



# PROCEEDING

The 6th International Conference on  
**Green Technology**

*Innovation in Islamic Perspective  
for Sustainable Development Action Toward International Challenges*

Malang, 18-19 September 2015

ISSN 2301-4490



Science and Technology Faculty

Maulana Malik Ibrahim State Islamic University

Jalan Gajayana 50 Malang, Jawa Timur, Indonesia



## Committee

### Steering Committee :

Dr. drh. Hj. Bayyinatul Muchtaromah, M.Si  
Dr. Sri Harini, M. Si  
Aldrin Yusuf Firmansyah, MT  
Linda Salma Anggreani, S.Si, MT  
Mohammad Nafie Jauhari, M.Si

### Editor

Prof. Toshifumi Sakaguchi  
Dr. Nor Atiah Ismail  
Assoc Prof. Dr. Akira Kikuchi  
Prof. Madya Dr. Mohamad Shanudin Zakariya  
Prof. Drs. Ec. Ir. Riyanarto Sarno, M.Sc., Ph.D.  
Priyantono Rudito Ph.D  
Dr. Cahyo Crysdian  
Dr. Suhartono, M.Kom  
Dr. Muhammad Faisal, MT  
Dr. Mokhamad Amin Haryadi, MT  
Dr. H. Imam Sujarwo, M.Pd  
Dr. Abdussakir, M.Pd  
Dr. Drs. Usman Pagalay, M.Si  
Dr. Agus Mulyono, M.Kes  
Dr. Ulfah Utami, M. Si  
Dr. Dra. Retno Susilowati, M.Si  
Dr. Evika Sandi Savitri, MP  
Elok Kamilah Hayati, M. Si  
Yulia Eka Putrie, MT

### Scientific Committee:

Supriyono, M.Kom  
Fachrur Rozi, M.Si  
Erna Hastuti, M.Si  
Dr. Agung Sedayu, MT  
Tri Kustono Adi, M.Sc  
Dwi Suheriyanto, S.Si., M.P  
Begum Fauziyah, M.Farm

### Organizing Committee

Dr. Eko Budi Minarno, M.Pd  
Citra Fidya Atmalia, SH  
Muhammad Ismail Marzuki, SE  
Tuti Indayani, SE  
Mujahidin Ahmad, S.Pt., M.Sc  
Roro Indah Melani, MT, M.Sc  
Ririen Kusumawati, M.Kom  
Ainatul Mardiyah, M.Cs  
Rusianah, S.Kom  
Nur Farida, S.Psi  
Abidin, S.Pd  
Hendri Cahyo Gunawan, S.Kom  
Eka Arif Santoso  
Aan Fuad Subarkah, S.Kom  
Weni Susilowati, S.AB  
Irratul Wardah, S.Kom  
Oktarina Eka Hartanti, SE  
Muhammad Hatif, S.Pd I  
Ernaning Setiyowati, MT  
Ivana Varita, S.Kom  
Prima Kurniawaty, ST., M.Si  
Deny Zainal Arifin, S.Kom  
Anton Prasetyo, S.Si  
Ahmad Latif Qosim, S.Kom  
Tarranita Kusumadewi, MT  
Sri Winarni, MT  
Gianto Widodo, S.Kom  
Aziz Mustofa, S.Kom



## FOREWORD

Sustainable development is development which meets the needs of the present without comprising the ability of future generations to meet their own needs. Sustainability is important because all the choices we pursue and all the actions that we make today will affect everything in the future. We need to make careful decisions at present in order to avoid limiting choices of the next generations at the future.

Sustainable development implies the fulfillment of several conditions: preserving the balance of the environment, preventing the exhaustion of natural resources, and optimizing the energy consumption. In the sustainable development action, there are many major challenges to be addressed. It requires us to re-think our growth in terms of social live that is more economical in its use of raw materials and energy. In this context, sustainable developments are now become an essential obligation.

