*} , S P Thanasupsin ¹
DESIGN AND EVALUATION OF MOBILE ULTRAFILTRATION-BASED POINT-OF-USE DRINKING WATER TREATMENT FOR LOW-INCOME COMMUNITIES
Y Wibisono ^{1,4*} , R V Astuti ² , G Djoyowasito ² , A W Putranto ¹ , N Izza ¹ , Sucipto ³

DESIGN FOR TEMPERATURE DISTRIBUTION OF CONTINUOUS FURNACE SYSTEM FOR SINTERING APPLICATION	49
Widyastuti ^{1*} , B P Anggara ¹ , W Jatimurti ¹ , A S Wismogroho ² , V M Prawiti ¹	
DEVELOPMENT STATUS AND CHALLENGES OF ORGANIC RICE FARMING IN INDONESIA	50
Sujianto ^{1,2*} , E Gunawan ² , Avishek Datta ¹	
FIELD NOTES: TERRESTRIAL ORCHIDS IN THE LAPPADATA FOREST, BONE, SOUTH SULAWESI	51
D Mudiana ^{1*} , E E Ariyanti ¹	
INTEGRATED SUSTAINABILITY INDEX OF EAST SURABAYA WITH CASBEE TOOLS TOWARDS SUSTAINABLE CITY	52
A Handryant ^{1*} , S Harini ¹ , T Kusumadewi ¹	
BRICKETTING POLYSTYRENE WASTE WITH THERMAL DECOMPOSITION AS FRIENDLY ENVIRONMENTAL BOILER FUEL	53
G C C Rohmana ^{1*}	
IMPLEMENTATION OF GREEN INDUSTRY STANDARD AT TEXTILE INDUSTRY AND TEXTILE PRODUCT	54
L Indrayani ^{1*}	
ESTIMATION OF CARBON ABSORPTION POTENTIAL, BIOMASS AND CARBON DEPOSIT MONITORING IN THE CITY OF MALANG	55
G N Madapuri ^{1*} , H N Azwar ¹ , M A Hasyim ¹	
STATISTICAL ANALYSIS OF STUDENT SATISFACTION IN FACILITIES AND SERVICES AT SCIENCE AND TECHNOLOGY FACULTY OF UIN MALANG	56
H Saadah ^{1*} , P Lestari ¹ , A F Rozanni ¹ , R D L N Karisma ¹	
INVENTORY AND PREVALENCE OF MILKFISH (Chanos chanos) DIGESTIVE TRACT IN MALANG CITY TRADITIONAL MARKET	57
E R Nursaputri ^{1*} , M A Fachrudin ¹	
ABSTRACT SCOPE C HUMAN ECOLOGY	
VEGETATION ANALYSIS USING POINT CENTERED QUARTER (PCQ) METHOD IN BORDER FOREST OF JEMBRANA BULELENG WEST BALI NATIONAL PARK (TNBB)	58
M Kundariati1 ^{1*} , A L Amaliyah ¹ , A N Arfianti ¹ , D A Puspitaningrum ¹ , I Fauziah ¹ , E F I R Hangestuti ¹ , R Istiana ¹ Afrida Rosania ¹	¹ , R
PARALLEL APPROACH IN RANK BASED ASSOCIATION RULE MINING	59
O Q Aziz ^{1*}	
EXTRACTION AND CHARACTERIZATION OF NANOCELLULOSE FROM SUGARCANE BAGASSE BY ULTRASONICATION METHODE	60
A Y Hisbiyah ^{1*}	
ANALYSIS OF FOOD HABITS TILAPIA (Oreochromis niloticus) THAT CAUGHT IN SANGIRAN RESERVOIR, NGAWI, EAST JAVA	61
D Arfiati ^{1*} , S Shofiah ¹ , N Cokrowati ²	

х

UTILIZATION OF POLYSTYRENE WASTE WITH BIODIESEL FROM COOKING OIL WASTE AS FEEDSTOCK IN CATALYTIC CRACKING USING AL-MCM-41/CERAMIC AND PD/AL-MCM-41/CERAMIC CATALYSTS	. 62
H Juwono ^{1*} , F S Pamungkas ¹ , A Elliyanti ¹ , A Assari ¹ , A H Dermawan ¹ , Arifah N ¹	
INFLUENCE OF BIODIESEL WASTE COCONUT OIL ON PRODUCE HYDROCARBON FRACTION BY CATALYTIC CRACKING WASTE POLISTIRENE AND ITS APPLICATION IN GASOLINE ENGINE	. 63
H Juwono ¹ , A Elliyanti ^{1*} , F S Pamungkas ¹ , A Assari ¹ , A H Dermawan ¹ , Arifah N ¹	
HEAVY METAL AND HARMFUL LIQUID WASTE MEMBRANES BASED ON GEOPOLYMER FLY-ASH/TiO2-rGO	. 64
A D Permatasari ^{1*} , N Fahira ¹ , N Fadhila ¹ , Subaer ¹	
BIOLOGICAL CONTROL OF Bemisia tabaci GENNADIUS BY USING ENTOMOPATHOGENIC FUNGI Aschersonia aleyrodis	. 65
Y Prayogo ^{1*} , M S Y I Bayu ¹	
COMPARISON BETWEEN CHEMICAL AND NATURAL TREATMENTS FOR BAMBOO AS BUILDING MATERIAL TOWARDS SUSTAINABLE CONSTRUCTION METHOD	. 66
E Setiyowati ^{1*} , A B Mappaturi ¹	
THE IMPLEMENTATION OF ETHICAL CONCEPTS TOWARD WASTE IN THE DESIGN OF FARMS AND THE CULTIVATION OF DUCKS IN MOJOKERTO	. 67
A H Al Manuddin ^{1*}	
UTILIZATION OF BLACK TEA WASTE AS BATIK NATURAL DYES ON COTTON AND SILK	. 68
M Triwiswara ^{1*}	
SCREENING OF BACTERIAL ISOLATE AND EXTRASELULAR ENZYME IDENTIFICATION IN MANGROVE ROOT SEDIMENTS FROM MANGROVE FOREST LABUHAN MARINGGAI, EAST LAMPUNG	. 69
T D Rosahdi ^{1*} , R Auliawati ¹ , A S Sa'adah ¹ , R B Satiyarti	
EFFECT OF FERTILIZATION AND SHOOT TIP PRUNING ON THE GROWTH OF SAMBILOTO (Andrographis paniculata (Burm. F.) NEES	. 70
Solikin ^{1*}	
THE INFLUENCE OF PHOSPHORUS FERTILIZER ON GROWTH AND YIELD OF MAIZE ON DRY LAND	. 71
W Handayati ^{1*}	
GREEN ENERGY FROM WASTE: MODIFICATION OF METHYL ORANGE DYE AS A LIGHT HARVESTER ON SOLAR CELL	. 72
H Setyawati ^{1*} , M S Hadi ¹ , H Darmokoesoemo ¹ , I K Murwani ² , A J Permana ¹ , F Rochman ¹	
AMPHIBIAN (Order anura) DIVERSITY IN TOURISM AREA OF COBAN PUTRI, COBAN JAHE, COBAN PELANGI, AND LEDOK AMPRONG, MALANG REGION, EAST JAVA, INDONESIA	. 73
B F Hanifa ^{1*} , A Khatimah ² , Y Indawati ² , A Hidayah ² , L Z L Elzain ² , L Septiadi ² , M A Hasyim ¹	
SEAGRASS VEGETATION ANALYSIS ON THE COAST OF HADIR AND BATU LAWANG BEACH KARIMUNJAWA NATIONAL PARK	. 74
M A Hasyim ^{1*} , M A Yaqin ¹ , M B Ulum ¹ , B F Hanifa ¹ , T Cahyono ²	

P	ARTICIPATORY ACTION RESEARCH: MATERNAL AND CHILD HEALTH SYSTEM
	M A I Anshori ^{1*} , A P Lestari ¹ , K A Devi ¹
<u>A</u>	BSTRACT SCOPE D_SUSTAINABLE ENVIRONMENTAL TECHNOLOGY
S	ONOCHEMICAL SYNTHESIS OF SrTiO₃/TiO₂ HETEROJUNCTION MATERIAL
V	'N Istighfarini ^{1*} , S N L Aprilia ¹ , A Prasetyo ¹
E	FFECT OF SYNTHESIS TIME ON PARTICLE SIZE OF Bi4Ti3O12 SYNTHESIZED BY MOLTEN SINGLE SALT NaCl METHOD
Т	Januari ¹ , N Aini ¹ , A Prasetyo ^{1*}
T	ESTING OF Trichoderma sp. FORMULATION ON PATHOGEN PREVENTION OF Fusarium oxysporum CAUSES OF WILT IN Capsicum frustescens IN VIVO78
С	Nisa ^{1*} , U Utami ¹
T	HE EFFECT OF NOZZLE SIZE ON DISSOLVED OXYGEN VALUE USING FINE BUBBLE AERATION. CASE STUDY: LEACHATE TREATMENT IN TPA MANGGAR
N	1 M Harfadli ^{1*}
S	YNTHESIS AND CHARACTERIZATION OF NANOPARTICLE MAGHEMITE (Υ-Fe2O3) AS PIGMENT FROM LATHE WASTE USING SONICATION – CALCINATION METHOD80
L	M Khoiroh ^{1*} , F Khidin ¹ , R Ningsih ¹
Α	NTIMICROBIAL FILM BASED ON LEMON OIL EMULSION-IMPREGNATED AGARAOSE/CHITOSAN
Ε	R Amanda ^{1*} , K Nisyak ¹ , Y A Prasetya ¹ , Y S Chalim ¹
T	HE EFFECT OF ORGANIC FERTILIZER FROM HOUSEHOLD WASTE AND LIQUID ORGANIC FERTILIZER ON GROWTH AND YIELD OF PAKCOY (Brassica few L.)82
A	Krismawati ^{1*}
U	TILIZATION OF Bacillus thuringiensis IN CONTROLLING ARMYWORMS (Spodoptera litura) ON TOMATO (Solanum lycopersicum) PLANTS83
A	Rizali ^{1*}
S	YNTHESIS OF SCHIFF BASE COMPOUND FROM VANILLIN AND ANILINE WITH VOLUME VARIATIONS OF ACID CATALYST FROM BELIMBING WULUH USING GRINDSTONE METHOD
F.	F. H. Abdurrafi1 ¹ *, A Hanapi ¹ , R Ningsih ¹
D	ETECTION LIMIT RESPONSE TIME QUARTZ CRYSTAL MICROBALANCE (QCM) IN COW GELATIN AND PIG GELATIN BASED ON TRIOCTYL METHYL AMMONIUM CHLORIDE MEMBRAN
N	1uthmainnah ^{1*} , I Tazi ¹ , A Sinda ¹ , I Fuada ¹ , F Falah ¹
В	IODIESEL PREPARATION FROM OIL FRACTION OF CRUDE POND PALM OIL THROUGH SIO2/SO3 ⁻ H ⁺ - CATALYZED ESTERIFICATION FOLLOWED BY KOH-CATALYZED TRANSESTERIFICATION
1	Herlina ^{1*} , W Simanjuntak ² , M Rilyanti ² , E R Safitra ³
E	FFECT OF DOPING FE ³⁺ AND CU ²⁺ ON THE MICROSTRUCTURE AND ELECTRICAL PROPERTIES OF CRYPTOMELANE-TYPE MnO2 PREPARED BY SOL-GEL METHOD
Ε	Hastuti ^{1*} , W Reni ¹ , I Yuliana ¹

EFFECT OF PRECIPITATION TIME ASSISTED BY ULTRASONICATION FOR SYNTHESIS OF ZnO PHOTOCATALYST	
S Setiadji ^{1*} , S Sanusi ¹ , D G Syarif ²	
UTILIZATION OF GEOTHERMAL SLUDGE AS A MATERIAL FOR MAKING ZEOLITE POLYMER NANOPARTICLES	
Yuastutik ^{1*} , L Ilmiyah ¹ , Y A Putri ¹ , Sumari ¹	
SYNTHESIS OF MATERIAL COMPOSITE rGO-TIO2 FROM COCONUT SHELLS BY SOL-GEL METHOD	90
U Hikmah ^{1*} , D R Yanti ¹ , N Aini ² , A Prasetyo ² , E Hastuti ¹	
THE EFFECT OF MICROWAVE IRRADIATION ON REDUCED GRAPHENE OXIDE FROM COCONUT SHELLS	91
D R Yanti ¹ , K Nikmah ¹ , U Hikmah ^{1*} , A Prasetyo ² , E Hastuti ¹	
TRANSESTERIFICATION OF COCONUT OIL USING MgO DOPED ZEOLITE-Y PREPARED FROM RICE HUSK SILICA	92
G G Pangesti ^{1*} , K D Pandiangan ¹ , W Simanjuntak ¹	
METHYL ROCAGLATE FROM THE STEMBARK OF Aglaia minahassae (Meliaceae) AND ITS CYTOTOXIC ACTIVITY AGAINST HELA CERVICAL CANCER CELL LINES	
N Kurniasih ^{1,2*} , A Supriadin ¹ , R Abdulah ³ , D Harneti ² , U Supratman ^{2,4} , M N A B M Taib ⁵	
ANTICANCER ACTIVITY IN 2-METHOXY-4-((4 METHOXYPHENILIMINO)METHYL)PHENOL COMPOUND O T47D BREAST CANCER CELLS	N
L Sukria ¹ , E K Hayati ^{1*} , A Hanapi ¹	
GREEN SYNTHESIS OF GOLD NANOPARTICLES USING BIOMOLECULS EXTRACT OF KETAPANG LEAF (Terminalia catappa) AND NONI (Morinda citrifolia L.) FRUIT	
D C Dewi ^{1*} , D E Rahma ¹ , M W Hidayat ¹ , S Amalia ¹	
POTENTIAL OF EXTRACT RICE BRAN FERMENTED BY Rhizopus oryzae AS ANTIBACTERIAL AGAINST Salmonella typhi	
A Jannah ¹ *, H Barroroh ¹ , A Ma'unatin ¹	
SYNTHESIS AND CHARACTERIZATION OF ALGINATE-CELLULOSE BEADS FROM CORN STALK AND APPLICATION AS ADSORBENT FOR METHYLENE BLUE	
E Yulianti ^{1*} , N Qosim ¹ , A Prasetyo ¹ , W A P Rohmatullah ¹ , L M Khoiroh ¹ , R Mahmudah ¹	
POROUS ALGINATE/CELLULOSE XANTHATE BEADS FROM CORN STALK WITH CaCO₃ AND NaCI AS POROGENS	
N W Azizah ¹ , E Yulianti ^{1*} , C N Hidayah ¹ , L M Khoiroh ¹ , R Mahmudah ¹ , A Prasetyo ¹	
SYNTHESIS AND CHARACTERIZATION OF SILICA GEL FROM LAPINDO MUD SIDOARJO	
A Rahmayanti ^{1*} , Q A'yuni ² , Hartati ³ , Purkan ³	
PRELIMINARY STUDY ON THE SITE-SPECIFIC NUTRIENT FERTILIZATION EFFICIENCY THROUGH SEVERAL TOOLS	100
D Sihombing ^{1*}	

POTENTIAL GROWTH AND PRODUCTION OF RICE (Oryza sativa) WITH ADDITIONAL APPLICATIONS OF LIQUID INORGANIC MICRO LEAF FERTILIZER	101
Sugiono ^{1*} , A Krismawati ¹	
BIODIESEL PRODUCTION FROM KESAMBI (Schleichera oleosa) OIL USING MULTI-WALLED CARBON NANOTUBES SUPPORTED ZINC OXIDE AS A SOLID ACID CATALYST	102
N P Asri ^{1*} , Y Yuniati ² , H Hindarso ³ , Suprapto ⁴ , R R Yogaswara ⁵	
SILICA-CELLULOSE GEL AS IMMOBILIZATION MATRIX FOR PSEUDOMONAS FLOURESCENS BACTERIA	103
M Royanudin ^{1*} , Y Utomo ¹ , S Wonorahardjo ^{1,2}	
PREPARATION, ANTICANCER TEST AND DRUG RELEASE STUDY OF DOXORUBICIN (DOX) SUPPORTED NAX ZEOLITE AGAINST BREAST CANCER CELLS (T47D)	104
E K Hayati ^{1*} , S N Khalifah ¹ , A D R Madjid ¹ , A Jannah ¹	
IMMUNOMODULATORY ACTIVITY OF EXOPOLYSACCHARIDES PRODUCED BY Leuconostoc mesenteroides STRAINS ISOLATED FROM PALM (Borassus flabellifer L.) SAP	105
A Ma'unatin ^{1.2*} , Harijono ¹ , E Zubaidah ¹ , M Rifa'i ³	
ADSORPTION ISOTERM AND THERMODYNAMIC OF MALACITE GREEN ON CORN STALK (Zea mays L.) MODIFIED CITRIC ACID	106
A F Romadhoni ¹ , E Yulianti ^{1*} , R Mahmudah ¹	
ISOLATION, IDENTIFICATION, AND BIOACTIVITY OF STEROIDS ISOLATES FROM Hydrilla verticillata PETROLEUM ETHER FRACTION	107
A G Fasya ^{1*} , S Amalia ¹ , B Purwantoro ¹	
ANTIOXIDANT ACTIVITY AND TOXICITY TEST OF STEROID COMPOUND IN COLUMN CHROMATOGRAPHY ISOLATES OF Chlorella sp. N-HEXANE FRACTION	108
R A Pratiwi ¹ , N Maghfiroh ¹ , A G Fasya ^{1*} , R Ningsih ¹ , D Yuliani ¹	
THE EFFECT OF ACID VARIATION ON PHYSICAL AND CHEMICAL CHARACTERISTICS OF CELLULOSE ISOLATED FROM Saccharum officinarum L. BAGASSE	109
B Fauziyah ^{1,2*} , M. Yuwono ³ , Isnaeni ³	
A COMPARISON STUDY ON THE SYNTHESIS OF Fe ³⁺ AND Cu ²⁺ -DOPED MnO ₂ AS AN ENERGY STORAGE	110
W R Agustin ^{1*} , I Yuliana ¹ , S D N Fadila ¹	
SYNTHESIS OF CaTi _{10.95} Fe _{0.05} O ₃ AND CaTi _{10.9} Fe _{0.1} O ₃ MATERIAL USING MOLTEN SINGLE SALT NaCl METHOD	111
D R Novianti ¹ , A D Prasetiyo ^{1*} , S N Khalifah ¹ , A Prasetyo ¹	
SYNTHESIS OF GALLIUM (III) DOPED MESOPOROUS TITANIUM DIOXIDE USING SONOCHEMICAL METHOD	112
Y S Dewi ¹ , A M Atsabiti ¹ , N Aini ¹ , A Prasetyo ¹	
SYNTHESIS AND CHARACTERIZATION OF FAUJASIT ZEOLITE FROM BLITAR KAOLIN WITH THE ADDITION OF ORGANIC TEMPLATE	113
R E Hardianty ^{1*} , A R Elendra ¹	

ABSTRACT SCOPE E GREEN ARCHITECTURE AND DESIGN

THE DIVERSITY AND ABUNDANCE OF MAMMALS IN THE HIGH CONSERVATION VALUE FOREST IN PALM OIL PLANTATION, SOLOK SELATAN, WEST SUMATRA
M Fadhillah ^{1*} , W Novarino ² , J Supriatna ¹
ANALYSIS OF HYDRAULIC SLUICE GATE SAPON-INTAKE IN PROGO RIVER YOGYAKARTA SPECIAL REGION (D.I YOGYAKARTA)
P Nuryanti ^{1*} , D Legono ²
DESIGN CONCEPT OF COMMUNITY PESANTREN DEVELOPMENT IN SUMBERPUCUNG MALANG USING SIMBIOSIS ARCHITECTURE APPROACH
B R S N Nurwana ^{1*} , T Isnainiah ¹
APPLICATION OF SENSORY THERAPEUTIC DESIGN APPROACH TO MATERNAL AND CHILD HOSPITAL DESIGN IN KECAMATAN SUMBERMANJING WETAN
D S Alim ¹ , I Nur F ¹ , N Junara ^{1*}
COMMUNITY ACCOMPANIMENT AT RW 16, MANGLIAWAN VILLAGE, PAKIS DISTRICT, MALANG REGENCY TO CREATE A CLEAN AND GREEN ENVIRONMENT
S Bekti ^{1*} , A A Pangestuti ¹ , E Fitrianifitriani ¹
ENTERPRISE ARCHITECTURE ZACHMAN FRAMEWORK IN MA'HAD SUNAN AMPEL AL'ALY
I Sabrina ¹ , F Y A Hidayatollah ¹ , S D Granita ^{1*}
CHARACTERISTICS OF PETUNG BAMBOO AS THE MAIN STRUCTURE OF WIDE SPAN BAMBOO HALL BUILDING AT GUBUKKLAKAH, PONCOKUSUMO, MALANG120
S M A A Busthomy ^{1*} , S A Husna ¹ , M A Bahar ¹
STORE FACADE RENOVATION FOR HERITAGE ARCHITECTURE
A R Setiono ^{1*}
STUDY OF HOUSE ORIENTATION AND THEIR PCALMENT TOWARDS SUSTAINABLE ISLAMIC RESIDENTIAL AREA
N Junara ^{1*} , E Mutiara ¹ , S Senjana ¹
REBRANDING EFFORT FOR PUBLIC AND PRIVATE TERRITORIES IN THE RIVERBANK SETTLEMENTS OF KAMPUNG TRIDI MALANG
A Subaqin ^{1*} , T Kusumadewi ¹ , I Faqihuddin ¹ , A Z Husna ¹
CONTRIBUTION OF BAMBOO MATERIALS IN ARCHITECTURE EDUCATION TOWARDS SUSTAINABLE COMMUNITY DEVELOPMENT
L Maslucha ^{1*} , Y E Putrie ¹ , S Rahma ¹ , A N Handryant ¹
SOCIO-ECOLOGICAL PERSPECTIVE IN NUSANTARA ARCHITECTURE KNOWLEDGES CONSTRUCTION
P P Wismantara ^{1*}
AQUAPONIC: FROM INNOVATION OF HOBBY LEAD TO FOOD
R S Sundari ^{1*}
ORGANIC ARCHITECTURE APPROACH IN DESIGNING A SURABAYA ZOO127

A C Hardiwibawa^{1*}

THE ECO-CULTURAL APPROACH INTEGRATING ISLAMIC VALUES WITH ARTHA WANTILAN CONCEPT ON THE FISH MARKET DESIGN IN KEDONGANAN BALI
M Jannah ¹ , E Mutiara ¹ , T Kusumadewi ^{1*}
THE USAGE OF BAMBOO MATERIAL AS AN AESTHETIC FINISHES TOWARDS GREEN AND ENVIRONMENTALLY FRIENDLY ARCHITECTURE
S Rahmah ^{1*} , L Maslucha ¹ , A N Handryant ¹ , Y E Putrie ¹ , V R Akbar ¹
APPLICATION OF ISLAMIC ARCHITECTURE APPROACH ON DESIGNING INTEGRATED HAJJ DORMITORY OF MALANG CITY
Ayuningtyas ^{1*} , N Jannah ¹ , E Setyowati ¹ , A Y Firmansyah ¹
SIDOARJO MUD VOLCANO MEMORIAL PARK
S Abidah ^{1*} , N R E Pitrayunsaharuun ¹
THE APPLICATION OF ECOLOGICAL ARCHITECTURE IN DESIGNING HOTEL RESORT OF LENGGOKSONO BEACH
R A Faulia ^{1*}
ABSTRACT SCOPE F ENERGY DAN GREEN CONVERSION
THE COMBUSTION STEP AND THE CHANGE IN THE FINAL LENGTH OF COMBUSTION IN JATROPHA OIL BY INCREASING THE SPRAY PRESSURE
A Wibowo ^{1*}
UTILIZATION PHOTOVOLTAIC AS A SOURCE OF HYBRID POWER PLANT IN CELAGEN ISLAND
I Susanto ¹ , W Sunanda ^{1,2*} , R Kurniawan ¹ , R F Gusa ¹ , F Arkan ¹
SELECTED PURPLE-FLESHED SWEET POTATO GENOTYPES WITH HIGH ANTHOCYANIN CONTENTS
E Ginting ^{1*} , R Yulifianti ¹ , F C Indriani ¹
APPLYING MATERIAL FLOW ANALYSIS FOR ESTIMATING THE AMOUNT OF PERSONAL COMPUTERS E-WASTE
R Siringo ¹ , H Herdiansyah ^{1*} , R D Kusumastuti ²
DEGRADATION KINETICS OF METHYLENE BLUE WITH PHOTOCATALYST TIO2
F Nurfiana ^{1*} , N A Kundari ¹ , A Aban ¹
NEW COMPOUNDS OF PREGNANONE FROM Calotropis gigantea ROOTS ACTIVELY AGAINST COLON CANCER CELL WIDR THROUGH CELL CYCLE INHIBITION
R Mutiah ^{1,2} , A Widyawaruyanti ^{3,4*} , Sukardiman ³
TURBIDITY OF Saccharomyces cerevisiae: A PROPOSED CELL QUANTIFICATION METHOD
A Syauqi ^{1*} , H Santoso ¹ , S N Hasana ¹
DISINFECTING TECHNOLOGY OF Camellia sinensis L. INOCULANTS THROUGH IN VITRO CULTURE
Sutini ^{1*} , W Wurjani ² , N Augustien ¹ , D U Pribadi ¹ , D A Purwanto ³

EFFECTIVNESS OF MACRO COMPOUND NK FERTILIZATION ON GROWTH AND YIELD OF CORN
L Aisyawati ¹ , Z Arifia ^{1*}
SYNTHESIS, CHARACTERIZATION, AND EVALUATION OF ZrO2-ZnFe2O4 ⁻ COMPOSITE CERAMICS AS A MAGNETIC PHOTOCATALYST FOR METHYLENE BLUE DEGRADATION
R H Putri ¹ , A Hardian ^{1*} , D G Syarif ²
PILOT SCALE PRODUCTION OF Boletus colossus CULTURE FOR PROMOTING GROWTH OF PARA RUBBER TREES
W Dechmahitkul ^{1*} , K Khumvongsa ¹ , P Mekvichitsaeng ¹
EFFECT OF ETHANOL EXTRACT OF WUNGU (Graptophyllum pictum L. (griff)) LEAF ON HISTOLOGICAL OBSERVATION OF TESTES ON MALE MICE INDUCED CADMIUM SULPHATE
F Wirapratama ¹ , L Suhargo ^{1*} , A Hayati ¹
ASSESSMENT OF AGRONOMIC PERFORMANCE AND SHATTERING RESISTANCE OF F7 SOYBEAN LINES 145
A Krisnawati ^{1*} , A Soegianto ² , B Waluyo ² , Kuswanto ²
THE INFLUENCE OF REDUCED GRAPHENE OXIDE NANOPARTICLES (rGO NPs) ON THE MICROSTRUCTURE OF METAKAOLIN GEOPOLYMER
R Irfanita ^{1*} , S S Desa ¹ , A D Permatasari ¹ , M R Fahlefy ¹ , S Wahyuni ¹ , Amran ¹ , A Setiawan ¹ , Subaer ¹
RELEASE TEST OF N, P, AND K OF COMPLETE SLOW RELEASE FERTILIZER (PUKAP JESTRO-1) AND ITS EFFECT ON THE GROWTH OF YOUNG SIAM CITRUS (Citrus nobilis lour.)
Sutopo ^{1*} , T G Ajj ¹ , E Budiyati ¹
SYNTHESIS AND CHARACTERIZATION OF GREEN MATERIAL FOR HEAT PROTECTION BASED ON METAKAOLIN GEOPOLYMER-MgO NPs COMPOSITE
S Wahyuni ^{1*} , S S Desa ¹ , R Irfanita ¹ , A D P Sari ¹ , A Setiawan ¹ , Subaer ¹
DETECTION OF Staphylococcus aureus IN INFECTION WOUNDS ON THE SKIN SURFACE
E R Ekawati ^{1*} , W Darmanto ²
SELECTION OF EARLY-GENERATION SOYBEAN LINES RESISTANT TO WHITEFLY USING SSR MARKERS
A Sulistyo ^{1*} , M S Y I Bayu ¹ , I M Tasma ² , N Argosubekti ³ , M J Mejaya ¹
PRELIMINARY STUDY ON ANTIMALARIAL AGENT FROM INDONESIAN Swietenia mahogany
A S Nugraha ^{1*,} B Triatmoko ¹ , D K Pratoko ¹ , A N W Pratama ¹ , Y D Purnomo ¹ , T A Laksono ¹
Senna occidentalis: INDONESIAN LEGUMINOSE AS SOURCE FOR ANTIMALARIAL AGENT
A S Nugraha ^{1*} , A N W Pratama ¹ , D K Pratoko ¹ , B Triatmoko ¹ , N B Winarto ¹ , T A Laksono ¹
HYDROGEN BOND ON CONFORMATIONAL CHANGE DURING THE MOVEMENT OF LID LIPMNK
D Herasari ^{1*} , Mulyono ¹ , Kamisah ¹ , D Pandiangan ¹ , M Rilyanti ¹ , H Satria ¹
PREPARATION OF ZSM-5 FROM RICE HUSK SILICA AND ALUMINUM FOIL USING TETRAPROPYLAMMONIUM BROMIDE (TPABr) AS A TEMPLATE

K D Pandiangan¹*, W Simanjuntak¹, Ilim¹, D Herasari¹, D I Alista¹



CATALYTIC PERFORMANCE OF HIERARCHICAL ZSM-5 SYNTHESIZED FROM SUGARCANE BAGASSE ASH IN TRANSESTERIFICATION REACTION OF COCONUT OIL FOR BIODIESEL PRODUCTION	155
M Rilvanti ^{1*} , E G Silviana ¹ , D Herasari ¹ , Burhani ¹ , A Laila ¹	
POTENTIAL OF KENIKIR LEAF EXTRACT (Cosmos caudatus) AS CORROSION INHIBITOR OF IRON IN 1% NaC SOLUTION	1 156
T Sudiarti ^{1*}	
AN ASSESSMENT OF EARLY WARNING SYSTEM: INITIAL SURVEY ANALYSIS	157
N S Rabe ^{1*} , M R M Hussain ¹ , I Zen ² , I Tukiman ¹ , R S Muda ³ , A F Mamat ³	
REPRODUCTIVE ACTIVITY PATTERN OF FOUR SPECIES OF CINNAMOMUM IN PURWODADI BOTANIC GARDEN	158
T Yulistyarini ^{1*}	
ASSESSMENT OF VEGETATION COVER THROUGH RED-EDGE SPECTRAL REFLECTANCE-BASED INDICES	159
L Mukaromah ^{1*}	
ABSTRACT SCOPE G GREEN SMART TECHNOLOGY INNOVATION	
DETECTION OF HIJAB SYAR'I AS SMART CLOTHES FOR MOSLEM PEOPLE USING HIGH PERFORMANCE OF PARALLEL COMPUTING	F 160
I Cholissodin ¹ *, D E Palupi ¹ , M Y Y Putra ¹ , S Aprilisia ¹	
COMPETENCE OF SMALL MEDIUM ENTERPRISE EMPLOYEES TO IMPLEMENT ISO 14001:2015	161
I Y Budi ^{1*} , M Karuniasa ¹ , R Nurcahyo ²	
SIMULATION OF CLIMATE CHANGE IMPACT ON MAIZE GROWTH AND PRODUCTION USING DSSAT	162
B Al Fanshuri ^{1*}	
THE EFFECT OF ADDITION Mn ²⁺ METAL IONS AND INCUBATION TIME TO Bacillus cereus CELLULASE ENZYME ACTIVITY FROM ENDOPHYTIC BACTERIA OF CURCUMA RHIZOME (Curcuma zanthorrizha roxb.)	163
C Sulistvantini ^{1*} , U Utami ¹	
SENTIMENT ANALYSIS OF NATIONAL LIBRARIES THROUGH SOCIAL MEDIA TWITTER	164
F K R Mahfud ^{1*} , N S Mudawamah ¹ , W Hariyanto ¹	
REMOVAL OF LEAD(II) FROM AQUEOUS SOLUTION USING WASTE HVS PAPER AS A LOW-COST ADSORBENT	165
V Amalia ^{1*} , Ernawati ¹ , E P Hadisantoso ¹	
GREEN INFRASTRUCTURE PATTERN OF THE MANGGAR RIVERSIDE AS MINAPOLITAN SETTLEMENT	166
M Ulimaz ^{1*} , N A Jordan ¹	
SYNTHESIS AND CHARACTERIZATION OF HEMATITE PIGMENT (a-Fe2O3) NANOPARTICLES FROM IRON LATHE WASTE USING SONICATION CALCINATION METHOD	167

R Habibah^{1*}, L M Khoiroh¹, R Ningsih¹

ETHNOBOTANY MENDONG PLANTS (Fimbristylis globusa) AS HANDICRAFTS IN THE WAJAK DISTRICT OF MALANG REGENCY1	68
E B Minarno ^{1*} , A Nadhifah ¹ , S F A Febryana ¹	
EXACT SOLUTION TO THE KLEIN-GORDON EQUATION ON MODIFIED SCHWARZSCHILD BLACK HOLES	69
A Romadani ^{1*}	
COMPLETION NEUTROSOFIC TRANSPORTATION PROBLEM TYPE 1 USING ZERO POINT METHOD1	POINT METHOD 170
E R Wulan ^{1*} , S D K Suci ¹	
ERP ENHANCEMENT OF THE PURCHASE AND WAREHOUSE MODULE IN THE ERA OF INDUSTRIAL REVOLUTION 4.0	171
E P R Lestari ¹ , N Kadir ¹ , V A Kristi ¹ , Supriyono ^{1*}	
CONCEPTUAL MODEL OF SMART SUSTAINABLE ENVIRONMENT CITY: LITERATURE REVIEW1	172
Syamsudin ^{1*} , D I Sensuse ¹	
CONSTRUCTION ANALYSIS OF THE STRING MOTION MODEL ON SASANDO MUSICAL INSTRUMENT	NSTRUMENT 173
A Kusumastuti ^{1*} , D N Brylliant ² , N A Hidayati ²	
PERFORMANCE EVALUATION OF THE REVISED DOUBLE SAMPLING CHART BASED ON MEDIAN RUN LENGTH WITH ESTIMATED PARAMETER1	l 174
F Rozi ¹ *, U S Pasaribu ¹ , U Mukhaiyar ¹	
PREDICTING THE CITY AND DISTRICTS CONSUMER PRICE INDEX IN EAST JAVA WITH THE GAUSSIAN-RADIAL BASIS FUNCTION KERNEL1	75
M F Rohmah ^{1*}	
IMPLEMENTATION OF TF.IDF WEIGHTING AND LATENT SEMANTIC INDEXING ON INFORMATION RETRIEVAL SYSTEM FOR INDONESIAN HEALTH ARTICLES1	76
M I Hasan ^{1*}	
MESSAGE COMMUNICATION STRATEGY IN MANAGEMENT OF WASTE BANK CENTONG VILLAGE GONDANG MOJOKERTO DISTRICT1	77
M Ningsih ^{1*} , R S Ramadhani ¹	
THE SIMULATION OF MECHANICAL EXCITEMENT EFFECT ON BONE DENSITY DUE TO THE AGE CHANGES BASED ON FINITE ELEMENT METHOD (FEM)1	178
K Yakin ^{1*} , N I Rusmana ¹ , M Tirono ¹	
THE SIMULATION OF MECHANICAL STIMULATION EFFECT ON BONE ELASTICITY LIMIT BASED ON FINITE ELEMENT METHOD (FEM)	TE 179
K Yakin ^{1*} , I Setyaningsih ¹ , M Tirono ¹	
DETERMINATION OF CUSTOMER PRICE INDEX WITH GENERALIZED SPACE TIME AUTOREGRESSIVE1	80
N I Nuronia ¹ , S Harini ^{1*}	
DEVELOPMENT OF REMOTELY OPERATED VEHICLES (ROV) UNDERWATER FOR UNDERWATER EXPLORATION USING PROPORTIONAL-INTERGRAL-DERIVAVTIVE(PID) CONTROL	,

^{1*}, W A Kurniawan¹

THE INFLUENCE OF SERVICE QUALITY AND PREVIOUS EXPERIENCE AS A MODERATOR TO TOURIST SATISFACTION IN BATU WITH PARTIAL LEAST SQUARES APPROACH
A D Mulyanto ^{1*} , E Rimawan ² , S Harini ¹ , R Ardiansyah ¹
APPLICATION OF SENSORY THERAPEUTIC DESIGN APPROACH TO MATERNAL AND CHILD HOSPITAL DESIGN IN KECAMATAN SUMBERMANJING WETAN
D S Halim ^{1*} , N F Isnaini ¹ , N Junara ¹
A COMPARATIVE ON DOUBLE BARRIER OPTION PRICING USING ANTITHETIC VARIATE AND CONTROL VARIATE MONTE CARLO SIMULATIONS
A Aziz ^{1*} , N C S Dewi ¹ , I F Maulida ¹ , A M Anwari ¹
WIENER AND TERMINAL WIENER INDICES OF ANNIHILATOR GRAPH OF COMMUTATIVE RING WITH UNITY
N D N Y Salma ¹ , L Afifah ¹ , Abdussakir ^{1*}
CREATING BATIK PATTERNS THROUGH THE MODIFICATION OF MANDELBROT SET
S A Rahmasri ^{1*} , T N Farendra ¹ , I I P Putri ¹
THE DESCRIPTION OF THE FUZZY SETS OPERATIONS IN LATTICE THEORY
L M W Mufaridho ¹ , A Zahro ¹ , E Alisah ^{1*}







Identification of Neuropeptides in Gastropod Mollusks. - Classical and Brand-new Approaches-

Fumihiro Morishita^{1*}, Toshio Takahashi², Takehiro Watanabe², Takuya Uto³, Kazuyoshi Ukena⁴, Megumi Furumitsu⁴, Toshihiro Horiguchi⁵

¹Program of Basic Biology, Graduate School of Integrated Sciences for life, Hiroshima University, Higashi-Hiroshima, Hiroshima, Japan ²Suntory Foundation for Natural Sciences, Seika, Kyoto, Japan ³Department of Biological Science, Graduate School of Science, Hiroshima University, Higashi-Hiroshima, Hiroshima, Japan ⁴Program of Life and Environmental Studies, Graduate School of Integrated Sciences for life, Hiroshima University, Higashi-Hiroshima, Hiroshima, Japan ⁵Center for Health and Environmental Risk Research, National Institute for Environmental Studies, Tsukuba, Ibaraki, Japan.

