



**2nd Junior Chemist
Colloquium 2009
PROGRAMME AND ABSTRACTS**

1-2 July 2009
Multimedia Theatre (TMM)
Faculty of Resource Science &
Technology
Universiti Malaysia Sarawak

Organised by

Department of Chemistry
Faculty of Resource Science & Technology
Universiti Malaysia Sarawak



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MESSAGE FROM THE DEAN



Assalamualaikum Warahmatullahi Wabarakatuh and Salam Sejahtera

I would like to extend a warm welcome to all participants to the 2nd Junior Chemist Colloquium organized by Department of Chemistry, Faculty of Resource Science & Technology, UNIMAS.

This colloquium will be an appropriate platform for postgraduate students to share their scientific findings in various disciplines of chemistry. It is hoped that the colloquium will play an important role to encourage and embrace cooperative and collaborative among the postgraduate students and researchers.

I would like to express my appreciation to the organizing committee for their great effort in organizing this colloquium and also to Universiti Malaysia Sarawak for their support.

To all participants, I wish you success in your research endeavors.

Professor Dr Shabdin Mohd Long

Dean

Faculty of Resource Science & Technology

MESSAGE FROM THE CHAIRPERSON



Assalamualaikum Warahmatullahi Wabarakatuh and Salam Sejahtera

Once again the Department of Chemistry, Universiti Malaysia Sarawak (UNIMAS) is hosting the annual Junior Chemist Colloquium (JCC).

The 1st JCC 2008 was initially organized with the aim to provide a platform for graduate students of Department of Chemistry, UNIMAS to share their research findings internally, and to nurture a good research culture among them. The success of the 1st JCC 2008 has led to the setting up of 2nd JCC 2009, where this time, the invitation for participation was extended to graduate students in Chemistry related field in other public universities in Malaysia.

More than 50 participants will present their research findings orally and by posters in this 2-day colloquium. It is hoped that through 2nd JCC 2009, graduate students in Chemistry related field across Malaysia will be able to exchange ideas and widen up their research knowledge.

Finally, I would like to take this opportunity to thank all the advisors and committee members of 2nd JCC 2009, Faculty of Resource Science and Technology, Centre for Technology Transfer and Consultation of UNIMAS, all plenary speakers and participants for making 2nd JCC 2009 happen.

Rafeah Wahi

Chairperson of Organizing Committee,
2nd JCC 2009

PROGRAMME

Wednesday, 1st July 2009

0800 - 0830 Registration

0830 - 0915 **PLENARY 1**

Chemical Research beyond Postgraduate

Prof. Dr. Lau Seng

Institute of Biodiversity and Environmental Conservation

UNIMAS

Chairperson : Assoc. Prof. Dr. Ling Teck Yee

Session 1A

Chairperson : Ms Azaima Razali

0915 - 0930 1A-01 **Study of Chemical Constituents from *Wedelia biflora* and *Wedelia trilobata***
Nuraqilah Othman (UNIMAS)

0930 - 0945 1A-02 **Phytochemicals Studies and Antimicrobial Activity of *Artocarpus lanceifolius***
Noor Safina Sulaiman (UTM)

0945 - 1000 1A-03 **Phytoremediation of Soil Contaminated by Heavy Metals**
Aisyaidil binti Hanri (UNIMAS)

1000 - 1030 Coffee break

Session 1B

Chairperson : Ms Yusralina Yusof

1030 - 1045 1B-01 **Chemical Constituents of *Etilingera littoralis* (Red Flower With Yellow Margin Variety)**
Siti Norsa'idah binti Norhayat (UTM)

1045 - 1100 1B-02 **Enantioselective Analysis of Modafinil in Pharmaceutical Formulations by Capillary Electrophoresis and Computational Calculation of Their Inclusion Complexes**
Khaldun Mohammad Mitlaq Al- Azzam (USM)

1100 - 1115 1B-03 **Sulfide Concentrations in Batang Ai Hydroelectric Reservoir**
Debbie Deborah Paka (UNIMAS)

1115 - 1130 1B-04 **Cytotoxic Properties of Flavonoids Isolated from the Barks of *Artocarpus fulvicorte***
Nur Azlin binti Othman (UTM)