Within the concept of rahmatan lil alamin, Islam considers it essential to preserve the environment and that the environmental management relies heavily on our actions today. To accommodate the above issues, the Faculty of Science and Technology of Maulana Malik Ibrahim State Islamic University dedicates an international seminar on science and technology "Innovation in Islamic perspective for sustainable development action toward international challenges".

We are delighted to invite the academicians, researchers, and practitioners to participate in this international seminar of

1. Natural science
2. Mathematics and Modeling
3. Computational Technology
4. Applied Science and Technology
5. Architecture
6. Pharmacy and Medical Technology

Best Regards

Committee



## Table of Content

Committe	ii
Foreword	iii
Table of Content	iv
<b>Natural Science</b>	
An Exploratory Study of Tomato Marketing in East Java <i>Kuntoro Boga Andri, Tiago Wandschneider, Teddy Kristedy</i>	01
Antibacterial Activity of Awar-Awar Leaves ( <i>Ficus septica</i> Burm F) Against <i>Staphylococcus aureus</i> ATCC 29523 and <i>Escherichia coli</i> ATCC 35218 <i>Arifah Khusnuryani, Zainatul Fuad</i>	14
Biodiversity and Relationship Rose Apple ( <i>Syzygium aqueum</i> Burm.F.Alston) Morphological Approach Through Nature in Plantation Bhakti, Pasuruan <i>Hamidah, Junairiah, Devi Mardiasuti</i>	20
Characteristics and Performance of Shalot Industry in Indonesia <i>Kuntoro Boga Andri, Tiago Wandschneider, Teddy Kristedy</i>	28
Characteristic Morphology on Seeds of Four Collection Plant That Have Been Cultivated in Purwodadi Botanical Garden <i>Firda Asmaul Husna, Agung Sri Darmayanti, Eko Sri Sulasmi</i>	36
Clarification of Protein Sub Unit Pili And Outer Membrane Protein (Omp) <i>Shigella flexneri</i> As Adhesion Protein With Hem Agglutination Test <i>Avin Ainur Fitrianiingsih</i>	41
Composition and Abundance Of Crustacea and Polychaeta In Mangrove Stands At Bulalo Kwandang District North Gorontalo Regency <i>Abubakar Sidik Katili, Ramli Utina, Susantika Kurapu</i>	48
Control of Fusarium Wilt Disease in Onion Plants ( <i>Allium Ascolonicum</i> ) Using Trichoderma Biofungicide <i>Diding Rachmawati, Eli Korlina, Baswarsiati</i>	52
Detection Terpenoid of Fern Genus Dryopteris, Asplenium, and Davalia in Taman Hutan Raya Raden Soerjo <i>Ajeng Wijarprasidya, Firda Asmaul Husna, Istamaya Ariani, Eko Sri Sulasmi</i>	58
Effect of Sargassum Filipendula Fucozanthin Against Hela Cell And Lymphocyte Proliferation <i>Kartini Zailanie, Umi Kalsum</i>	62