*e-mail: fumi425@hiroshima-u.ac.jp

For the total understanding of the neural regulation of homeostasis and behaviors, elucidation of structure and function of neuropeptides is inevitable. Toward the isolation of neuropeptides, a classical technique is the combination of separation of the peptidic extract of nervous tissue by the high-performance liquid chromatography (HPLC) and screening of fractions with biological or immunological assays. Although this approach requires a relatively large amount of tissues for extraction and the screening is time-consuming, we have identified more than 15 kinds of bioactive neuropeptides in the nervous tissue of a marine snail, *Thais clavigera*. The purified peptides include APGWamide, FMRFamide, leucokinin, tachykinin, myomodulin, pentaFVamide, WWamide, and others. The molecular cloning of the precursor for those neuropeptides demonstrated that structurally related peptides are aligned in tandem on most of the precursor proteins. To identify the peptides on the precursors, we conducted the *de novo* sequencing of peptides in 50 of Thais brain with the nanoLC-Orbitrap-tandem mass spectrometry. This challenge ended with identification of more than 2,000 kinds of peptides, including novel neuropeptides, as well as the neuropeptides found on the precursor proteins, from the tissue. Thus, this technique is suitable for the comprehensive identification of peptides from relatively small amount of tissues. However, several peptides identified by the classical technique, such as APGWamide and leudokinin, were not identified, which suggests the limitation of this brand-new technique. To our experience, combination of HPLC separation and bioassay, followed by de novo sequencing by the nanoLC-Orbitrap-MS/MS is one of the practical approaches to identify bioactive peptides from small amount of nervous tissue.s

Keywords: neuropeptides, gastropod mollusks, precursor proteins



Construction of Bio-Template C- Doped g-C3N4-Based Hybrid Nanocomposites with Enhanced Visible-Light Photocatalytic Activity

Mohamad Saufi Rosmi^{1*}, Mohamad Azuwa Mohamed², Siti Munirah Sidik¹, Illyas Md Isa¹, Suriani Abu Bakar¹, Mohammad Kassim²

¹Department of Chemistry, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Perak, Malaysia ²Fuel Cell Institute (SELFUEL), Universiti Kebangsaan Malaysia, Selangor, Malaysia

*e-mail: Saufirosmi@fsmt.upsi.edu.my

Graphitic carbon nitride (g-C₃N₄) is a promising material for photocatalytic applications such as solar fuels production through CO₂ reduction and water splitting, and environmental remediation through the degradation of organic pollutants. This promise reflects the advantageous photophysical properties of g-C₃N₄ nanostructures, notably high surface area, quantum efficiency, interfacial charge separation and transport, and ease of modification through either composite formation or the incorporation of desirable surface functionalities. However, the issues related to fast charge recombination rate and poor conductivity need to be addressed to improve the $g-C_3N_4$ photocatalytic performance. Here, we report the concurrent growth synthesis of well-interconnected g-C₃N₄ and C, N doped TiO₂ (anatase/rutile) mixed phased by using facile sol-gel assisted heat treatment. The evolution of core-shell nanostructures heterojunction was elucidated by varying the temperature of heat treatment. It is worthy to note that, the simultaneous formation of multicomponent heterojunction with coreshell structure provide an enormous impact in designing highly active photocatalyst with superior interfacial charge transfer. Also, we proposed the synthesis of bio-mimetic C-doped graphitic carbon nitride (g-C₃N₄) with mesoporous microtubular structure through a simple chemical wet bio-template impregnation approach (direct impregnation and hydrothermal impregnation) using urea as a precursor and kapok fibre as bio-template and in-situ carbon dopant. Our finding indicated that the hydrothermal impregnation had induced more in-situ Cdoping in $g-C_3N_4$ as compared to the direct impregnation approach. The introduction of in-situ C doping in the g-C₃N₄ and the mesoporous microtubular structure remarkably enhanced lightharvesting capability up to near-infrared regions. Also, we discussed the usage of biotemplating method of regenerated cellulose membrane as nanoreactor to synthesis C-doped mesoporous TiO2 nanorods.

Keywords: graphitic, carbon nitride, nanostructure, photocatalyst



The Potency of 10-gingerol as a Primary Candidate to Become an Anti-Cancer Agent: Study of Cumulus Cell

Dr. Kiptiyah, M.Si^{1*}

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: qibthiyah@yahoo.com

This research revealed whether 10-gingerol have potency as a primary candidate to become an anti-cancer agent that indicated by induction of cell death and anti-proliferation. In this case is exhibited through induction of cumulus cell death that described by pro-oxidative stress, proapoptosis and necrosis, and anti-proliferation. This study used an *in-vitro* analysis by culturing cumulus cells in M199 that containing 20 mM D-glucose and 10-gingerol in various concentrations (0, 12, 16, and 20 µM) and later detected oxidative stress which involved SOD activity and MDA concentration. Cumulus cell death was detected through apoptotic and necrotic activity using an Annexin V-FITC with PI detection kit. In addition, used in-silico analysis by utilizing Pyrx and discovery studio visualization. The *in-vitro* data revealed that the presence of 10-gingerol treatment exhibited increasing oxidative stress which involved SOD activity and MDA concentration along with the period of incubation and dosage administration. In this treatment resulted also promoting apoptotic Cells. Both of these data have been published. Furthermore, 10-gingerol also gave influence to necrotic cumulus cell but didn't significantly. Finally, 10-gingerol showed its contribution to decrease cumulus cell proliferation significantly which described by percentage of live cumulus cell as follows at 24 h in concentration of 0 μ M (57.58 ± 1.6^f),12 μ M (59.21 ± 1.58^f), 16 μ M (61.04 ± 3.03^f), and 20 μ M (83.54 ± 0.31^g); at 48 h in concentration of 0 μ M (50.71 ± 2.72^{ef}),12 μ M (43.73 ± 0.57^e), 16 μ M (28.43 ± 0.26^c), 20 μ M (28.65 ± 1.39^c); at 72 h in concentration of 0 μ M (42.43 ± 0.33^{de}),12 μ M (22.41 \pm 1.67^{bc}), 16 μ M (23.03 \pm 0.62^{bc}), 20 μ M (22.48 \pm 1.7^{bc}); and at 96 h in concentration of 0 μ M (28.41 ± 1.49^c),12 μ M (27.92 ± 0.09^c), 16 μ M (12.23 ± 2.79^{ab}), and 20 μ M (8.34 ± 1.28^a). The *in-silico* data confirmed that the substance of 10-gingerol induced oxidative stress, apoptosis, and inhibited cell cycle process and then its proliferation through HTR1A functions. Inhibition of this protein function would inactivate GSK3B and AKT-1 activity. Consequently, the activity of anti-apoptotic protein such as NOS3, ILK, MDM2, mTOR, and RICTOR will be inhibited and induce pro-apoptotic protein such as FOXO1, FOXO3, and PTEN. These findings indicate that 10-gingerol have a potency as a primary candidate to become an anti-cancer agent.

Keywords: 10-gingerol, anti-cancer agent candidate, cumulus cell.



Beneficial Role of Trichoderma in Agriculture: a Study in Leguminous Plants

Eriyanto Yusnawan^{1*}, Alfi Inayati¹, Yuliantoro Baliadi¹

¹Indonesian Legumes and Tuber Crops Research Institute, Indonesian Agency for Agricultural Research and Development, Malang, Indonesia

*e-mail: eyusnawan@litbang.pertanian.go.id

Trichoderma spp. are well known as saprophytic fungi and easily found in soil. Some of the species have rhizosphere competence ability which associates with many plant roots. Colonization of plant roots by these beneficial fungi has been reported to protect plants from fungal pathogen infection particularly soil borne pathogens as well as to enhance plant growth. Several mechanisms involve in the antagonistic activity including competition of nutrients and space, hyperparasitism by producing lytic enzymes such as chitinase, protease, β -glucanase, and antibiosis by producing volatile and non volatile organic compounds. The volatile organic compounds affect plant pathogens without direct contact. These compounds also regulate plant growth and trigger plant immunity. Apart from biotic stress reduction, these beneficial fungi also alleviate abiotic stress such as drought and salinity stress. During plant-fungal interaction, *Trichoderma* spp. stimulate significant changes of physiology and metabolism of the plants. This genus triggers proliferation of secondary roots, increase shoot length, seedling fresh weight and yield. These beneficial fungi also increase nutrient ability for plants. This presentation will discuss the role of *Trichoderma* spp. in agriculture in terms of alleviating biotic stress particularly in leguminous plants.

Keywords: antagonistic activity, biotic stress, leguminous plant, plant growth promoter, trichoderma

A Genetically Defined Virus Inoculum for Production of Spodoptera exigua Multiple Nucleopolyhedrovirus in Insect Cell Culture with Enhanced Insecticidal Activity

Kanokwan Poomputsa^{1*}

¹Biotechnology Program, School of Bioresources and Technology, King Mongkut's University of Technology Thonburi (Bang khun thian), Bangkok, Thailand

*e-mail: kanokwan.poo@kmutt.ac.th

Spodoptera exigua multiple nucleopolyhedrovirus (SeMNPV) is highly pathogenic and monospecific to beet armyworm (Spodoptera exigua). SeMNPV occlusion bodies (OBs) have therefore been used as S. exigua bio-insecticides. Although high yields of effective SeMNPV OBs can be produced in infected S. exigua larvae, microbial contaminations are often found and affect the physical stability and insecticidal activities of formulated products. Technology based on the viral propagation in insect cell cultures, in which the production process is standardized, environmental controlled and scalable, is considered as an alternative, providing that several existing restrictions are overcome. A major impediment to baculovirus production in insect cell culture is the accumulation of defective mutants which become dominant upon sequential baculovirus passages. These mutants had their virulence genes conferring insecticidal activities such as per os genes deleted, and hence decline of their insecticidal activities. However, this problem is not found using insect larvae. It could be due to cooperation among mixed genotypes in wildtype SeMNPV which naturally co-infect into multicellular insect larvae. Thus, a mixed genotypes virus inoculum comprises of those beneficial characteristics with their mutual interaction mimicking wild-type SeMNPV populations, was formulated. Techniques such as XbaI restriction enzyme analysis for genome analysis, PCR rapid screening for *pif2* encoding *per os* infection factor and plaque purification, were employed in the process of obtaining desired genotypes. SeMNPV OBs produced using this new virus inoculum to infect Se-UCR1 insect cell culture showed 2.8 times greater insecticidal activity than the control. Use of the genetically defined virus inoculum is thus a promising approach to generate SeMNPV insecticides in insect cell culture.

Keywords: Spodoptera exigua, nucleopolyhedrovirus, insecticidol activity

Endoglucanase Activity of Cellulolytic Bacteria Indigenous Rice Bran By in Vitro and in Silico

Akyunul Jannah^{1*}, Aulanni`am², Tri Ardyati³, Suharjono³

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia ²Faculty of Veterinary Medicine, Universitas Brawijaya, Malang, Indonesia ³Department of Biology, Universitas Brawijaya, Malang, Indonesia

*e-mail: akyunul_jannah2008@yahoo.com

Endoglucanase activity can be described through in vitro and in silico. The degradation pattern of endoglucanase illustrates the phenotypic character of these microorganisms. Phenotype characters are a combination of gene expression and environmental influences. Isolation cellulolytic bacteria of Indigenous rice bran produced 2 isolates, namely, BE 8 and BE 14 isolates with In vitro analysis to ability an endoglucanase activity. The two isolates were able to produce optimum endoglucanase at pH 7, Mg2+ and 37 °C. Based on the identification of phenotypic and phylogenetic, BE 8 isolates were identified as Bacillus subtilis while BE 14 isolates were Bacillus cereus. Endoglucanase activity in silico can be demonstrated through endoglucanase gene expression. Endoglucanase genes BE 8 isolates and BE 14 isolates each measured 862 bp (246 aa) and 874 bp (263 aa). Endoglucanase gene isolate BE 8 has a catalytic cellulase domain in which is found the BglC gene, CBM (Cellulose Binding Module) which is an enzyme binding region with a substrate at residue 228 - 246, active site at amino acids 77-86 namely VIYEIANEPN and belongs to the Glycosyl Hydrolase group (GH 1) and GH5. Endoglucanase gene BE 14 isolate has a domain containing Gen BscZ which is a character of endo- β -1,4-glucanase Y found in base sequence 25-152, active site in amino acid sequence 133-151 namely ATDGDIAYSLLIAHKQW and included in the GH group. Functionally, the protein sequences of the endoglucan coding genes of isolates BE 8 and 14 have cellulase activity specifically endoglucanase which is indicated by the existence of domains and active sites. The results of the two sequence showed a high level of similarity. This indicates a close gene relationship between the two protein sequences.

Keywords: endoglucanase activity, endoglucanase gene, in vitro, in silico, domain

Application of Electron Accelerator for Flue Gas Treatment of Coal Power Plant to Support Green Technology

Darsono^{1*}

¹Centre for Accelerator Science and Technology, BATAN, Yogyakarta, Indonesia

*e-mail: darsono2150@gmail.com

Fossil fuels, which include coal, natural gas, petroleum, shale oil, and bitumen, are the main source of heat and electrical energy, but burning these fuels will emit pollutants to the environment. Most countries use coal-burning power plant in generating electricity for living needs such as household electricity and industrial development. This power plant generates large quantities of pollutants (SO_x and NO_x) that create acid rain and smog leading to the water and soil degradation and they can affect living things. To meet rising worldwide energy demand, projections call for the use of coal to increase by 50 percent from 2006 - 2030, as a consequence SO_x and NO_x pollutions will rise. There are two conventional technologies to decrease air pollution from coal power plant, the first is FGD (flue gas desulfurization) based on SO₂ absorption in lime or limestone slurry, and the second is SCR (selective catalytic reduction) based on NO_x reduction over a catalyst to atmospheric nitrogen with ammonia as a reductant. But these technologies can not treat different pollutants in the one-step process. To support green technology program, this paper describes a modern technology called EBFGT (electron beam flue gas treatment) which can treat SO_x and NO_x in the one-step process using electron accelerator. The technology and economy comparison between FGD, SCR, EBFGT as well as the existing EBFGT in the world are compiled.

Keywords: electron accelerator, electron beam, flue gas treatment, FGD, SCR, EBFGT



The Implementation of Behavioral Architecture in the Designing of Special-Needs Schools

Wasilah^{1*}

¹Department of Architectural Engineering, Universitas Islam Negeri Alauddin Makassar, Makassar, Indonesia

*e-mail: wasilah@uin-alauddin.ac.id

Green designs are those designs that are environmentally friendly, sustainable and are made possible by effectively and efficiently incorporating the behaviors of the main users of the design space. Successful designs bring satisfaction, comfort, and safety to their users, and facilitate users' activities. This study examines the incorporation of such principles in the designing of special-needs schools. Using phenomenology to understand the behaviors of school users, this study produces a design for special-needs schools that reflect local wisdom and aesthetics and can thus be enjoyed by all elements of society. This study shows the importance of incorporating the behaviors (rather than the mere physical abilities) of users into architectural designs and highlights the connection between green design and local wisdom.

Keywords: green design, local wisdom, behavioral architecture, special-needs schools, visual impairment







Conversion of Dau Citrus Farm to Organic: an Improvement Discourse. *A review*

L Mufidah^{1*}, S Widyaningsih¹, E Budiyati¹

¹Indonesian Citrus and Subtropical Fruits Research Institute, Batu, Indonesia

*e-mail: lyli.mufidah@gmail.com

Dau is a growing citrus production center. In maintaining production, farmers are continuously using variations of fertilizers and pesticides. This has an impact on the fruit quality and soil fertility. Conversion to organic is one of the improvement discourses. Literatures on the conversion of the annual crop in this case citrus are still limited. In this review we try to look at multidimensional aspects, starting from cultivation, disease management and social science. An example of managing conversion (demonstration farm) using local ingredients will help farmers. In addition, the government's role in regional management and agribusiness support can help the transition process that will occur. The economic increase from the premium price of organic products is believed in some literature as the driving force of farmers to convert, needs to be directed to sustainability issues for the solidity of organic foundation.

Keywords: citrus farming, conversion, organic, interdisciplinary, high pesticides



Understanding the Requirements for Wudhu (Ablution) Water Volume Based on Changes in Chemical Oxygen **Demand for Several Days**

D Suhendar^{1*}, G Giftia¹, Yunita², W Purnamasari³, H Sandi¹, S Ruhama¹, V Amalia¹, E P Hadisantoso¹

¹Department of Chemistry, Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia

²Department of Biology Education, Faculty of Education and Teacher Training, Institut Agama Islam Negeri Syekh Nurjati, Cirebon, Indonesia ³Public Communication Bureau - Secretariat of the Ministry of Tourism of the Republic of Indonesia

*e-mail: dede.suhendar@uinsgd.ac.id

Muslims perform ablution before prayer. Islamic teachings convey the importance of paying attention to the volume of water used for ablution, which is as much as a minimum of two qullah (around 200 - 300 liters) for water that has interacted with objects other than containers. To overcome the unavailability of this volume, taking water requires a dipper or flow. To understand the existence of these volume requirements, we have observed changes in chemical oxygen demand (COD) in natural water in volume variations for several days. Separately we also performed the same aeration treatment in volume variations for several days. Three types of treatment were carried out three times, namely (1) involving large volumes of water (100 -300 liters) for 35 days, (2) involving small volumes of water (5,0-17,5 liters) with the addition of sucrose and rhodamine B dyes for 10 days, and (3) involves a small volume of water (5 - 30 liters) by adding methylene blue dves for 25 days. Of all treatment variations, there was an increase in COD over time. The difference was that the increase in COD was slower with increasing volume, while the aeration treatment further slowed the increase in COD with reduced water volume. Based on these observations it can be concluded that the volume requirements for ablution have the purpose of teaching Muslims about the functions and requirements of water to clean body parts that are susceptible to dirt from soil, water and air, without increasing health risks due to the use of contaminated water.

Keywords: ablution, chemical oxygen demand, two qullah



Utilization of Baglog Waste as Bokashi Fertilizer with Local Microorganisms (MOL)

D S Sunarya^{1*}, Nisyawati², W Wardhana³

¹Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok, Indonesia ²Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok, Indonesia

*e-mail: 28dewintasrs@gmail.com

The study was conducted in February-March 2019 in the central hydroponic greenhouse of agrotourism Cilangkap, East Jakarta. The research was conducted with the aim of producing bokashi fertilizer from processing baglog waste with variety of activators EM-4, MOL papaya, MOL banana hump, and MOL cow dung. Bokashi fertilizer is made with 6 types of combinations (P0 - P5). Bokashi parameters measured include qualitative parameters (color, smell and texture) and quantitative parameters (temperature, moisture content, pH, and nutrient content Carbon (C) Nitrogen (N), Phosphorus (P) and Potassium (K)). Data from bokashi parameter measurements were analyzed descriptively then compared with compost quality standards according to SNI 19-7030 in 2004. The results showed that bokashi fertilizer could be made within 21 days with nutrient was in accordance with compost quality standards according to SNI 19-7030 vears 2004. Overall, the resulting bokashi fertilizer contains element of Potassium (K) which is higher than elements of Nitrogen (N) and Phosphorus (P). The best combination is shown by P4 with blackish brown characteristics, smells like soil, has loose texture, temperature 36 °C, moisture content 50 %, pH 7, content of C (41.30 %), N (1.36 %), P (0.66 %), and K (2.27 %).

Keywords: baglog waste, bokashi, compost, EM-4, local microorganisms (MOL)



Modeling and Optimization of Palm Oil Moisture Loss as Biodiesel Pretreatment

Y Hendrawan^{1*}, N S Maharani¹, B D Argo¹, Y Wibisono¹

¹Department of Agricultural Engineering, Faculty of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia

*e-mail: yusufhendrawan@gmail.com

One solution to the problem of energy that can be used as a substitute for fuel oil is biodiesel. Palm oil can be used as biodiesel raw material. The advantage of palm oil is its sustainable availability. However, the water content of palm oil still cannot meet the biodiesel quality requirements based on ASTM D975-08a and ASTM D6751-12 which is less than 0.05%. The purpose of this study is to model and optimize the concentration of zeolite and adsorption times to decrease water content in palm oil. The method in this research is to use activated zeolite adsorption. Data from the results of water loss in palm oil as a pretreatment in the manufacture of biodiesel will be processed using response surface methodology (RSM) with the central composite design (CCD) so that a model and optimum point of zeolite concentration and adsorption time can be found. The model produced using the response surface methodology (RSM) method with a central composite design (CCD) design in the form of quadratic equations. The optimization results produce an optimum value of water loss of 2.74% with an error rate of 4.20%. This optimum value is achieved by zeolites concentration of 13.20% and adsorption time of 126.11 minutes.

Keywords: adsorption, biodiesel, palm oil, response surface methodology, zeolites



The Technical and Financial Feasibility Analysis on the Establishment of a Waste-Processing Unit for Coconut Shell (Liquid Smoke and Activated Carbon)

A F Mulyadi^{1,2*}, S Wijana^{1,2}, I A Dewi^{1,2}, R Andayani^{1,2}

¹Department of Agriindustrial Technology, Faculty of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia ²Palm Based Agroindustry Research Group, Universitas Brawijaya, Malang, Indonesia

*e-mail:arie febrianto@ub.ac.id

This study aims to know the financial and technical feasibility analysis on the establishment of a waste-processing unit for coconut shells, especially the production of liquid smoke and activated carbon. Liquid smoke has many benefits, among others, to preserve foodstuffs, as a latex coagulant, and to prevent woods from termite attack. Activated carbon has many uses in the water processing industry, sugar industry, medicine industry, and others. Generally, activated carbon is used as adsorbent. The research results show the technical feasibility, including the geographic location of industries in North Sulawesi, adequate potential of raw materials, concentration of phenol liquid smoke of 1720 mg/l, yield liquid smoke of 1.21%, and pH of the liquid smoke of 4. H3PO4 activation in activated carbon has 3.39% moisture content, 1.196,05 mg/g Iodine adsorption capacity, 26.67% yield, and an annual production capacity of 1.5 tons/day, which can be met with the appropriate technology selection. The financial feasibility of the production of activated carbon results in the following: the production cost of IDR 191.502/units, the selling price of IDR 268,103/units, the break-even point of 871 units or IDR 233,436,408. The financial feasibility for the production of liquid smoke results in the following: production cost of IDR 63.834/ units, the selling price of IDR 89,368/ bottle, the break-even point 2.613 units, or IDR 233,436,408. The Net Benefit/Cost is 3.51, the payback period is 1 year 7 month 25 days, net present value is IDR 2,530,315,712, and the internal rate of return is 90.98%.

Keywords: Activated carbon, coconut shell, feasibility study, liquid smoke
The Impact of Agricultural Activities in Drawdown Area on Sustainability of Delingan Reservoir Function

A A Muntiani^{1*}, Suntoro², Sunarto³

 ¹Department of Environmental Science, Postgraduate School, Universitas Sebelas Maret, Surakarta, Indonesia
²Department of Environmental Science, Postgraduate School, Universitas Sebelas Maret, Surakarta, Indonesia
³Department of Soil Science, Universitas Sebelas Maret, Surakarta, Indonesia

*e-mail: arzhia niz@yahoo.co.id

Delingan Reservoir is one of the reservoirs in Central Java that functions as irrigated paddy fields in the Delingan and surrounding areas. The current condition of the reservoir is quite alarming. Water shrinks during the dry season, resulting in an open area at the edge of the reservoir called drawdown. Drawdown area is the area at the edge of a body of water or reservoirs that are frequently exposed to the air due to changes in water level. Changes in the water level can be caused by evaporation or by water usage in the case of reservoirs. When the low tide of the drawdown area was utilized by the local people for agricultural activities, namely planting annual crops. Problems with agricultural activities in the drawdown area affect the sustainability of reservoir functions. This study aims to identify agricultural activities in the drawdown area of the Delingan Reservoir and determine its impact on the sustainability of reservoir functions. The research method uses a survey to the respondent who planted in the drawdown area. The results of this study are agricultural activities in the Delingan Reservoir drawdown area still using conventional tillage systems (intensive tillage). The impact is an increase in the rate of sedimentation of 6.381 m³/year from 3.021 m³/year over the past 5 years and resulted in the depletion of reservoir reservoirs of 0.89 million m3. In conclusion, agricultural activities in the drawdown area of the Delingan reservoir can reduce reservoir function.

Keywords: delingan reservoir; drawdown; sustainability; reservoir function



Development of Ecosystem Health Index in Rural Areas of Java Island: Preliminary Results

A Yuwono¹, Y Wardiatno^{1*}, R Widyastuti¹, D Wulandari², M Natali¹

¹Institut Pertanian Bogor, Bogor, Indonesia ²Universitas Islam Indonesia, Yogyakarta, Indonesia

*e-mail: yusli@ipb.ac.id

Assessment of ecosystem health in Indonesia is currently being conducted poorly due to the lack of a national standard. This study aimed to formulate a quantitative system to justify the rural ecosystem quality using six indicators, i.e. air pollution index (API), water pollution index (WPI), forest coverage index (FCI), biodiversity index (BI), public health index (PHI) and environmental health index (EHI). API, WPI, and FCI have been implemented by now, whereas BI, PHI as well as EHI were exercised to improve the current system. The novel approach was implemented in rural areas of Java Island (Regencies of Pandeglang, Bandung, Temanggung, Magetan, and Bangkalan). Data was collected from environmental management and health authorities during March-May 2019. The data was analyzed and subsequently expressed into indices ranging from 0 to 100. The result of the analysis revealed that ecosystem health index of Bandung Regency, Temanggung Regency, Bangkalan Regency, and Magetan Regency were 67.03, 80.68, 81.76 and 78.66, respectively, where national score in 2017 was 66.46. It indicates that the ecosystem quality of these four regencies is generally well managed. On the other side, however, ecosystem health of Pandeglang Regency needs more attention to improve since its score was merely 65.22.

Keywords: ecosystem health index, environment, Java Island, Madura, rural



Molecular Identification of Phosphate-Solubilizing Yeast Isolate KR.1 BP.4 from Citatah Karst Area

A R Hafsari^{1*}, F R Khoerunnissa¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Sunan Gunung Djati Bandung, Bandung, Indonesia

*e-mail: anggitarahmi@uinsgd.ac.id.com

Citatah Karst Area has diverse microorganisms, including phosphate-solubilizing yeasts. Phosphate-solubilizing yeasts in the soil play an important role in solubilizing organic phosphates into inorganic ones absorbable by plants for photosynthetic process and root development. Phenotypical and biochemical identification of phosphate-solubilizing yeast isolate KR.1 BP.4 has been reported, but molecular identification should be performed to ensure accurate results. The aim of this research was to identify the species of phosphatesolubilizing yeast isolate KR.1 BP.4. This research was carried out by a descriptive method using the following ITS primers: forward primer ITS1 (5'-TCC GTA GGT GAA CCT GCG G-3') and reverse primer ITS4 (5'-TCC TCC GCT TAT TGA TAT GC-3'). The method consisted of three stages, namely extraction with Genomic DNA Mini Kit (Blood and Cultured Cell), PCR with KAPA2G Robusta PCR MasterMix, and electrophoresis and sequencing. Data analysis was performed using BLAST, and alignment was performed using MEGA 6.0. The phosphate-solubilizing yeast isolate KR.1 BP.4 was identified as Trichosporonasahii with an ITS fragment length of 774 bp. Based on the phylogenetic tree and genetic distance, the T. asahii isolate KR.1 BP.4 had the closest relatedness with T. asahii strain V9, T. asahii strain V3, T. asahii YCH116, T. asahii KDLYL 4-1, T. asahii V1, T. asahii AP.MSU6, and T. asahii PMM08-1100L at a distance2 value of 0%. From this research, it can be concluded that the isolate KR.1 BP.4 belongs to the species Trichosporonasahii.

Keywords: karst, phosphate, yeast, PCR, internal transcribed spacer (ITS), trichosporonasahii

Callus Metabolites Induction Noni (*Morinda citrifolia L.*) Using Combination 2,4-Dichlorophenoxy Acetic acid and 6-Benzylaminopurine in Vitro

M F Annas^{1*}, R S Resmisari¹, I D A Indah¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: Farid.annas.22@gmail.com

Noni (Morinca citrifolia L.) has many secondary metabolites compounds. Aims of this research are to determine the effect combination of plant growth regulator (PGR) 2,4-D and BAP and to determine the optimal concentration to induce calli metabolites of noni seeds. This study used an experimental method with a randomized block design (RCBD) using a combination of plant growth regulators 2,4-D and BAP with 12 treatments, each with 3 replications. The parameters observed were callus appears, percentage of callus explant area, percentage of callus explants, callus weight, callus texture, and callus color. The results showed the optimal combination in inducing callus emergence day is the combination of 0.5 ppm 2,4-D + 0 ppm BAP with 37.5 days induction time after initiation, the percentage of callus area 96.25%, the percentage of explant callus 68.75 %, and callus weight 91.5 mg. The callus that is formed is yellow and has a compact texture, indicating the callus is producing secondary metabolites. Data analysis using ANOVA with DMRT 5% further test. Giving PGR combination has significant effect on the induction of noni metabolite callus.

Keywords: callus, in vitro, noni, PGR

Influence of Chitosan for Anatomy Structure and Antraquinon Content of Metabolites Callus Noni (*Morinda citrofolia l.*)

M F Annas^{1*}, N Alfiani¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: Farid.annas.22@gmail.com

Aims of this research are to determine the effect of chitosan administration on the anatomical structure and anthquinone content of the noni metabolite callus. This study used an experimental method with a randomized block design (RCBD) with 6 treatments (0, 5, 10, 15, 20, 25 (mg / L)) each with 4 replications. The parameters observed were callus color, callus anatomy, callus end weight, and callus antraquinone level. Test for antraquinone levels using the alizarin method. Data analysis used ANOVA with a further test of 5% DMRT. The provision of chitosan affects real against the anatomical structure and the nonraquinone antraquinone content.

Keywords: anatomy, antraquinone, chitosan, callus, noni



ID ABSTRACT: ABS-96

Population Density, Human Development Index, Priority Watersheds and Voluntary Disclosure of Pollutant Release Data by Textile Companies in Indonesia

A A Birry^{1*}, S W Utomo¹, H Herdiansyah¹

¹School of Environmental Science, Universitas Indonesia, Salemba, Indonesia

*e-mail: ahmad.ashov@gmail.com

There are currently twenty textile companies in Indonesia that have voluntarily disclosed information about their release of hazardous chemicals from their production facilities on an internet page. The information disclosure is carried out using the PRTR system approach, and individually by the twenty companies. In the period of 2013 to 2019, together, 43 information disclosures were recorded. All companies that disclose their pollutant release data are located in locations with very high population densities. Meanwhile, 75% of them operate in locations with high HDI levels. In addition, only one company that voluntarily disclosed their pollutant release data is not located in priority watersheds. This study might provide the first step for further research on the driving or pulling factors of the voluntary information disclosure. Information should be the rights of the public.

Keywords: hazardous chemicals; information disclosure; prtr; textile industry; water pollution; PROPER



The Potency of Macrozoobenthos Diversity at Ledok Amprong River as Practicum Source for Biology Student

S Habibi¹, A R Ubaid², Romaidi^{2*}

 ¹Department of Biology, Universitas Terbuka, Malang, Indonesia
²Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: romaidi@bio.uin-malang.ac.id

The diversity of Macrozoobenthic in Ledok Amprong River Malang Regency was studied. Sampling station was determined by using purposive random sampling. In total, eight families of macrozoobenthic were identified. The averages of diversity index were also categorized as medium level. The diversity of macrozoobenthic was also affected by some environmental factors such as; temperature, salinity, DO, the content of organic substrate, that were significantly effected and pH was highly significant effected. The result of macrozoobenthos study was also used as practicum source for biology student of Open University. The result of this study was also presented and analyzed which exhibited the increasing of student motivation to study invertebrate taxonomy course.

Keywords: macrozoobenthos, diversity, practicum source



Searching for Antimalarial Agent from Indonesian *Euodia* suaveolens

D K Pratoko¹, B Triatmoko¹, A N W Pratama¹, W N Rohmatillah¹, T A Laksono¹, A S Nugraha^{1*}

¹Indonesia Drug Utilisation and Discovery Research Group, Faculty of Pharmacy, University of Jember, Jember, Indonesia

*e-mail: arisatia@unej.ac.id

Antimalarial resistance is an important health issue in Southeast Asia, including Indonesia, since the region frequently becomes the first place for the emergence of the problem, but some ethnic groups in the endemic areas may survive from the fatal infection. The use of medicinal plants, for example Euodia suaveolens, has been part of the culture combating against the Plasmodium infection. The study aimed to explore the antimalarial potential of the plant, which was collected from Malang, East Java, Indonesia, in the form of crude methanol extract. Antimalarial assay using in vitro Plasmodium falciparum model was conducted. Dragendorf's reagent and H-NMR spectroscopy are used for phytochemical studies. Results show that the methanol extract of E. suaveolens demonstrated antimalarial activity. NMR spectroscopy revealed a typical flavonoid type compound. In conclusion, E. suaveolens has potential as an antimalarial and suggests the needs to scrutinize the bioactive compounds.

Keywords: Indonesian medicinal plant, antimalarial, Euodia suaveolens



The Effect of Crystallization Time on Structure, Microstructure, and Catalytic Activity of Zeolite-A Synthesized from Rice Husk Silica and Food-grade Aluminum Foil

W Simanjuntak^{1*}, K D Pandiangan¹, Z Sembiring¹, G G Pangesti¹, A Simanjuntak¹

¹Faculty of Mathematics and Natural Science, Lampung University, Bandar Lampung, Indonesia

*e-mail: wasinton.simanjuntak@fmipa.unila.ac.id

This study was conducted to evaluate the effect of crystallization time on structure, microstructure, and catalytic activity of zeolite-A synthesized from rice husk silica (RHS) and food-grade aluminum foil. Four samples were prepared with fixed crystallization temperature of 100 °C and crystallization time of 48, 72, 96, and 120 h respectively, followed by calcination treatment at 550 °C for 6 h. The structure of the samples was evaluated using XRD and microstructure using SEM. For catalytic activity assessment, the zeolites were used in pyrolysis of mixed ground cassava tuber (GCT) and palm oil. The liquid fuels from the pyrolysis experiments were analyzed using XC-MS technique to identify the chemical composition of the liquids. Characterization using XRD technique revealed that zeolite-A has been produced at 48 hour crystallization time. Quite a significant effect of crystallization time on surface morphology of the samples as seen by SEM, was observed, with the most evident are the shape and size of the particles. The liquid fuels produced were found to contain hydrocarbon as the main component, with relative percentage in the range of 85 to 92%, suggesting that synthesized zeolites are promising catalyst for biogasoline production.

Keywords: zeolite A, crystalization, calcination, pyrolysis

Comparative Study of CO₂ Corrosion Inhibition of Mild Steel in Brine Solution by the Oligomers of 2-vinylpyridine and 4vinylpyridine

Ilim^{1*}, S Bahri¹, R Marjunus², W Simanjuntak¹, M Rilyanti¹

¹Chemistry Department, University of Lampung, Lampung, Indonesia ²Physic Department, University of Lampung, Lampung, Indonesia

*e-mail: ilim@fmipa.unila.ac.id

Comparative study on the use of oligometric compounds, O(4-VP) and O(2-VP) as carbon dioxide corrosion inhibitors of mild steel was carried out. The oligomers were synthesized using hydrogen peroxide initiator. The performance of oligomers as an inhibitor was evaluated by linear polarization resistance (LPR), carried out at varying inhibitor concentrations and temperatures. This study also studied the characteristics of the adsorption and protection mechanisms of each of the corrosion inhibitors tested. The experimental results demonstrated that O(4-VP) and O(2-VP) can decrease the corrosion rate of mild steels in corrosive solution, their protection abilities are better at higher concentration. The effect of temperature on these two types of oligomeric compounds is different, in which the corrosion protection of O(4-VP) increased with temperatures, suggesting that the oligomers were chemically adsorbed by the mild steel surface while for the oligomer of O(2-VP), the opposite is true which is related to physisorption. This is supported by thermodynamic quantities of each compound, especially DGads (about -40 kJ mol-1) and DHads (about 77 kJ mol-1) and the value of f and Kads decreases with increasing temperature for O(4-VP, while O(2-VP) has DGads (about -20 kJ mol-1) and DHads is negative. The more negative the value of DHads, the more physisorption and the more positive the value leads to chemisorption. Both 2-vinylpyridine and 4vinylpyridine monomers give opposite results to their oligomers, in which the monomers exhibit no inhibition activity, instead they promoted the corrosion of the mild steel.

Keywords: O(4-VP), O(2-VP), mild steel, corrosion inhibitor, CO² corrosion

Cropping Patterns and Plants Diversity in Agroforests in Wringin Village Subdistrict of Wringin Bondowoso East Java

Solikin^{1*}, S A Nugroho¹

¹Research Center for Plant Conservation and Botanic Gardens, Indonesia

*e-mail: solikin@lipi.go.id

Agroforest has an important role in supporting food security, energy, and water sustainably. The study aimed to determine cropping patterns and plant diversity in agroforests applied by farmers in Wringin Village Subdistrict WringinSitubondo Eat Java was conducted in March 2018. Data collection was conducted by field observation and interviewing the farmers. The field study was conducted by purposive sampling where plots laid randomly on each cropping patterns in the fields. A combination of rice (Oryza sativa L.) and cassava (Manihot esculenta Crantz) with tree plants were dominance model of cropping patterns applied by the farmers. There were thirty-two species of plants cultivated by farmers in agroforests.

Keywords: agroforest; crop; diversity, pattern



The Response of Several Groundnut Cultivars on Fertilization in Dry Lands with Dry Climate

A Wijanarko^{1*}

¹Indonesian Legumes and Tuber Crops Research Institute, Malang, Indonesia

*e-mail: ndy_wijanarko@yahoo.com

The existing technology for growing groundnuts in dry lands with the dry climate in East Sumba District of East Nusa Tenggara Province is very simple/ordinary, and introduction of superior groundnut cultivar and improved technology are predicted will increase its productivity. The experiment was undertaken to find out the performance of improved technology and superior cultivars on increasing pod yield productivity. The experiment was done at Laipori Village, Pandawai Subdistrict, East Sumba District from February-May 2018. The experiment applied a randomized block design two factorial with three replicates. The treatments consisted of two factors. Factor one was five groundnut genotypes (five superior: Kancil, Hypoma 3, Hypoma 1, Hypoma 2, and Kelinci and one local Sandel cultivar), factor 2 was two types and dosages of fertilization (low: 50 kg Phonska/ha, high: 100 kg Phonska/ha+50 kg SP36+500 kg FYM/ha). The results indicated that initial soil fertility status was high pH (>7.0), low total N, moderate available P, high K, Ca, Mg concentration. The improved technology that has been tested consisted of superior cultivar of Kancil, and the application of 50 kg Phonska/ha. Kancil cultivar was able to increase pod yield by 26% higher than that of Local Sandel cultivar.