Effect of Plant Population Some Variety of Soybean in Upland <i>Zainal Arifin, Indriana RD</i>	71
Heritability and Growth of Four Shallot Varieties at Off Season in Bojonegoro <i>Fuad Nur Azis, Kuntoro Boga Andri</i>	77
Identification of Bioactive Compounds of the Moss <i>Leucobryum aduncum</i> Dozy and Molk <i>Junairiah, Tri Nurhariyati, Suaibah, Ni'matuzahroh, Lilis Sulistyorini</i>	84
Identification Tannin Compound of Three Genus Pterodophytes in Taman Hutan Raya Raden Soerjo <i>Eko Sri Sulasmi, Sitoresmi Prabaningtyas, Murni Sapta Sari</i>	89
Isolation and Characterization of Nitrogen Fixing Bacteria From Post-Mining Soil of Limestone Quarry: Bacterial Sreening For Eco-Fertilizer <i>Mashudi, Nisa Rachmania Mubarik, Ratih Dewi Hastuti</i>	93
Krokot ( <i>Portulaca Oleracea</i> . L) As a Natural Sensitizer For Tio2 Dye-Sensitized Solar Cells: The Effect Of Temperature Extract <i>Reyza Anni Mufidah, Khamidinal, Endaruji Sedyadi, Didik Krisdiyanto</i>	99
Occurrence of Important Pest and Disease on <i>Polianthes tuberosa</i> in East Java <i>Wahyu Handayati</i>	106
Potency of Tropical Fruit Juices as Natural Antioxidant Source <i>L.H. Mukminin, P.M. Al Asna, S. Sundari, B. Lukiati</i>	112
Potential Development of <i>Dioscorea composita</i> L. and <i>Dioscorea bulbifera</i> L. <i>Sri Hutami, Ragapadmi Purnamaningsih, Surya Diantina</i>	117
Rutin Compound From <i>Malus Domesctica</i> Against Colon Cancer Based On In Silico <i>Arindra Trisna Widiensyah, Ardini Pangastuti, Rizka Elan Fadilah</i>	125
Seedlings Growth of a Critically Endangered Species, <i>Hopea sangal</i> , on Various Growing Media <i>Soejono</i>	131
Study of Microbiological at Coastal Water in Port Dickson, Malaysia <i>Prima Aswirna</i>	139
Study of Various Factors For Hairy Root Growth of <i>Artemisia Annua</i> <i>Ragapadmi Purnamaningsih, Sri Hutami, Ireng Darwati</i>	148
Synthesis of <i>l-menthyl</i> Acetate by Esterification <i>l-menthol</i> and Acetate Anhydride with Variation of Time <i>Novia Suryani, A. Ghanaïm Fasya, Rurini Retnowati, Akyunul Jannah</i>	155



The Influence of Media Osmotic on Characters of <i>Celosia</i> in Vitro Callus <i>Retno Mastuti, Nunung Harijati</i>	162
The Periphyton Community Structure In The Habitat Of Lawar ( <i>Perinereis cf. cultrifera</i> ) At Wearlilir Waters In The Southeast Maluku <i>Martha Rettob</i>	168
The Use of Plant as a Natural Larvacide to the Mortality <i>Aedes Aegypti</i> Larvae <i>Aseptianova</i>	173
<b>Applied Science &amp; Technology</b>	
Attack Shoot Borers <i>Scirpophaga excerptalis</i> Walker (Lepidoptera; Pyralidae) Planting System In Multiple Sugarcane ( <i>Saccharum officinarum</i> L.) <i>Andi Muhammad Amir</i>	178
Application Technology of Post-Harvest Sweet Corn in the Tawangargo Village, Karangploso District, Malang <i>Lailatul Isnaini, Baswarsiaty</i>	190
Bioecology Pest Rodents on Mung Bean Plant Fore Belu East Nusa Tenggara and Control <i>Riza Ulil Fitria</i>	201
Effect of Complementary Liquid Fertilizer on Quality Parameters and Physico-chemical Characteristics of Cabbage ( <i>Bassica oleraceae</i> L.) During Preservation <i>Ita Yustina, Sri Zunaini Sa'adah, Rohmad Budiono, Farid R. Abadi</i>	206
Effect of Grafting and Variety on Disease Development and Production of Tomato <i>Eli Korlina, Evy Latifah, Kuntoro Boga Andri, Joko Mariyono</i>	213
Feed Efficency and Body Weight Gain of Fat Tailed Sheep Fed Dry Vegetable Waste as Substitution of Concentrates <i>Siti Istiana, Dini Hardini, Eni Fidiyawati</i>	221
Greenhouse Dryer Performance for Drying Thin Slices of Potato Tuber <i>Farid R. Abadi, Ita Yustina</i>	225
Introduction of 4 New Superior Varieties of Inpari Paddy in Scholl Field-Integrated Crops Management (ICM) <i>Sugiono, Amik Krismawati</i>	232
Lawar Nutritional Content and Lawar Pellets <i>Martha Rettob, Cenny Putnarubun, Nally Erbabley, Santy Rahantoknam</i>	239
Mechanical Properties of Brass Metal Matrix Composite (MMC) reinforced with Fly Ash <i>Aminnudin, Heru Suryanto</i>	243