Keywords: dry lands with dry climate, fertilization, new superior cultivar



Kenaf Plant Resistance on The Root Gall Nematodes (*Meliodogyne incognita*)

P Parnidi^{1*}

¹Balai Penelitian Tanaman Pemanis dan Serat (BALITAS), Malang, Indonesia

*e-mail: parnidibalittas88@gmail.com

Kenaf is one of the natural fiber-producing plants. Root gall nematode (Meloidogyne spp.) is one of the important plant pest organisms in the kenaf. Kenaf plants are generally susceptible to root gall nematodes ie: M. incognita. M. arenaria, and M. javanica. Infestation of nematodes in the roots causes the plant to grow stunted, severe attacks can cause death. This activity aims to determine the level of resistance of several kenaf genotypes to root gall nematodes (Meloidogyne incognita). The semi-field experiment using a randomized block design of three replications was carried out at the BalittasKarangploso Experimental garden with altitude of 515 in May - December 2018. Experiments using the genetic material of seven kenaf genotypes were varieties KR 4, KR 5 and KR 6, varieties KR 1 and KR 15 and Kenafindo 2, and accession of DS 028 and SSRH 023. Planting kenaf was carried out on polybags of size 30 x 30 cm with spacing of 25 cm x 50 cm and distance between replications of 100 cm. The experiment was carried out by infecting 15 HST kenaf plants with incognita nematodes in a population of 40 instars II nematodes in 100 grams of soil. As a positive control all genotypes were planted on the same media without incognita nematodes and as negative controls SSRH 023 accession was used as a close relative of the kenaf which was resistant to nematodes. Planting media used by soil and sand in a ratio of 2: 1. Sterilization of planting media using 4% formalin solution. The results showed that resistance to the research material genotype had different levels. Based on the root gall index, the SSRH (H. asetosella) genotype was categorized as resistant to nematodes. The KR 4, KR 15 and KR 5 genotypes show a moderate resistance level. Meanwhile, the Kenafindo 2 genotype shows a very susceptible. As a result of nematode infestation (M. incognita) there was a decrease in growth in plant height, stem diameter, stover weight, fresh stem weight and fresh weight of roots. The highest decrease in plant growth was found in Kin 2 and KR 1 compared to negative control.

Keywords: kenaf, nematodes, Meliodogyne incognita, root gall



UHPLC Analysis of the 1,4 Naphthoquinone in the Indonesian Medicinal Plant *Eleutherine palmifolia* (L) Merr

R Annisa^{1*}

¹Department of Pharmacy, Faculty of Medical and Health Science, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: rahmiannisa@farmasi.uin-malang.ac.id

Medicinal plants are widely used, currently for the preparation of various pharmaceutical forms. Eleutherinepalmifolia (L.) Merr is a typical plant in Kalimantan in Indonesia. This study aims to analyze quantitative 1.4 naphthoquinone on E. palmifolia using UHPLC. The separation was carried out with Thermo Fisher Scientific UHPLC Ultimate 3000 RS coupled with a diode array detector (DAD), C18 column was used. UV detection was carried out at 254 nm for 10 minutes. The mobile phase consists of an isocratic method (methanol 95% (A) and chloroform 0.5% (B). The UHPLC method developed in this study shows selectivity with linearity in the working range and excellent precision and accuracy, making it suitable for determining content 1, 4 naphthoquinone. 1, 4 naphthoquinone in E. palmifolia compared to the standard 1.4 naphthoquinone. At concentrations of 12.00 μ g / mL E.palmifolia extract contained 7.79 μ g/ mL \pm 0.01 1.4 naphthoquinones.

Keywords: UHPLC, 1 4 naphthoquinone, Eleutherine palmifolia (L) merr



Larvicides Effects of Extract Ethyl Acetate Aglaia glabrata Leaves and Its Fractination to Aedes aegypti Larvae

A Supriadin^{1*}

¹Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia

*e-mail: asupriadin@uinsgd.ac.id

Aglaia glabrata is a species of the Meliaceae family. Secondary metabolites in the ethyl acetate extract and its fractionation of A. glabrata leaves have determined by analyzed phytochemical test land FTIR spectrum. Probit analysis method is used to determine of larvacides effect LC50 to Aedes aegypti larvae. Ethyl acetate redistillation use to maceration of leaves. Ethyl acetate extract was fractionated by Vacuum Liquid Chromatography (VLC), Thin Layer Chromatography (TLC), and Gravitational Column Chromatography (GCC). Phytochemical test of extract was positively showed flavonoids, tannins, and alkaloids, meanwhile the fraction was positively flavonoids only. The analysis spectrum FTIR of fractionation was known functional groups of -OH, -CH, C=O, aromatic C=C and C-O. Several larvaes of Aedes aegypti were used instar III to determine larvicides test. Mortality data of Aedes aegypti were probit analyzed to determine the LC50 for 24 h. The extract can be categorized toxic if the value of LC50 < 1000 ppm. The result of probit analysis shows that the fraction more toxic with LC50 value is 574.229 compared to the extract which LC50 value is 1037.08 ppm.

Keywords: Aglaia glabrata, Aedes aegypti, LC50



Synthesis of Fe₂O₃ Nanoparticle from Battery Waste for Photocatalytic Treatment of Methylene Blue

E P Hadisantoso^{1*}, F Rahmawati¹, V Amalia¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia

*e-mail: ekoph@uinsgd.ac.id

Synthesis of Fe_2O_3 nanoparticles for decolorization of methylene blue by photocatalytic method has been done. The outer of the battery is made from iron, which is the potential to be converted into Fe_2O_3 . In this study used AA battery waste as an iron source. In a battery AA the iron mass is around 20%. The nanoparticles of Fe_2O_3 prepared by precipitation method. The Fe_2O_3 nanoparticles were synthesized from an iron which was dissolved with acidic solutions and deposited with alkaline solutions. After it was characterized using XRD and SEM. The XRD data show that the Fe_2O_3 particles were rhombohedral crystals. SEM data shows that the average size of Fe_2O_3 is 100 nm. The Fe_2O_3 nanoparticles were used to reduce the intensity of methylene blue under visible light. The highest percentage of decolorization was 84.57%, with the experimental conditions: the mass of Fe_2O_3 was used 90 mg, the exposure time was 5 h and the concentration of the solution of methylene blue was used 5 ppm.

Keywords: nanoparticles, Fe₂O₃, photocatalyst, methylene blue, battery waste



Productivity of Soybean under Palm Oil Plantation on Tidal Swamps Due to Several Packages of Technology

A Harsono^{1*}

¹Indonesia

*e-mail: rifharsono@yahoo.co.id

The research was aimed to determine soybean productivity in various technological packages for soybean cultivation on oil palm plantations. The research was conducted in Barito Kuala of South Kalimantan, using a randomized block design with four replications. The treatment consists of six technological packages, namely: (1) farmer technology, (2) recommendation, (3) improvement-1, (4) improvement-2, (5) improvement-3, and (6) improvement-4. The results indicate that plantations of oil palm on type C tidal swamps is suitable for soybean development. On the tidal swamps with pH soils 4.30, low of K and Ca, recommend technology package can increase pH soils from 4.30 to 5.15; availability of P, Ca, and Mg; uptake of N and K; plant weight; filled pods; and increase seed yields 86% from farmer technology 1.00 to 1.86 t/ha. Improvement-1 technology 1.00 to 2.00 t/ha. Increased doses of dolomite, organic, N, and P fertilizers from improvement-1 technological packages did not significantly increase seeds yield. This findings suggest that for developing soybean on tidal swamps, recommendation or improvements-1 technological packages could be recommended.

Keywords: oil palm plantation, soybean, tidal swamps

Molecular Identification of Phosphate Soulbilizing Bacteria Isolate 1 BP. 2 with 16S rRNA Genes from Kars Citatah Area

A F Hafsari^{1*}

¹Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia

*e-mail: anggitarahmi@uinsgd.ac.id

The aim of this study was to identify bacterial species of phosphate solubilizing bacteria isolate KR.1 BP.2. This research was conducted using descriptive method using 27F and 1492R primers: forward primer 27F (5'-AGAGTTTGATCMTGGCTCAG-3') and primary reverse 1492R(5'-TACGGYTACCTTGTTACGACTT-3'). The method used is three stages, namely extraction with Genomic DNA Mini Kit (Blood and Cultured Cell), PCR with PCR MasterMix and sequencing. Data analysis using BLAST and alignment with MEGA 6.0. Results. Molecular identification shows that the KR phosphate solvent bacteria. 1. BP long identified as Enterobacter cloacae species fragment 1572, bootstrap value 100, query cover value 98%, E-value 0.0, and Maximum Identity 92%. This result is reinforced by the biochemical test results that isolate bacteria KR BP.2 belongs to the species Enterobacter sp.

Keywords: karst, Phosphate, bacteria, NCBI, Enterobacter sp.



Response of Groundnut Promising Lines to Various Environments

J Purnomo^{1*}

¹Indonesia

*e-mail: joko.purnomo75@ymail.com

Groundnuts (Arachis hypogaea L.) belong to palawija or dryland crops and groundnuts are successfully cultivated in various environments (agro-ecologies). The ability to respond to the different growing environments results in broad yield variation among cultivars and locations. The presence of superior cultivars with stable high pod yields and resistant to diseases will support the high productivity at the national level. The experiment was conducted to evaluate the response of groundnut promising lines grown in various environments. A number of 18 groundnut lines and 2 checked cultivars were grown in 3 different environments i.e. lowlands with heavy, and sandy soil texture at Ngawi, and Banyuwangi Districts, and dry alkaline soils at Tuban District. A randomized block design with three replicates was applied in each site. Each genotype was planted in a 2 m x 5 m plot size with plant spacing of 40 cm inter rows x 10 cm intra row, 1 seed/hole. The basal fertilizer of 250 kg/ha composite NPK Phonska was applied at planting time. The result indicated that location (site), genotype as well as its interaction was significantly influenced the growth and yield variables. This indicates that the response of genotypes to its environments was presence. Four lines i.e. BK10/LG5)-295-50, BK1/LG5)-37-64, BK1/LG5)-B13-29-6, and BK1/LG5)-B13-6-1 gave high pod yields: 4.4 t; 4.2 t; 4.1 t, and 4.1 t dry pods/ha consecutively. These pod yields were higher than those of checked cultivars Katana 1 and Hypoma 1. Based on its regression coefficients (bi) and regression deviation cofficents (Sdi) these four lines were stable with its stability were over the average value. Instead of producing high pod yields, those four lines are resistant to leaf spot and rust diseases, moderate maturity, so are they are merit to be proposed as newly superior cultivars.

Keywords: groundnut, promising lines, cultivate

Pod Yield and Haulm Weight Peanut Cultivars Grown in Dry Lands with Dry Climate

A A Rahmianna^{1*}

¹Indonesia

*e-mail: anna_rahmianna@yahoo.com

Peanut (Arachis hypogaea L.) is the third major food crops in Indonesia after maize and soybean. The seeds contain oil, protein, and carbohydrate which are benefit to human health. Despite of its health benefit, farmers sell all the pods in order to get cash. The haulms or fodders which stay green until harvesting time is an important source for livestock during dry season. In drylands with dry climate where there is only one growing season, however, the haulms are left in the field. This is one obvious benefit so that C-organic content of the soils is high. Drylands with dry climate such as in East Nusa Tenggara are the potential lands for peanuts. The experiment was conducted to assess the pod and haulm yields of eleven peanut cultivars grown in drylands with low rainfall at Sumba Timur District of East Nusa Tenggara during February-May 2017. Ten peanut superior cultivars and one local cultivar are grown in two sites: Laipori and Palakahembi Villages. A randomized block design with three replicates was applied in each site. The treatment was cultivar: Local Sandel, Bison, Gajah, Hypoma 1, Hypoma 2, Kancil, Kelinci, Takar 1, Talam 1, Talam 2, and Tuban that belonged to Spanish type expect Kelinci that was a Valencia type. A 100 kg/ha of composite NPK fertilizer was applied at sowing time, water source was merely from rainfall. The pesticides were applied three times during the growing period. The results indicated that the average pod yields of 10 national cultivars from two sites were 1.75-2.57 times higher than that of Local Sandel. Hypoma 1 cultivar gave the highest with 2.313 t/ha of dry pod yield s or 157% higher than that of Local Sandel yield. Instead of producing high pod yield, Hypoma 1 also produced 6.1 t of fresh haulms/ha and those superior cultivars were 5.3-7.2 t/ha. These amounts benefited the soil organic materials after completing the experiment as showed by its high amount of organic matters: 5-5.2%. These amounts are the ideal amount of organic matters contained by soils to maintain soil fertility. In summary, the superior cultivars especially Hypoma 1 can be proposed to the farmers in Sumba Timur because of its high pod yields and organic matters content in soils after the cultivars harvested.

Keywords: peanut, dry land, pod yield, Haulm weight



ID ABSTRACT: ABS-143

Preparation of Zeolite-Y from Rice Husk Silica and Food Grade Aluminum Foil as Catalyst for Co-pyrolysis of Mixed Cassava Tuber and Palm Oil

S Sascori^{1*}, W Simanjuntak¹, K D Pandiangan¹

¹Graduate Student, Lampung University, Bandar Lampung, Indonesia ²Sumatera Institute of Technology, Lampung Selatan, Indonesia

*e-mail: sonisascori@gmail.com

In this research, zeolite-Y prepared from rice husk silica and food-grade aluminum was applied as catalyst for co-pyrolysis of mixed cassava tuber and palm oil to obtain bio-crude oil (BCO). Zeolite samples were prepared using hydrothermal process at 110 oC with varied crystallization time of 24, 48 72, 98, and 120 h. Zeolite samples were calcined at 550 oC for 6 h and characterized using XRD and SEM. Synthesized zeolites were then applied as catalyst co-pyrolysis of mixed cassava tuber and palm oil, and the BCO produced was analyzed using GC-MS. The experimental results obtained show that BCOs produced contain hydrocarbon as the main component.

Keywords: zeolite-Y, rice husk silica, pyrolysis, bio-crude oil

Modification of Corn Stalk Using Citric Acid as Biosorbent for Methylene Blue

E Yulianti^{1*}, S N Khalifah¹, A Prasetyo¹, A S Irviyanti¹, G P Yudisputra¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: enyyulianti@kim.uin-malang.ac.id

Cornstalks have the potential as biosorbent on decreasing the levels of dyestuffs in waste. The characteristic of the FTIR corn stalk modified Citric acid is analyzed in this study. Quantitative analysis of total function group is determined by Boehm titration method. Effects of modification of citric acid on the ability of methylene blue adsorption shown in the capacity of adsorbents. The results of IR spectra analysis after modified citric acid indicates a new cluster C = O ester at a wavenumber of 1737 cm⁻¹ so that it can be known that the esterification reaction has occurred on the cornstalk. The highest total functional group at the time of the corn stalk modified the citric acid 1 M is 3.77 meq/gram. The increase in total function groups corresponds to the increase in the capacity of the adsorption from 65.58 mg/g to 88.10 mg/g. This suggests that the citric acid modification affects the ability of the cornstalk in methylene blue adsorption of methylene blue is pH 5 with absorbent power to methylene blue at 460.018 ppm. At the determination of the adsorption order using the 1st order equation was obtained R² results show that methylene blue adsorption occurs in physics and chemistry.

Keywords: corn stalk, citric acid, adsorption, methylene blue



Farmacology Potency of Thin Layer Chromathography Steroid Isolates of *Chlorella Sp* Chloroform and Ethyl Acetate Fraction

D S Megawati^{1*}, A G Fasya², A R Dinasti², M Syofiyah², R A Pratiwi², N Maghfiroh²

¹Department of Pharmacy, Faculty of Medical and Health Sciences, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indoensia

²Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: dewisinta@farmasi.uin-malang.ac.id

Al-Qur'an surah as Syu'ara verse 7 shows that Allah SWT growed many good and advantages plants, such as micoalgae *Chlorella sp. Chlorella sp.* are contained some secondary metabolites, such as steroid compounds. Purpose of this research is to know toxicity levels and antioxidant activity steroid compound chloroform fraction from hydrolysis methanol extract of microalgae *Chlorella sp.* Cultivation is conducted in a laboratory scale using Sprouts Extract Medium (MET) 4% and harvesting conducted every day 10. Dry *Chlorella* sp. biomass was macerated using methanol solvent. The extract then hydrolyzed with 2 N of HCl and partitioned with chloroform, then the separation using Thin Layer Chromatography (TLC) preparative. Isolates conducted toxicity tests using Brine Shrimp Lethality Test (BSLT) and antioxidant activity test with DPPH. The toxicity and antioxidants test showed that isolates steroid of ethyl acetate fraction had LC₅₀ values is 14.965 ppm and has a value of EC₅₀ is 77.78 ppm. Identification of steroid compounds with UV-VIS spectrophotometer has a maximum wavelength of 204 nm and identification with FTIR results showed functional groups OH, geminal dimethyl (-C (CH3) 2), C = O, C = C, C-secondary OH and = CH (alkenes) attributed to steroid compounds.

Keywords: *Chlorella sp*, steroid, chloroform and ethyl acetate fraction, thin layer chromatography, antioxidant and toxicity

Potential Use of Compounds from Neem Leaf (*Azaradirachta indica juss*) as PPRG and ESRα Inhibitors to Control Breast Cancer Cell Growth

Supriyanto^{1,2*}, M Rifa'i⁴, Yunianta³, S B Widjanarko⁴

¹Postgraduate of Agroindustrial Technology Program, Faculty of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia

²Department of Agroindustrial Technology, Faculty of Agriculture, Universitas Trunojoyo Madura, Bangkalan, Indonesia

³Department of Food Science and Technology, Faculty of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia

⁴Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Brawijaya, Malang, Indonesia

*e-mail: supriyanto@trunojoyo.ac.id

Treatment using the herbal compound is currently being developed rapidly. The compounds of herbs are believed to cure various degenerative diseases. The purpose of this study was to analyze the potential of the compound azadirachtin, deacetylnimbin, deacetylsalannin, salannin, and nimbin compounds in neem leaf extracts for target protein inhibitors namely PPRG and ESR α PPRG is the main regulator of adipose tissue function microvascular endothelial cells (ATEC), while ESR alpha is a protein that mediates all of the effects of estrogen and are important in the growth of prostate and breast cancer. Inhibition of alpha ESR can prevent the proliferation and growth of breast cancer cells by affecting estrogen receptor binding performance and hormonal cause inhibition of breast cancer cell proliferation. Insilico analysis results show that deacetylnimbin and deacetylsalannin are able to inhibit the protein ESR Alpha. The results of the analysis using docking showed that deacetylnimbin and deacetylsalannin could replace the drug tamoxilin. In vitro and in vivo studies are needed to validate the results of the study in insilico

Keywords: neem leaft, PPRG, ESRa, breast cancer and insilico

Response of Date Palm Seeds (*Phoenix dactylifera L.* var. Mozafati) Using Various Scarifications Through in Vitro Culture

S R N Effendi^{1*}, N Alfiani¹, R S Resmisari¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: firafy@gmail.com

Date palm (Phoenix dactylifera L.) are one of the plants that can live in tropical regions like Indonesia. Dates have a variety of ingredients and health benefits, both to prevent and treat a disease. Indonesia still relies on importing dates from other countries. Propagation of dates is still being developed conventionally, so it takes a long time because of the hard texture of the seed coat. Therefore, a technique to solve dormancy is needed by scarification through in vitro culture techniques. The purpose of this study was to determine the effect of scarification techniques on the response of germination of date palm seeds (*Phoenix dactylifera*) var. Mozafati. The research is experimental by using a completely randomized design (CRD). The study consisted of 5 treatments with 3 replications, namely: mechanical scarification (sanding), physical scarification (hot water immersion), physical scarification). Data were tested using ANAVA 5%, if there were significant differences then continued the DMRT test with a significance level of 5%. The results of the study showed the effect of scarification treatment on the date of seed germination. The fastest scarification treatment was using H₂SO₄ solution with 14.67 HST, explant percentage germinated 100%, and germination length 19.83 cm.

Keywords: dates, Phoenix dactylifera l., scarification, H₂SO₄



Ethnobotanical Research of Plants for Traditional Ceremony Mitoni Used By Community of Mojosari, Mojokerto

D L Rahmawati^{1*}, S Felinda¹, R S Resmisari¹, E B Minarno¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim, Malang, Indonesia

*e-mail: diah.lailil@gmail.com

Mitoni Traditional Ceremony is a traditional ceremony that is an action before the birth process precisely when the womb age 7 months or at the age of seven months of pregnancy. Mitoni Traditional Ceremony is done hereditary for generations in a certain area. Mitoni Traditional Ceremony aims to request the safety of the mother and baby so that the procession of the birth is smooth. Kinds of plants are used in traditional Mitoni ceremonies. Some people in Awang-Awang, Sawahan, and Mojosari Village is still used kind of plants as material for traditional Mitoni ceremonies. This study aimed to determine and finding plants which are used in traditional mitoni ceremony in Mojosari, plant organs used in mitoni traditional ceremony, philosophy of plant used, and the process in searching plants and conservation. The collecting of data uses the Purposive Sampling technique. The collecting data through Semi-Structure with an interview of 10 respondents with key person baby shaman and elders area Mojosari in Villages Awang-Awang, Sawahan, and Mojosari. The results showed that 13 species of plants used in mitoni traditional ceremonies in Awang-Awang, Sawahan, and Mojosari communities, Mojosari District Mojokerto Regency.

Keywords: Ethnobotany, Mitoni traditional ceremony, Plants



Isolation of Low Density Polyethylene (LDPE) Degrading Bacteria from Supit Urang Landfill, Malang Regency

D P A Wardani¹, R Solicha¹, D W Al Ikhsani¹, Romaidi^{1*}, T Sakaguchi²

 ¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
²Department of Life Sciences, Faculty of Life and Environment, Prefectural University of Hiroshima, 562 Nanatsuka, Shoubara, Hiroshima, Japan

*e-mail: romaidi@bio.uin-malang.ac.id

Accumulation of polyethylene and plastic waste pose a major ecological threat since they are found as non-degradable component or polymers in environment. The aims of this study were to isolate LDPE degrading bacteria and identify based on their morphological characters. For this purpose, soil samples from Supit Urang landfill Malang were prepared for bacterial isolation. The biodegradation potential of the isolates was investigated with the existence of clear zone in minimal salt medium by using LDPE powder as the sole carbon source. The result of this study revealed that several bacterial isolates have ability to grow in medium containing different concentration of LDPE. Our study found that several bacterial isolates have similar characteristic with *Bacillus* sp. This study is the first report on plastic-associated bacteria that can degrade LDPE isolated from Supit Urang landfill that probably can be used for further plastic bioremediation.

Keywords: Biodegradation, Bacteria, Low-density polyethylene

Analysis Contamination of Microplastic in Bottled Water Based on FTIR and E-Tongue Using LDA and PCA Method

S N Margareta^{1*}, W Y Setyandita¹, H Muttamaqin¹

¹Department of Physics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail:silvi.nadya21@gmail.com

Plastic is one of the materials widely used by the public such as food packaging. The e-tongue in this study was developed in 16 lipid membrane-based sensor channels. Each lipid polymer sensor membrane consists of a different polymer membrane. Membranes are made by combining polyvinyl chloride (PVC) as a matrix, 4 different types of plasticizers (2-NPOE, bis (2-Ethylhexyl) as defects, bis (2-Ethylhexyl) phosphate, bis (1-butyl pentyl) adipate), and 4 types of lipids (Octadecylamine, Oleyl alcohol, Methyltrioctylammonium chloride, and acetic acid (oleic acid)) for active ingredients. This electronic tongue is used to classify bottled water patterns from various samples and FTIR is used to determine bottled water content. The data obtained show that the microplastic content was not identified in the FTIR data. Electronic Tongue results using the PCA method show that mineral water sample 2 which has a characteristic pattern that is the same or similar to mineral water sample 3 and processing data using the LDA method can be explained that the classification pattern formed can distinguish the classification of bottled water from various samples.



Study of Focal Mechanism and Peak Ground Intensity to Find out The Fault Types and the Extent of Physical Damage for Lombok Earthquakes in 2018

D A Pamungkas^{1*}, E Susanti¹, R Amelia¹

¹Department of Physics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: dimasariopamungkas@gmail.com

Indonesia is an archipelagic country which is located in the meeting of three large plates in the world. This causes earthquakes occur frequently in Indonesia. For example is Lombok earthquake which occurred on 29 July - 1 October 2018. This study aims to identify the caused of earthquake, focal mechanism, and peak ground intensity of Lombok earthquake. From the analysis of the epicenter and hypocenter distribution of the earthquake it can be identified that the cause of the Lombok earthquake was back-arc thrust Flores deformation activity. Then from the analysis of the focus mechanism showed that there are two types of faults from the Lombok earthquake, reverse, and oblique faults. The highest value of peak ground acceleration which counted by Mc. Guirre method is 360-420 gal and located in Sambelia subdistrict. The highest seismic intensity value which counted by Wald's equation is equal to VII-VIII MMI and located in East Lombok and North Lombok districts. The results of this study are expected to provide information to the government and the local community about the earthquake frequently area as consideration for the purposes of earthquake resistant building planning and to be used as a reference of earthquake disaster mitigation to minimize the impact of physical damage and number of victims.

Keywords: Earthquake, Back Arc Thrust Flores, Focal Mechanism, Fault Types, Peak Ground

Intensity



The Increased Yield of Rice due Application of High-Potassium-NPK Fertilizer to Low-Potassium-Soil Content

N Istiqomah^{1*}, T Sudaryono¹, C Tafakresnanto¹

¹Balai Pengkajian Teknologi Pertanian Balibangtan, East Java, Jalan Raya Karangploso KM 4 Malang Telp. 0341 494052, Fax 0341 471255

*e-mail: istiqomahnurul1973@gmail.com

The main problem that the fertilizer added to plant not rationally applied by farmer. Some farmers use particular fertilizer with over dose but some of them use lower dose which resulted in under-quality of rice yield caused by unbalance nutrient in soil. Soil with the status of low pottasium nutrient need to be applied by NPK fertilizers with higher pottasium content. The aim of the research is to observe the optimal dose of 15-10-18 NPK fertilizer in rice growth and yields. This research is arranged in Randomized Block Design with 4 replications. Treatment consists of 8 combinations of fertilizing which resulted in 32 treatments of 4x6 m2 plot. The types of treatment studied are as follow: (A) Treatment with no fertilizer as control; (B) Treatment with recommendation dose of 200 kg/ha Urea and 300 kg/ha15-15-15 NPK; (C) Fertilizer dose of 200 kg/ha15-10-18 NPK; (D) Fertilizer dose of 300 kg/ha15-10-18NPK; (E) Fertilizer dose of 400 kg/ha15-10-18NPK; (F) Fertilizer dose of 200 kg/ha Urea and 200 kg/ha15-10-18NPK; (G) Fertilizer dose of 200 kg/haUrea and 300 kg/ha15-10-18NPK; (H) Fertilizer dose of 200 kg/ha Urea and 400 kg/ha15-10-18 NPK. Characters observed are as follow: plant height, the amount of productive tiller, panicle height, empty grains percentage, weight of 1000 seeds, and yield ton/ha. Farming financial analysis in order to determine farming feasibility is conducted in the end of research. The result showed that those treatments are significantly different in terms of plant height, the amount of productive tiller, empty grains percentage, weight of 1000 seeds, and ton/ha yield; but those treatments are not significantly different in panicle height. The yield of E treatment (400 kg/ha 15-10-18 NPK) reaches 8.03 ton/ha whereas the harvesting yield of F treatment (200 kg/ha15-10-18 NPK and 200 kg/ha urea) reaches 7.63 ton/ha. As a result, farming income from E treatment is about IDR 29.148.000 with R/C Ratio of 3,09 and B/C Ratio of 2,05; whereas farming income from F treatment is about IDR 27.966.00 with R/C Ratio of 3,18 and B/C Ratio of 2,18.







Digital Workplace: Digital Transformation for Environmental Sustainability

N Yalina^{1*}, I S Rozas¹

¹Universitas Islam Negeri Sunan Ampel, Surabaya, Indonesia

*e-mail: nitayalina@uinsby.ac.id

Environmental Sustainability becomes major issue around the world. Energy consumption and air pollution are some important issues that have been discussed among the scholars and practitioners. The purpose of this paper is to examine how digital workplace implementation could contribute to empower environmental sustainability, why this is important and how this can be achieved. This paper also proposed a model for future research regarding the impact of digital workplace implementation on environmental sustainability.

Keywords: Digital Workplace, Digital Transformation, Environmental Sustainability



How to Design Information Technology by Ergonomic Aspect at University Library

F S Bahtiar^{1*}, F J Pamungkas¹, G Chandra P¹

¹Department of Informatics Engineering, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: firma.sb@gmail.com

The library is a support in university academic activities. Besides that, the existence of the library is also vital in supporting learning and research of a university. The service and convenience of the library are assessed from several factors, one of which is the use of information technology. Using the right information technology in the library will increase the satisfaction of library users. The approach through ergonomics aspects in the use of information technology and its features can be used optimally by users and minimize incompatibility of prepared information technology. With ergonomic aspects, it is expected to be a standard for how to use valid information technology. So, in the future, the university library will be a place that can provide high comfort and satisfaction to library users

Keywords: Technology Information, Ergonomic, Library

The Application of the Green Architecture Principles of Tri Harsono Karyono to Design Natural Tourism in Pasuruan

A Krisnawangseh^{1*}, E Mutiara¹, A Bahar¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: afnikrisna07@gmail.com

Green architecture is an architecture that empowers natural resources, including energy, water, and materials, and minimizes negative impacts on the environment. Green architecture is a step to realize sustainable human life with 3 main principles, namely: energy savings, resource use and use of local materials. Of the three principles above, it will be applied to pennant natural tourism Natural tourism is a form of recreation and tourism that utilizes the potential of natural resources, namely a source of water, both in natural conditions and after cultivation, allowing tourists to obtain physical and spiritual freshness, gain knowledge and experience, and grow inspiration and love for natural.

Keywords: green architecture, natural tourism, springs umbulan

Green Technique for the Extraction of Basa Fish (*Pangasianodon hypopthalmus*)

A L Pradana^{1*}, S P Thanasupsin¹

¹Department of Chemistry, Faculty of Science, King Mongkut's University of Technology Thonburi, Thailand

*e-mail: aditludfipradana@gmail.com

This study aims to extract collagen by using environmentally benign solvent. Two methodologies were carried out; the conventional method by using acetic acid as a solvent, and the green technique by using water acidified by carbon dioxide under mild condition as solvent. Basa fish (Pangasianodon hypopthalmus) is the top fifth most consumed fish in Thailand. High demand generates more waste and will eventually be disposed at sanitary landfills, which will cause air pollution due to especially unpleasant smell of fish skin and bones. This study utilizes the waste and turns it into valorization materials. Collagen's proportionally high demand relates to its manifold applications. However, the application of conventional method, other than solvents that pollute the environment, also requires a long extraction time and a low of yield. It was recorded that using a green technique, the yield of dry weight collagen increased by nine times on fish skin and eight times on bone. Functional groups represented the presence of collagen; amide A, amide B, amide I, amide II, and amide III were confirmed after being characterized by FTIR with type I calf collagen standard. In addition to using environmentally benign solvent and increasing yield, the use of acidified water by carbon dioxide as a solvent can also shorten the extraction time where 104 h are needed for conventional methods, but only 56 h with carbon dioxide.

Keywords : basa fish (Pangasianodon hypopthalmus), collagen, extraction, green technique



Design and Evaluation of Mobile Ultrafiltration-based Pointof-use Drinking Water Treatment for Low-income Communities

Y Wibisono^{1,4*}, R V Astuti², G Djoyowasito², A W Putranto¹, N Izza¹, Sucipto³

¹Bioprocess Engineering, Univ. of Brawijaya, Jl. Veteran No.1 Malang 65145, Indonesia

²Agriculture Engineering, Univ. of Brawijaya, Jl. Veteran No.1 Malang 65145, Indonesia

³Agro-industrial Technology, Univ. of Brawijaya, Jl. Veteran No.1 Malang 65145, Indonesia

⁴MILI Water Research Institute, PO Box 301 ML, Malang 65101, Indonesia

*e-mail: Y_Wibisono@ub.ac.id

A sufficient reserve of clean water is very important for sustaining human life. Water is used for direct consumption or used for food production. Indonesia has abundance of water resources, either fresh and salty water. However, improved drinking water is still uneasy to access. While centralized water treatment facilities do not provide a ready use drinking water due to expensive cost and extensive on-site process or distribution system, bottled water generally accepted for daily consumption. Nevertheless, bottled drinking water is significantly expensive and the left overused plastic bottle become major contributor to plastic pollution. A mobile and compact point-of-use drinking water treatment is a pivotal answer to provide clean, healthy and low-cost drinking water and user-friendly instrument for low-income households and communities. The designed device consists of sand/activated carbon filter to remove organic debris and particles, and ultrafiltration to remove unwanted macromolecules such as humic and also harmful microorganisms. Moreover, the ultraviolet emitted to kill remains microorganism and preventing infection. Long term application of the mobile point-of-use drinking water treatment in local communities is also reported.

Keywords: point-of-use, drinking water treatment, ultrafiltration, membrane, ultraviolet


Design for Temperature Distribution of Continuous Furnace System for Sintering Application

Widyastuti^{1*}, B P Anggara¹, W Jatimurti¹, A S Wismogroho², V M Prawiti¹

¹Institut Teknologi Sepuluh November, Surabaya, Indonesia ²Physics Research Center, Lembaga Ilmu Pengetahuan Indonesia, Serpong, Indonesia

*e-mail: wiwidmaterial@gmail.com

This paper presents a design for the temperature distribution of continuous furnace system. This furnace is used in sintering application for powder metallurgy product. Design conduct for furnace system such as heating and insulation systems also material handling. Temperature analysis is focused on temperature distribution on sample. The temperature distribution also analyzed based on material layout during sintering process. All results are based on heat transfer, confirmed by ANSYS software. The results showed that the optimum zone temperature in the pre-sintered (225° C) and sintered zones (300° C) are 210.44° C and 293.52° C, respectively.

Keywords: continuous furnace, temperature distribution, ANSYS, sintering



Development Status and Challenges of Organic Rice Farming in Indonesia

Sujianto^{1,2*}, E Gunawan², Avishek Datta¹

¹Department of Food, Agriculture, and Bioprocess (FAB), School of Environment, Recourses, and Development, Asian Institute of Technology (AIT), P.O. Box 4, Klong Luang, Pathum Thani 12120, Thailand. ²Indonesian Agency for Agricultural Research and Development (IAARD), Indonesian Ministry of Agriculture, Jl. Ragunan 29 Pasar Minggu Jakarta Selatan 12540, Indonesia.

*e-mail: suj14nt0@gmail.com

Rice (Oryza sativa) plays an essential role for the Asian countries with 90% world production, consumption, and stocks in this region, include Indonesia. Intention of improving rice quality can be seen from total of certified organic rice area that increased significantly from 1,142.3 ha (2012) to be 3,152.5 ha in 2016 with the average growth 21 %, annually. The main objective of this study is to explore the recently status of organic rice farming and identify the constraints, challenges, and opportunity addressed to local and globalized world market. Organic rice production is still in initiation stage, concentrated in populated islands, and cultivated in small spot area produced unevenly over regions. Regarding fundamental principles of organic agriculture, organic rice in Indonesia has many opportunities, challenges and constraints. Many assessments showed that organic rice is more profitable than conventional rice due to its premium price, prospectus market both from domestic and international demand, and government support. Organic rice farming (ORF) is closely related to factors endowment suitability. Organic rice farming mostly has a different utilized variety. It has minimum of information about technological cultivation, fertilization, and soil management. Some constraints are lack of organic fertilizer, land suitability, farmers' knowledge adopting GAP, and consumers' awareness. Critical challenge is how to cultivate organic rice with higher productivity while mitigating and decreasing the emission.

Keywords: organic rice, challenges, constraints, agricultural practices, market



Field Notes: Terrestrial Orchids in the Lappadata Forest, Bone, South Sulawesi

D Mudiana^{1*}, E E Ariyanti¹

¹Purwodadi Botanic Garden – Indonesian Institute of Sciences

*e-mail: dmudiana@yahoo.com

Plant exploration activities carried out in the Lappadata Forest Area, Matirro Bulu Village, Libureng District, Bone Regency, South Sulawesi in July 2017 succeeded in recording as many as 7 species of terrestrial orchids, namely: Eulophia nuda Lindl., Dienia ophrydis (J.Koenig) Seidenf (Seidenf), Crepidium koordersii (JJSm.) Szlach., Nervilia aragoana Comm. ex Gaudich., Nervilia plicata (Andrews) Schltr., Nervilia puntata (Blume) Makino, and Habenaria beccarii Schltr. They grew is in shady and damp places on thick or humid soils. This paper will discuss the field notes of those terrestrial orchids found in Lappadata Forest Area.

Keywords: terrestrial orchids, lappadata forest, Bone



Integrated Sustainability Index of East Surabaya with Casbee Tools towards Sustainable City

A Handryant^{1*}, S Harini¹, T Kusumadewi¹

¹Department of Architecture, Faculty of Science and Technology Faculty, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: aishasadja24@gmail.com

Surabaya is a city that continues to grow from year to year. Various problems that can be identified in the city of Surabaya include population density due to immigration. Statistics show that in 2014 Surabaya's population reached 3,020,305 million with a total poverty line of 168,000 people or 5.97% of the total population. This research is focused on the East Surabaya area with samples in Kendangsari Village, RungkutKidul Village and RungkutTengah Village. The three locations have the same character in the form of industrial estate supported by residential areas both settlements and surrounding housing. This research uses descriptive quantitative and qualitative approaches. Observations were made on several environmental aspects which were grouped into aspects of Quality (Q) and load (L). These aspects are aspects in the assessment of the Comprehensive Assessment Built Environment Efficiency - Urban Development (CASBEE-UD) index. Based on calculations it is known that the index for the East Surabaya region is (B +) Good, this index shows the quality level of the region one level below the quality of sustainable areas. The index results indicate that the region is approaching sustainable status. Based on the results of calculations and scoring it is known that the environmental quality in this region is good at 3.5 (three point five), with a breakdown of the environmental quality index of 2.4 (two point four), social quality index of 3.8 (three point eight)) and economic quality index of 4.4 (four point four). However, the environmental burden received by this region is moderate, so the score obtained is 2.7 (two point seven).

Keywords: CASBEE, east surabaya, sustainable, city



Bricketting Polystyrene Waste with Thermal Decomposition as Friendly Environmental Boiler Fuel

G C C Rohmana^{1*}

¹Indonesia

*e-mail: galuhcitra123@gmail.com

Modernization that is not supported by the equal welfare of the people confronts the government, especially the Indonesian Government, in an increasingly uncontrolled situation. The situation in question is the problem of unresolved waste, whose growth is increasingly uncontrolled, especially Styrofoam (polystyrene) waste. Styrene production in 1973 was recorded at 25,000 tons, and in 2010 the number jumped 1,000 times to 25 million tons. Plastic waste takes 100-500 years to decompose and Styrofoam as unravelablewaste. The use of plastic materials as packaging is very unfriendly or conservative for the environment. If there are no restrictions or a good handling system, Indonesia, which is supposed to be a developed country, is transformed into the world's largest waste contributor. Styrofoam can be processed by utilizing heat to break up its long polymer chain. Thermal Decomposition Method is a processing process where Styrofoam will experience breaking of bonds and coal tar formation, with the addition of organic waste it will increase the value of product heat capacity. Brickett products are analyzed in two stages where the highest conversion results from the first analysis will be analyzed further according to coal analysis. The results of this product have a conversion of 69% with the conformity of ash content, water content and volatile matter reaching 79%.

Keywords: polystyrene, organic waste, thermal decomposition, bricket

Implementation of Green Industry Standard at Textile Industry and Textile Product

L Indrayani^{1*}

¹Indonesia

*e-mail: indrayanililin@gmail.com

At present industrialists must begin to shift from the industry as usual to an environmental industry or what is now known as a green industry. An important issue in the principle of green industry that needs to be understood and implemented is industries in their production processes implement sustainable efficiency and effectiveness in resources. The green industry is not only oriented towards improving the economic sector but also concerned with environmental sustainability. So the negative impact on the environment and the use of natural resources providers of industrial supports, does not result in a decrease in the carrying capacity and capacity of the environment. Therefore to realize the textile industry and textile products that are environmentally friendly, the necessity to develop industrial performance by integrating the principles of the green industry into the production process. This paper will explain the implementation of green industry characteristics that can be adapted into each stage of the production process in the textile industry and textile products, especially the batik industry. The characteristics of the green industry include the efficiency of the use of input materials, namely raw materials and auxiliary materials and the use of alternative materials that are more environmentally friendly, low energy and water intensity, minimization of waste both liquid and solid waste and reducing emissions due to the use of low-carbon technology. Each characteristic is equipped with criteria in the green industry standard (GIS) that can be used by textile and textile products industrialists, especially the batik industry in implementing the principles of green industry.

Keywords: textile industry, batik industry, green industry, environment sustainability



Estimation of Carbon Absorption Potential, Biomass and Carbon Deposit Monitoring in the City of Malang

G N Madapuri^{1*}, H N Azwar¹, M A Hasyim¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: gitaniken1203@gmail.com

Climate change increases the concentration of the greenhouse effect, this was caused by the lack of trees as a function of carbon sequestration. Therefore, this study aims to calculate the magnitude of the potential of trees as carbon sinks. The used method was vegetation analysis, to calculate the estimation of biomass, carbon storage and CO2 absorption using the allometric equation Brown (1997), Brown and Lugo (1984), and Morikawa (2003). The study was conducted at six stations representing the city of Malang, they are Tlogomas Street, North of Ahmad Yani Street, Letjend Sutoyo Street, Panglima Sudirman Street, Sudanco Supriadi Street, and Kolonel Sugiono Street. The study was conducted by calculating the diameter of the tree. The results of this study are that the most carbon-absorbing tree is *Pterocarpus indicus* with a value of 311.746,37 and the region that absorbs the most carbon is Letjend Sutoyo Street that located in the middle of the city.

Keywords: climate change, carbon-stock, allometric equation, Malang



Statistical Analysis of Student Satisfaction in Facilities and Services at Science and Technology Faculty of UIN Malang

H Saadah^{1*}, P Lestari¹, A F Rozanni¹, R D L N Karisma¹

¹Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: helliyatussaadah8@gmail.com

The quality of a college determined by facilities and services. The main benchmarks to determine the level of quality in facilities and services are student satisfaction. Since they are academic and administrative customers. The aim of the research is to analyze student satisfaction in facilities and infrastructures. The sampling method used stratified random sampling. The research used primary data which is filled in an online questionnaire. The sample of research is students in Mathematics, Biology, Physics, Chemistry, Information Engineering, and Architectural Engineering class of 2016 and 2017. The method in this research used ordinal logistic regression and GAP analysis. The result of ordinal regression is students who satisfied in responsiveness is 52,1% compared to unsatisfied. GAP analysis is used to get quality improvement. Hence, the management should be improved in empathy aspect. The aspect indicator has located in quadrant II using GAP analysis. The management should be concerned in those aspects to satisfy their students.

Keywords: GAP analysis, ordinal logistic regression, student satisfaction

Inventory and Prevalence of Milkfish (*Chanos-chanos***) Digestive Tract in Malang City Traditional Market**

E R Nursaputri^{1*}, M A Fachrudin¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: esamadarn@gmail.com

Milkfish is categorized in family *Chanidae* which widely spread in Southeast Asia. It has never free from various parasites, especially endoparasites in its digestive tract. In fact, lots' of people really like to consume milkfish and it might impact to the consumer's health. Therefore, aims of this study are to stock taking and calculate the prevalence of parasite in milkfish intestine. The examination was done by observing and storing the whole organ in a petri dish containing Sodium Chloride 0.1%. The identification was done under the light Olympus Microscope with 40 magnifications. *Ascaridida, Spirurida* and *Phasmadia* were found as the result. The prevalence of the endoparasite was about 37.5%.

Keywords: stocktaking, prevalence, milkfish, Malang







Vegetation Analysis using Point Centered Quarter (PCQ) Method in Border Forest of Jembrana Buleleng West Bali National Park (TNBB)

M Kundariati1^{1*}, A L Amaliyah¹, A N Arfianti¹, D A Puspitaningrum¹, I Fauziah¹, E F I R Hangestuti¹, R Istiana¹, R Afrida Rosania¹

¹Department of Biology, Faculty of Mathematics and Science, State University of Malang, Malang, Indonesia

*e-mail: maisunakundariati@gmail.com

The aim of this study was to determine plant diversity in the border forest of Jembrana Buleleng West Bali National Park (TNBB), to find out the Important Value Index (INP) on each plant diversity in the border forest of Jembrana Buleleng West Bali National Park and to find out the influence of abiotic factors on border forest Jembrana Buleleng West Bali National Park and to fund out the influence of abiotic factors on border forest Jembrana Buleleng West Bali National Park (TNBB). This research was conducted on 30 March-1 April 2018. The design of the vegetation analysis study using the Point Centered Quarter (PCQ) method. The results of this study are the plant diversity in the border forests of Jembrana Buleleng West Bali National Park (TNBB) found 4 species, namely *Borassus flabellifer* L., *Phyllantus emblica, Vitex cofassus*, and *Albizia falcataria. Borassus flabellifer* L. has an INP of 71.01%, *Vitex cofassus* has an INP of 57.66%, *Phyllantus emblica* has an INP of 137.49%, *Albizia falcataria* has an INP of 33.85%. West Bali National Park in general has an average air temperature of 36°, 70% air humidity, 32° soil temperature, dry soil moisture, 7.5 soil pH and low light intensity. Abiotic factors affected the INP of each plant. This is because each plant has a degree of adaptation in different environments.

Keywords: plant biodiversity, West Bali national park, point centered quarter (PCQ)

Parallel Approach in Rank Based Association Rule Mining

O Q Aziz^{1*}

¹Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: kid.1412.thief@gmail.com

Association rules are an interesting topic in data mining. A large number of rules of the items obtained from the association rule mining algorithm leads to the length of time required to get good results. RANWAR or Rank Based Weighted Association Rule mining has better performance when compared with apriori algorithm. The rules obtained at RANWAR have a high significance and correspond to the real significance of the processed data. Our concern is the large size of data will require a long time required process of determining the rule. One way to overcome this is to propose parallel algorithms. This research discusses a parallel implementation of RANWAR. The data that will be used is a microarray data type. The parallel implementation will be done in GPU.

Keywords: data mining, parallel, association rule mining, microarray



Extraction and Characterization of Nanocellulose from Sugarcane Bagasse by Ultrasonication Methode

A Y Hisbiyah^{1*}

¹Sekolah Tinggi Ilmu Kesehatan RS Anwar Medika, Sidoarjo, Indonesia

*e-mail: yuihisbi@gmail.com

This study focuses on the extraction of nanocellulose from Sugarcane Bagasse by ultrasonication method. Ultrasonic waves can accelerate the dispersion process of nanocellulose particles so that extraction runs faster and environmentally friendly. The baggasse was treated by chemical treatment with ultrasonic waves, and then the nanocellulosa was prepared using acid hydrolysis with ultrasonic waves. The effect of ultrasonication was investigated. X-ray diffraction analysis was used to characterize the crystalline structure of cellulose and nanocellulose. Fourier-transformed infrared spectroscopy analysis was used to characterize the chemical composition of extracted cellulose and nanocellulose that verifying the removal of lignin and hemicellulose during cellulose extraction process from sugarcane bagasse. Scanning electron microscopy was used to characterize morphology of bagasse, cellulose, and nanocellulose. The result of X-ray diffraction and Fourier-transformed infrared spectroscopy analysis showed that breakages of intramolecular hydrogen bonds and glycosidic bonds occurred during the hydrolysis process. Furthermore, The result of X-ray diffraction and scanning electron microscopy analysis indicating that nanocellulose prepared by ultrasonication has higher crystallinity than naocellulose prepared without ultrasonication.

Keywords: extraction, characterization, nanocellulose, sugarcane bagasse, ultrasonication

Analysis of Food Habits Tilapia (*Oreochromis niloticus*) that Caught in Sangiran Reservoir, Ngawi, East Java

D Arfiati^{1*}, S Shofiah¹, N Cokrowati²

¹Fisheries and Marine Science, Universitas Brawijaya, Malang, Indonesia ²Mataram University

*e-mail: d-arfiati@ub.ac.id

In fishing activities in the Sangiran Reservoir, Tilapia is an often caught fish and based on the results of research conducted in the absence of phytoplankton in the maintenance environment, the tilapia growth increases by approximately 0.062 % for a month. The purpose of this study was to determine the relationship between the number and types of plankton in the tilapia stomach and in the waters and to analyze the eating habits of tilapia (Oreochromis niloticus). This study uses a survey method. fish were captured as many as 100 tail by the stomach and placed on plastic containing 10 ml of Na-fis, then added to 5% formalin and stored in the cooler. Then brought to the laboratory to observe the plankton and identified under the microscope. The results of this study indicate that the genera Microspora, Mougetia and Spyrogyra, which have the highest frequency, are the most frequent. 82%, 82% and 77%. These genera are phytoplankton that have filaments and can attach to rocks. The highest frequency of occurrence of zooplankton is found in rotifers with a value of 83%. the preferred index of Rotifera, Arthropoda, Cyanophyta, and Chlorophyta is positive, which means that plankton is favored by fish. The comparison of Chlorophyta plankton in stomach and water is 37:57 and . The comparison of Rotifera in stomach and water is 68:59 means that fish like plankton, Mollusca not found in stomach of Tilapia but that division is found in the water. During the study, the water quality was in conditions that could support the life of Tilapia. The zooplankton of the Mollusca group must be used to fill empty food niches.

Keywords: nile, meal, stomach, plankton, da



ID ABSTRACT: ABS-55

Utilization of Polystyrene Waste with Biodiesel from Cooking Oil Waste as Feedstock in Catalytic Cracking Using Al-MCM-41/Ceramic and Pd/Al-MCM-41/Ceramic Catalysts

H Juwono^{1*}, F S Pamungkas¹, A Elliyanti¹, A Assari¹, A H Dermawan¹, Arifah N¹

¹Department of Chemistry, Faculty of Science, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

*e-mail: hjachmad@gmail.com

Liquid fuel from polystyrene plastic waste with co-reactant of cooking oil waste biodiesel has been obtained. The catalysts used in catalytic cracking are Al-MCM-41/ceramic and Pd/Al-MCM-41/ceramic catalysts. Morphology and elemental composition were observed with SEM EDX, the crystal structure observed with XRD, surface area and pore volume were analyzed by Nitrogen adsorption-desorption each calculated by BET and BJH method, acidity determined by FTIR-Pyridine, and temperature resistance analyzed by DTA. The results of catalytic cracking were investigated using Gas Chromatography-Mass Spectroscopy (GC-MS). Characterization of the catalyst showed that acidity was reduced because the Si/Al ratio was reduced after the impregnation and the surface area of Al-MCM-41/ceramics also decreased. SEM EDX shows that the composition of the carbon element on the surface of the Pd/Al-MCM-41/ceramic catalyst is smaller compared to the Al-MCM-41/ceramic catalyst. The results of the GC-MS characterization of liquid fuels from catalytic cracking using Pd/Al-MCM-41/ceramics catalyst, have a percentage of gasoline fraction (C7-C12) of 74.9% at 120 minutes cracking. The mixture of fuel from the addition of 150 mL liquid fuel resulting from catalytic cracking with Pd/Al-MCM-41/ceramic catalyst has the highest calorific value of 19160.61 (kcal/kg) and the performance of the gasoline Genset engine has the highest thermal efficiency of 28.27 %.

Keywords: liquid fuel, catalytic cracking, PS plastic waste, waste cooking oil biodiesel, hydrocarbon fraction performance

ID ABSTRACT: ABS-56

Influence of Biodiesel Waste Coconut Oil on Produce Hydrocarbon Fraction by Catalytic Cracking Waste Polistirene and Its Application in Gasoline Engine

H Juwono¹, A Elliyanti^{1*}, F S Pamungkas¹, A Assari¹, A H Dermawan¹, Arifah N¹

¹Department of Chemistry, Faculty of Science, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

*e-mail: arditaelliyantii@gmail.com

Liquid fuel from polystyrene waste and waste cooking oil biodiesel was successfully obtained through catalytic cracking using Al-MCM-41/Ceramic. The structure, morphology, acidity, and porosity of the catalyst were studied by XRD, SEM-EDX, Piridine FTIR, and N₂ gas adsorption-desorption. The products of catalytic cracking were analyzed using gas chromatogram-mass spectroscopy (GC-MS). The highest yield was obtained at feedstock variations of 57% (P): 43% (M) with the number of hydrocarbon fractions (< C7) is 0.48%, hydrocarbon fraction (C8 - C12) is 20.99%, and hydrocarbon fraction (> C12) is 78.53% in the cracking time 1 hour. Physical characteristics were reported in the form of density, flash point, heating value, and RON respective. The performance of liquid fuels with commercial fuels, Premium (RON 88), and additives of methyl tertiary butyl ether (MTBE) comparisons of 225 (mL): 750 (mL): 18.25 (mL) respectively produce thermal efficiency on engine use gasoline generator sets is 28.22% at the load of 2118 Watts. Based on this research, all variations of feedstock produce liquid fuels that are in accordance with SNI 06 3506-1994 concerning the quality of gasoline fuel types

Keywords: catalytic cracking, polystyrene waste, waste coconut oil, liquid fuel

Heavy Metal and Harmful Liquid Waste Membranes Based on Geopolymer Fly-Ash/TiO₂-rGo

A D Permatasari^{1*}, N Fahira¹, N Fadhila¹, Subaer¹

¹Laboratory of Material Physics, Faculty of Mathematics and Science, Universitas Negeri Makassar and Center of Excellent of Green Material & Technology, Makassar, Indonesia

*e-mail: permatasarianitadewi@yahoo.co.id

In this study, the geopolymer membrane was fabricated using fly-ash and TiO₂/rGO as heavymetal and liquid waste membranes. Graphene oxide (GO) synthesized using modified Hummer's Method then transform into reduced graphene oxide (rGO) using thermal reduction method at 160 °C for 4 h. This study investigate the effects of different concentration of TiO₂/rGO (TiO₂/rGO 0%, TiO₂ 0.5%/rGO1%, TiO₂ 1%/rGO 1%, and TiO₂ 1,5%/rGO1%) on membrane ability to absorb heavy metals and harmful liquid waste. Geopolymer membranes were characterized by X-ray Diffraction (XRD) to study the structure and their phases. The morphology was examined using Scanning Electron Microscopy (SEM). The functional groups of membranes were examined by Fourier Transform Infrared (FTIR). Atomic Absorption Spectroscopy (AAS) measurement was used to study the ability of membranes to separate heavy metals from liquid body. The UV-Visible technique was used to study the ability of the membrane to absorb organic liquid waste compounds.

Keywords: heavy metal, geopolymer, liquid waste, membrane



Biological Control of *Bemisia tabaci* Gennadius by Using Entomopathogenic Fungi Aschersonia Aleyrodis

Y Prayogo^{1*}, M S Y I Bayu¹

¹Indonesian Legumes and Tuber Crops Research Institute, Malang, Indonesia

*e-mail: yusmani.prayogo@yahoo.com

Bemisia tabaci is the main pest of many food crops, plantations, and horticulture. This pest plays an important role as a vector of various types of viruses. This research aims to study the efficacy of biological control of B. tabaci on soybean by using entomopathogenic fungi Aschersonia aleyrodis. The experiment was conducted inscreen house and laboratory of biopesticide, Indonesian Legumes and Tuber Crops Research Institute in 2018. The experiment consists of; the evaluation of LD₅₀ and LT₅₀ of A. aleyrodis fungi on nymph and adult stage, pathogenicity of A. aleyrodis onvarious stage of B. tabaci, impact of A. aleyrodis fungi infection to B. tabaci life cycle, and persistence of A. aleyrodis on soybean. The result showed that LD₅₀ of A. aleyrodis for controlling B. tabaci was used conidia density 106/mL with LT₅₀ three days after innoculation. A. aleyrodis strain Aa-J18 obtained from B. tabaci was very pathogenic because it can kill nymph and adult of B. tabaci with the mortality up to 99%. Aplication of A. aleyrodis causing a decrease in fecundity of B. tabaci up to 83,84%, thwart egg haching up to 96,78%, delayed egg hatching period up to three days, and shorten period of female adult up to 82,92%. Conidia suspension of A. aleyrodis that applied on soybean surface in the afternoon was able to survive until fifth week. Therefore, A. aleyrodis strain Aa-J18 has opportunity to be used as biological agent for controlling *B. tabaci* on soybean and potentially be used as alternative to replace chemical insecticide.

Keywords: A. aleyrodis, B. tabaci, patogenicity, persistance, mortality



Comparison between Chemical and Natural Treatments for Bamboo as Building Material towards Sustainable Construction Method

E Setiyowati^{1*}, A B Mappaturi¹

¹Department of Architecture, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: ernaning@arch.uin-malang.ac.id

Bamboo is one of the natural materials that need to undergone special treatments before it can be used as a permanent building material. Discussion on chemical and natural treatment for bamboo as a building material has started since the last few decades. Some architects of these days prefer to use chemical treatment to keep bamboo's durability. On the other hand, there are some new methods of bamboo treatment using natural material that is more environmentally friendly. This paper aims to compare these two different methods, which one is better yet easier to be used by the local community. This paper adopts a content analysis method in order to achieve the research objectives on bamboo as a sustainable construction material. The variables are determined better ways with low cost, short period of time, and the procedure of the treatment. This paper shows that the natural treatment for bamboo is better and much friendlier to be practiced by the local communities. The results of this study also inform that the procedures are complicated as compared to the chemical treatment but, it can be done easily by the local people who have more understanding of how to work with bamboo. The time needed for this natural process is the same as the chemical treatment, but the cost is cheaper. This study highlighted the importance of using natural bamboo treatment for construction industry in Indonesia.

Keywords: bamboo preservation, bamboo chemical treatment, bamboo natural treatment, sustainable material

The Implementation of Ethical Concepts toward Waste in the Design of Farms and the Cultivation of Ducks in Mojokerto

A H Al Manuddin^{1*}

¹Indonesia

*e-mail: abdulhafid041194@gmail.com

Indonesia is a country that has very high potential of livestock to be developed and considered. One of the animals that need attention is Duck. Considering that ducks are the nutritional suppliers of Indonesian society, according to the data of egg products in 2015 approximately 16% of the national scale and 2% for the meat. This data shows that the national scale of duck commodities need to be improved. In addition, there are more issues that must be solved such as dirt waste polluting the peat in Indonesia. According to the data, Brantas River in East Java, it has been contaminated by estradiol-17 β compounds, it is a hormone that commonly produced by females of animals and humans. These hormones entering the waters through the urine or feces which then entering the aquatic environment. Therefore, designing livestock and duck processing areas to be a container and solution for developing and providing solutions to the existing problems. The design of livestock and duck processing area located in Mojosari, Mojokerto regency, East Java. That place is a duck farm area with consideration of the large number of Ranch Ducks and has the original area's type of ducks namely Mojosari's Duck. The designing approach is based on the issue of waste livestock in that area, especially Brantas River which also through that livestock and duck processing area. According to that issue, the theme that was used is Eco-Teach Architecture which contained a principle to solve environmental problems in livestock and duck processing area.

Keywords: duck, ethical concept, Farm Design

Utilization of Black Tea Waste as Batik Natural Dyes on Cotton and Silk

M Triwiswara^{1*}

¹Indonesia

*e-mail: triwiswara@gmail.com

The production of bottled tea beverages generates a large amount of black tea waste which may cause serious environmental problems without proper handling. Black tea waste has potential as batik natural dyes due to the tannin contains. In this study the potential of black tea waste to dye batik on cotton and silk has been investigated. Black tea waste was extracted using water as the solvent with 1:5 of material to solvent ratio for 1 h in 100 °C of temperature. The dying performance of the extracts was evaluated by measuring the K/S value and the chromatic values CIELab. The fastness properties of the dyed samples and the effect of different mordant type on dyeing quality were also studied. The fastness properties of the samples were in the range of good to excellent. The results show that there is a strong possibility to utilize black tea waste as batik natural dyes on cotton and silk.

Keywords: black tea waste, batik, natural dye, cotton, silk, colour fastness, mordants



Screening of Bacterial Isolate and Extraselular Enzyme **Identification in Mangrove Root Sediments from Mangrove** Forest Labuhan Maringgai, East Lampung

T D Rosahdi^{1*}, R Auliawati¹, A S Sa'adah¹, R B Satiyarti²

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Sunan Gunung Djati Bandung, Bandung, Indonesia ²Department of Biology, Faculty of Education, Universitas Islam Negeri Raden Intan Lampung

*e-mail: tina dr@uinsgd.ac.id

Mangrove forests have significant microbial diversity and play an important role in various environmental processes. In the mangrove ecosystem, there are many bacteria by carrying out various metabolic activities, one of which is enzyme activity. The use of enzymes in various applications in the industrial sector has recently increased, while the need for enzymes in Indonesia still depends on imported products. The enzymes produced from bacteria are more efficient and easier to produce than enzymes produced from animals and plants. Therefore, exploring local enzyme-producing bacteria needs to be done. One of them is by utilizing the abundance of bacteria found in Mangrove Forest Labuhan Maringgai, East Lampung. The aims of this study were to screen bacteria from mangrove sediment and test the activity of extracellular enzymes (proteolytic, amylolytic, lipolytic and cellulolytic) in bacterial isolates. This research was conducted in 4 stages, namely sample preparation, screening using spread plate method (stocking cup), purification of isolates, qualitative enzyme activity test on Zobell media and minimal media and gram staining of bacterial isolates. Indications of amylase are characterized by the formation of clear zones with starch substrate 1% (b/v), protease characterized by clear zone with skim substrate milk 1% (b/v), lipase characterized by white precipitate with tween substrate 1% (v/v) and cellulase characterized by clear zone with CMC substrate 1% (b/v). The results showed that Zobell media obtained 10 isolates with amylolytic potential, 10 proteolytic isolates, 10 lipolytic isolates (small activity) and 10 cellulolytic isolates, whereas at the minimum media 8 isolates with amylolytic potential, 10 proteolytic isolates, no lipolytic activity and 10 cellulolytic isolates. The results of gram staining on isolates showed 7 isolates included in gram-positive bacteria and 3 isolates included in gramnegative bacteria.

Keywords: mangrove, bacterial screening, enzyme activity, gram staining

Effect of Fertilization and Shoot Tip Pruning on the Growth of Sambiloto (*Andrographis paniculata* (Burm. f.) Nees)

Solikin^{1*}

¹Lembaga Ilmu Pengetahuan Indonesia, Indonesia

*e-mail: solikin@lipi.go.id Indonesia

Sambiloto (*Andrographis paniculata* (Burm. f.) Nees) is one of scientific herbal medicine material which needs to be conserved and cultivated. The study aimed to determine the effect of urea fertilization and shoot tip pruning on the growth of sambiloto (*Andrographis paniculata* (Burm. f.) Nees) was conducted in the glasshouse of Purwodadi Botanic Garden in November 2015 - May 2016. The experiment used Split plot Randomized Blocks Design with two treatments, i.e. urea fertilization and shoot tip pruning. The urea fertilization treatment as the main plot was consisted of fertilizing urea 1g/plant (N1) and without fertilizer (N0). The treatment of shoot tip pruning as subplot, i.e. without pruning (D0), pruning shoot tip at the time of 12 leaves stage (D1), 16 leaves stage (D2), 20 leaves stage (D3) and early flowering (D4) on the main shoot. Each treatment combination was replicated three times. The results showed that fertilizing of urea had significant effect to dry weight of the stem, leaf, generative organs and total plant. Whereas shoot tip pruning treatment did not has significant effect on the plant growth.

Keywords: fertilizer, growth, medicinal plant, pruning, Andrographis paniculata

The Influence of Phosphorus Fertilizer on Growth and Yield of Maize on Dry Land

W Handayati^{1*}

¹Assessment Institute of Agriculture Technology East Java, Malang, Indonesia

*e-mail: wahyuhandayati@yahoo.com Indonesia

Phosphorus component is one of the important nutrients for seed-producing plants such as maize. In this regard, an assessment has been carried out on the dry land of Banjararum village, Singosari district, Malang regency East Java province from January to May 2017 (550 m asl). The purpose of the study was to determine the influence of P fertilizer the growth and yield of maize. The experiment used a randomized block design with 4 replications. As treatments were a) control (without P), b) SP-36 125 kg (positive control), TSP with dose c) 50, d) 100, e) 150 and f) 200 kg, Rock Phosphate (RP) with dose g) 200 , h) 300, i) 400 j) 500 kg / ha. All treatment plots were given Urea and KCl fertilizer with a dose of 350 kg and 75 kg per ha, respectively. As an indicator plant, NK 212 maize variety was used. The results showed that the application of TSP and Rock Phosphate fertilizers had the same effect as SP-36 fertilizers that commonly used by farmers on plant growth and harvest yield. Observation of plant growth, especially plant height, stem diameter, and leaf length showed significant differences especially with control. The best plant growth was obtained from the TSP and RP in the highest dose fertilizer. Observation of harvest yield and components of the yield also showed significant differences compared to the control and treatments of TSP and RP in the lowest dose. The highest yield was obtained at 200 kg /ha TSP fertilization reaching 7.78 tons per ha and not significantly different from the highest RP and SP36 dosage levels. The use of RP fertilizer was as effective as TSP and SP 36 for plant growth and harvest yield.

Keywords: maize, fertilizer, phosphorus, TSP, rock phosphate, plant growth, yield



Green Energy from Waste: Modification of Methyl Orange Dye as a Light Harvester on Solar Cell

H Setyawati^{1*}, M S Hadi¹, H Darmokoesoemo¹, I K Murwani², A J Permana¹, F Rochman¹

 ¹Departement of Chemistry, Faculty of Science and Technology, Universitas Airlangga, Surabaya, Indonesia
 ²Department of Chemistry, Institut Teknologi Sepuluh Nopember Surabaya, Surabaya, Indonesia

*e-mail: harsasi-s@fst.unair.ac.id

The purpose of this research is to modify methyl orange be a complex compound Fe (II) - methyl orange and apply it as a light harvester on DSSC (Dye-Sensitized Solar Cell) technology. Titanium dioxide was used as a semiconductor and synthesized from tetrabuthylorthotitanate (TBOT). The wavelength spectra of Fe (II) -methyl orange was characterized by UV-Vis spectrophotometer and showed d-d transition at 420.50 nm and charge transfer at 262 nm. The interaction of metal-ligand bonding (Fe –N) was characterized by FTIR spectrophotometer and shown at wavenumber 316.33 cm⁻¹. Fe(II)-methyl orange was a paramagnetic compound with a magnetic moment 3.9 BM and ionic compound because of its conductivity higher than its solvent. The photovoltaic analysis confirmed that Fe(II)-methyl orange produced a current of 40 mA, a voltage of 0.38 V and an efficiency of 0.24%.

Keywords: methyl orange, Fe (II), light-harvester, DSSC, efficiency



ID ABSTRACT: ABS-168

Amphibian (*Order anura*) Diversity in Tourism Area of Coban Putri, Coban Jahe, Coban Pelangi, and Ledok Amprong, Malang Region, East Java, Indonesia

B F Hanifa^{1*}, A Khatimah², Y Indawati², A Hidayah², L Z L Elzain², L Septiadi², M A Hasyim¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

²Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: berryfhanifa@uin-malang.ac.id

The research aims to explore and identify amphibian (*Order anura*) in some of tourism location in Malang surrounding area. This research was conducted from October 2017 until June 2018. Visual encounter method combined with purposive sampling was applied in specimen retrieval in night time. Each location was divided into 3 major zones according to its dominant habitat. Specimens were identified by using "Amphibian of Java and Bali" by D.T.Iskandar. Voucher specimens were preserved in Laboratory of Ecology, Biology Department, Faculty of Science and Technology UIN Malang. Diversity index was calculated by using Shannon-Wiener formula and compared for each location. The result showed that 477 specimens from 14 species of 6 families were collected (Buffonidae, Ranidae, Dicroglossydae, Megophrydae, Rhacophoridae, Microhylidae). The highest diversity index found in Ledok Amprong (H'=1.642), meanwhile the lowest was found in Coban Pelangi (H'=0.669). The highest dominant index found in Ledok Amprong (D'=0.699).

Keywords: amphibian, diversity, Malang

M A Hasyim^{1*}, M A Yaqin¹, M B Ulum¹, B F Hanifa¹, T Cahyono²

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
²National Park Management Section 1 Kemujan, Karimunjawa National Park, Jepara, Indonesia

*e-mail: asmunimuhammad05@gmail.com

The purpose of this study was to determine the structure and condition of seagrass communities (Seagrass) in the waters of Ladies Beach and Batu lawang national park karimunjawa. This exploratory research used descriptive qualitative methods, each study location is divided into 2 transects. Data identified at SPTN Office 1 Kemujan Karimunjawa National Park. The results of the study were 6 species of seagrass, namely: Holodule uninervise, Thalassodendron ciliatum, Halophila minor, and Syringodium isoetifolium, Thalassia hemprichii and Cymodocea serrulata. The percentage of seagrass cover namely Holodule uninervise is 38.04 %. Thalassodendron ciliatum of 6.25%, Halophila minor of 29.56%, Syringodium isoetifolium of 31.25%, Thalassia hemprichii at 14.21% and Cymodocea serrulata to 16.9%. Whereas the highest density of seagrass species in Hadirin Beach is from the Uninervise Holodule type 72.30%, with 858 stands on the first transect and 54.66% on the second transect with 253 stands. Whereas for the highest Batu Lawang Beach is the type of Thalassia hemprichii 51.1% with 162 stands, on the first transect and 44.9% with 114 stands. The substrate has the type of sandy clay and coral fragments. *Holodule Uninervise* is the most dominant species found on the beach of Hadir meanwhile *Thalassia hemprichi* is the most dominant species in Batu Lawang.

Keywords: seagrass, Hadirin beach, Batu Lawang beach, Karimun Jawa National Park.



Participatory Action Research: Maternal and Child Health System

M A I Anshori^{1*}, A P Lestari¹, K A Devi¹

¹Department of Informatics Engineering, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: 16650029@student.uin-malang.ac.id

The birth of a child is basically very much awaited in every family. In order to the mother be safe and the child be born healthy, she must perform antenatal care routinely to the obstetrician or to the midwife. The longer the gestational age, the fetus will also grow and develop, so if not carried out proper supervision can cause problems both during pregnancy, at the time of delivery, even childbirth, and the worst can result in death of mother and baby. Pregnancy screening is also an effort to reduce maternal mortality. The frequency of antenatal care is used to assess the use of antenatal services in quantity. The higher the coverage of antenatal care, the more likely the process of pregnancy and childbirth can be carried out properly. So that the examination of the womb during pregnancy is something that should not be missed and underestimated. In the obstetric examination the doctor or midwife will tell about the health of the fetus, fetal development, nutrition or any good food consumed during pregnancy, how to set a healthy diet for pregnant women, various exercise tips and healthy life that supports fetal growth and counting estimated date of birth of the baby. The estimated date of birth of a baby is not always the same as birth. Not a few who turned out to give birth before the estimated date and not a few also gave birth after the estimated date. From the problems, the solution to overcome this is that an Android-based application can be made that can connect between midwives and expectant mothers and can search for the nearest midwife. With this application, it is expected to help make it easier for mothers and midwives to find out the growth record of the fetus while in the womb and facilitate the mother in the process of giving birth, especially during emergencies so that the mother will be immediately addressed by the nearest midwife and is expected to minimize the maternal mortality rate and baby during childbirth.Based on acceptance tests conducted on several users, it can be concluded that 84.3% of users agree that the application of "Sehati" is useful to support the health of pregnant women and children with an easy-to-understand appearance. Other statements include 9.1% neutral, and 6.6% disagree.

Keywords: obstetrician, midwife, pregnancy, antenatal care







Sonochemical Synthesis of SrTiO₃/TiO₂ Heterojunction Material

V N Istighfarini^{1*}, S N L Aprilia¹, A Prasetyo¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, malang, Indonesia

*e-mail: vinoganessa@gmail.com

A composite $SrTiO_3/TiO_2$ heterojunction photocatalyst was prepared by sonication methods. The heterojunction material $SrTiO_3/TiO_2$ was synthesized using an ultrasonic cleaning bath for 4 h, by mixing $SrTiO_3$ and TiO_2 with variations in the comparison of mol 1:1, 1:2, 1:4 and 1:6. Characterization using XRD shows heterojunction material consisting of $SrTiO_3$ and TiO_2 anatase without any impurities, with the morphological surface, observed using SEM indicating the agglomerated particles. The band gap of heterojunction material with a variation in mol $SrTiO_3$:TiO₂ of 1:1, 1:2, 1:4 and 1:6 are 3.11; 3.09; 3.07; and 3.07 eV respectively. The all of band gap is lower than the $SrTiO_3$ and TiO_2 band gap, i.e. 3.2 eV.

Keywords: composite photocatalyst, heterojunction, sonochemical, SrTiO₃, TiO₂

ID ABSTRACT: ABS-11

Effect of Synthesis Time on Particle Size of Bi₄Ti₃O₁₂ Synthesized by Molten Single Salt NaCl Method

T Januari¹, N Aini¹, A Prasetyo^{1*}

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: antoniaprasetyo@gmail.com

 $Bi_4Ti_3O_{12}$ was synthesized by molten salt method using single salt NaCl with calcination time variations: 2, 4, 8, and 16 h at 900 °C. The effect of synthesis time on particle size and morphology was investigated. The X-ray diffraction data showed that the sample $Bi_4Ti3_3O_{12}$ was successfully synthesis and there are no found impurities. The image from scanning electron microscopy showed that the shape of $Bi_4Ti3_3O_{12}$ particle is plate-like and particle size increases as calcination time.

Keywords: Bi₄Ti3₃O₁₂, molten salt method, calcination time, particle size



ID ABSTRACT: ABS-20

Testing of *Trichoderma sp.* Formulation on Pathogen Prevention of *Fusarium oxysporum* Causes of Wilt in *Capsicum frustescens* in vivo

C Nisa^{1*}, U Utami¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail:cnisa67@gmail.com

Fusarium wilt caused by pathogenic molds Fusarium oxysporum has attacked many cayenne plants. This disease can reduce chili production by 60%. At present the prevention of Fusarium wilt still uses chemical fungicides and if applied in the long term it is feared that it will cause new impacts on the environment. The liquid formulation from coconut water waste and Tempe liquid waste can be used as a propagation medium for Trichoderma sp. and can be used as an antagonist agent for the pathogen Fusarium oxysporum. This study used an experimental method with Completely Randomized Design. The formulations used were concentrations of 100 mL, 200 mL, 300 mL, 400 mL, 500 mL, and 600 mL. Observation of test parameters included: incubation period, incidence of disease, and intensity of attacks and microscopic observations on stomata and xylem and phloem. The results of testing the formulation of *Trichoderma* sp in vivo showed that the disease incubation period was 7 HSI. The incidence of the disease is 100%, and for the intensity of the attack by giving a dosage formulation of Trichoderma sp with a dose of 100 ml- 600 ml has a significant effect. The most effective formulation dose is as much as 400 mL with an intensity of attack of 28%. Microscopic observations on healthy leaf stomata have a larger size and more in number than the stomata that is sick. Then microscopic observations of xylem and phloem tissue on larger cells of healthy stems, cell order neater, loose, and safranin colors weaker than sick stems.

Keywords: Trichoderma sp. formulation, pathogen Fusarium oxysporum, cayenne pepper (Capsicum frustescens)

The Effect of Nozzle Size on Dissolved Oxygen Value Using Fine Bubble Aeration. Case Study: Leachate Treatment in Tpa Manggar

M M Harfadli^{1*}

¹Institut Teknologi Kalimantan, Balikpapan, Indonesia

*e-mail: maarijharfadli@itk.ac.id

Leachate is a concentrated liquid that is harmful to soil and groundwater. This liquid comes from the process of decomposition of waste material by microorganisms in landfills. Leachate has the characteristics of high organic content. To reduce the organic content, one of them is to increase the dissolved oxygen in leachate. The method used with the aeration system diffuses using fine bubble aeration. Based on this background, a leachate water treatment test was carried out using the fine bubble aeration system in order to see the effect on the value of dissolved oxygen or DO produced. The method used in this experiment using a closed reactor system by varying nozzle diameter of 1.5 mm, 2 mm and 3 mm. Air to flow with a pressure of 3 bar, aeration time for 120 minutes, the volume of water as much as 25 l. The results showed that there was an effect of nozzle size on DO values. The highest increase in DO occurred in 1.5 mm diameter reaching 7.4 mg/L, while the highest 2 mm and 3 mm DO sizes reached 6.6 mg/L and 6.5 mg/L respectively. Based on the comparison of DO values of each diameter, it can be concluded that the 1.5 mm is more effective in increasing the dissolved oxygen concentration in leachate water treatment using fine bubble aeration.

Keywords: leachate, fine bubble aeration, dissolved oxygen, nozzle



Synthesis and Characterization of Nanoparticle Maghemite (γ-Fe₂O₃) as Pigment from Lathe Waste Using Sonication – Calcination Method

L M Khoiroh^{1*}, F Khidin¹, R Ningsih¹

¹Department of Chemistry, Faculty Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia.