Preference Test of Sustainable Food Household area (KRPL)'S Products in Sukorejo Village, Ponorogo <i>Sri Satya Antarlina, Aniswatul Khamidah</i>	247
Respons of New Varieties Rice to Important Pests in Bangkalan Rainfed <i>Donald Sihombing, Wahyu Handayati</i>	257
Sago Palm (Metroxylon sagu rottb.) as potential Genetic Resource For Food and Environmental Conservation <i>Yati Supriati</i>	263
Study on the Ash Composition of <i>Albazia F alcataria</i> <i>Mokh. Hairul Bahri</i>	271
The Assessment of Field Usage on Productive Age Podang Mango Plantation For Intercrops <i>Sri Yuniastuti</i>	273
The Assesment of NSV's Role in Increasing Wetland Rice Productivity at Kediri Regency <i>Sri Yuniastuti, Sri Satya Antarlina</i>	280
The Combustion of Hydrogen on Reaction Jathropa Oil and Water <i>Agus Wibowo, I.N.G Wardana, Slamet Wahyudi, Denny Widhiyanuriyawan</i>	287
The Effectiveness of Inorganic Fertilizer Usage on Growth and Yield of Field Rice <i>Amik Krismawati, Sugiono</i>	292
Thermal Degradation Of Mendong Fiber <i>Heru Suryanto</i>	306
<b>Mathematics and Modelling</b>	
Analysis of Torque Vertical on String Model <i>Ari Kusumastuti, Sri Sasi Yuni Nurhayati</i>	310
Assimilation and Accomodation Description of The Eighth Grade Students with Low Ability in Learning Phytagoras Theorem <i>Herfa MD Soewardini</i>	315
The Effectiveness of Calculus Based on Contextual Learning Model <i>Nana Sepriyanti, Ahmad Fauzan</i>	323



<b>Computational Technology</b>	
Monitoring on the Development of Small and Middle Business in Malang Based on Geographic Information System (GIS) and Fuzzy Sugeno <i>Gianto Widodo, Novta Dany'el Irawan, Mustamin Hamid, Soleh Hadi Purnomo</i>	327
White Box Testing on the Learning Assesment Software Development <i>Muhammad Nuris, Fatchurrochman, Zainal Abidin</i>	334
<b>Architecture</b>	
Emerging Landscape Visual Quality Assessment for Rural Spatial Planning in Bumiaji District, Batu City <i>Dina Poerwoningsih, Antariksa, Amin Setyo Leksono, Abdul Wahid Hasyim</i>	341
Performance Attributes Determination of Tawang Alun Terminal in Jember <i>Agung Sedayu</i>	354
Strategy on Green Building to Reduce Overall Thermal Transfer Value in the Orthopedic Hospital in the Tropics <i>Hendro trilistyo, Erni Setyowati</i>	362
Sustainable Pedestrian Ways in Central Business District of Tunjungan Surabaya <i>Ardy Maulidy Navastara Veronica Mandasari</i>	369
The Quality Evaluation of Regional Structure of Ijen Area in Malang City Towards Sustainable Urban Development <i>Aldrin Yusuf Firmansyah</i>	377
<b>Pharmacy and Medical Technology</b>	
Alstonia Scholaris : Alkaloids Isolation, And Potency Toward Toxoplasmosis Identification <i>Begum Fauziyah, Ali Abraham, Qodia Rahmawati, Roudlotul Nadhifah, Fadhilatul Ismiyah</i>	388
Can Miswak Extract Be Topical Antimicrobial? <i>Atina Yuliandari, Faiqotul Choirroh, Abdul Syakur</i>	393
Comparison The Anticancer Effect Of Extract And Fraction Calotropis Gigantea Radix On Human Colon Cancer Widr And Breast Cancer T47D Cell Lines <i>Roihatul Mutiah, Sukardiman, Aty Widyawaruyanti</i>	398
Date Fruit as a Potential Pharmaceutical Product Rich in Antioxidants <i>Neneng Fadi'ah Idzni</i>	407