*e-mail: lilikmfx@kim.uin-malang.ac.id

Nanoparticle maghemite coated polyethylene glycol (PEG) is synthesized using precursor variation by the sonication-calcination method. The precursor manufactured from lathe waste that is solved using (a)HCl: HNO₃, (b)H₂SO₄: HNO₃, and (c)H₂SO₄: HCl. Samples are characterized using XRD, color reader, FTIR, and SEM-EDX. The X-ray diffraction pattern shows that Rietveld Refinement confirms only one single-phase assigned to magnetite (Fe₃O₄) after sonication, one single-phase assigned to maghemite (γ - Fe₂O₃) after calcination stage, and widened peaks indicating nanometer size. From the color reader, the highest lightness achieved at (a) variation. Fourier transform infrared spectroscopy measurements confirm the bonding of PEG to the magnetite and maghemite nanoparticles. SEM-EDX data shows that the distribution of the particle of γ - Fe₂O₃ is not uniform. There are impurities such as silica.

Keywords: lathe waste, maghemite, sonication-calcination



Antimicrobial Film Based on Lemon Oil Emulsion-Impregnated Agaraose/Chitosan

E R Amanda^{1*}, K Nisyak¹, Y A Prasetya¹, Y S Chalim¹

¹Sekolah Tinggi Ilmu Kesehatan RS Anwar Medika, Sidoarjo, Indonesia

*e-mail: eviomittarizki@gmail.com

This study focuses on the extraction of nanocellulose from Sugarcane Bagasse by ultrasonication method. Ultrasonic waves can accelerate the dispersion process of nanocellulose particles so that extraction runs faster and environmentally friendly. The baggasse was treated by chemical treatment with ultrasonic waves, and then the nanocellulosa was prepared using acid hydrolysis with ultrasonic waves. The effect of ultrasonication was investigated. X-ray diffraction analysis was used to characterize the crystalline structure of cellulose and nanocellulose. Fourier-transformed infrared spectroscopy analysis was used to characterize the chemical composition of extracted cellulose extraction process from sugarcane bagasse. Scanning electron microscopy was used to characterize morphology of bagasse, cellulose, and nanocellulose. The result of X-ray diffraction and Fourier-transformed infrared spectroscopy analysis showed that breakages of intramolecular hydrogen bonds and glycosidic bonds occurred during the hydrolysis process. Furthermore, The result of X-ray diffraction and scanning electron microscopy analysis indicating that nanocellulose prepared by ultrasonication.

Keywords: extraction, characterization, nanocellulose, sugarcane bagasse, ultrasonication

The Effect of Organic Fertilizer from Household Waste and Liquid Organic Fertilizer on Growth and Yield of Pakcoy (*Brassica few L*.)

A Krismawati^{1*}

¹East Java Assessment Institute for Agricultural Technology, Malang, Indonesia

*e-mail: krismawati_amik@yahoo.com

The high volume of organic fertilizer from household waste provides abundant raw materials for making organic fertilizer is very potential to be used as organic fertilizer for the cultivation of pakcoy (Brassica few L.). The research aimed to obtain the type of solid and liquid organic fertilizer which can improve plant growth and the production of pakcoy. The research was conducted from January to February 2016 at the Institute of Agricultural Technology (AIAT), Karangploso, Malang, East Java. The study used a Randomized Block Design (RBD) which was repeated 4 replications. The treatment consists of 2 types, namely organic fertilizer of household waste consisting of 3 levels, namely K1 = 100% organic waste household + SuperDegra decomposer + cow dung + molasses + bran + doses of 0.5 kg/polybag; K2 = 100% organic waste household + Promi decomposer + cow dung + molasses + bran (doses of 1.0 kg/polybag), and K3 = 100% organic waste household + EM-4 decomposers + cow dung + molasses + bran (doses 1.5 kg/polybag). The treatment of various types of liquid organic fertilizer consists of 3 levels consisting of L1 = liquid organic fertilizer 4 ml/liter of water, L2 = liquid organic fertilizer 8 ml /1 of water, and liquid organic fertilizer 12 ml /liter of water. Data analysis using Analysis of Variance (ANOVA) carried out with LSD test level of 5%. The results of laboratory analysis showed organic fertilizer from organic waste of 100% + Promi decomposer + cow dung + molasses + bran considered organic fertilizer because its contains C-organic = 18.89%, N-total = 1.29%, P₂O₅ = 1.09%, K₂O = 1.22%, and C/N-ratio = 17.33. The result showed of combination 100% organic waste household + EM-4 decomposer + cow dung + molasses + bran (doses 1.5 kg/polybag) + liquid organic fertilizer 12 ml/1 liter of water (K3L2) the effect of number of leaves, canopy width, and the best production of mustard with fresh weight 505 gram/polybag.

Keywords: organic fertilizer, household waste, growth, yield, pakcoy
Utilization of *Bacillus thuringiensis* in Controlling Armyworms (*Spodoptera litura*) on Tomato (*Solanum lycopersicum*) Plants

A Rizali^{1*}

¹Department of Agroecotechnology, Faculty of Agriculture, Lambung Mangkurat University, Banjarmasin, Indonesia

*e-mail: arizali25@yahoo.com

Tomato plants are horticultural commodities that can provide benefits to farmers, beside the market demand that continues to increase, the cultivation method is easy. Tomatoes are also one type of vegetable plant that contains many vitamins and proteins that have been known by elderly people. Numerous chemical insecticides have been used in order to control pests, which damage for agriculture. While they are too expensive in the developing countries and harmful to both human and the environment. In addition, target insect pests rapidly develop biological resistance especially at higher rates of application. The chemical insecticides are still contributing to human life enormously, but they have been distributed in ecological system of organisms including human beings because of their low specific toxicity to any organism and their low specific toxicity to any organism and their slight decomposition in nature. An alternative control is needed with microbial insecticide which is using B. thuringiensis B. thuringiensis used in this study is B. thuringiensis which is already commercial. Then carried out purification as follows *B. thuringiensis* concentration of 5 g per liter of water, 10 g per liter of water, 15 g per liter of water, 20 g per liter of water. In treatment B. thuringiensis10 g per liter of water can stop eating at 2 h after application, and has been able to control as much as 75%.

Keywords: bacillus thuringiensis, armyworm, tomato

Synthesis of Schiff Base Compound from Vanillin and Aniline with Volume Variations of Acid Catalyst from Belimbing Wuluh Using Grindstone Method

F. F. H. Abdurrafi1^{1*}, A Hanapi¹, R Ningsih¹

¹Departement of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: rachmawati_ningsih@kim.uin-malang.ac.id

Schiff base compound was a product between carbonyl and primary amine compounds in acidic condotion. Based on several studies, the compound had activity as corrosion inhibitor. Schiff base compounds were synthesized from vanillin and aniline using natural acid catalysts from belimbing wuluh (Averrhoa Blimbi L.) with volume variations 0; 0.25; 0.5; and 1 mL and grinded for 10 minutes. The synthesized compound was characterized its physical properties. Further characterization included a UV-Vis spectrophotometer, Fourrier Transform Infra Red spectrophotometer (FTIR) and gas chromatography-mass spectrometer (GC-MS). The corrosion inhibition efficiency on metals was carried out in HCl 1M. Synthesized compounds were yellowish-white solids, slightly soluble in water, and had melting point at 149-151 °C. The yield with volume variations 0; 0.25; 0.5; and 1 mL in a row were 96,84; 93,81; 92,45 and 89,69% The synthesized compound had λ maks 283-284 and 325-330 nm. This compound had an imine bond (-C=N-) with wavenumber 1584.909-1585.974 cm⁻¹. The product with a 0 mL catalyst were characterized by GC-MS showed a peak at with retention time 24,173 minutes and m/z 227. It had similarity with molecular weight of the 2-methoxy 4-((phenylimino)methyl)phenol compound. The inhibition efficiency of these compounds were 39.38 to 77.40%.

Keywords: aniline, corrossion inhibitors, grindstone method, natural acid catalyst, schiff base, vanilin



ID ABSTRACT: ABS-62

Detection Limit Response Time Quartz Crystal Microbalance (QCM) in Cow Gelatin and Pig Gelatin Based on Trioctyl Methyl Ammonium Chloride Membran

Muthmainnah^{1*}, I Tazi¹, A Sinda¹, I Fuada¹, F Falah¹

¹Department of Physics, Science and Technology of Faculty, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: muthmainnahmsi@gmail.com

Research on QCM sensor response time on pig gelatin and beef gelatin has been carried out. The trioctyl methyl ammonium chloride polymer membrane covers the surface of the QCM. Spin coating technique is used to coat QCM. QCM without polymer membrane starts responding at the 3rd second with a frequency value of 10604009.2 Hz. Steady-state occurs at a frequency 15924734.3 Hz. In the sample of the pig without the membrane QCM began to respond in the second second with a frequency value of 10604014.4 Hz. In the 11th second a steady-state occurs with a frequency of 15924309.7 Hz. QCM with a polymer membrane began responding to cow gelatin samples at the 3rd second with a frequency value of 10598906.2 Hz. Steady-state occurs at a frequency of 15919183.8 Hz. In the second second QCM with the polymer membrane layer has responded to pig gelatin samples at a frequency value of 10591953.2 Hz. steady-state occurs in the 11th second with a frequency value of 5908920.7 Hz.

Keywords: QCM, cow gelatin, pig gelatin, spin coating, polymer membrane, response time



ID ABSTRACT: ABS-63

Biodiesel Preparation from Oil Fraction of Crude Pond Palm Oil through SiO₂/SO₃⁻ H⁺-Catalyzed Esterification Followed by KOH-Catalyzed Transesterification

I Herlina^{1*}, W Simanjuntak², M Rilyanti², E R Safitra³

¹Department of Chemistry, Institut Teknologi Sumatera, Bandar Lampung, Indonesia ²Department of Chemistry, Faculty of Mathematics and Natural Science, Universitas Lampung, Bandar Lampung, Indonesia

³Department of Chemistry, Institut Teknologi Sumatera, Bandar Lampung, Indonesia

*e-mail: herlinaidra@gmail.com

In this study, silica extracted from sugarcane bagasse was sulfated by wet impregnation method using H_2SO_4 solution with variations in the concentration of 0, 0.5, 1, 1.5, and 2 M as the sulfating agent. The sulfated silica was subsequently subjected to calcination at 40 °C, and then tested as catalyst for esterification of crude pond palm oil using methanol. The experimental results revealed that the catalysts exhibit good catalytic performance, enabling the achievement of up to 85% reaction yields. Physical characteristics of the catalysts were investigated using different techniques, including Fourier infra-red (FTIR) spectroscopy, x-ray diffraction (XRD), scanning electron microscopy (SEM), and particle size analysis (PSA). These characterization techniques reveal that successful sulfation of the silica was achieved.

Keywords: sugarcane bagasse, silica, sulfated, crude pond palm oil

Effect of Doping Fe³⁺ and Cu²⁺ on the Microstructure and Electrical Properties of Cryptomelane-Type MnO₂ Prepared by Sol-Gel Method

E Hastuti^{1*}, W Reni¹, I Yuliana¹

¹Department of Physics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: erna@fis.uin-malang.ac.id

Manganese oxide (MnO₂) is an alternative metal oxide material that has potential as an energy storage application. In this study, the cryptomelane-type MnO₂ doped Fe³⁺ and Cu²⁺ were successfully prepared using the sol-gel method. Fumaric acid was added to the KMnO4 in aqueous solution and modified with FeCl₃.6H₂O and CuCl₂.4H₂O to form different properties. The phase transformation and lattice parameter of the products were characterized using X-ray diffractometry (XRD). The morphology of sample was observed by SEM, and electrical properties were tested using RCL meter. The results showed that adding Fe³⁺ and Cu²⁺ provided higher value of conductivity and capacity of MnO₂.

Keywords: manganese oxide, doping, energy storage, sol gel



Effect of Precipitation Time Assisted by Ultrasonication for Synthesis of ZnO Photocatalyst

S Setiadji^{1*}, S Sanusi¹, D G Syarif²

¹Department of Chemistry, Universitas Islam Negeri Sunan Gunung Djati Bandung, Bandung, Indonesia ²Central Technology of Nuclear Materials and Radiometry, BATAN, Bandung, Indonesia

*e-mail: s.setiadji@gmail.com

Contamination of dye wastewater can be caused by the textile industry wastewater processingis not according to standards. Photocatalyst is one of themethods that can be used to reduce dye wastewater as a pollutant. ZnO samples that resulted from Zn(OAc)₂.2H₂O as a precursor via precipitation method assisted by ultrasonic time variation have been studied. Then the ZnO sample functioned as a photocatalyst to degrade methylene blue. Zinc acetate hydrate was dissolved and then it precipitated by oxalic acid. The ultrasonic time that varied during the ZnO precipitation was without ultrasonic (ZnO-0), 60 minutes (ZnO-1) and 120 minutes (ZnO-2). Then the precipitate was filtered, dried at 110 °C and calcined at 500 °C. From XRD results showed that all ZnO samples have diffraction patterns that correspond to ZnO wurtzite phase and a hexagonal structure with a P63 mc space group with values of a = b = 3.25 Å and c = 5.2Å. The crystallite size that calculated by Scherrer equation becomes smaller due to increasing the ultrasonic time, i.e. 17.69 nm (ZnO-0), 16.10 nm (ZnO-1) and 14.64 nm (ZnO-2). Analysis of Brunauer-Emmett-Teller (BET) provided the specific surface area of ZnO samples are 45.64 m^2/g (ZnO-0), 66.73 m^2/g (ZnO-1) and 143,487 m^2/g (ZnO-2). The degradation percent of methylene blue 10 ppm using the ZnO photocatalyst samples was resulted by optimum condition at pH 10 after 60 minutes of UV illumination are 94.51%, 97.58% and 98.52% for without ultrasonic (ZnO-0), 60 minutes (ZnO-1) and 120 minutes (ZnO-2), respectively. The photocatalytic activity of ZnO samples showed that increasing the ultrasonic time was more effective to degrade the methylene blue.

Keywords: photocatalyst, ultrasonic, precipitation, ZnO, methylene blue

Utilization of Geothermal Sludge as a Material for Making Zeolite Polymer Nanoparticles

Yuastutik^{1*}, L Ilmiyah¹, Y A Putri¹, Sumari¹

¹Universitas Negeri Malang, Malang, Indonesia

*e-mail: yuastutik34@gmail.com

The processing geothermal energy into electrical energy produce geothermal sludge. Geothermal sludge also has the potential to cause crust on the PLTP equipment, thereby potentially hampering the work of the PLTP. Geothermal sludge has a high silica content. This study aims to utilize geothermal sludge as a raw material for making zeolite nanoparticle polymer composite. This research method consisted of (1) geothermal sludge preparation, (2) zeolite synthesis, (3) syntesis of zeolite magnetic nanoparticle polymer composite, (4) composite vharacterization using XRD and FT-IR. Composite polymer nanoparticle coposites succesfully synthesized indicated by the presence of a peak of 30.5; 35.9; 43.6; 54.0; 57.6; 63.2 °. Wave numbers resulting from the functional group characterization using FT-IR show the presence of Fe-O, O-Si-O, N-H and O-H goups at 547.78; 1002.98; 3361.93 and 3593.38 cm⁻¹.

Keywords: geothermal sludge, composite, zeolite



Synthesis of Material Composite rGO-TiO₂ from Coconut Shells by Sol-Gel Method

U Hikmah^{1*}, D R Yanti¹, N Aini², A Prasetyo², E Hastuti¹

 ¹Department of Physics, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
 ²Department of Chemistry, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: utiyahikmahsby@gmail.com

The rGO- TiO₂ composite photocatalyst is receiving great attention because of its high performance. But the study of rGO- TiO₂ composite with sources of rGO material derived from the utilization of organic waste such as coconut shells is limited. In this study, the synthesis of nanocomposite rGOTiO₂ was described with rGO obtained from coconut shells. The rGO samples produce through oxidation and reduction process. The transform of graphene oxide into reduced graphene oxide was assisted by microwave irradiation. The obtained rGO then composite with Titanium tetraisopropoxide (TTIP) by sol-gel method. The composite of rGO-TiO₂ was characterized by XRD, FTIR, UV-Vis, and SEM-EDS.

Keywords: rGO- TiO₂ composite, microwave irradiation, sol-gel method, photocatalyst



The Effect of Microwave Irradiation on Reduced Graphene Oxide from Coconut Shells

D R Yanti¹, K Nikmah¹, U Hikmah^{1*}, A Prasetyo², E Hastuti¹

 ¹Department of Physics, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
 ²Department of Chemistry, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: utiyahikmahsby@gmail.com

Reduced graphene oxide has been synthesized by microwave irradiation assisted. The effect of microwave irradiation on its crystal structure and electrical conductivity was investigated. Graphene oxide was synthesized using a modified hummers method then reduced by LAA (LAscorbic Acid) as a reducing agent with microwave irradiation assisted. The irradiation time varied by 10, 20, 30, and 40 minutes. The samples characterized by Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy-EDAX (SEM-EDAX), X-Ray Diffractometer (XRD), and Inductance Capacitance and Resistance Meters (LCR-Meters). The LCR-Meter result shows the electrical conductivity of rGO ranged from 0.16 to 1.07 µS.

Keywords: reduced graphene oxide, microwave irradiation, coconut shell



Transesterification of Coconut Oil Using MgO Doped Zeolite-Y Prepared from Rice Husk Silica

G G Pangesti^{1*}, K D Pandiangan¹, W Simanjuntak¹

¹Graduate Student, Lampung University, Bandar Lampung, Indonesia

*e-mail: gesagustami@gmail.com

In this investigation, zeolite-Y prepared from rice husk silica was doped with MgO using impregnation method and then tested as catalyst for transesterification of coconut oil. Four zeolite samples were prepared by varied crystallization time of 48, 72, 96, and 120 h at fixed temperature of 100 °C. The impregnation process was conducted by placing the zeolite in magnesium nitrate solution with a concentration of 1.5% and stirred for 6 h by a magnetic stirrer. The mixture was aged for 22 h at room temperature then washed with distilled water and dried in oven at 80 °C. The dried sample was then calcined at 550 °C for 6 h to form MgO doped zeolite-Y and then tested as catalyst for transesterification of coconut oil. To confirm the presence of MgO, the samples were characterized using XRF. The establishment of zeolite structure was verified using XRD technique and microstructure using SEM. The experimental results demonstrated that MgO was successfully doped into zeolite, with the relative amount varied with crystallization time. The presence of samples as multiphasic material was suggested by the XRD and SEM analysis. The composites exhibit decent catalytic performance as revealed by the results of transesterification with the highest conversion of 70% was achieved.

Keywords: MgO, zeolite, transesterification

Methyl Rocaglate from the Stembark of *Aglaia minahassae* (Meliaceae) and Its Cytotoxic Activity Againsts HeLa Cervical Cancer Cell Lines

N Kurniasih^{1,2*}, A Supriadin¹, R Abdulah³, D Harneti², U Supratman^{2,4}, M N A B M Taib⁵

¹Department of Chemistry, Faculty of Sciences and Technology, Sunan Gunung Djati Islamic State University, Bandung, Indonesia
²Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor, Indonesia
³Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Jatinangor, Indonesia
⁴Central Laboratory of Universitas Padjadjaran, Jatinangor, Indonesia
⁵School of Chemical Sciences, Universiti Sains Malaysia, Minden, Penang, Malaysia

*e-mail: nunungkurniasih@uinsgd.ac.id

Rocaglates and rocaglamides are the chemical marker of genus Aglaia, the biggest genus in Meliceae family. This research describes the isolation and structure elucidation of rocaglate compound from the stembark of *Aglaia minahassae*. Dried stembark of *A. minahassae* extracted with methanol and then partitioned with n-hexane, ethyl acetate, and n-butanol, respectively. The n-hexane extract then was separated and purified with chromatography techniques to obtain isolated compound. The chemical structure of isolated compound was elucidated by IR, NMR 1D, NMR 2D as well as mass spectra and by comparison with those previously reported spectra data. The compound identified as methyl rocaglate. This compound showed cytotoxicity activity against HeLa cervical cancer cells with IC₅₀ values of 1.51 μ M.

Keywords: Aglaia minahassae, stembark, methyl rocaglate, cytotoxic

Anticancer Activity in 2-Methoxy-4-((4 Methoxyphenilimino)methyl)phenol Compound on T47D Breast Cancer Cells

L Sukria¹, E K Hayati^{1*}, A Hanapi¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri, Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: eloksunardji@yahoo.com

2-methoxy-4-((4-methoxyphenilimino)methyl)phenol compound is a Schiff base compound synthesized from vanillin and p-anisidin. The purpose of this research is to determine the stability of the 2-methoxy-4-((4-methoxyphenilimino) methyl) phenol compound and to test the anticancer activity of 2-methoxy-4-((4-methoxyphenilimino) methyl) phenol in inhibiting T47D stability breast cancer cells. The the 2-methoxy-4-((4 of methoxyphenylimino)methyl)phenol compound was carried out by characterization using chemical tests, identification using FTIR and GC-MS. While the anticancer activity test of compound 2-methoxy-4-((4-methoxifenilimino) methyl) phenol using the MTT method. The results of re-characterization using chemical tests, identification of FTIR and KG-SM showed the compound was still stable. The IC50 value of compound 2-methoxy-4-((4 methoxyphenilimino) methyl) phenol was 353,038 µg/mL.

Keywords: schiff-base compound, breast cancer cell T47D, FTIR, GC-MS, MTT



Green Synthesis of Gold Nanoparticles using Biomoleculs Extract of Ketapang Leaf (*Terminalia catappa*) and Noni (*Morinda citrifolia L.*) fruit

D C Dewi^{1*}, D E Rahma¹, M W Hidayat¹, S Amalia¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: dayanasidi@yahoo.com

The synthesis of eco-friendly gold nanoparticles is a branch of nanoscience for many applications. Biomolecules present in plant extract can be used to reduced gold ion to nanoparticles in single-step green synthesis process, low cost and non-toxic. This study focuses on the rapid synthesis of gold nanoparticles (AuNP) using the aqueous extract of Noni (Morinda citrifolia L.) fruit and ketapang (Terminalia catappa) leaf. This study included the reduction of HAuCl4 to Auº using the active compound from both extracts by domestic microwave. The AuNP were characterized by UV-Vis and Transmission Electron Microscopy (TEM). The red-burgundy color of the solution indicated the formation of AuNP. The UV–Visible spectroscopy results showed the optimum volume of bioreductors is 1.2 mL respectively, while the optimum heating time to produce AuNP was 150 seconds (ketapang leaf extract) and 60 seconds (Noni fruit extract). The stability time of AuNP reduce with ketapang leaf extract was 14 days, while AuNP reduce with Noni fruit extract only 7 days. The analysis of transmission Electron Microscopy (TEM) using a magnification of 80000 times indicated that the size of the gold AuNP reduce with ketapang leaf extract was 7.5-21.87 nm with an average size of 13 nm while AuNP reduce with Noni fruit extract was 16.815-28.335 nm in the form of spherical, trigonal and hexagonal

Keywords: gold nanoparticle, green synthesis, Terminalia catappa, Morinda citrifolia L.



Potential of Extract Rice Bran Fermented by *Rhizopus oryzae* as Antibacterial againsts *Salmonella typhi*

A Jannah^{1*}, H Barroroh¹, A Ma'unatin¹

¹Department of Chemistry, Faculty of Science And Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: akyunul_jannah@yahoo.com

Rice bran is a waste of rice milling which is abundant in Indonesia and contains bioactive compounds. The availability of bioactive compounds in rice bran can be increased through fermentation using *Rhizhopus oryzae*. This study aims to determine the effect of rice bran fermentation time on antibacterial activity against Salmonella thypi. The duration of rice bran fermentation for 5 and 7 days while as a control was rice bran without fermentation. Antibacterial test used the disk diffusion method with various concentrations of fermented and unfermented rice bran ethanol extracts which were 25%, 12.5% and 6.25% (w/v) as a positive control using chloramphenicol and DMSO as negative control. The highest zone inhibitory analysis showed that the antibacterial activity of fermented rice bran extract for 5 days was 13.03 ± 3.08 mm, while for 7 days was 7.9 ± 3.44 mm and unfermented rice bran was 9.73 ± 1.1 mm. The results of this study showed that the fermented rice bran ethanol extract for 5 days had the highest antibacterial activity for inhibiting the growth of *Salmonella thypi*.

Keywords: antibacterial, fermented rice bran, Rhizhopus oryzae



Synthesis and Characterization of Alginate-Cellulose Beads from Corn Stalk and Application as Adsorbent for methylene blue

E Yulianti^{1*}, N Qosim¹, A Prasetyo¹, W A P Rohmatullah¹, L M Khoiroh¹, R Mahmudah¹

¹Department of Chemistry, Faculty of Science And Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: envyulianti@kim.uin-malang.ac.id

Beads are porous materials that have a micrometer diameter up to millimeters. Beads can be made by composing alginate with cellulose xanthate. It is can be made from cellulose xanthate extracted from corn stalks. Alginate-cellulose xanthate composite beads can absorb water but have low mechanical strength. The addition of a porogen $CaCO_3$ agent can produce better beads pore that it can increase the absorption of beads. The mechanical strength of the beads can be improved by soaking the alginate-cellulose xanthate beads with a crosslinked zinc acetate agent. Making Beads was carried out by the ionic gelation method. This method can increase the mechanical strength of beads with the crosslinking process of alginate with zinc acetate. Characterization of samples using FTIR (Fourier transform infrared) and SEM-EDX (scanning electron microscope-electron dispersive Xray), optical microscopy, and swelling beads test. Synthesis of alginate-cellulose xanthate beads obtained with round-shaped beads and high mechanical strength. This is indicated by the presence of new wave peaks on FTIR spectra results, at wavelengths of 1117 cm⁻¹, 1000 cm⁻¹, and 520 cm⁻¹ which indicate the formation of xanthate groups. The resulting beads are also more porous, this is indicated by the results of SEM characterization which shows the particle surface of beads with higher porogen concentration resulting in more formed pores. The resulting pores are folds. The addition of porogen produces round beads, this is shown from optical microscope images. Beads without porogen have an unround shape compared to beads with the addition of porogen. The mechanical strength of beads is higher, this is indicated by the presence of zinc elements in the EDS results of 59.16%, 54.72%, 53.26%, and 55.77% for each bead without porogen, beads 0.5 gram porogen, 1 gram porogen beads, and 1.5 g porogen beads. Beads with porogen 0.5 g have higher swelling power that is equal to 14.83%. The highest adsorption capacity at 408 h is 80,76 mg/g and the lowest adsorption capacity at 384 h is 46,88 mg/g.

Keywords: beads, alginate cellulose xhantate, crosslink agent, porogen CaCO₃, methylene blue



Porous Alginate/Cellulose Xanthate Beads from Corn Stalk with CaCO₃ and NaCl as Porogens

N W Azizah¹, E Yulianti^{1*}, C N Hidayah¹, L M Khoiroh¹, R Mahmudah¹, A Prasetyo¹

¹Department of Chemistry, Faculty of Science And Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: enyyulianti@kim.uin-malang.ac.id

The high cellulose content in corn stems has the potential to be used as a composite material in the making of alginate-cellulose xanthate beads. Alginate and cellulose are biodegradable, renewable and non-meltable polymers that have wide applications in various industrial sectors. The purpose of this study was to determine the effect of porogen types of CaCO₃ and NaCl. beads are characterized using Fourier Transform Infrared (FTIR), swelling, porosity, and Scanning Electron Microscope-Energy Dispersive X-Ray (SEM-EDX) tests. The highest swelling and porosity values were 1.5 g of CaCO₃ porogen and 1.5 g of NaCl porogen. FTIR data shows the appearance of wavenumbers in the 800 cm-1 region which indicates the presence of Zn-O groups. SEM-EDX data without porogen show rough and hollow surfaces. the surface of the 1.5 g CaCO₃ beads is smooth and has a slight cavity, while the surface of the 1.5 g NaCl surface is scaly and fold-shaped.

Keywords: beads, alginate cellulose xanthate, crosslink agent, porogen CaCO₃, methylene blue





Synthesis and Characterization of Silica Gel from Lapindo Mud Sidoarjo

A Rahmayanti¹*, Q A'yuni², Hartati³, Purkan³

¹Environmental Engineering Program, Universitas Nahdlatul Ulama Sidoarjo, Sidoarjo, Indoensia

²Chemical Engineering Program, Universitas Nahdlatul Ulama Sidoarjo, Sidoarjo, Indonesia

³Departement of Chemistry, Universitas Airlangga, Surabaya, Indonesia

*e-mail: ardhana.rahma@gmail.com

Silica gel was synthesized from Lapindo mud by sol-gel process. Sodium silica commonly used as a precursor to prepare silica gel. A Lapindo mud was mixed with sodium hydroxide, stirred and heated at 80 °C for (1, 2, 3, 4, 5) h to prepare odium silicate. Hydrochloric acid was then slowly added to the sodium silicates solution to obtain silica gel. pH 4 selected as the optimum pH in the synthesis of silica gel. The collected Lapindo mud was characterized by X-Ray Fluorescence (XRF). The XRF confirmed that Lapindo mud contains high amounts of silica, with content ranging from 36% to 50% as the dominant component, therefore Lapindo mud has great potential as a raw material for silica synthesis. The purity of synthesized silica was determined by XRF and showed that silica purity was 35.8%. The yield of synthesized silica at 1, 2, 3, 4, 5 h were 20.5%; 18.0%; 32.1%; 32.2% and 21.3%, respectively. Hence the optimum yield was obtained at 4 h of reaction.

Keywords: silica gel, sol-gel process, Lapindo mud, extraction

Preliminary Study on the Site-Specific Nutrient Fertilization Efficiency through Several Tools

D Sihombing^{1*}

¹Assessment Institute of Agriculture Technology East Java, Malang, Indonesia

*e-mail: donaldsiltoru@yahoo.com

To solve the very high doses problem of inorganic fertilizers using on lowland rice by farmers, the Research and Development Agency of the Ministry of Agriculture of the Republic of Indonesia has introduced a number of assistive devices such as Paddy Soil Test Kit (PSTK) or the application of Planting Calendar (PC) and Nutrient Manager for Rice (NMR) which can be accessed online or via SMS Center. To find out the reliability of the three tools as well as a demonstration plot for farmers, an assessment was carried out in Jambu village, Burneh District Bangkalan Regency East Java Province from March to July 2014. The experiment used a factorial split-plot design, with 5 replications. As the main plot were two varieties of lowland rice namely Inpari 4 and Inpari 10; and as a subplot was fertilization (dosage level/inorganic type) based on a. farmer's practices (250 kg Urea, 300 kg NPK Ponska, 100 kg SP-36, 50 kg KCl) b. PSTK (290 kg Urea, 75 kg SP-36 and 50 kg KCl), c. PC (150 kg Urea, 350 kg Ponska) and d. NMR (125 kg Urea, 250 kg Ponska). The observations showed that there was no effect of interaction between varieties and fertilization on plant growth. Only fertilization treatment shows a real difference in the influence on plant growth. The highest plant posture and the highest number of tillers were obtained in the PC treatment. Observation of the plotting yield and the harvest yield weight showed that there was no interaction between varieties and fertilization, but had a significant difference effect in fertilization treatment. The highest weight of plotting yield and harvest yield was obtained in the fertilizer treatment of 3.62 kg/6.25 m2 and 5.784 tons ha⁻¹ and were only significantly different from the PSTK treatment. Thus the use of assistive devices, especially the PC and NMR applications were more efficient in the use of inorganic fertilizers with the yields equivalent to the farmer's treatment.

Keywords: nutrient, fertilization efficincy, paddy soil test kit

Potential Growth and Production of Rice (*Oryza sativa*) with Additional Applications of Liquid Inorganic Micro Leaf Fertilizer

Sugiono^{1*}, A Krismawati¹

¹Assessment Institute for Agricultural Technology in East Java, Malang, Indonesia

*e-mail: astro_bptp@yahoo.co.id

The main factor in efforts to increase rice production through optimum fertilizing and sitespecific are using of new superior varieties and maximum maintenance. The application of micro fertilizer accompanied macronutrients that given sufficiently and balanced, expected to be able to improve nutrient adequacy for plants so that the yield and quality of the crop will better. Micronutrient fertilizer is applied through the leaves, it will more effective because nutrients can be absorbed directly, effectively repeating the lack of microelements and nutrient absorption by leaf cells is faster. To determine the effectiveness of compound liquid inorganic micro leaf fertilizer with 1.11% Zinc content, Copper 1.11%, Lead < 0.1%, and other materials conducted research on rice plants. Locations in irrigated rice fields in dry season (May -September) in Pasuruan district, East Java. Using Randomized Design Block (RDB) with 9 treatments, replication 3 times and new superior rice varieties of Inpari 30. The results of the study were significantly different for plant height, number of productive tillers, panicle length, and yield. Liquid anagronic micro leaf fertilizer application can increase yield at dose of 6 ml/l combined with 300 kg/ha urea + 100 kg/ha SP-36 + 75 kg/ha KCl with production of 7.68 t/ha of harvested dry grain, with the highest value of RAE (Relative Agronomic Effectiveness) 116.85. Analysis of farming system with the application of the addition of liquid anogronik micro leaf fertilizer with B/C ratio was 1.66.

Keywords: inorganic liquid, lowland rice, micro leaf fertilizer, production



Biodiesel Production from Kesambi (Schleichera oleosa) Oil using Multi-Walled Carbon Nanotubes Supported Zinc Oxide as a Solid Acid Catalyst

N P Asri^{1*}, Y Yuniati², H Hindarso³, Suprapto⁴, R R Yogaswara⁵

¹Department of Chemical Engineering, Faculty of Engineering, Universitas W.R. Supratman, Surabaya, Indonesia.

²Department of Chemistry, Faculty of Natural Science, Universitas Ma Chung, Malang, Indonesia.

³Department of Chemical Engineering, Faculty of Engineering, Universitas Katolik Widya Mandala, Surabaya, Indonesia.

⁴Department of Chemical Engineering, Faculty of Industrial Technology, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia.

⁵Department of Chemical Engineering, Faculty of Engineering, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Surabaya, Indonesia.

*e-mail: nyoman_puspaasri@yahoo.com

Biodiesel is often produced utilizing homogeneous acid or base catalyst so that it's cost making always higher than that of petroleum diesel. In many years, heterogeneous catalyst development for biodiesel production became a hot topic among scientists because of its many advantages including easy separation and catalyst reusability. In this study, multi-walled carbon nanotubes supported zinc oxide (ZnO/MWCNTs) as solid acid catalyst had been successfully prepared via the stober-like process. There are several % loading of ZnO variations ranging from 10 - 35% of catalyst weight. These catalysts then were characterized by x-ray diffraction (XRD), surface area, and SEM EDX analysis. Transesterification of kesambi (Schleichera oleosa) oil also had been done to test the activity of the solid catalyst. Biodiesel had been successfully produced from kesambi oil using this catalyst yielding quite high methyl ester concentration. The potential of this catalyst showed from its large surface area with the maximum area until 409 m²/gram. Moreover, ZnO content in this catalyst acts as acid active site inside the pore of catalyst enhancing the rate of transesterification reaction. It can be concluded that ZnO/MWCNTs catalyst can be potentially used as heterogeneous catalyst for biodiesel production.

Keywords: biodiesel, kesambi oil, multi-walled carbon nanotubes, solid acid catalyst, transesterification. zinc oxide.



SIlica-Cellulose Gel as Immobilization Matrix for *Pseudomonas flourescens* Bacteria

M Royanudin^{1*}, Y Utomo¹, S Wonorahardjo^{1,2}

¹Department of Chemistry, Faculty of Mathematics and Science, Universitas Negeri Malang, Malang, Indonesia ²Center of Advanced Material and Renewable Energy (CAMRY), Universitas Negeri Malang, Malang, Indonesia

*e-mail: moch.royanudin@gmail.com

Waste management, of heavy metal in particular, through bioremediation requires process optimization to improve its efficiency and effectivity. There are several methods commonly performed to improve the bioremediation process, one of which is through immobilization. This study serves as the preliminary stage in studying the use of silica material prepared from rice husk modified with cellulose of nata de coco as the immobilization matrix for pseudomonas flourescens. P. flourescens was immobilized in matrix silica with variation of contact time, while temperature reaction and stirring speed were kept constant. Bioremediation assessment of P. flourescens was carried out in cadmium standard solution. The result showed that the optimum contact time of P. flourescens with matrix silica was achieved at 30 min contact time variation, resulting in 99.19% embedding of bacteria into silica matrix. Heavy metal bioremediation process using P. flourescens immobilized in silica matrix yielded positive result, by decreasing heavy metal concentration of 10 ppm initially to 2 ppm. The result indicates that silica-cellulose matrix exhibits high potential as the immobilization matrix for P.

Keywords: immobilization, psudomonas, silica, cellulose

Preparation, Anticancer Test and Drug Release Study of Doxorubicin (DOX) Supported NaX Zeolite Againsts Breast Cancer Cells (T47D)

E K Hayati^{1*}, S N Khalifah¹, A D R Madjid¹, A Jannah¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: eloksunardji@yahoo.com

Doxorubicin (DOX) is an antracycline antibiotic that commonly used in anticancer treatment. Doxorubicin has side effects such as cardiotoxicity which can be reduced by supporting in the inorganic material. In this research, IC50 values of doxorubicin supported into NaX zeolite had been studied to inhibit the growth of breast cancer cells (T47D). Doxorubicin was supported on zeolites by the dry impregnation method with several ratios a DOX: zeolite ratio of 1:100; 2:100; 5:100. Then it was analyzed using FTIR in the way to observe the changes of doxorubicin after supported on zeolite. Anticancer activity test was carried out in vitro by the MTT method. The rate of drug release was analyzed for 24 h. FTIR analysis of the results showed that there was a new absorption band which indicates that doxorubicin has been successfully supported into zeolites. MTT test results obtained doxorubicin IC₅₀ values itself was 490 µg / mL and after supported on zeolites with several ratio 1: 100, 2: 100, 5:100 were 850, 1055 µg/mL, 440 µg/mL, 143 µg/mL and 172,981 µg/mL respectively. The concentration of doxorubicin released was directly proportional along with time.

Keywords: doxorubicin, zeolite NaX, breast cancer (T47D), MTT

ID ABSTRACT: ABS-165

Immunomodulatory Activity of Exopolysaccharides Produced by *Leuconostoc mesenteroides* Strains Isolated from Palm (*Borassus flabellifer L.*) Sap

A Ma'unatin^{1.2*}, Harijono¹, E Zubaidah¹, M Rifa'i³

¹Department of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia
 ²Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
 ³Department of Biology, Universitas Brawijaya, Malang, Indonesia

*e-mail: a_maunatin@yahoo.com

Exopolysaccharides (EPS) are polysaccharides that produced and secreted by microbes into the environment. The aim of this study was to evaluate the immunomodulatory effects of EPS given to **BALB**/c mice before induced by lipopolysaccharides (LPS) from bacteria. The EPS used was produced by two strains of *Leuconostoc mesenteroides* on different medium which were MRS supplemented with sucrose (EPS M5 and EPS M7) and palm sap (EPS N5 and EPS N7). The results of flow cytometric analysis of spleen lymphocytes showed EPS M5 and EPS M7 were able to increase cytokine production (IL-2 and TNF- α) and reduce INF- γ whereas EPS N5 and EPS N7 reduced the production of cytokines (IL-2 and TNF- α) and increased INF- γ . These results indicate that the EPS produced by two strains of *Leuconostoc mesenteroides* isolated from Palm (*Borassus flabellifer L.*) sap have immunomodulatory activity in vivo.

Keywords: exopolysaccharide, Leuconostoc mesenteroides, cytokines, immunomodulator



Adsorption Isoterm and Thermodynamic of Malacite Green on Corn Stalk (Zea mays L.) Modified Citric Acid

A F Romadhoni¹, E Yulianti^{1*}, R Mahmudah¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: enyyulianti@kim.uin-malang.ac.id

Cornstalk is one of the agricultural waste that has not been utilized. This study aims to determine the isothermic type of adsorption and thermodynamic adsorption of malachite green on citric acid-modified corn stems and determine its morphology using Scanning Electron Microscopy (SEM) and optical microscopy. The adsorption isotherm in this study follows the Langmuir isothermic adsorption type with an adsorption capacity of 87.7193 mg/g. The results of the adsorption thermodynamic parameters with values (ΔG°) -9.991 kJ/mol, (ΔH°) -18.41 kJ/mol, and (ΔS°) -0.0285 kJ/mol.K which shows that the adsorption of malachite green in cornstalk occurs spontaneously and exothermic. The morphological characterization of the cornstalk surface using SEM shows that the unmodified cornstalk has an irregular flake structure after the modification of the cornstalk is thought to have many pores and is in the form of fiber. The surface of cornstalk after adsorption of malachite green in the form of fiber and more dispersed. Optical microscope results showed that the adsorption process of malachite green occurs evenly on the entire surface of the citric acid-modified cornstalk.

Keywords: adsorbent, cornstalk, citric acid, methylene blue, malachite green

Isolation, Identification, and Bioactivity of Steroids Isolates From *Hydrilla verticillata* Petroleum Ether Fraction

A G Fasya^{1*}, S Amalia¹, B Purwantoro¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia

*e-mail: fasya.organik@kim.uin-malang.ac.id

Hydrilla verticillata contains some active compounds that potential as an antioxidant, antibacterial, anticancer, antimicrobial and antitumor. One of the active compounds in *Hydrilla verticillata* are steroids. The aim of this research was to isolate, to identify and to determine the toxicity and antioxidant activity of steroid compounds in petroleum ether (PE) fraction of *Hydrilla verticillata. Hydrilla verticillata* biomass powder was extracted by maceration using ethanol solvent. The ethanol extract was hydrolyzed with 2 N of hydrochloric acid and then partitioned with petroleum ether solvent. The steroid compounds from petroleum ether fraction were separated with Preparative Thin Layer Chromatography (TLC) and Column Chromatography. The steroid isolates were identified by UV-Vis spectrophotometer, FTIR and LC-MS to know kinds of steroid compounds. The toxicity level and antioxidant assay of steroid isolates were determined by BSLT and DPPH method, respectively. The result of the study showed that extraction through maceration produced 4.54% yield, whereas product yield of partition using n-hexane was around 65.41%. The steroid isolates from TLC and Column Chromatography separation has toxicity and antioxidant properties. Based on toxicity test, LC₅₀ value of steroid isolate was 1.41 and 12.2 ppm for TLC separation.

Keywords: *Hydrilla verticillata*, steroid, petroleum ether fraction, TLC and column chromatography, antioxidant and toxicity

Antioxidant Activity and Toxicity Test of Steroid Compound in Column Chromatography Isolates of *Chlorella sp.* n-Hexane Fraction

R A Pratiwi¹, N Maghfiroh¹, A G Fasya^{1*}, R Ningsih¹, D Yuliani¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: fasya.organik@kim.uin-malang.ac.id

Microalgae Chlorella sp. is a microscopic plant that contains various types of secondary metabolites such as flavonoids, tannins, and steroids. Secondary metabolites in *Chlorella sp.* have many benefits, as antioxidant, antitoxic, and antibacterial. This study aims to isolate the steroid compounds contained in n-hexane fraction of Chlorella sp. By column chromatography and to know the level of toxicity and its potential as an antioxidant. Secondary metabolite compounds from Chlorella sp. Was extracted using maceration method with methanol solvent. The crude methanol extract then hydrolyzed with 2 N of HCl and then partitioned with n-hexane solvent. The steroid compound was determined by Liebermann Burchard (LB) reagent. Then the separation is done by column chromatography using a mixture of n-hexane and ethyl acetate in the ratio of 95:5; 90:10; 85:15; 80:20; 80:20 and 80:20. The results of separation and monitoring with KLTA found that the isolate in fraction C showed that there was a single spot that was thought to contain steroid compounds. Antioxidant activity test with DPPH method and toxicity test with BSLT method were carried out at concentrations of 1, 2, 3, 4 and 5 ppm. Isolate C has a very strong antioxidant potential with an EC₅₀ value of 6.224 ppm. LC₅₀ value of isolate C was 7.55361 ppm. Based on the identification of isolate C using a UV-Vis spectrophotometer a maximum wavelength of 204 nm was obtained. Identification of isolate C using FTIR resulted in absorption of specific functional groups of steroid compounds such as: OH, Csp^3 -H, $-CH_2$ -, C = C, -CH (CH₃) 2 or geminal dimethyl, secondary O-H and (CH₂) 2. Identification of isolate C was also carried out using LC-MS/MS which resulted in fragmentation with m/z values of 397, 395 and 369 respectively, indicating that there were steroid compounds of β -sitosterol, stigmasterol and cholesterol levels.

Keywords: Chlorella sp, steroid, n-hexane fraction, column chromatography, antioxidant, toxicity

The Effect of Acid Variation on Physical and Chemical Characteristics of Cellulose Isolated from *Saccharum officinarum L.* Bagasse

B Fauziyah^{1,2*}, M. Yuwono³, Isnaeni³

 ¹Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia
 ²Department of Pharmacy, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
 ³Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

*e-mail: fauziyah@farmasi.uin-malang.ac.id

Saccharum officinarum L. bagasse is waste from sugarcane plants containing lignin, hemicellulose, cellulose and wax compounds. Isolation of cellulose from sugarcane can be done by acid hydrolysis of sugarcane waste and delignification with Sodium Hydroxide (NaOH). The objectives of this research were to study the effect of acid type and concentration on the physical and chemical characteristics of cellulose isolated from sugarcane bagasse. Variations of acid used were HNO₃; H₂SO₄; HCl; HNO₃: H₂SO₄ (3:1); HNO₃: HCl (3:1) and H₂SO₄:HCl (3:1). Cellulose characteristics observed were color, shape and powder properties such as Hausner Ratio, Carr's index, Angle of Repose and function group of cellulose using FTIR (Fourier Transform Infra-Red). According to cellulose standard, cellulose that isolated with HNO₃; HNO₃: H₂SO₄ (3:1); HNO₃:HCl (3:1) were white powder form. Cellulose color that obtained with other acids were beige fiber form. Nitrate optimizes the process of sugarcane hydrolysis by changing the shape of the lignin contained in the pulp into the form of nitro lignin which can be dissolved in the base. This effect can also be seen from the yield of cellulose bagasse obtained, which is 8.83 ± 0.00 (nitric acid); 6.62 ± 0.08 (sulfuric acid); 5.86 \pm 0.01 (hydrochloric acid); 8.82 \pm 0.00 (nitric acid: sulfuric acid); 8.06 \pm 0.24 (nitric acid: hydrochloric acid) and 6.20 ± 0.05 (sulfuric acid: hydrochloric acid). The results showed that hydrolysis process of cellulose with nitric acid was more effective than sulfuric acid and hydrochloric acid. Standard cellulose FTIR spectra showed peaks at 3367 cm⁻¹ for Free OH stretching of cellulose; 2901 cm⁻¹ for CH stretching of cellulose; 1373 cm⁻¹ which shows CH and CO bonds in polysaccharide aromatic ring and 896 cm⁻¹ which showed β -glycosidic linkages. Sugarcane bagasse cellulose samples that isolated with nitric acid showed peaks that correspond to standard cellulose. Hausner ratio, Carr's index and Angle of Repose values of sugarcane bagasse cellulose isolated with HNO₃ in sequence were 1.08 (excellent); 7.79 (Excellent); 50.2 (Medium). These values correspond to the standard of cellulose powder.

Keywords: Saccharum officinarum L, acid hydrolysis, cellulose, physical and chemical properties

A Comparison Study on the Synthesis of Fe³⁺ and Cu²⁺-Doped MnO₂ as an Energy Storage

W R Agustin^{1*}, I Yuliana¹, S D N Fadila¹

¹Department of Physic, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: wahyureni19@gmail.com

Manganese dioxide (MnO₂) is a metal oxide that has potential as an energy storage material. To improve the electrical properties, MnO₂ is doped with Fe³⁺ and Cu²⁺. In this study, the solgel method was used to synthesize MnO₂ with an addition of 0.05 mole of dopant. The XRD spectra showed that no impurity phase was found at the diffraction peak in the alpha-MnO₂ phase. However, the addition of Fe³⁺ causes peak intensity decrease, thereby causing an amorphous phase. SEM results show the morphological structure with the same average grain size, with a range of 34-59 nm. Doping Fe³⁺ and Cu²⁺ can increase the conductivity, permittivity, and capacitance of materials. This is due to differences in atomic radii and the number of valence electrons between MnO₂ and dopants, which affect the ion migration. The conductivity and capacitance of MnO₂ doped Fe³⁺ are higher than Cu²⁺ doping.

Keywords: manganese dioxide, doping, energy storage, conductivity, capacitance



Synthesis of CaTi_{10.95}Fe_{0.05}O₃ and CaTi_{10.9}Fe_{0.1}O₃ Material using Molten Single Salt NaCl Method

D R Novianti¹, A D Prasetiyo¹, S N Khalifah¹, A Prasetyo^{1*}

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: antoniaprasetyo@gmail.com

Calcium titanate (CaTiO₃) is one of material that belongs to the perovskite structure family which has the potential as a photocatalyst material. The photocatalyst activity of CaTiO₃ is only working at ultraviolet area, therefore, it was required to improve it. One of strategies to improve the photocatalytic activity is doped with metal such as Fe, Cu, and Zr. In this work, CaTiO₃ compounds were doped Fe using molten single salt NaCl method. Based on *X*-ray diffraction data, CaTi_{10.95}Fe_{0.05}O₃ and CaTi_{10.9}Fe_{0.1}O₃ were successfully obtained without impurities. DRS UV-Vis data showed a change of the absorption pattern due to doping with Fe³⁺.

Keywords: CaTiO₃, Fe, molten salt method, NaCl



Synthesis of Gallium (III) Doped Mesoporous Titanium Dioxide Using Sonochemical Method

Y S Dewi¹, A M Atsabiti¹, N Aini¹, A Prasetyo¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: yolandasintiadewi@gmail.com

TiO₂ is one of semiconductor oxide materials that have very good efficiency to be used as photocatalyst. However, TiO₂ is less active in visible radiation which is the main component of sunlight. Modification of TiO₂ by the addition of gallium as dopant and CTAB surfactant as structure-directing template can increase the photocatalytic properties of TiO₂. Gallium (III) 0; 0.5; 1; 1.5; and 2% doped mesoporous TiO₂ have been successfully synthesized using sonochemical method with calcination temperature at 450 °C. The physico-chemical properties of all the synthesized photocatalyst were determined by XRD, FTIR, DRS, N₂ adsorption-desorption, and SEM-EDX. Gallium (III) doped mesoporous TiO₂ was identified having single anatase phase with space group I4₁/amd. 1 wt% Ga–Mesoporous TiO₂ exhibited the best synthesized photocatalyst due to the lowest band gap energy value (2.88 eV) that equivalent with 429 nm, therefore it has good response in the visible range than others.

Keywords: Ga-Meso TiO₂, CTAB, sonochemical method



Synthesis and Characterization of Faujasit Zeolite from Blitar Kaolin with the Addition of Organic Template

R E Hardianty^{1*}, A R Elendra¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: rumaishaeka34@gmail.com

Zeolite NaX was successfully synthesized from Blitar kaolin using a hydrothermal method with the addition of organic templates. Silica and alumina from Blitar's kaolin are the main sources of NaX zeolite synthesis. The synthesis process was carried out in two ways: (a) activation of kaolin into metakaolin through the alkaline fusion method with the addition of NaOH (b) zeolite synthesis through hydrothermal method using temperature of 100 °C for 2 h. Alkaline fusion process was carried out using weight ratio NaOH/kaolin 2:1. The mixture was calcined at 600 °C for 1 h. The zeolite NaX was synthesized through variations of organic templates, they are TMAOH (tetramethylammonium hydroxide), TMABr (tetramethylammonium bromide), and CTABr (cetyltrimethylammonium bromide). Organic template with the best synthesis results then performed a molar ratio variation of 0.5; 0.7 and 1. The results of XRD analysis show kaolin and quartz impurities turned into sodium silicate and few metakaolins after the alkaline fusion process. SEM result shows the change in morphology of kaolin with multi-layered plate into metakaolin with an irregular/amorphous shape after the process of alkaline fusion. FTIR spectra which indicate the changes of kaolin into metakaolin is characterized by the disappearance of absorption at area 912 and 797 cm⁻¹ in the spectrum of metakaolin. The synthesized zeolite NaX has absorption in the regions of 996, 750, and 567 cm⁻¹ which are the typical peaks of zeolite faujasite. XRD data shows that zeolite NaX was successfully synthesized with a mixture of sodalite when using TMAOH template, mixture of sodalite and NaY when using TMABr and CTABr. Zeolite NaX with the best crystallinity was found in addition (TMA) 20 molar ratio 0.7, while in the molar ratio 0.5 and 1 crystallinity NaX zeolite was reduced.

Keywords: Zeolite NaX, organic templates, alkaline fusion, hydrothermal method







The Diversity and Abundance of Mammals in The High Conservation Value Forest in Palm Oil Plantation, Solok Selatan, West Sumatra

M Fadhillah^{1*}, W Novarino², J Supriatna¹

¹Department of Biology, Universitas Indonesia, Depok, Indonesia ²Department of Biology, Universitas Andalas, Padang, Indonesia

*e-mail: maya.fadhillah@gmail.com

The high conservation value (HCV) is the remaining forest area in palm oil plantations to be maintaining biodiversity, especially any species of mammals. This study aimed to reveal the diversity of mammals in the HCV area of Solok Selatan oil palm plantation near Kerinci Seblat National Park, West Sumatra. The observation was conducted using camera traps that had been installed in six locations during the year of 2016-2018. Data analyzed both quantitatively and qualitatively. A total of 26 mammals' species were recorded using camera trap in this study. The species were divided into six order: Artiodactyla (n=6), Carnivora (n=9), Perissodactyla (n=1), Primata (n=5), Rodentia (n=4), dan Scandentia (n=1). Based on the capture rate, several species showed a high abundance such as Macaca nemestrina (relative abundance indeks/RAIi=32.18), Sus scrofa (RAIi=8.32), Muntiacus muntjak (RAIi=7.70), Hystrix brachyura (RAIi=6.12), and Sus barbatus (RAIi=5.69), while the lowest was Prionodon linsang, Arctictis binturong, and Paradoxurus hermaphrodites (RAIi=0.03). To know the role of HCV for the sustainable palm oil industry, it takes more research specifically related to the diversity and abundance of mammals in the palm oil plantation.

Keywords: camera trap, mammals, palm oil



Analysis of Hydraulic Sluice Gate Sapon-Intake in Progo River Yogyakarta Specail Region (D.I Yogyakarta)

P Nuryanti^{1*}, D Legono²

¹Departement of Landscape Architecture, Faculty of Agriculture, Institut Pertanian Bogor, Bogor, Indonesia

²Departement of Civil Engineering, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia

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

Progo River is a source of water from one of the harvest to irrigate the DIY irrigation network. Sapon area of 2250 Ha, by tapping water from Progo through Sapon intake. In order for the water requirement for Sapon irrigation area can be fulfilled according to the demand of water debit based on the water needs of System Planning (August - Jul planting pattern) and Alternative water supply (Oct - Sep). Hence it is necessary to operate the technique on the door Sapon intake by re-analyzing the Sapon intake watergate in terms of hydraulics. The method used is field observation by conducting interviews and hydraulic analysis watergate by analyzing water door height (ha). From the analysis results obtained for the intake operational system based on the water demand system planning (planting pattern Agust - Jul) to be more efficient 4-door openings are not necessary because 1, 2 and 3-door openings meet the requirements for operational intake doors with high door openings https://www.height.com and alternative water demand system planning (Planting pattern Agust - Jul) to be more efficient 4-door openings are not necessary because 1, 2 and 3-door openings meet the requirements for operational intake doors with high door openings https://www.height.com and alternative water demand system planning (August - Jul) to be more efficient 4-door openings are not necessary because 1, 2 and 3-door openings meet the requirements for operational intake doors with high door openings https://www.height.com and alternative water demand system planning (August - Jul planting pattern) is more efficient than the intake door operation based on alternative water demand (Oct - Sep). From the results of the analysis can be concluded that Sapon intake capable of flowing water in accordance with the required discharge.

Keywords: hihidrulyc, sluice, intake



Design Concept of Community Pesantren Development in Sumberpucung Malang Using Simbiosis Architecture Approach

B R S N Nurwana^{1*}, **T Isnainiah¹**

¹Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indoensia

*e-mail: nurwana18@gmail.com

Today's education is a necessity and obligation for every individual human being, both early childhood education and adulthood, in essence education seeking knowledge is not limited to old age. People's boarding schools are present in the concept of a new boarding school that develops among ordinary people that accommodates all circles, both early age to old age. The people's boarding school aims to humanize humans, become human beings who are more populist and dignified. The design of the development of the people's boarding school is expected to facilitate the needs of the people's boarding schools in order to realize better Islamic boarding schools in architectural design. Public boarding schools exist in socializing with the community, promoting community empowerment infiltrated with religion and culture, public schools have jargon. "We learn, we teach and we give the title. from the continuation of the people with santri who always symbiosis between the two who did not dominate among them, the designer had an idea in the approach to choose the Symbiosis Architecture approach. Symbiotic architecture moves on the principle of more than different dualism that unite and relate to each other. The principle of symbiosis applied in this design is Intermediary space, Hybridization, and Symbolization. The principle of symbiosis is integrated with the values of Islam which results in the concept of "Unified, empowered, and Bertqwa, hoping that later this design will be able to unite the community with the community, santri with santri, and the community with santri. To be more empowered to be able to understand the situation with one another and be able to fight together to remain devoted to Allah SWT. United in the design site provides intermediary space, namely the square as a unifying space between different cultures, hybridization presents the gazebo and pendopo spaces as communal spaces and symbolization present new symbols of one culture with other cultures that are focused on devotion to Allah SWT.

Keywords: islamic boarding school, domestic, symbiotic architecture



ID ABSTRACT: ABS-67

Application of Sensory Therapeutic Design Approach to Maternal and Child Hospital Design in Kecamatan Sumbermanjing Wetan

D S Alim¹, I Nur F¹, N Junara^{1*}

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: nunik.junara@yahoo.com

Despite Indonesia has high population, but it still has a big problem with the prosperity level because of the number of maternal and infant mortality rates. it is due to the limited number of health facilities in the subdistrict. For this reason, the development of health facilities that aims to increase awareness and the ability to live healthy in order to realize the optimal degree of public health is needed. One of the health facilities that can meet these needs is Maternal and Child Hospital. This facility can function as a place for health services as well as a place for health education, especially regarding maternal and child health. Apart due to the limited number of health facilities, psychological problems of patients can worsen the process of pregnancy until postpartum. Therefore, the building is designed as psychological and physiological therapy tool. The Sensory Therapeutic approach is one alternative approach that can solve the problem. Sensory Therapeutic must stimulate 5 types of senses, namely touch (skin/nerve), vision (eyes), smell (smell), taste (tongue), hearing (ears). Building design will also be adapted to the culture and manner of Islam in treating pregnant women and children and government regulations of hospital building. The implementation of these values can be seen from the floor plan design that follows the flow of activities and hijab values. in addition, interior designs and therapeutic parks are using natural materials and vegetation with a variety of textures, colors, and odors.

Keywords: maternal and child hospital, sensory therapeutic, Islamic value
Community Accompaniment at RW 16, Mangliawan Village, Pakis District, Malang Regency to Create a Clean and Green Environment

S Bekti^{1*}, A A Pangestuti¹, E Fitrianifitriani¹

¹Institut Keguruan dan Ilmu Pendidikan Budi Utomo, Malang, Indonesia

*e-mail: susilobekti2006@gmail.com

One of the environmental problems faced by Malang Regency is the high amount of garbage generated by the community every day. The regions that are the biggest contributors for garbage are Singosari and Pakis Districts. RW 16 in Mangliawan Village is one of the areas located in Pakis District. The main problems happening in the region were the level of awareness and understanding of community in managing garbage were still low and the environment was arid and hot. The solution to overcome this problem was to invite the community to conduct a comparative study. The other activities were to provide accompaniment to community of RW 16 to manage waste and to plant TOGA (family medicinal plants) and vegetables. The program has been able to increase the community's awareness and understanding to manage garbage, in addition, it can motivate community so that they are willing to grow TOGA and vegetables in order to create a green environment.

Keywords: community accompaniment, garbage, TOGA, clean and green



Enterprise Architecture Zachman Framework in Ma'had Sunan Ampel Al'aly

I Sabrina¹, F Y A Hidayatollah¹, S D Granita^{1*}

¹Department of Informatics Technology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: selvigranita@gmail.com

Ma'had Sunan Ampel Al'aly (MSAA) is an educational institution under the auspices of the State Islamic University of Maulana Malik Ibrahim Malang. This institution aims to condition the formation of academic culture and the development of religious knowledge for students of Maulana Malik Ibrahim State Islamic University of Malang. Ma'had Sunan Ampel Al'aly has many fields that regulate the affairs of ma'had, and therefore requires a system that can help in managing MSAA. Designing a system can also be known as Enterprise Architecture (EA). Enterprise Architecture is a management practice to design a system that can maximize a company's resources to achieve its performance goals. Zachman Framework is a framework of enterprise architecture models most widely known and used. An understanding of this framework is useful in determining the appropriate method of architecture in a system design. In this study Enterprise Architecture using the Zachman Framework method can help design a management system on Ma'had Sunan Ampel Al'aly (MSAA).

Keywords: enterprise architecture, Zachman framework



Characteristics of Petung Bamboo as the Main Structure of Wide Span Bamboo Hall Building at Gubukklakah, Poncokusumo, Malang

S M A A Busthomy^{1*}, S A Husna¹, M A Bahar¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: wijaya0776@gmail.com

Dendrocalamus asper, or commonly known as "petung bamboo", is one of the local bamboo varieties that has a thick and wide stem perimeter. Based on its characteristics, petung bamboo has always been the ultimate choice to be utilized as the primary structure of bamboo buildings from a small span building until a wide span building. Nevertheless, there is limited access to the literature which studies the petung bamboo as the primary structure of wide span buildings. This problem had gained our attention to conduct examination and further study. The examination and analysis of petung bamboo as the primary structure in Gubukklakah Hall building is crucial, due to the structural material recommendation for the architectural design in the future. This study was focusing on the examination of petung bamboo's characteristics as the primary structure of wide span buildings. There are several methods used in this study such as the qualitative method, literature studies, and case studies. Three important aspects will be discussed in the petung bamboo as the primary structure of the wide span building study framework: characteristics, strength, and on-site application. Hopefully, the study framework can give a positive contribution to Indonesian architecture development in terms of analytical data and documentation from petung bamboo as the primary structure in Bamboo Hall Building.

Keywords: structure, wide span, petung bamboo, characteristics



Store Facade Renovation for Heritage Architecture

A R Setiono^{1*}

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: arsetiono@gmail.com Indonesia

The facade of architecture is an element that looks straight in the eye. From here, it is known that the shape on a work of architecture can convey meaning to people visually. The making of architecture is crucial to the success of the architecture, including the architecture of the beauty shop. The beauty shop is in heritage conservation area in Malang. Heritage meanings were contained either in the form of architecture as a whole, as well as the symbolic elements that exist on the object architecture. This study interprets the heritage architecture on facade building design store. Studies mainly in the facade of buildings. This study used a qualitative method approach descriptive-interpretative. The data obtained through field observations by directly observing the object, recording to examine and to study documents/literature where the study was conducted by studying books and literature, research results, notes and especially with regard to the architecture of the Heritage and sustainability building.

Keywords: Façade, interpretation, architecture, heritage

Study of House Orientation and Their Pcalment towards Sustainable Islamic Residential Area

N Junara^{1*}, E Mutiara¹, S Senjana¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: nunikjunara@arch.uin-malang.ac.id

Indonesia is a country that is full of dynamics in its physical development. Within the city rapid development growth, there are existing kampungs preserved with their high cultural and traditional potentials quietly settled within the modernisation. Muslim kampungs are one of the traditional settlements embedded with significant Islamic characteristics. Today, the traditional settlement, including the Muslims Kampong are under threat due to Indonesian urban sprawl and formation. Religious factors or beliefs are one of the factors that determine occupational typology. In traditional societies, this is a dominant factor signifying their community identity. Research indicators include nature of law, faith in religion and culture, design principal from Syariah law and social principal. This study aims to explore the relationship between traditional settlement patterns with religious influences, especially Islam, in Indonesia through house orientation and their placement. This paper adopts a content analysis methods in order to achieve the research objective on Islamic housing typology through four prominent scholars in housing study. Analysis method does with on-screen digitization to indicated orientation and their placentation houses. From the content analysis, it is learned that the orientation and placement of houses has a significant relationship with the Moslem worldview. The mosque is the centre of orientation for community activities in Moslem kampungs. The existence of mosques and pesantren is one of the factors forming the orientation of residential Moslem area. This study enhances the existing literature on the importance of house orientation and their placement in the Moslem residential area.

Keywords: Moslem kampungs, housing orientation, sustainable Moslem residential



Rebranding Effort for Public and Private Territories in the Riverbank Settlements of Kampung Tridi Malang

A Subaqin^{1*}, T Kusumadewi¹, I Faqihuddin¹, A Z Husna¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: agussubaqin2014@gmail.com

The Tridi village of Malang, located in East Java Indonesia is one of the residential areas located on the banks of Brantas River. This area used to be a slum setllement with compact living community, received less maintenance and facilities from the local authority. This paper discusses on the results of rebranding effort of Tridi village as the riverbank residential area as an important tourist attractions in Malang. Territories are an important part of survival, not only in terms of physical characteristics, but also social comfort that can be achieved through house setting, space organization and its wholistic spatial planning. Territories in architecture are human boundaries as living things that have interests, identities and defenses against the intervention of others. The territoriality character of space can be seen from the components of fix and semi fix which become the magnet of the emergence of activities and are formed from the agreement of the community. This study uses the content analysis method based on literature studying on space territory in residential areas with variables; stipulation of organization and spatial planning, identity and agreement in the community or community. The results of this study indicate that the territories of public and private spaces in the Tridi village area after rebranding have changed the boundaries and characteristics of space territory caused by changes in the function of the area as a tourist village. This study informs on the importance of rebranding the slump settlement into a productive and active local tourism product.

Keywords: Re-branding, physical territory, human settlements, river bank residential, local tourism, community based tourism

Contribution of Bamboo Materials in Architecture Education towards Sustainable Community Development

L Maslucha^{1*}, Y E Putrie¹, S Rahma¹, A N Handryant¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: lulumisbach05@gmail.com

Bamboo is one of the natural recources that easily can be found in forest, villages, and riverside area in a tropical country like Indonesia. Bamboo is a common and potential material that can be developed in people community. On the other hand, architecture education in Indonesia has less focusing on bamboo as part of the architectural design material. In architecture education, bamboo just introduced as one of natural material for architectural design. Even though, bamboo has many potential functions for the architectural design aspect, such as interior material, exterior material, structural material, etc. The used of bamboo rarely found for one of typical design studio in architecture education. Architecture education should improve the methodology of design studio not only introduce bamboo as a material, but also practice bamboo for a design studio. Architecture education is a potential way to introduce and educate bamboo for sustainable community development because an architect is a profession that has a relationship with people. Bamboo is one of material that adequate people towards sustainable community development. This paper adopts analysis content to achieve the research objective on the contribution of bamboo materials in architectural education for sustainable development. With the right methodology design studio using bamboo, will resulting architects that can educate people aware to using of bamboo, towards sustainable community development.

Keywords: bamboo materials, architecture education, sustainable community development

Socio-Ecological Perspective in Nusantara Architecture Knowledges Construction

P P Wismantara^{1*}

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: Wismantara16@gmail.com

Discourse that emerged in the West today is awareness of repairing environmental damage, so that in the realm of architecture emerges discourse about eco-architecture, green architecture and sustainable architecture. Unfortunately this effort to improve the environment is only partial individualistic, which ignores the natural and built environment around the building. Meanwhile, some local architecture in Nusantara shows awareness that architecture has a locality character and exists together with the human community and with the surrounding natural and built environment. This paper seeks to formulate the principles of knowledges construction in Nusantara Architecture which are based on socio-ecological aspects. The hope is to form an architectural strategy that directs architecture to human society and the surrounding environment in the knitted equilibrium system, which has a Nusantara character. This strategy can at least create a new architecture that is contextual, sustainable, and can answer the problems of humanity and the environment in the contemporary Nusantara. The method used is descriptive criticism, which seeks to expose the facts as they are, and is based on logical considerations, empirical experience, and intuition. In this study, a number of layers of Socio-Ecological characters in the Nusantara Architecture are raised with each other, namely Sunatullah (natural law), humanity, locality, togetherness-prosperity, and togetherness.

Keywords: socio-ecology, Nusantara architecture, knowledges-construction, equilibrium



Aquaponic: From Innovation of Hobby Lead to Food

R S Sundari^{1*}

¹Faculty of Agriculture, Universitas Perjuangan, Tasikmalaya, Indonesia

*e-mail: ristina.sitisundari@yahoo.com

Make farming throughout the aquaponics system is implemented most as an innovative hobby. In progress, this hobby activity has given another benefit such as food sovereignty achievement at least by themselves, in addition to economically and health of the family. This research was intended to analyze food sovereignty created by aquaponics as innovation hobby. The research method used SWOT and IE Matric Analysis. The result determined that for those any priority strategies as followed: upgrade any insight deal with aquaponics, socialize aquaponics system either as hobbies or commercial, increase aquaponics yield consumption and consumer expendable, implement the food health and sovereignty by aquaponics, upgrade smart agribusiness capacity to enhance distribution channel and procure lower start-up cost.

Keywords: farming, aquaponics, food sovereignty



Organic Architecture Approach in Designing a Surabaya Zoo

A C Hardiwibawa^{1*}

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibhrahim Malang, Malang, Indonesia

*e-mail: airlanggachw@gmail.com

This has been done well by the Surabaya Zoo for 100 years to preserve animals. However, in recent years there have been many cases of wildlife deaths that have decreased the quality of animal life. The problems need to be solved, in this design using the synthesis analysis method. The analysis is done on the form, site, space, structure, and utility using the principles of organic architecture according to Frank Lloyd Wright's theory, among others: 1) Satisfy social, physical, and spiritual, 2) Flexible and adaptable to the environment, 3) Exist in the Continoust present and future. The theme of organizational architecture is acting as the basis of consideration in deciding the design alternatives offered. The alternative design is judged on the aspects of organic architecture that aligns buildings with nature, as well as interiors, landscape environments, and interconnected building locations. The result is a redesigning concept to be able to restore its good image in Indonesian and foreign communities. The environmental potential of the Surabaya Zoo can be optimized by improving existing facilities and infrastructure. Restores poor image with the abundance of wildlife deaths. It can be improved by optimizing Indonesia's endemic animal conservation as the new face of Surabaya Zoo. Organic theme determination can serve as a platform for organizing all the needs of infrastructure and facilities in the Surabaya Zoo.

Keywords: organic architecture, design, zoo



The Eco-Cultural Approach Integrating Islamic Values with Artha Wantilan Concept on The Fish Market Design in **Kedonganan Bali**

M Jannah¹, E Mutiara¹, T Kusumadewi^{1*}

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: tarra_nita@arch.uinmalang.ac.id

Bali is an island that has many coastal areas, one of is Kedonganan and there is a fish market that is quite famous among the surrounding population and the tourists. The object of design in the form of redesigning the Fish Market is associated with an eco-cultural approach, namely an approach that takes into account the continuation of nature and also local culture, namely traditional Balinese Architecture. Traditional Balinese architecture is very closely related to the teachings and beliefs of Hinduism. Many of the values contained in traditional Balinese architecture are based on values in Hinduism through the application of various principles of forms that contain the identity and architectural values. The application of traditional architecture to modern buildings is one example of a market. However, there are a number of values in Hinduism that contradict the values in the Islamic religion. In this journal, we will explain about applying the concept of art that is integrated with the value of Islam in the design of fish market buildings in Kedonganan. The values of the Islamic integration argument are used to examine aspects adapted to the Artha Wantilan concept based on the characteristics of Bale Wantilan, so that its application in the design of the fish market still contains elements of Balinese architecture and remains integrated with Islamic values. The method used is descriptive qualitative, by collecting the literature review, examining several aspects related to the object of research, and applying the results of the study in object design. So that the results of this study are able to know the shape of the roof, building body and foot of the building and ornaments that are applied and have been adapted to the needs of the fish market building and also integrated Islamic values.

Keywords: Artha Wantilan, fish market, Islamic integration, traditional Balinese architecture, semi-open



The usage of Bamboo Material as An Aesthetic Finishes towards Green and Environmentally Friendly Architecture

S Rahmah^{1*}, L Maslucha¹, A N Handryant¹, Y E Putrie¹, V R Akbar¹

¹Department of Architecture, Faculty of Science and Thecnology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: sukma.az@gmail.com

Indonesia is one of the tropical countries that has 63.7% of its land use covered with forest. Bamboo is one of the local materials used by the traditional community. However, bamboo is starting to be recognized as one of the important materials for green and friendly architecture. Bamboo is easy to be processed because bamboo is natural material and environmentally friendly. The characteristic of bamboo is dynamic, aesthetically pleasing with its natural look. Therefore, bamboo with these unique characteristics can be applied to the exterior and interior design finishes such as roofs, floor, walls, ventilation, and furniture. Bamboo and its values enriching space design and has the ability to be combined with other design materials and finishes. This paper intends to investigate the usage of bamboo material as an aesthetic finishes towards green and environmentally friendly architecture. The content analysis is adopted in this research. Descriptive analysis is also used as part of the methodology. The results of this study inform that bamboo is one of the most preferred materials by the architects in Indonesia. It is among the best sustainable construction materials and able to work as a renewable resource. This study encourages bamboo materials to be used in the green and sustainable architecture as this effort will reduce forest cutting in the tropical country of Indonesia.

Keywords: the usage, bamboo, environmentally friendly architecture, natural material



Application of Islamic Architecture Approach on Designing Integrated Hajj Dormitory of Malang City

Ayuningtyas^{1*}, N Jannah¹, E Setyowati¹, A Y Firmansyah¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: nanaarchi17@gmail.com

The design of the integrated haj hostel in Malang is a design that facilitates preparatory activities before the departure of the pilgrimage. The design is located in Malang City which is the second-largest city in East Java after the city of Surabaya. Every year the city of Malang departs hundreds of pilgrims to perform the fifth pillar of Islam in the city of Mecca and the city of Medina. So far, preparatory activities before the pilgrimage are carried out in places that are not suitable for their use, such as on the school or university grounds. Along with the increasing number of pilgrims who depart each year requires Malang City to provide a place that accommodates the Hajj hostel uses linear qualitative analysis where the design analysis is supported by various data collections related to the formation of the basic idea of the design. This design implements Islamic architecture that produces a design with a strong, not excessive, efficient, and prioritizes comfort and safety.

Keywords: Hajj, dormitory, Islamic architecture, integrated



Sidoarjo Mud Volcano Memorial Park

S Abidah^{1*}, N R E Pitrayunsaharuun¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: say.abidah@gmail.com

Sidoarjo mud volcano is a hot mudflow incident due to a leak in a drilling well carried out by PT. Minarak Lapindo Brantas. Based on the data that released by BPLS in 2013, the facts in the site showed that due to the hot mudflow, it had drowned some parts of Sidoarjo regency, approximately 601 ha. This study aims to provide design ideas formed as site concepts and memorial facilities which include education, recreation, and documentation functions with the memory and the making of places approach. This study uses qualitative methods using primary data formed as observational studies and secondary data formed as object studies and approach literature. Then the data were analyzed by linear methods formed as function, space, shape, and site. The design concept was obtained from the results of the analysis by applying the principles of the approach. The results of this study are suggestions of design concepts appeared as site, spaces, and shape concepts applied in the design of the Sidoarjo mud volcano memorial park in the hope of providing memorial facilities to the people of Sidoarjo especially after the Sidoarjo hot mudflow incident.

Keywords: Sidoarjo mud volcano, memorial park, memorial, memory, making of places

The Application of Ecological Architecture in Designing Hotel Resort of Lenggoksono Beach

R A Faulia^{1*}

¹Indonesia

*e-mail: fauliara12@gmail.com

Indonesia is a country which has many natural tourism potentials, such as beach, mountains, waterfall tourism, etc. One of the examples is in Malang District that has many tourist attractions which are often visited by local and foreign tourists. However, from all natural tourism potentials owned by Malang District, they haven't been supported with adequate infrastructure, especially littoral. It is because access to south beach is rather difficult for some location points and the location is also far from downtown, in which there is still minimum beach facilities and infrastructures, especially for proper and comfortable hotel. Therefore, it is needed comfortable and proper hotel which has good view of wave character and the beach is perfect surfing. The ecology approach is chosen to customize the object and the location, so that it can be built comfortable, adequate, environmental friendly resort hotel and ecology approach can minimize natural damage. Furthermore, adventure living concept is also applied in designing resort hotel so that visitors can feel different trips like adventuring in wild nature.