Effect of Polysaccharide Krestin From <i>Coriolus Versicolor</i> on Antibody Titer Mice Exposure Due <i>Pseudomonas Aeruginosa</i> <i>Sri Puji Astuti Wahyuningsih, Nadyatul Ilma Indah Savira, Win Darmanto</i>	412
Performance Analysis of General Hospital Pharmacy of University Muhammadiyah Malang With Customer Perspective Approachment <i>Ika Ratna Hidayati</i>	418
Reverse Docking Reveals <i>Annona Muricata</i> 's Muricatocin C As A Candidate Of Ppary Inhibitor (A New Alternative Drug For Osteoporosis' Therapeutic) <i>Ahmad Fauzi, Agung Pambudiono, Erna Wijayanti</i>	424
Sanguinarine Chloride as a Result of Virtual Screening For Candidate of Egfr Inhibitor <i>Agung Pambudiono, Wasiatus Sa'diyah, Yulya Fatma, Diandara Oryza</i>	429
The Characteristic Feature Of Type 2 Diabetic Animal Models Induced By High Fructose Diet Ang Multiple Low Dose Streptozocotin <i>Nurlaili Susanti</i>	434
The Optimization Of Eluent Chromatography Thin Layer 2-D For The Purification Of Isolat Alkaloid Of Pulai Having Potention As Anti-Toxoplasma <i>Arief Suryadinata, Begum Fauziyah, Fitria Rahmawati</i>	440





Innovation in Science perspective for sustainable development action toward international challenges

# certificate

Number: Un.03.6/HM.00.5/2282/2015

This is to certify that

*Mokh. Hairul Bahri*

has been awarded a certificate for the participation as

*Presenter*

in the 6<sup>th</sup> International Conference on GREEN TECHNOLOGY  
organized by Science and Technology Faculty,  
Maulana Malik Ibrahim State Islamic University  
Malang, East Java, Indonesia

Malang, 18-19<sup>th</sup> September 2015

Organizing Committee

Aldrin Yusuf Firmansyah, MT  
The Chairman

Science and Technology Faculty

Dr. drh. Bayyinatul Muchtaromah, M.Si  
The Dean



Science and Technology Faculty  
Maulana Malik Ibrahim State Islamic University  
Jalan Gegeron ST Malang 65144, East Java, Indonesia  
phone/fax: +62 341 5580933  
<http://satek.mai-malang.ac.id>



## STUDY ON THE ASH COMPOSITION OF *Albazia Falcataria*

Mokh. Hairul Bahri

Student of Doctorate Program of Mechanical Engineering Science, University of Brawijaya Malang  
Mechanical Engineering Department, University Of Muhammadiyah Jember  
Email : mhairulbahri@yahoo.com

### ABSTRACT

Search environmentally energy sources to reduce the impact of global warming is being done. The Government of Indonesia through SMRTI 2006 was developing and implementing science and technology fields of new and renewable sources of energy to support the security of energy supply in 2025 for the next of human survival. Biomass is a one of renewable energy. In this research, Sawdust Of Albazia Falcataria as solid fuel was investigated using SEM-EDAX to know the composition for preventing damage in heat exchanger. Problems in heat exchanger are slagging and fouling caused by biomass burning. The investigation of *Albizia Falcataria* were contains S, K before burning 0,27%, 0,56% and 0,49%, 0,82% for ash respectively. By using biomass energy as solid fuel decreased usage of fossil fuel to diminish global warming effect and sustainability of the earthlife

### Keywords

Albazia Falcataria; Renewable energy; Ash; biomass;

### INTRODUCTION

Biomass as fuel was investigated by several researcher, they found that there were slagging and fouling when using biomass combustion in Boiler system. (Liao C 2007,88) (Giron RP 2012, 26(3)). Biomass was potential resources of energy because they can grow fastly than fossil fuels. They can be as balancer in the world, use CO<sub>2</sub> to grew up and release O<sub>2</sub>. This research goal was to identified the element contains of Albazia Falcataria as solid fuel.