Keywords: ecology, design, Architecture





The Combustion Step and the Change in the Final Length of Combustion in Jatropha Oil by Increasing the Spray Pressure

A Wibowo^{1*}

¹Universitas Pancasakti Tegal, Tegal, Indonesia

*e-mail: aguswi1@gmail.com

Increased pressure on jatropha oil with a spray combustion process with a pressure of 1700 psi, 1900 psi and 2100 psi results in different stages of combustion. At a pressure of 1700 psi produces two stages of combustion, at a pressure of 1900 psi it produces three stages of combustion and at a pressure of 2100 psi produces four stages of combustion. By using a high-speed camera, the results of changes at the end of the combustion are obtained, which is the reduction in the length of the spray combustion flame. This shows that combustion in jatropha oil leaves burning fatty acids slowing down so that in combustion the jatropha oil spray leaves the burning crust.

Keywords: jatropha oil, spray combustion, stages of combustion

Utilization Photovoltaic as a Source of Hybrid Power Plant in Celagen Island

I Susanto¹, W Sunanda^{1,2*}, R Kurniawan¹, R F Gusa¹, F Arkan¹

¹Department of Electrical Engineering, Universitas Bangka Belitung, Bangka, Indonesia

²Research Centre for Energy and Information Technology, Universitas Bangka Belitung, Bangka, Indonesia

*e-mail: wahrisunanda@gmail.com

Celagen Island is one of the outer islands in Bangka Belitung Islands Province. It is located in South Bangka Regency with a population of 1234 inhabitants. To meet the electrical energy needs of 1604 kWh/day, currently supplied from the diesel power plant. A modeling of photovoltaic-based hybrid power plants and diesel power plants is designed to reduce the operational costs of a diesel power plant. The most economical modeling is the supply of 72% of the electricity from the diesel power plant and 28% of the electricity from photovoltaic.

Keywords: hybrid, photovoltaic, diesel power plant



Selected Purple-Fleshed Sweet Potato Genotypes with High Anthocyanin Contents

E Ginting^{1*}, R Yulifianti¹, F C Indriani¹

¹Indonesian Legumes and Tuber Crops Research Institute, Malang, Indonesia

*e-mail: erlianaginting@yahoo.com

Purple-fleshed sweet potato is rich in anthocyanins that is beneficial for health due to its antioxidant activity. Therefore, 13 promising genotypes of purple-fleshed sweet potato and two improved varieties as checks (Antin 2 and Antin 3) were studied their physical, chemical and sensorial characteristics. The results showed that the flesh colours ranged from purple, deep purple to white purplish, which their lightness colours (L*) negatively correlated with anthocyanin contents (R2 = 0.65). Antin 3 had the highest content of anthocyanins (177.48 g/100 g fw), while the lowest value was seen in MSU 10001-32 genotype (27.01 g/100 g fw). None of the promising genotypes contained anthocyanins higher than Antin 3, however RIS 10051-01 had similar anthocyanins content (155.47 g/100 g fw) to that of Antin 2. Two deep purple genotypes, MSU 10010-43 and MSU 10002-26 had dry matter contents (33.43% and 37.85%) similar and higher than that of Antin 3, while MSU 10021-26 and Antin 2 had the same dry matter contents, suggesting that they are suitable for flour processing. A variation of 2.52-5.15% dw; 52.86-70.49% dw; 1.90-7.56% dw and 17.59-24.17% dw were noted for ash, starch, reducing sugar, and amylose contents between genotypes. High anthocyanins is normally associated with bitter taste, however the steamed tubers of deep purple genotypes, namely MSU 10010-43 and Antin 3 were fairly liked for their colour, texture and taste attributes. MSU 10001- 15, the white purplish genotype showed slightly higher scores than those of two genotypes, suggesting that the three genotypes are tailored for steamed food purposes.

Keywords: anthocyanins, food, purple-flesh, sweet potato.

Applying Material Flow Analysis for Estimating the Amount of Personal Computers E-waste

R Siringo¹, H Herdiansyah^{1*}, R D Kusumastuti²

 ¹ School of Environment, Universitas Indonesia, Jakarta Pusat, Indonesia
 ²Department of Management, Faculty of Economics and Business, Universitas Indonesia, Depok,Indonesia

*e-mail: herdis@ui.ac.id

The fourth industrial revolution has triggered an increase in the demand for information and communication technology equipment. Computers are useful in modern days and it is reflected in the ownership of these technological appliances which experienced steady growth in recent years. In 2017, about 20% of Indonesian households possess these particular electronic devices. This raising demand undoubtedly will correspond to the escalating volume of computer waste. Furthermore, it raises concern since valuable as well as toxic materials are embedded in e-waste. On the other hand, proper e-waste management is absent in the country. The current study aims to quantify the amount of e-waste generated from these particular technological devices in this country by applying material flow analysis. The flow model is developed based on data on household ownership of computers and it corresponds to the previous study that indicated if obsolete computers are donated (42%), sold (33%), stored (17%), or recycled (8%). The 10 years prediction shows that in 2019 and 2029 the amount of e-waste in the country is about 172.tons and 296 tons respectively. It portraits how the amount of e-waste will continue to increase, therefore, it is imperative to design and implement sustainable e-waste management.

Keywords: e-waste, material flow analysis, personal computer, e-waste management, Indonesia

Degradation Kinetics of Methylene Blue with Photocatalyst TiO₂

F Nurfiana^{1*}, N A Kundari¹, A Aban¹

¹Polytechnic Institute of Nuclear Technology, National Nuclear Energy Agency, Sleman, Indonesia

*e-mail: fifi.nurfiana@batan.go.id

Titanium dioxide (TiO₂) as solid semiconductors in the form of thin films or suspended particles have been proposed as an environment-friendly photocatalytic process for removing pollutants from gas and liquid streams. In this research we are conducting an investigation photocatalytic activity of commercials TiO₂ Tiona. Photocatalytic activity examined under UV light illumination with air bubbling. The purpose of this study is to determine the effect of mass of TiO₂ and to determine the kinetics of Methylene Blue degradation as a model pollutant of water. Material TiO₂ Tiona weighed with a certain mass is added to 10 ppm Methylene Blue then adsorbed for 30 minutes in the dark condition and recorded as the initial point (t=0 minutes). The mixture was photocatalically degraded in the photoreactor for 210 minutes and 7 samples were taken in 15, 30, 45, 60, 90, 120, and 210 minutes. Samples centrifuged and analyzed by UV-Vis spectrophotometer to determine the concentration. The results of this study showed that the most effective mass of TiO_2 is 0.4 g in 100 mL of 10 ppm Methylene Blue with the highest percentage of degradation is 99.717% at time, t = 120 minutes. After ploting the kinetics model of order 0, order 1, order 2, parabolic-diffusion, and modified Freundlich, it can be concluded that the kinetics model of Methylene Blue degradation follows the second-order kinetic with regression, $R^2 = 0.9988$ and the constant reaction rate, k = 0.0048L. mg⁻¹ min⁻¹.

Keywords: TiO₂, kinetics, waste, degradation

New Compounds of Pregnanone from *Calotropis gigantea* Roots Actively against Colon Cancer Cell WiDr through Cell Cycle Inhibition

R Mutiah^{1,2}, A Widyawaruyanti^{3,4*}, Sukardiman³

 ¹Departement of Pharmacy, Faculty of Medical and Health Sciences, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Malang, Indonesia
 ²Graduate Program, Faculty of Pharmacy, Universitas Ailangga, Surabaya, Indonesia
 ³Departement of Pharmacognosy and Phytochemistry, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia
 ⁴Institute of Tropical Disease, Universitas Airlangga, Surabaya, Indonesia

*e-mail: aty@ff.unair.ac.id

Calotropis gigantea (L.) W. Aiton (C. gigantea) is a medicinal plant that has been empirically proven to have anticancer activity. In a previous study, it was reported that the fraction of ethyl acetate from the root part of C. gigantea has higher anticancer activity than the other fractions. It suspected that the ethyl acetate fraction of C. gigantea root contains active compounds that are responsible for the anticancer activity. This study aims to determine the anticancer activity of active compounds from the ethyl acetate fraction of C. gigantea root regarding induction of apoptosis, cell cycle arrest, Expression of caspase-8 colon cancer cell WiDr. Isolation of the active compounds from the ethyl acetate fraction of C. gigantea root was carried out using Bioassay-guided Isolation method. Identification of active compounds was using NMR-1H, NMR-13C, HMBC, HMQC and UPLCMS / MS methods. The anticancer activity test of the identified compounds performed by using MTT method. The induction of apoptotic and cell cycle arrest evaluated by a flow cytometry method. For the results of this study, two active compounds were identified namely (1) (Pregnanon-5-en, 3,14,17 trihydroxy-12- (4'-cyclohexyl benzoate) -, (3β, 12β, 14β) - (9CI) , (2) Pregn-5-en-20-one, 3,8,14-trihydroxy-12 - [(4'-hydroxy benzoyl) oxy] -, $(3\beta, 12\beta, 14\beta, 17\alpha)$ - (9CI). Both compounds inhibited the growth of colon cancer cell WiDr with IC50 values consecutively were 15.89 μ g / ml and 0.77 μ g / ml. Both compounds increased the induction of apoptotic by increasing sub-G1, S, and G2-M following depletion of G0-G1 phase accumulation.

Keywords: Calotropis gigantea, pregnanone, colon cancer

Turbidity of *Saccharomyces cerevisiae***: A Proposed Cell Quantification Method**

A Syauqi^{1*}, H Santoso¹, S N Hasana¹

¹Department of Biology, Faculty of Mathematics and Natural Sciences, Islamic University of Malang, Malang, Indonesia

*e-mail: syauqi.fmipa@unisma.ac.id

The relation between cell and turbidity (cloudiness) in suspended form is studied intensively to facilitate the estimation of the cell number. A standard curve in turbidimetry has utility to compare the turbidity reading value for the determination of *Saccharomyces cerevisiae* cell number and using a model. A standard curve is a prospect in this issue for the cell that has an inherent inaccuracy in the method as well as spectrophotometry. This research is conducted to obtain a model for the standard curve using analysis and diagnosis of the linear regression. Measuring the relative standard error (SE) value of the dependent variable by simulation of turbidity value. We obtained the smallest relative SE from one of the five datasets that resulted in less than ten percent of the relative SE on the estimated cell number. Plotting all of the bivariate data resulted in a larger error on the scattered light intensity at the higher cell number value, and this characteristic was named heteroscedasticity. Application of turbidity method for cell enumeration per mL in the media was significant equal and lower coefficient variation than the result of verification by a viable method.

Keywords: regression, model, verification



Disinfecting Technology of *Camellia sinensis L*. Inoculants Through in vitro Culture

Sutini^{1*}, W Wurjani², N Augustien¹, D U Pribadi¹, D A Purwanto³

¹Department of Agrotechnology, Faculty of Agriculture, Universitas Pembangunan "Veteran", Surabaya, Indonesia
²Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
³Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Airlangga, Surabaya, Indonesia

*e-mail: tien_basuki@yahoo.com

Leaves of the *Camellia sinensis* plant is a very economically valuable commodity and can be applied to various fields. Such as in the fields of agriculture, food and beverage and medicine. The problem that is found in the land area is the presence of plants that are more than ten years old that need to be plant rejuvenated. Rejuvenation with grafting and cutting techniques is strongly influenced by the climate and extensive agricultural land. To overcome this problem, in vitro culture techniques are applied as an effort to conserving/producing plant seeds that are free of disease pests, controlled environments and with narrow land or laboratory scale. This research aimed to determine the inoculant of *Camellia sinensis* which gave the best results on the disinfecting through in vitro culture technique. The method used in the research was using two types of inoculants, they are shoot buds and young shoots in the disinfecting of *Camellia sinensis* plants with shoot bud inoculants showed the lowest level of contamination with the number of growing inoculants close to 85 percent in twelve weeks of inoculant harvesting.

Keywords: Camellia sinensis, disinfectant, Inoculants, vitro



Effectiveness of Macro Compound NK Fertilization on Growth And Yield of Corn

L Aisyawati¹, Z Arifin^{1*}

¹Assesment Institute for Agricultural Technology, Malang, Indonesia

*e-mail: arifin_bptpjatim@yahoo.co.id

The purpose of this research is to know the effectiveness of macro compound NK fertilization on growth and yield of corn. The experiment was conducted in dryland of Banjararum Village, Singosari Subdistrict, Malang Regency on Dry Season 2016, using experimental plot 6 m x 4 m was designed in randomized block with 6 combinations of fertilization, and repeated 4 times, namely : (1) **A** (0 kg Urea/ha + 0 kg SP-36/ha + 0 kg Ponska/ha + 0 kg NK/ha), (2) **B** (300 kg Urea/ha + 50 kg SP-36/ha + 200 kg Ponska/ha + 0 kg NK/ha), (3) **C** (300 kg Urea/ha + 50 kg SP-36/ha + 0 kg Ponska/ha + 200 kg NK/ha), (4) **D** (275 kg Urea/ha + 50 kg SP-36/ha + 0 kg Ponska/ha + 300 kg NK/ha), (5) **E** (250 kg Urea/ha + 50 kg SP-36/ha + 0 kg Ponska/ha + 400 kg NK/ha), and (6) **F** (225 kg Urea/ha + 50 kg SP-36/ha + 0 kg Ponska/ha + 500 kg NK/ha). The results showed that macro compound NK fertilization is giving 500 kg NK/ha with 225 kg of Urea/ha and 50 kg SP-36/ha (treatment of **F**) obtained yield of 11,2 t/ha dry seeds with the profit of corn farming IDR. 1,905,000 per hectare.

Keywords: macro compound NK fertilizer, growth, yield, corn farming



Synthesis, Characterization, and Evaluation of ZrO₂-ZnFe₂O₄ Composite Ceramics as a Magnetic Photocatalyst for Methylene Blue Degradation

R H Putri¹, A Hardian^{1*}, D G Syarif²

¹Department of Chemistry, Faculty of Sciences and Informatics, Universitas Jenderal Achmad Yani, Cimahi, Indonesia ²Centre of Applied Nuclear Science and Technology, BATAN, Bandung, Indonesia

*e-mail: arie.hardian@lecture.unjani.ac.id

Methylene blue is one of textile liquid wastes that can damage aquatic ecosystems and has a threshold value of 5 mg/L. Ceramic composites of ZrO₂-ZnFe₂O₄ have been synthesized by the coprecipitation method to degrade methylene blue with the irradiation of UV light. Characterization using X-Ray Diffraction (XRD), Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM / EDS), Surface Area Analyzer (SAA) and Spectrophotometer UV-VIS. Analysis of X-ray diffraction patterns showed a tetragonal crystal system of ZrO₂, a cubic crystal system of ZnFe₂O₄ and a composite ceramic graph system only seen in the ZnFe2O4 crystal system, and the crystallite size obtained was 5,81 nm. The results of the analysis of Scanning Electron Microscopy (SEM) showed that the surface morphology of composite ceramics was heterogeneous and agglomerated, and the results of Energy Dispersive Spectroscopy (EDS) obtained composition composition of Zr 6.52%, Zn 9.31%, Fe 23.58%, and O 58.73%. The results of the Surface Area Analyzer (SAA) characterization obtained a specific surface area of ZrO_2 - $ZnFe_2O_4$ which was 112.376 m²/g. The magnetic properties tested by external magnetic fields have weak magnetic properties. Photodegradation activity of the most optimum ZrO₂-ZnFe₂O₄ composites at pH 10 for 120 minutes with degradation percentage of 93.561%. Potential in dealing with waste from methylene blue.

Keywords: magnetic photocatalyst, ceramic composite, local mineral, ZrO₂-ZnFe₂O₄



ID ABSTRACT: ABS-51

Pilot Scale Production of *Boletus colossus* **Culture for Promoting Growth of Para Rubber Trees**

W Dechmahitkul^{1*}, K Khumvongsa¹, P Mekvichitsaeng¹

¹King Mongkut's University of Technology, Thonburi, Thailand

E-mail: wairuj@yahoo.com

Boletus colossus is an Ectomycorrhiza fungi. It grows on roots of big trees such as Rubber tree, Mango tree and etc. This mushroom grows by using the organic materials that released from the roots. The moisture adsorbed on the fungi makes the roots resist the drought better. The mushroom can also turn some insoluble inorganic materials into the form that plants can make use of. This research is to study the production of the starter culture by using low cost media .The result shows that the fungi can grow best in whey to 9.2 g/L (dry weight) in 10 days. The liquid broth can inhibit the growth of pathogens (*Alternaria brasicola, Alternaria pori* and *Fusarium solani*) on Potato-Dextrose agar. The starter culture can also be produced in a 50L fermenter to the dry weight of 8.1 g/L in 6 days. Loam is the best as solid carrier followed by peat moss. The result in one year shows that the Para rubber trees grow with the fungi has significantly longer stems, leaves, and roots.

Keywords: Boletus colossus, Para Rubber trees, pilot-scale production





Effect of Ethanol Extract of Wungu (*Graptophyllum pictum L*. (Griff)) Leaf on Histological Observation of Testes on Male Mice Induced Cadmium Sulphate

F Wirapratama¹, L Suhargo^{1*}, A Hayati¹

¹Departemen of Biology, Faculty of Science and Technology, Universitas Airlangga, Surabaya, Indonesia

*e-mail: lis.suhargo@gmail.com

This research was aimed to determine the benefits of wungu leaf extract on testicular histology that has been induced by cadmium. The administration of cadmium was done with the aim of making oxidation stress increased. The animals used in the research are 25 male mice, which were divided into 5 groups, namely the control group (0,1ml distilled water), negative control (cadmium 20 mg/kg 10 days and aquadest 25 days), three groups treated with cadmium 20 mg/kg for 10 days, then given ethanol extract of leaves wungu with doses of 25, 50 and 75 mg/kg for 25 days, respectively. All mice after the research ends will be sacrificed, the organs of the testes are cut off. The testes histology was made using the paraffin method and Haematoxylin and Eosin staining. The result shows that administration of cadmium solution can damage the testicular histology due to oxidation stress by cadmium. Ethanolic extract of wungu leaves shows improvement in testicular histology after induction with cadmium, wungu leaves contain flavonoids which function as antioxidants. The dose of 50 mg/kg ethanolic extract of wungu leaves can affect the improvement of testicular histology (Seminiferous tubule diameter, epithelial thickness, and spermatogenic cell count).

Keywords: Wungu leaf, testes histology, Cadmium



Assessment of Agronomic Performance and Shattering Resistance of F7 Soybean Lines

A Krisnawati^{1*}, A Soegianto², B Waluyo², Kuswanto²

¹Indonesian Legume and Tuber Crops Research Institute, Malang, Indonesia ²Universitas Brawijaya, Malang, Indonesia,

*e-mail: my_ayda@yahoo.com

Soybean productivity can be increased through optimizing the agronomic performance and minimizing the yield losses due to pod shattering. The objectives of this study were to evaluate the agronomic performance and shattering resistance of F7 soybean lines. Twenty-one F7 lines including three check varieties (Dega 1, Detap 1, and Anjasmoro) were evaluated in two soybean production centers (Blitar and Mojokerto, East Java, Indonesia) from July to October 2018. The field experiment was arranged in a randomized block design with four replications. The screening for shattering resistance was done by the oven-dry method in the laboratory. The results showed that the performance of plant height, number of filled pods, seed size, and seed yield were higher in Mojokerto compared to the location of Blitar, meanwhile, the average branches number in Blitar was higher than in Mojokerto. The yield of Detap 1 (2.89 t/ha) was highest than two other check varieties. Three lines produce higher yield than Detap 1, namely Anjs/G100H-44 (3.33 t/ha), Anjs/Rajabasa-306 (3.22 t/ha), and Anjs/Rajabasa-311 (3.26 t/ha). The agronomic traits for determining high yields differ between locations. In Blitar, the determinant of high yield was a higher plant to supports the development of nodes and the number of filled pods. In Mojokerto, a high yield line was determined by the number of nodes and seed size. The assessment for shattering resistance resulted seven highly resistant lines, twelve resistant lines, three moderately resistant lines, one susceptible line, and one highly susceptible line. Three selected lines with high yield and resistant to pod shattering were recommended to be tested in the various environments.

Keywords: path analysis, oven method, simultaneous selection



The Influence of Reduced Graphene Oxide Nanoparticles (rGO NPs) on The Microstructure of Metakaolin Geopolymer

R Irfanita^{1*}, S S Desa¹, A D Permatasari¹, M R Fahlefy¹, S Wahyuni¹, Amran¹, A Setiawan¹, Subaer¹

¹Laboratory of Material Physics, Department of Physics, Centre of Excellence of Green Material and Technology (CeoGM-Tech), Faculty of Mathematic and Natural Science, Universitas Negeri Makassar, Makassar, Indonesia

*e-mail: reskyirfanita@gmail.com

Reduced graphene oxide nanoparticles (rGO NPs) is one of the advanced green nano-materials with valuable properties that offer promising novel applications particularly when it is combined with other materials. The main objective of this study was to investigate the influence of rGO addition on the microstructure of metakaolin geopolymer. Graphene oxide (rGO) was synthesized from graphite by using modified Hummer's method and rGO NPs was produced from GO through thermal calcination at 160° C for 4 h in an autoclave. Geopolymer paste was produced through alkali activation method of metakaolin and cured at temperature 70° C for 2 h. The rGO NPs was dispersed into geopolymer paste with various concentrations, 0, 3, 6 and 9% relative to the mass of metakaolin. The crystal structure and morphology of rGO NPS and geopolymer-rGO NPs composites were investigated by means of x-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier Transform Infrared (FTIR). The results indicated that rGO NPs as two-dimensional material was successfully produced and characterized. The addition of rGO NPs was found to form strong bond with geopolymer species and hence improve the quality of geopolymer morphology.

Keywords: geopolymer, graphene, green materials, NPs, reduce graphene oxide (rGO)

ID ABSTRACT: ABS-73

Release Test of N, P, and K of Complete Slow Release Fertilizer (PUKAP JESTRO-1) and Its Effect on the Growth of Young Siam Citrus (*Citrus nobilis Lour.***)**

Sutopo^{1*}, T G Aji¹, E Budiyati¹

¹Indonesian Citrus and Subtropical Fruits Research Institute, Malang, Indonesia

*e-mail: opotus10@gmail.com

ICSFRI has assembled a complete slow-release fertilizer (PUKAP JESTRO-1) to increase the efficiency and effectiveness of fertilizing citrus plants and reduce nitrate pollution in underground water. This study aimed to study the release of N, P, K elements of PUKAP JESTRO-1 fertilizer and its effect on the growth of young Siam citrus plants. The main ingredients include PUKAP JESTRO-1 fertilizer (17% N, 8% P2O5 and 6% K2O and microelements), Urea (46% N), SP 36 (36% P2O5), KCl (59% K2O), NPK YaraMila (16% N, 16% P₂O₅, 16% K₂O), and one month old Siam citrus planted in vertisol soil. Fertilizer release test was carried out through fertilizer incubation in the laboratory and periodically measuring the remaining N, P, and K in the fertilizer. Study of the effect of fertilizer on plant growth was carried out using a randomized block design consisting of 5 treatments and 5 repetition: 400 g/plant/year mixed fertilizer (200 g Urea + 150 g SP36 + 50 g KCl); 200 g/plant/year PUKAP JESTRO-1; 300 g/plant/year PUKAP JESTRO-1; 400 g/plant/year PUKAP JESTRO-1; 400 g/plant/year NPK YaraMila (16-16-16). The dosage was divided into 6 and applied once every 2 months. The experimental results showed that PUKAP JESTRO-1 could release N nutrient until the fourth week, P until the tenth week, and K until the eighth week. Application of 300 g/plant/year PUKAP JESTRO-1 increased plant height and branch length (crown width) from the application of 400 g/plant/year of mixed fertilizer and also increased N content of leaves.

Keywords: citrus growth, slow-release fertilizer, nitrogen, phosphate, potassium



Synthesis and Characterization of Green Material for Heat Protection Based on Metakaolin Geopolymer-MgO NPs Composite

S Wahyuni^{1*}, S S Desa¹, R Irfanita¹, A D P Sari¹, A Setiawan¹, Subaer¹

¹Laboratory of Material Physics, Department of Physics, Centre of Excellence of Green Material and Technology (CeoGM-Tech), Faculty of Mathematic and Natural Science, Universitas Negeri Makassar, Makassar, Indonesia

*e-mail: ayusariwahyuni18@gmail.com

The main objective of this study was to produce and characterize green material for heat protection based on metakaolin geopolymer-MgO nanoparticles. Metakaolin geopolymer was produced through alkali activation method and acted as a binder or matrix to MgO NPs which was prepared via hydroxide precipitation followed by thermal decomposition of the hydroxide at 750oC for 2 h. The concentration of MgO NPs was varied from 0, 4, 8 and 12% relative to the mass of metakaolin. The mixture between geopolymer and MgO NPs was molded in accordance with the characterization purposes and cured at 70 °C for 2 h. The resulting composites were then stored at room temperature in open air for 28 days before performing any measurements. The functional groups between geopolymer species (Si - O - AI) and MgO NPs were examined by using Fourier Transform Infrared (FTIR). The ability of the composite to contain thermal (heat) energy as a function of MgO NPs concentration was measured by using Differential Scanning Calorimetry (DSC) from 25 °C to 400 °C with a heating rate at 20 °C/minute. The heat resistance of the composite was measured by inserting the samples inside nabertherm furnace at 600 °C as well as 800 °C for 2 h. The mechanical properties of the as-prepared geopolymer-MgO NPs and exposed samples at 600 °C and 800 °C. The results showed that metakaolin-MgO NPs composite is an excellent green material for heat protection for wide possible applications.

Keywords: geopolymer, heat protection, metakaolin, MgO NPs

Detection of *Staphylococcus aureus* in Infection Wounds on the Skin Surface

E R Ekawati^{1*}, W Darmanto²

¹Universitas Maarif Hasyim Latif, Sidoarjo, Indonesia ²Universitas Airlangga, Surabaya, Indonesia

*e-mail: evysains@dosen.umaha.ac.id

Infection wounds on the surface of the skin are easily colonized by various kinds of microorganisms. The microorganisms that cause inflammation on the skin surface are a class of pyogenic bacteria. *Staphylococcus aureus* is one of the groups of pyogenic bacteria that produce the enzyme β -lactamase and can eliminate the antibacterial power, especially the penicillin group. The existence of these enzymes will damage the β -lactam ring, so antibiotics become inactive. This research aimed to detect the presence of *Staphylococcus aureus* in pus from a skin infection wound. This type of research is descriptive qualitative. Three pus samples were isolated and identified by culture and biochemical reaction tests using RapID STAPHPLUS. The results of the study identified 2 isolates of *Staphylococcus aureus* with a probability of >99.9% and 1 isolate of *Staphylococcus hyicus* with a probability of 86.92%.

Keywords: Staphylococcus aureus, pus, skin wound infection



Selection of Early-Generation Soybean Lines Resistant to Whitefly Using SSR Markers

A Sulistyo^{1*}, M S Y I Bayu¹, I M Tasma², N Argosubekti³, M J Mejaya¹

¹Indonesian Legumes and Tuber Crops Research Institute, Malang, Indonesia ²I MadeTasma Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development, Indonesia

³Indonesian Center for Food Crops Research and Development, Indonesia

*e-mail: apri.sulistyo@gmail.com

Selection is a routine activity in a plant breeding program. But usually plant breeders are hindered by the large amount of genetic material that must be selected, especially in the segregated generation. This study is a preliminary study with the aim of selecting F1 generation of soybean populations resistant to whitefly using SSR markers. The study was conducted in June - August 2018. The genetic material used was 86 soybean lines resulted from crossing between Anjasmoro (high yielding varieties and susceptible to whitefly) and IAC 100 and G100H (genotype resistant to whitefly). Evaluation of soybean resistance to whitefly was carried out at ILETRI, while DNA analysis using SSR markers was carried out at ICABIOGRAD. The results of the endurance test using free-choice test method show that there is diversity in the intensity of leaf damage due to whitefly infestation. This indicates the integration of resistance genes from IAC 100 and G100H into Anjasmoro. This result is supported by the results of DNA analysis using SATT 045 primer which show that there are soybean lines that carries two DNA banding pattern at once, one from Anjasmoro and the other from IAC 100 or G100H. Soybean lines that have these banding patterns can be propagated through the selfing or back cross method to get the segregated generation. SATT 045 primers can continue to be used to select molecularly soybean lines that are resistant to whitelfy.

Keywords: DNA banding pattern, leaf damage intensity, soybean lines, SSR, whitefly



Preliminary Study on Antimalarial Agent from Indonesian Swietenia mahogany

A S Nugraha^{1*,} B Triatmoko¹, D K Pratoko¹, A N W Pratama¹, Y D Purnomo¹, T A Laksono¹

¹Drug Utilisation and Discovery Research Group, Faculty of Pharmacy, University of Jember, Jember, Indonesia

*e-mail: arisatia@unej.ac.id

Malaria is a global public health concern due to the increase of resistance to antimalarials, therefore the search for new antimalarials is of importance. This study was conducted to explore the antimalarial activity of *Swietenia mahogany* in the form of crude methanolic extract. The plants were collected from Klaten, Central Java, Indonesia. In vitro antimalarial assay was done against Plasmodium falciparum. Phytochemical studies were done chemically using Dragendorf's reagent and spectroscopically using H-NMR technique. Results show that the extract indicated positive antimalarial activity. Preliminary chemotype studies revealed the extract constitute alkaloid compounds in which proton NMR indicated a typical aromatic alkaloid molecular structure. In conclusion, *S. mahogany* is potential for antimalarial agent and further studies are necessary to obtain the bioactive compounds responsible for the claimed activity.

Keywords: Indonesian medicinal plant, antimalaria, Swietenia mahogany



Senna occidentalis: Indonesian Leguminose as Source for Antimalarial Agent

A S Nugraha^{1*}, A N W Pratama¹, D K Pratoko¹, B Triatmoko¹, N B Winarto¹, T A Laksono¹

¹Drug Utilization and Discovery Research Group, Faculty of Pharmacy, University of Jember, Jember, Indonesia

*e-mail: arisatia@unej.ac.id

As stated in history, antimalarial agents are closely related to natural product research. *Senna occidentalis* is among many potential medicinal plants based on ethno-traditional knowledge. This study was conducted to profile the activity for antimalarials from the crude methanol extract of the plant, which was collected from Malang, East Java, Indonesia. Antimalarial assay against *Plasmodium falciparum* was done in vitro. Chemical identification using Dragendorf's reagent and spectral analysis from H-NMR spectroscopy were conducted. The results demonstrate that the extract constitutes typical phenolic backbones that are effective as antimalarial. Further experiment is required to define the responsible antimalarial compounds.

Keywords: Indonesian medicinal plant, antimalaria, Senna occidentalis


Hydrogen Bond on Conformational Change during the Movement of Lid lipMNK

D Herasari^{1*}, Mulyono¹, Kamisah¹, D Pandiangan¹, M Rilyanti¹, H Satria¹

¹Department of Chemistry, Universitas Lampung, Bandar Lampung, Indonesia

*e-mail: dian.herasari@fmipa.unila.ac.id

Manuk lipase (lipMNK) is an enzyme from Geobacillus uzunensis indigenous to Manuk Crater, Garut, West Java. The catalytic activity of lipMNK is highly dependent on conformational change from closed lid (c-lipMNK) to open lid (o-lipMNK). LipMNK is a lipase that has double lids in segments 175 - 195 and 221- 230. One of the interactions involved in this conformational change is the hydrogen bond. Observation of hydrogen bond at the movement of lid was carried out by molecular dynamics simulation with AMBER software and structural analysis using VMD 1.9.3. In this conformational change of lipMNK, there are 54 hydrogen bonds that are conserved; while 26 pairs of hydrogen bond interactions in c-lipMNK are lost and 34 new hydrogen bond interactions are formed in the o-lipMNK in the lid opening movement. Out of the interactions above, only 6 pairs of interactions involve residues in the lid segment. The residues are Arg179, Lys229, Phe225, Phe267 as hydrogen bond acceptors. These residues are thought to have an important role in maintaining stability and activity of lipMNK.

Keywords: lipase, lipMNK, conformational change, hydrogen bond



Preparation of ZSM-5 from Rice Husk Silica and Aluminum Foil Using Tetrapropylammonium Bromide (TPABr) as a Template

K D Pandiangan^{1*}, W Simanjuntak¹, Ilim¹, D Herasari¹, D I Alista¹

¹Department of Chemistry, University of Lampung, Bandar Lampung, Indonesia

*e-mail: kamisah.delilawati@fmipa.unila.ac.id

Zeolite of the type ZSM-5 is an interesting material with various applications, one of them as a catalyst. In this research, ZSM-5 was prepared from rice husk silica and food-grade aluminum foil using tetrapropylammonium bromide (TPABr) as a template or structure-directing agent. The main purpose of the study is to investigate the effect of crystallization time on structure, microstructure, and the activity of zeolites as catalyst for rubber seed oil transesterification. The preparation of zeolites was conducted with hydrothermal process at fix temperature of 180°C with varied crystallization time of 24, 48, 72, 96, and 120 h. The samples were calcined at 600 °C for 6 h and then characterized using XRD and SEM technique. The XRD and SEM characterization confirmed that ZSM-5 was successfully produced from raw materials and preparation procedures applied. The zeolites also exhibited catalytic activity in transesterification to convert fatty acids in rubber seed oil into corresponding methyl esters.

Keywords: ZSM-5, rice husk silica, aluminum foil, catalyst, transesterification, rubber seed oil

ID ABSTRACT: ABS-126

Catalytic Performance of Hierarchical ZSM-5 Synthesized from Sugarcane Bagasse Ash in Transesterification Reaction of Coconut Oil for Biodiesel Production

M Rilyanti^{1*}, E G Silviana¹, D Herasari¹, Burhani¹, A Laila¹

¹Chemistry Department, Faculty of Mathematics and Natural Science, Universitas Lampung, Bandar Lampung, Indonesia

*e-mail: mita.rilyanti@fmipa.unila.ac.id

The catalytic performance of hierarchically porous ZSM-5 (Zeolite Secony Mobile-5) prepared using silica extracted from bagasse ash in the transesterification of coconut oil into biodiesel has been carried out. The silica was extracted from bagasse ash using NaOH solution and subsequently crystallized using the Solid State Conversion (SSC) method to produce pore hierarchical ZSM-5. The catalytic activity of the zeolite was evaluated through a series of transesterification reactions at varied experimental conditions including reaction time, the ratio of methanol to oil, and the amount of catalyst. The results show that bagasse ash silica is amorphous and can crystallize to produce a hierarchical pore ZSM-5 at 170 °C for 48 h. Transesterification experiments demonstrated that the zeolite is able to convert coconut oil with a yield of 88% with a reaction time of 2 h, 1: 9 oil to methanol ratio and 9% catalyst amount. This achievement suggests that sugarcane pulp has the potential as a source of silica for development of advanced material, to support development of energy sources in the future.

Keywords: silica, sugarcane bagasse ash, hierarchical ZSM-5, transesterification, biodiesel



Potential of Kenikir Leaf Extract (*Cosmos caudatus*) as Corrosion Inhibitor of Iron in 1% NaCl Solution

T Sudiarti^{1*}

¹Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia

*e-mail: tety.sudiarti@uinsgd.ac.id

The use of natural waste as a corrosion inhibitor has not been widely reported. Among them are kenikir leaves (Cosmos caudatus) which in the form of extracts contain compounds such as flavonoid, alkaloid, and tannin. These compounds have the potential to have corrosion inhibition activities because they have groups that can be adsorbed strongly on metal surfaces. This study aims to determine the inhibition activity of kenikir leaf extract on iron in 1% NaCl medium. Ethyl acetate (semi-polar) and methanol (polar) solvents were used to extract kenikir leaves using maceration method. Characterization carried out was phytochemical test and functional group analysis with FTIR. The Wheel Test method is used to determine the inhibitory activity with variations in concentration and temperature. The surface analysis of iron by SEM (Scanning Electron Microscopy). The inhibition activity of kenikir leaf extract increased with increasing inhibitor concentrations. The optimum concentration obtained was 32 ppm with inhibition efficiency of 86.84% in extracts of semi-polar fraction and 24 ppm with inhibition efficiency of 79.93% in extracts of the polar fraction. The temperature rise from 25-55 °C causes inhibition activity to decrease and achieves optimum inhibition efficiency at 25 °C. Kenikir leaf extract has Langmuir isotherm adsorption properties with free energy adsorption of -14.98 kJ/mol for extracts of semi-polar fraction and -15.56 kJ/mol for extracts of the polar fraction. The results of the surface analysis by Scanning Electron Microscopy (SEM) showed that kenikir leaf extract could inhibit corrosion rates with iron surfaces that had fewer pores than without inhibitors.

Keywords: kenikir leaf extract, Cosmos caudatus, corrosion inhibitor of iron

An Assessment of Early Warning System: Initial Survey Analysis

N S Rabe^{1*}, M R M Hussain¹, I Zen², I Tukiman¹, R S Muda³, A F Mamat³

 ¹Kulliyyah of Architecture and Environmental Design, International Islamic University Malaysia, Selangor, Malaysia
²Al Madinah International University, Kuala Lumpur, Malaysia
³Tenaga Nasional Berhad Research Tenaga Nasional Berhad, Malaysia

*e-mail: Suzilawati@Iium.Edu.My

In Cameron Highlands, Lembah Bertam area and further downstream villages in Susu Dam area are prone and vulnerable to the highest occurrence of floods, especially during monsoon season. Thus, Early Warning System (EWS) was set up to avoid or to reduce the impact of natural hazard turn disasters such as floods, landslides and storms with the aim to reduce the vulnerability and disaster risks that signify the effectiveness of EWS in the realization of the affected community. To test the awareness and preparedness of the community in the selected area, a questionnaire survey was employed as the data collection method. The questionnaire survey was conducted before the direct engagement on the EWS information with the community. Using the mixed sampling method of cluster random sampling, a total of 800 respondents were involved in the survey that came from 11 villages, and 5 main ethnicity groups. From the result, there was a positive relationship shows that respondents who claimed they knew about the EWS from information signage were those who in the older age category and have earned higher monthly income. On the other hand, there is a negative relationship between respondents' age and monthly income against other sources that indicates respondents who claimed they knew about the EWS from other sources were those who in younger age category and have a low monthly income.

Keywords: Early warning system; dam, hazard, Cameron Highlands.



Reproductive Activity Pattern of Four Species of Cinnamomum in Purwodadi Botanic Garden

T Yulistyarini^{1*}

¹Indonesia Purwodadi Botanic Garden, Purwodadi, Indonesia

*e-mail: tyulistyarini@yahoo.com

Cinnamomum is a genus of evergreen aromatic trees belonging to the Lauracea family. The species of Cinnamomum have aromatic oils in their leaves and bark. The genus includes a great number of economically important trees. Research on phenology of vegetative and reproductive activity of four species (*Cinnamomum burmanii*, *C. iners*, *C. verum*, and *C. sintoc*) was conducted to know their respon in relation to seasonal change in rainfall, air temperature and air humidity in Purwodadi Botanic Garden. The vegetative and reproductive activities were observed once per week based on the abundance of leaves, flowers, and fruits using a scoring method from 0-4, for 6-8 years of observations. The rainfall per month, temperature, and humidity were simultaneously recorded. Data were analyzed by Principal Component Analyses to determine the microclimate variables that have correlation to the reproductive activity patterns of all four species. Most species started flower budding during Juni – Agustus, except *C. burmanii* which produced flowers 2-3 times per year in small quantity. Flowering of *C. burmanii* showed strongly positive correlations with rainfall intensity, while the other three species by rainfall. Six dry months proceeding a long dry season in 2015 caused this species did not produce flowers and fruits.

Keywords: cinnamomum, flowering, fruiting, pattern



Assessment of Vegetation Cover through Red-Edge Spectral Reflectance-Based Indices

L Mukaromah^{1*}

¹Research Center for Plant Conservation and Botanic Gardens, Indonesia Institute of Sciences, Indonesia

*e-mail: laily.mukarromah@gmail.com

Remote sensing has raised a novel prospect for investigating and monitoring vegetation and other Earth's surface components. In this study, Red Edge Normalized Vegetation Index was calculated on airborne HyMap imagery to assess vegetation cover on Rottnest Island, Western Australia. Results show significant variation between vegetation types, signify the discrimination of woodland from another land cover. The spectral characteristics of vegetation and red edge indices were also briefly reviewed in order to exploit the potential information of this point spectrum and its possible key role in future research of vegetation and environmental changes. This study offers the potential use of red edge indices derived from HyMap imagery for landscape characterization at 3.5 spatial resolution.

Keywords: red-edge spectral, vegetation, reflectance, indices

159







Detection of Hijab Syar'i as Smart Clothes for Moslem People Using High Performance of Parallel Computing

I Cholissodin^{1*}, D E Palupi¹, M Y Y Putra¹, S Aprilisia¹

¹Faculty of Computer Science, Universitas Brawijaya, Malang, Indonesia

*e-mail: imamcs@ub.ac.id

In today's millennial era, Moslems are required to remain consistent in using shar'i clothing. But sometimes someone is very difficult to distinguish between syar'i clothes and those that are not syar'i. Based on current technological developments, distinguishing any object can be done through detection techniques using digital image processing. Digital image processing in the present day has become one of the areas that can be processed to help various problems associated with the image. However, it requires very long time-processing and ineffective processing. Performance Central Processing Unit (CPU) alone is not enough. Therefore, it takes time allocation processing that can cut time to speed up the process. This study discusses how to compare performance analysis to digital image between Graphics Processing Unit (GPU) and Central Processing Unit (CPU). The performance analysis uses CUDA and Yolo Darknet, because it allows specialists in parallel programming to use GPU resources and can perform the object detection process quickly and accurately by applying an artificial neural network algorithm to the image of someone who uses the hijab syar'i as smart clothes for Moslem. So that the user as a Moslem is able to identify independently and as an evaluation automation combined with the help of the implementation of the detection. Some hardware, software, file dependency specifications are used to support the implementation process. The test results prove that by using a CPU, it takes more time to recognize the hijab syar'i on the digital image being tested, when compared to using a GPU.

Keywords: detection, hijab syar'i, smart clothes, Moslem, parallel computing, cuda, yolo darknet

Competence of Small Medium Enterprise Employees to Implement ISO 14001:2015

I Y Budi^{1*}, M Karuniasa¹, R Nurcahyo²

¹School of Environmental Science, Universitas Indonesia, Salemba, Indonesia. ²Department of Industrial Engineering, Universitas Indonesia, Depok, Indonesia

*e-mail: ina.yulianingtiyas@gmail.com

SME employees are the main executors in the implementation of the standard in SME included the standard of environmental management system ISO 14001:2015. The success of this standard implementation is extremely determined by the competence of SME employees in understanding and implementing ISO 14001:2015 until the purpose of implementation can be achieved such as reaching environmental target, improving environmental performance, and fulfilling arrangement obligation. This research aims to see the competence of SME employees in the implementation of ISO 14001:2015 until the purpose of this standard implementation can be achieved. The method used in this research was quantitative research method. For this purpose, the research instruments was in the form of questionnaires designed and tested on SME employees. Data were processed statistically. The research results showed that the competence of SME employees in the implementation of ISO 14001:2015. Besides that, SME employees also understand environmental regulations and the management of waste produced by SME.

Keywords: small medium enterprise, employee, ISO 14001, competence, environmental management system

Simulation of Climate Change Impact on Maize Growth and Production Using DSSAT

B Al Fanshuri^{1*}

¹Indonesian Agency for Agricultural Research and Development (IAARD), Jakarta Selatan, Indonesia

*e-mail: buyung.fanshuri@gmail.com

Solar radiation, temperature, and CO_2 are important climate variables on crop production. Climate change is a very serious threat to the agricultural sector and potentially bring new problems for the sustainability of agricultural production systems. This paper aims to know the impact of climate change on maize growth and production by simulating changes in climate variables. The case study was at Pak Chong District, Nakhon Ratchasima province, Thailand. There are eight treatments simulation and one treatment as a control; (1) no change (control), (2) solar radiation (SR) + 30%, (3) SR - 30%, (4) CO₂ + 25 ppm, (5) CO₂ - 25 ppm, (6) maximum temperature + 30 °C, (7) maximum temperature - 30 °C, (8) minimum temperature + 30 °C, (9) minimum temperature - 30 °C. Simulation use Decision Support System for Agrotechnology Transfer (DSSAT) software. SR adds 30% obtained highest production due to highest on grain number and pod weight. In contrast, SR - 30% reached the lowest yield.

Keywords: climate change, solar radiation, temperature, CO₂, DSSAT



The Effect of Addition Mn²⁺ Metal Ions and Incubation Time to *Bacillus cereus* Cellulase Enzyme Activity from Endophytic Bacteria of Curcuma Rhizome (*Curcuma zanthorrizha* Roxb.)

C Sulistyantini^{1*}, U Utami¹

¹Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: cahyanings96@gmail.com

Cellulase is one of the most widely used enzymes in the industrial world and waste decomposition process. Bacillus cereus is one of the bacteria that can produce cellulase enzymes that can hydrolyze cellulose to glucose. The addition of cofactors and incubation time can help determine the optimum conditions needed by cellulase enzymes to work optimally. This study aims to determine the effect of adding Mn²⁺ metal ions and incubation time to the activity of cellulase enzymes from Bacillus cereus endophytic bacteria. This research is experimentally using a Completely Randomized Design (CRD) factorial design with two factor treatments and 3 times repetition. The first factor is variation of addition Mn^{2+} metal ions which are 5, 10, and 15 mM, the second is variation of incubation time which are 1, 2, 3, 4, and 5 h. The data were analyzed using Analysis Of Variance (ANOVA) and if the data significantly affected the parameter, then it would be continued by Duncan Multiple Range Test (DMRT) with the fault level 5%. The result showed that the interaction of addition Mn^{2+} metal ions and incubation time affected the cellulase enzyme activity Bacillus cereus from endophytic bacteria. The highest cellulase enzyme activity obtained from interaction addition Mn^{2+} metal 10 mM and incubation time 3 h with an activity 0.335 U/mL, while the lowest cellulase enzyme activity obtained from interaction addition Mn²⁺ metal 15 mM and incubation time 5 h with an activity 0.073 U/mL.

Keywords: Mn²⁺ metal ion, incubation time, cellulase activity, Bacillus cereus

Sentiment Analysis of National Libraries through Social Media Twitter

F K R Mahfud^{1*}, N S Mudawamah¹, W Hariyanto¹

¹Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: fakhris.cr7@gmail.com

The library is a gate of science and a heart of civilization. Indonesia already has a national library consisted of 27 floors and is equipped with facilities that are adequate for user needs. Apart from that, we need to see opinions from the community as users. Public opinion about the library is critical for library managers to evaluate services and facilities from the library. One way to find out the views of the community is by using social media twitter. Twitter social media is often used in channeling opinions or expressing opinions about specific topics; besides social media, twitter is commonly used for digital campaign movements. Submission of views and even digital campaigns on Twitter social media greatly influence the opinions and even behavior of society in various ways. This study analyzes tweets about national libraries by classifying, both positive opinions and negative opinions. In this study, twitter data will go through the preprocessing, weighting, and classification stages. TF-IDF and TF binary are used in weighting in this study. The classification used in this study to evaluate classification performance

Keywords: sentiment analysis, national library, Twitter, classification



Removal of Lead (II) from Aqueous Solution Using waste HVS paper as a low-cost adsorbent

V Amalia^{1*}, Ernawati¹, E P Hadisantoso¹

¹Universitas Islam Negeri Sunan Gunung Djati, Bandung, Indonesia

*e-mail: vinaamalia@uinsgd.ac.id

Lead (II) is included in heavy metals because it has a high toxicity. The concentration of Lead (II) that exceeds the threshold can pollute the environment and health. One way to reduce Lead (II) levels is by adsorption using HVS paper. HVS paper is used as an adsorbent because it has cellulose content in it which will bind Lead (II) metal. The purpose of this study was to determine the effect of adsorbent mass, adsorbate concentration, contact time and pH of adsorbates absorbed in the adsorbent of HVS paper and determine the adsorption capacity (Qe) and adsorption efficiency. The adsorption process is carried out using the Batch method, using a mass variation of 0.06; 0.08; 0,1; 0.12; and 0.14 g, variations in concentrations of 75, 90, 105, 120 and 135 ppm, variations in contact time 5, 10, 15, 20, and 25 minutes, variations in pH 3, 4, 5, 6, and 7. Paper adsorbents HVS is made by converting it to pulp using a 10% b/v NaHCO₃ solution which is then refluxed using 5% b/v Na₂HPO₄. Furthermore, the adsorbent is characterized by the Fourier Transform Infrared Spectroscopy (FTIR) and there are functional groups such as -OH, C - H, and C - O which help in binding to Lead (II) metal in the adsorption process. The characterization of Scanning Electron Microscope (SEM) shows the morphological form of the HVS adsorbent, namely agglomerated fine particles. To determine the levels of absorbed Lead (II) metal, an analysis using Atomic Absorption Spectrophotometry (AAS) was carried out. From the results of the analysis, it was found that the optimum adsorption of HVS paper adsorbent was carried out at 0.1 g mass in 105 ppm Lead (II) solution with 10 minutes contact time and pH solution 5. The adsorption isotherm model showed Langmuir isotherm and Freundlich isotherm.

Keywords: Lead (II), HVS paper, adsorption, optimization, isotherm



Green infrastructure Pattern of the Manggar Riverside as Minapolitan Settlement

M Ulimaz^{1*}, N A Jordan¹

¹Institut Teknologi Kalimantan, Balikpapan, Indonesia

*e-mail: megaulimaz@itk.ac.id

Manggar River Village is one of the high-density settlements with characteristics of wood as main material. Most residents were worked as fishermen and farmers to support minapolitan activities. The area was located on the edge and surface the river, linear housing patterns, parallel and surface the river) lead to the slum river settlements. The strategy to urban development based on green infrastructure (ecological infrastructure) must be integrated with the Balikpapan Spatial Plan (RTRW). Manggar village was establish as a traditional protected settlement. Green infrastructure planning should be integrated with the residential space to improve the quality of city and community life. The concept of sustainable city development needs to balance economic, socio-cultural and environmental development by increasing green infrastructure. The purpose of this study is to analyze the priorities of green infrastructure based on the characteristics of the space. The distribution patterns by analysis of Geographic Information Systems approach was used as a methodology. The results of the analysis show that the distribution of infrastructure has a random pattern with the highest density level which is a corridor that serves as a place for drying fish. Communities use this infrastructure as a high intensity public space. Strategy for improving the function of infrastructure is create formation of corridor patterns and the distribution of fish drying points to reduce waste.

Keywords: green infrastructure, riverside settlement, minapolitan, fisherman



ID ABSTRACT: ABS-28

Synthesis and Characterization of Hematite Pigment (α Fe₂O₃) Nanoparticles from Iron Lathe Waste Using Sonication Calcination Method

R Habibah^{1*}, L M Khoiroh¹, R Ningsih¹

¹Department of Chemistry, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia.

*e-mail: 15630060@student.uin-malang.ac.id

Iron lathe waste has been used to prepare pigment hematite nanoparticles by the sonicationcalcination method. The concentration of urea was varied using 1; 1.5 and 4.5 M. Samples were characterized using XRD, color reader, and SEM-EDX. The X-ray diffraction pattern shows that hematite phase is formed in crystalline structure and nanoparticle size. From the color reader value, the highest reddish degree achieved at 1.5 M variation. SEM-EDX data shows that it is composed of nanosized particles, but still agglomeration. There are impurities such as carbon and silica.

Keywords: iron lathe waste, hematite, sonication-calcination



Ethnobotany Mendong Plants (*Fimbristylis globusa*) as Handicrafts in the Wajak District of Malang Regency

E B Minarno^{1*}, A Nadhifah¹, S F A Febryana¹

¹Depart,emt of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia,

*e-mail: budi_minarno@yahoo.com

Mendong (*Fimbristylis globusa*) is a grass plant that looks morphological in terms of rice and is used for a variety of crafts. Handcraft from mendong plants are often found in Blayu Village Wajak District. The purpose of this research is to get information related to the utilization of mendong plant (*Fimbristylis globusa*). The type of research used is descriptive explorative through survey and interview method. The communities of Wajak District such as Blayu Village, Meduran Village dan Bebekan Village utilize mendong plants (*Fimbristylis globusa*) as handicrafts such as mats and ropes.

Keywords: mendong, handicraft, wajak



Exact Solution to the Klein-Gordon Equation on Modified Schwarzschild Black Holes

A Romadani^{1*}

¹Universitas Islam Negeri Maualan Malik Ibrahim Malang, Malang, Indonesia

*e-mail: arista.romadani@uin-malang.ac.id

In this paper, we solved the Klein-Gordon equation for a light reside in an area influenced by strong gravitational field from massive Black Holes. The gravitational field determined by a modification of Schwarzschild spacetime. The modified Schwarzschild metric was obtained from f(R) theories of gravity, as one of the simplest modifications to General Relativity with constant scalar curvature R_0. Modified gravity theories have received more attention lately due to combined motivation coming from astrophysics, cosmology and high-energy physics. The solution of Klein-Gordon equation used variable separation method with the complex part of radial symmetry. The numerical methods were presented for the prediction of the solution and compared with nonrelativistic Coulomb type solutions.

Keywords: Klein-Gordon, black holes, f(R) theories of gravity

ID ABSTRACT: ABS-60

Completion Neutrosofic Transportation Problem Type 1 Using Zero Point Method

E R Wulan^{1*}, S D K Suci¹

¹Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Sunan Gunung Djati Bandung, Bandung, Indonesia

*e-mail: elis_ratna_wulan@uinsgd.ac.id

Neutrosophic set has been introduced as an extension of the crisp set, fuzzy set, and intuitionistic fuzzy set. The neutrosophic set explains uncertain, inconsistent, and incomplete information about transportation problems in the real world. The neutrosophic set has independent characteristics and has 3 components: the function of truth, the function of uncertainty, and the function of untruth. In the problem of neutrosophic transportation using trapezoidal neutrosophic numbers while demanding and supplying use crips numbers. This research introduces ways to find a minimum solution for type 1 of neutrosophic transport problems. One of the methods used in the search for a minimum solution for the problem of neutrosophic transportation is the zero point method.

Keywords: fuzzy intuitionistic, neutrosophic set, neutrosophic transportation problem type 1, *zero point method.*

ERP Enhancement of the Purchase and Warehouse Module in the Era of Industrial Revolution 4.0

E P R Lestari¹, N Kadir¹, V A Kristi¹, Supriyono^{1*}

¹Department of Informatics Engineering, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: priyono@ti.uin-malang.ac.id

Enterprise Resources Planning (ERP) is an integrated system which used to integrate all business processes in a company. Sinar Mart is a company that sells electrical and electronic equipment in the city of Malang. Management at this company is still using a manual system and transactions using Microsoft Excel. In this case, ERP implementation is a good solution that can help to improve a company's business processes. Odoo is a complex ERP that can handle all kinds of interrelated business processes and can be customized as desired. Blackbox testing method used as software testing for functionality testing. The results of this study are improving the company's business processes using the Purchase and Warehouse module in the Sinar Mart Malang.

Keywords: purchase, warehouse, blackbox testing, ERP



Conceptual Model of Smart Sustainable Environment City: Literature Review

Syamsudin^{1*}, D I Sensuse¹

¹Faculty of Computer Science, Universitas Indonesia, Depok, Indonesia

*e-mail: syamsudin72@ui.ac.id

Urban developments have challenges to maintain environmental sustainability as the primary sustainable dimension supported by economic and social dimensions. The human cannot live without sufficient vital environment elements such as air, water, and land space. Urban city growth with high-density population, industrialization, fossil fuel transportation energy, and limited green space have a direct effect of increasing greenhouse gases and environmental contamination in air-water-land. Smart sustainable environment city (SSEC) is a necessity in urban development by using information and communication technology as the core of city governance to connected stakeholders in smart sensing sustainable enterprise system. This research aims to design a conceptual model of SSEC based on smart enterprise architecture using a literature review methodology. The processes are including searching, categorizing, and relating each element and indicator of SSEC into one holistic enterprise architecture model. A number of significant challenges associated with SSEC city were identified including policies (vision, objective, management), stakeholders (governance, service provider, citizen, community), business processes (utility water-waste-land-energy, natural resources, disaster prevention), applications (smart application, interoperability, autonomous decision system), data (big data, cloud, data warehouse, security), infrastructures (internet-network, GIS, smart sensing, utility grid, waste grid, environment grid), and IoT sensors (air quality, water quality, GPS, visual, climate-weather, disaster, static-mobile-social sensor). The study provides valuable information to the city governance practitioners by illustrating the holistic process of SSEC from high-level city vision to the operational level of the smart sensor system. This study also provides further direction to future researchers.

Keywords: conceptual model, enterprise architecture, smart sustainable environment

Construction Analysis of the String Motion Model on Sasando Musical Instrument

A Kusumastuti^{1*}, D N Brylliant², N A Hidayati²

 ¹Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia
²Department of Mathematics, Universitas Brawijaya, Malang, Indonesia

*e-mail: arikusumastuti@gmail.com

String is one of mathematical modeling object has been studied in the world. In this paper, researchers focus on the construction analysis of the string motion model on Sasando. The purpose of the research is to determine the form of the string motion on Sasando musical instrument and validating the model. Construction analysis was done by identifying problems, variables, parameters, energies, and the forces occur on the string of Sasando. Based on the identifying results, mathematical model that represents the problem of string motion on Sasando expressed as a second-order linear partial differential equation with u denote the vertical displacement experienced by the string at the point x at time t. The first step of the validation test is simulations of mathematical models using Matlabr. The result obtained shows the oscillatory motion and the string motion on Sasando reliable to real case. However, the result of first step validation test is not sufficient to determine validity of the model and next step validation test are needed to complete this research.

Keywords: pde, wave, string motion, construction, mathematical model, Sasando, vibration

Performance Evaluation of the Revised Double Sampling[–] Chart Based on Median Run Length with Estimated Parameter

F Rozi^{1*}, U S Pasaribu¹, U Mukhaiyar¹

¹Statistics Research Group, Institut Teknologi Bandung, Bandung, Indonesia

*e-mail: fachrur201@s.itb.ac.id

The advantages of the revised double sampling (DS)⁻ chart are can detect small and moderate process mean shifts quickly and reduce the sample size. This chart is usually investigated when the process parameters are assumed to be known. In practice, the process parameters are usually unknown and have to be estimated from an in-control Phase-I dataset. An expression for the run length distribution of the revised DS⁻ chart is evaluated, by conditioning and taking parameter estimation. Since the run length distribution is generally highly skewed and changes with the magnitude of the mean shift, the number of Phase-I samples and sample sizes, the traditional chart's performance measure, i.e. the average run length, is confusing and not a good representation of a typical chart's performance. Therefore, it is argued that the median run length (MRL) provides a more intuitive and credible interpretation. This paper (i) evaluates the effect of Phase-I parameter estimation on the performances of the revised DS⁻ chart with estimated parameters. The optimal chart which provides the quickest out-of-control detection speed for a specified shift of interest is designed according to the number of Phase-I samples commonly used in practice.

Keywords: conditional run length, median run length, process mean shift, parameter estimation, revised double sampling (DS)-X chart, unconditional run length



Predicting the City and Districts Consumer Price Index in East Java with the Gaussian-Radial Basis Function Kernel

M F Rohmah^{1*}

¹Indonesia

*e-mail: miminfr@gmail.com

An Economic indicator regarding information on prices of goods and services paid by consumers is known as the Consumer Price Index (CPI). In this study the researchers predicted the Consumer Price Index of Foodstuffs in Cities and Districts in East Java with the Gaussian-Radial Basis Function (RBF) Kernel. As a comparison, Foodstuff Type CPI issued by the Central Bureau of Statistics (BPS) and as an input variable are taken from the prices of basic commodities in three districts namely Banyuwangi District, Jember District and Sumenep District and five cities namely Kediri City, Madiun City, Malang City, Probolinggo City and Surabaya City. The Support Vector Regression (SVR) method used to predict the CPI. The SVR method aims to find a function as a regression function hyperplane that matches the input data by making the least error possible. Forecasting data using the SVR method, the data will be divided as training data and testing data. With the Gaussian-Radial Basis Function (RBF) kernel where the function is to produce the smallest Mean Squared Error (MSE) in the City of Kediri by 0.008 and the Mean Absolute Percentage Error (MAPE) of 0.023. The average MSE is 0.01023 and the average MAPE is 0.034.

Keywords: consumer price index, support vector regression, mean absolute percentage, error, mean square error, gaussian-radial basis function



Implementation of TF.IDF Weighting and Latent Semantic Indexing on Information Retrieval System for Indonesian Health Articles

M I Hasan^{1*}

¹Indonesia

*e-mail: Muhisan2@gmail.com

Recently, digital technology grows so rapidly that result in greater data and information spread on the internet. The Information Retrieval System is required to make it easier to search the large dimensioned data. One of the utilization of information retrieval system is used to search the various health complaints experienced by internet users. One of the most popular methods is document ranking using the vector space model based on the weighted value of TF.IDF. The method only performs weighting based on the frequency of occurrence of term in the document regardless of user preferences. The term weighting method based on user preferences needs to consider the semantic relation between term to improve the relevance of search results. Latent Semantic Indexing is one of the indexing methods in the information retrieval system that considers the semantic relation between term. This research develops the method of weighting TF.IDF by adding Latent Semantic Indexing. The data used is a collection of health article documents taken from some websites selected by researchers. The results show that TF.IDF.LSI produces a higher Mean Mean Precision (MAP) value than the TF.IDF. In sequential MAP values of TF.IDF.LSI at rank-k 10 and 15 are 86% and 82.4%. This value is higher than the TF.IDF that result MAP values at rank k-10 and 15 are 82.8% and 79%.

Keywords: lantent semantic index, TF.IDF weighting, retrievel system

Message Communication Strategy in Management of Waste Bank Centong Village Gondang Mojokerto District

M Ningsih^{1*}, R S Ramadhani¹

¹Indonesia Communication Science Study Program, Faculty of Social Science and Political Science, Universitas Islam Majapahit, Mojokerto, Indonesia

*e-mail: masnia_ningsih@unim.ac.id

Like every inhabited area, Centong Village also cannot avoid the waste problem. How to provide awareness of the negative effects of waste on the community, how to process it and distributing waste that can be economic value to the community. With the majority of people earning a living as farmers, making a fundamental paradigm shift in waste management, from the collect - transport - waste paradigm to processing based on waste reduction and waste management, is not an easy thing for the management of the waste bank. This is in accordance with Law No. 18 of 2008 concerning Waste Management by the Ministry of Environment, along with Government Regulation No. 81 of 2012. The declared of the 3R program (Reduce, Re-use, and Recycle) by the government is a form of follow-up to the law, which is then passed on by the regional government to the villages in the region. Through research using this case study method, we want to know how the message communication strategy is in managing the waste bank organization in Centong village. From the results of this study, it is known the formulation of the message communication strategy in the management of the Waste Bank in Centong village, namely the first communication message relating to the importance of a healthy environment and its impact, and the second message communication is related to the economic value of waste.

Keywords: message communication strategies, waste bank management, case studies



The Simulation of Mechanical Excitement Effect on Bone **Density Due to the Age Changes Based on Finite Element** Method (FEM)

K Yakin^{1*}, N I Rusmana¹, M Tirono¹

¹Department of Physics, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: khusnulyakin@uin-malang.ac.id

As we get older, the bone density will decrease. The speed of the bone formation process decreases progressively after reaching the peak of bone mass in the age range of 25-30 years. This symptom of reducing bone density is known as osteoporosis. Osteoporosis occurs due to a disruption in bone remodeling (the process of formation and resorption of bone) due to several conditions. Factors that influence bone remodeling include sex hormones, nutritional intake (calcium, phosphorus, zinc, vitamins B6, C, D, and K), physical activity (mechanical stimulation). Therefore, this study will simulate the effect of mechanical stimulation on femoral bone density. The mechanical stimulation provided in this study is in the form of walking. In this study there are four stages, namely constructing the femur bone which consists of 2 layers (cortical and trabecular layers) with FEM in the form of triangular and quadrilateral elements. Then, input bone properties based on age (Young's modulus and Poisson's ratio). The next to do is calculating the stress, strain and strain rate in the reversal phase (steady-state) with the finite element method (FEM). The calculation of bone density will be done by using the thermodynamic equation of V. Klika and F. Marsik. This study found that there was bone density in cortical and trabecular bones due to the changes of age. The triangle element reported the following results. Bone density before being given mechanical stimulation for the age of 25 years is 1.1261 g/cm^2 for cortical bone and 0.7296 g/cm^2 in trabecular bone and for age 45 years is 1.1517 g/cm² for cortical bone and 0.7374 g/cm² in trabecular bone. After being given a mechanical stimulus with a force (1674N) to walk, a bone density of 1.8052 g/cm² of cortical bone and 0.8127 g/cm2 of trabecular bone was obtained. Meanwhile the quadrilateral element obtained the following results. Bone density before being given mechanical stimulation for the age of 25 years is 1.0704 g/cm² for cortical bone and 0.8398 g/cm² in trabecular bone and for age 45 years is 1.4019 g/cm² for cortical bone and 1.1690 g/cm^2 in trabecular bone. After being given a mechanical stimulus with a force (1674) to walk, a bone density of 2.7572 g/cm² of cortical bone and 1.8594 g/cm² of trabecular bone was obtained. So, there were changes and differences in bone density due to the changes of age and mechanical stimulation. Based on these simulation results, it can be concluded that mechanical stimulation can increase bone density so that it can slow down the process of bone mineral loss. The bone density will decrease due to the change of age. In this case, the triangle element represents a better result with an accuracy 98 % compared to the quadrilateral element.

Keywords: bone remodeling, bone density, finite element method



The Simulation of Mechanical Stimulation Effect on Bone Elasticity Limit Based on Finite Element Method (FEM)

K Yakin^{1*}, I Setyaningsih¹, M Tirono¹

¹Department of Physics, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: khusnulyakin@uin-malang.ac.id

Osteoporosis is a disease of the bone that is characterized by decreased bone density so that bones become porous and become susceptible to fractures. This decrease in bone density occurs due to the process of demineralization in the bone after passing through the peak of bone mass and occurs in the age range of 25-30 years. The normal rate of decrease in bone density is around 0.5% - 1.5% every year and about 2% - 5% for osteoporotic bones. Osteoporosis occurs because of an imbalance in bone remodeling phase between resorption and formation processes. In this case, osteoclasts are responsible for the resorption process and osteoblasts are responsible for the formation process. There are factors that influence the process of bone remodeling, including age, gender, sex hormones (estrogen and testosterone), nutrient intake (calcium, phosphorus, zinc, vitamins B6, C, D, and K) and physical activity (mechanical stimulation). Therefore, this study will simulate the effect of mechanical stimulation on the femoral bone elasticity limit. This mechanical stimulation in the form of physical activity when standing and walking. It is hoped that these mechanical stimuli can provide information on bone elasticity limits and have a positive effect on bone remodeling process. In this study there are five stages, firstly constructing the femur in 2 layers (cortical and trabecular bone) in the form of triangular and quadrilateral elements. Then input bone properties based on age (Young's modulus and Poisson's ratio). Then the calculation of stress, strain and rate strain in the reversal phase (resting phase) with FEM. Then the calculation of bone density using the thermodynamic equation of V.Kika and F.Marsik and continued calculation of the bone elasticity limit. Based on these studies, due to mechanical stimulation given to the bone, the results obtained data limit the cortical bone elasticity of the femur (stress limit). In the triangle element, the stress results are $1.5495 \times 10^5 Pa$ (F = 1350 N) and $2.0144 \times 10^5 Pa$ (F = 1755 N) for cortical bone. Whereas the trabecular bone obtained data of bone elasticity limit result are $3.844 \times 10^4 Pa$ (F = 1350 N) and $4.5298 \times 10^4 Pa$ (F = 1755 N). Then, the quadrilateral element results in the stress are $1.447 \times 10^5 Pa$ (F = 1350 N) and $1.881 \times 10^5 Pa$ (F = 1755 N) for cortical bone. And the trabecular bone obtained data result are 5.3329 \times 10⁴ Pa (F = 1355 N) and 6.9328 \times 10⁵ Pa (F = 1755 N). Thus, there is a change in bone elasticity due to mechanical stimulation. Based on the simulation results, it can be concluded that mechanical stimulation can increase the bone elasticity limit of stress up to 30% for cortical and trabecular bone of femur, both the results shown in the triangular element and the results in the quadrilateral element. It is hoped that this mechanical stimulation can slow down the rate of bone mineral loss. However, the quadrilateral element cannot represent the results of the distribution of forces exerted on the bone. Thus, with triangular elements can give better results.

Keywords: bone remodeling, bone density, elasticity limit, finite element method, mechanical stimulation

ID ABSTRACT: ABS-170

Determination of Customer Price Index with Generalized Space Time Autoregressive

N I Nuronia¹, S Harini^{1*}

¹Department of Mathematics, Faculty of Sciences and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: sriharini@mat.uin-malang.ac.id

Customer Price Index (CPI) is one way to analyze the level of consumption needs of people for goods and services within a certain time. The development of the current CPI determination is not only influenced by time but also by spatial heterogeneity between regions. In this study the determination of the CPI in Surabaya, Kediri, and Probolinggo uses the Generalized Space-Time Autoregressive (GSTAR) approach. Based on the results of the analysis there is the influence of spatial heterogeneity between Surabaya, Kediri, and Probolinggo. Based on Probolinggo Root Mean Square Error (RMSE) values, the economic growth rate is the most stable compared to Surabaya and Kediri.

Keywords: spatial heterogeneity, Customer Price Index, GSTAR, RMSE



Development of Remotely Operated Vehicles (Rov) Underwater For Underwater Exploration Using Proportional–Integral–Derivative (Pid) Control

R A Putra^{1*}, W A Kurniawan¹

¹Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: riezq.25@gmail.com

The research aims to develop a robot underwater Remotely Operated Vehicle (ROV) with PID control. In this development the Arduino Mega 2560 microcontroller is used as an input and output controller and responsible for carrying out PID calculations. The MPU-6050 sensor is used to read the accelerator and gyroscope values. The PID controller that is applied is used to adjust the balance of the robot when in water. The controller PID uses an accelerator and a gyroscope that is converted to an angle value using the Euler Formula as the controller input. In the calculation two axes are used to adjust the balance, the X axis (Pitch) and Y (Roll). Whereas as an output using 4 DC motors. For tunning the values of constants P, I, and D is done by making changes slowly starting at the value of 0 until a certain value is desired.

Keywords: microcontroller, Pid, Rov, underwater



The Influence of Service Quality and Previous Experience as a Moderator to tourist Satisfaction in Batu with Partial Least Squares Approach

A D Mulyanto^{1*}, E Rimawan², S Harini¹, R Ardiansyah¹

¹Department of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia ²Industrial Engineering Department, Universitas Mercubuana, Malang, Indonesia

*e-mail: angga.dwi.m@mat.uin-malang.ac.id

Tourist satisfaction became the main key to increase the number of tourism visitor. This research was held to know about the influence of service quality to the tourist satisfaction in Batu. In addition, in this research testing the moderation effect of previous experience on the influence of service quality to the tourist satisfaction. This research used Partial Least Square-Structural Equation Modeling (PLS-SEM) with Multigroup Analysis (MGA) to answer the hypothesis. The result is service quality has a significant positive effect on tourist satisfaction, so the better the service quality, it would increase the tourist satisfaction significantly, but the previous experience didn't give moderation effect. Tourists are quite satisfied with tourism destinations in Batu City. Service quality on tourism destinations in Batu City is quite good.

Keywords: partial least square, tourism, tourist satisfaction, service quality, previous experience

Application of Sensory Therapeutic Design Approach to Maternal and Child Hospital Design in Kecamatan Sumbermanjing Wetan

D S Halim^{1*}, N F Isnaini¹, N Junara¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: dini.alim170396@gmail.com

Despite Indonesia has high population, but it still has a big problem with the prosperity level because of the number of maternal and infant mortality rates. It is due to the limited number of health facilities in subdistrict. For this reason, the development of health facilities that aims to increase awareness and the ability to live healthy in order to realize the optimal degree of public health is needed. One of the health facility that can meet these needs is Maternal and Child Hospital. This facility can function as a place for health services as well as a place for health education, especially regarding maternal and child health. Apart due to the limited number of health facilities, psychological problems of patients can worsen the process of pregnancy until postpartum. Therefore, the building is designed as psychological and physiological therapy tool. The Sensory Therapeutic approach is one alternative approach that can solve the problem. Sensory Therapeutic must stimulate 5 types of senses, namely touch (skin/nerve), vision (eyes), smell (smell), taste (tongue), hearing (ears). Building design will also be adapted to the culture and manner of Islam in treating pregnant women and children and government regulations of hospital building. The implementation of these values can be seen from the floor plan design that follows the flow of activities and hijab values. In addition, interior designs and therapeutic parks are using natural materials and vegetation with a variety of textures, colors, and odors.

Keywords: maternal and child hospital, sensory therapeutic, Islamic value



A Comparative on Double Barrier Option Pricing Using Antithetic Variate and Control Variate Monte Carlo Simulations

A Aziz^{1*}, N C S Dewi¹, I F Maulida¹, A M Anwari¹

¹Department of Architecture, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: abdulaziz@mat.uin-malang.ac.id

An option is a derivative contract that gives the holder the right, but not the obligation, to buy or sell the underlying at given price either on or before a certain date. Some types of options traded on stock market are vanilla and exotic options. Barrier options are considered exotic options. Barrier options are divided into two types, they are single barrier options and double barrier options. A double barrier option has to consider each barrier separately to determine the magnitude and direction of the barrier shift. There are several methods that can be used to calculate option values, including the numerical simulation method of Antithetic Variate and Control Variate Monte Carlo. The purpose of this research was to determine the results of comparing the value of double barrier knock-out call and put option using Antithetic Variate and Control Variate Monte Carlo simulations. Antithetic Variate and Control Variate Monte Carlo simulations were done using Matlab R2013a. The results of the simulations with 10,000 repetitions show that option value pricing using Control Variate Monte Carlo simulations has error estimate smaller than Antithetic Variate Monte Carlo. So double barrier option pricing using Control Variate Monte Carlo simulations is better than Antithetic Variate Monte Carlo simulations. This research can be developed to find option value with another parameter and option types.

Keywords: Antithetic Variate, Control Variate, double barrier, Monte Carlo, option

Wiener and Terminal Wiener Indices of Annihilator Graph of Commutative Ring With Unity

N D N Y Salma¹, L Afifah¹, Abdussakir^{1*}

¹Departement of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: abdussakir@gmail.com

A graph G is an ordered pair (V (G), E (G)) consisting of a set V (G) called a line and set E(G), disjoined from V (G), which is called a side. Graphs are very diverse like the Wiener index which is the sum of all distances in each different and the Wiener Terminal index, which is the sum of all distances in each round whose degrees are equal to one. This article discusses the Wiener Index value and Terminal Wiener Index on the Annihilator Graph in the Commutative Ring with Unity of integer Z_{2n} with $n \ge 3$, n is a prime number. Wiener Index on the Index Ring with Unity of integer Z_{2n} with $n \ge 3$, n is prime number.

Keyword: annihilator graph, commutative ring with unity, terminal wiener index, wiener index



Creating Batik Patterns through the Modification of Mandelbrot Set

S A Rahmasri^{1*}, T N Farendra¹, I I P Putri¹

¹Departement of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: selyar98@gmail.com

In this modern era, the younger generation is considered to be consumptive and forget about Indonesia's cultural heritage by switching to foreign products. The existence of batik fractal product that uses algorithm and mathematical calculation, expecting could be a connector between digital technology field, science, and Indonesian batik craftsman in appropriate proportion to compete in the era creative industry. Besides batik fractal product can be made with a relatively fast time and varied motifs. One of the ways to make fractal batik is by using the Mandelbrot set. The Mandelbrot set is a collection of complex numbers that are squared continuously until many iterations. The Mandelbrot set equation is $z_2 = z^2 + c$ where z is the current point on orbit and z_2 is the next point. This research will focus on making and combining several new batik patterns from the modification of the Mandelbrot set using MATLAB

Keywords: batik, fractal, matlab, modification, the Mandelbrot set.



The Description of the Fuzzy Sets Operations in Lattice Theory

L M W Mufaridho¹, A Zahro¹, E Alisah^{1*}

¹Departement of Mathematics, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Malang, Indonesia

*e-mail: evawatialisah@mat.uin-malang.com

A set in abstract algebra with one binary operation is semilatis if the operation satisfies idempotent, commutative, and associative. We can say that the algebra is lattice if it consists of two binary operations and semilattice respectively. The definition of fuzzy sets itself is the development of crip set which has membership function in range [0,1]. Commonly, lattice uses the crisp sets as the object, but here we want to use fuzzy sets as the object to know how the description intersection and union as fuzzy operations in lattice theory. Here we have applied the intersection and the union as fuzzy operations and the fuzzy sets that we have used is a closed interval of α -cut from triangle membership function. By this research, the fuzzy sets as triangle membership function with intersection and union is a lattice which has been satisfied the property in lattice theory, that is commutative, associative, idempotent, and absorption. As a suggestion to next research, you can use the other application of operations of fuzzy logic or fuzzy number in lattice theory or others.

Keyword: Fuzzy, Intersection, Lattice, Membership Function, Union.