### MATERIAL AND METHOD

Fresh sawdust of Albazia Falcataria was collected from local sawmill business at Lumajang State, East Java Provincy, Indonesia.

Investigation using SEM-EDAX conducted at Central Laboratorium, Physics

Department, Mathematics and Natural Science Faculty, State University of Malang by compare fresh sawdust of Albazia falcataria and the ash from reactor combustion. Reactor temperature set to 900 ° C as similar to commons boiler (Konsomboon et al. 2011).

### RESULT AND DISCUSSION

Combustion of biomass released amount of Cl and S, also alkali metals such K and Na. It shows in table 1 that percentage of Sulfur (S) and Potassium (K) increased from 0.27% to 49% and 0.56% to 0.82% respectively. Potassium primally exist as KCl<sub>(g)</sub> and KOH<sub>(g)</sub>, while Sulphur and Chlorine are present as SO<sub>(g)</sub> and HCl<sub>(g)</sub>. There was Chlorine in the combustion of Albazia Falcataria, it means KCl compound will be established during Albazia Falcataria combusted. With decreasing temperature KOH<sub>(g)</sub> is converted to K<sub>2</sub>SO<sub>4(g,s)</sub> and K<sub>2</sub>CO<sub>3</sub> by gas phase reaction, while KCl<sub>(g)</sub>

condensed as KCl<sub>(s)</sub>. According to chemical equilibrium all sulphur should be bond as solid K<sub>2</sub>SO<sub>4</sub> (Christensen 1995).

Table 1. Element Contains in Fresh Sawdust of Albazia Falcatoria and The Ash

Element	Fresh Sawdust		Ash	
	Wt%	At%	Wt%	At%
C	10.54	18.74	54.53	62.15
O	35.25	47.05	43.15	36.93
Na	02.81	02.61		
Mg	02.00	01.76		
Al	01.82	01.44	00.38	00.22
Si	14.06	11.07		
P	01.36	00.94	00.23	00.10
S	00.38	00.25	00.27	00.12
K	02.93	01.60	00.56	00.20
Ca	24.55	13.08	00.51	00.17
Fe	03.80	01.45		
Cl			00.35	00.14

Source: Independent experiment

## CONCLUSION

Result from this experiment shows that Sawdust of Albazia Falcatoria has potential properties as solid fuel but it must be reduced and controlled S, Cl and K

By using biomass energy as solid fuel will decreased usage of fossil fuel to diminish global warming effect and sustainabilty of the earthlife.

## REFERENCES

- Christensen, K.A., The formation of submicron particles from the combustion os straw, Ph.D Dissertation, Department of Chemical Engineering , Technical University Of Denmark, 1995
- Konsomboon, Supatchaya, Suneerat Pipatmanomai, Thanid Madhiyanon, and Suvit Tia. 2011. "Effect of Kaolin Addition on Ash Characteristics of Palm Empty Fruit Bunch ( EFB ) upon Combustion." *Applied Energy* 88 (1). Elsevier Ltd: 298–305. doi:10.1016/j.apenergy.2010.07.008.
- Giron RP, Suarez Ruiz I, Ruiz B, Fuente E, Gill RR, Fly ash from the combustion of forest biomass (Eucalyptus globulus bark) a biomass boiler system, composition and physico-chemical properties, *Energy Fuels*, 2012(26), 1540-56
- Liao C, Wu C, Yan Y, The characteristics of inorganic elements in ashes from a 1 MW FCB biomass gasification power generation plant, *Fuel Processing technology*, 2007(88), 149-56