- 1130 - 1145 1B-05 **Investigation on the Potential Use of Several Organic Wastes As Feedstock for Microwave Pyrolysis**
Sharifah Mona binti Abd Aziz Abdullah (UNIMAS)
- 1145 - 1200 1B-06 **Alkaloids Isolated from the Bark of *Cryptocarya Densiflora***
Wan Nurul Nazneem bt Wan Othman (UM)
- 1200 - 1215 1B-07 **Impacts of Aquaculture on Nutrient Concentrations and DO Level in Santubong River, Sarawak**
Michelle Christine Miod (UNIMAS)
- 1215 - 1245 **Poster Session I**
PP-01 – PP-11
Venue : Foyer Level 1
Faculty of Resource Science & Technology
- 1245 - 1400 Lunch break
- Session 1C**
Chairperson : Ms Maya Asyikin Mohd Arif
- 1400 - 1415 1C-01 **A Novel Method for the Determination of Un-Derivatized Fatty Acids Using Reversed Phase HPLC With Contactless Conductivity Detection**
Ahmad (Moh'd Ali) Hasan Makahleh (USM)
- 1415 - 1430 1C-02 **Tidal Effect on the Ammonia – Nitrogen Dispersion Along Batang Salak Duing anak Buda (UNIMAS)**
- 1430 - 1445 1C-03 **A Preliminary Study on Pollution and Water Quality Improvement in Sg. Sarawak**
Sabrina Ummi (UNIMAS)
- 1445 - 1500 1C-04 **Synthesis and Molecular Structure Of 3-Benzyl-7,7,8A-Trimethyl-5-Thioxo-Tetrahydro-3H-Oxazolo[3,2-F]Pyrimidin-2-(5H)-One**
Nur Eliyanti Ali Othman (UKM)
- 1500 - 1515 1C-05 **Synthesis and Characterization of Cyclotriphosphazene Bearing Schiff's Base and Chalcone Derivatives**
Chiew Wang See (UNIMAS)
- 1515 - 1530 1C-06 **Synthesis , Crystal structure , Spectroscopic Studies of alkyl-3-(3-hydroxyphenyl)-3,4dihydrobenzo[e][1,3]oxazepine-1,5-dione**
Mohammad Abdul Karim Talaq (USM)
- 1530-1545 Tea break

Session 1D

Chairperson : Mdm Amira Satirawaty Mohd Pauzan

- 1545-1600 1D-01 **Potential Liquid Crystal Compounds from Sugar-Chalcone Derivatives**
Dyg Halimatulzahrah bt Abang Kamaluddin (UNIMAS)
- 1600-1615 1D-02 **Synthesis, Characterization and Anti-Proliferation Studies of N-1-(2-Hydroxy-3-Methoxybenzyl)-2-(2-Hydroxy-3-Methoxyphenyl)-1H-Benzimidazole**
Mohammed Hadi Saeed Al-Douh (USM)
- 1615-1630 1D-03 **Synthesis and Structural Study of N-(3-Chloropropionyl)-N^o-(fluorophenyl) thiourea Isomers**
Nur Liyana binti Ismail (UKM)
- 1630-1645 1D-04 **Synthesis and Characterization of Zeolite H-ZSM-5 For Xylene Isomerization**
Norzahir bin Sapawe (USM)

Thursday, 2nd July 2009

- 0830-0915 **PLENARY 2**
Research Trends in Postgraduate Education
Prof. Dato Dr. Laily bin Din
Centre for Graduate Management
UKM
Chairperson : Dr. Zainab Ngaini
- 0915-0945 **OPENING ADDRESS**
YBhg. Prof Dr. Khairuddin Abd Hamid
Vice Chancellor
UNIMAS
Chairperson : Dr. Zainab Ngaini
- 0945-1015 Coffee break
- 1015-1100 **PLENARY 3**
Global Green Technology: Water-Rich and Micro-extraction Methods
Prof. Dr. Mohd. Marsin Sanagi .
Ibnu Sina Institute for Fundamental Science Studies
UTM
Chairperson : Dr. Zainab Ngaini

Session 2A

Chairperson : Ms Maya Asyikin Mohd Arif

- 1100-1115 2A-01 **Synthesis and Molecular Structure of Metal-EDTA Complexes As Inorganic Nutrients for Fertigation Farming**
Farah Khuwailah bt Ahmad Bustamam (UKM)
- 1115-1130 2A-02 **Synthesis, Characterization, Anti-Oxidant Property Of N'-(2-Hydroxy-4-Methoxybenzylidene)-Benzohydrazide Derivatives**
Nooraziah binti Mohd Lair (UM)
- 1130-1145 2A-03 **Reaction of 3-Chloro-2-Butanone with Ammonium Thiocyanate and The Succeeding Reaction with Amino Acids**
Nor Azlan Bin Hasan (UKM)
- 1145-1200 2A-04 **Fabrication of All Solid-State Thin-Film Electrochemical Capacitors (Ecs)**
Wee Boon Hong (UNIMAS)
- 1200-1215 2A-05 **Effect of Temperature on Mwcnts Functionalization for The Formation of Stable Mwcnts Colloidal System**
Fatirah bt Fadil (UTM)
- 1215-1230 2A-06 **Comparison of Mechanical Properties Between Low Design Polyethylene Nanocomposite and Composite Using A-Alumina Article as Filler**
Jenney Ngu Lim Song (UPM)
- 1230-1245 2A-07 **Photocatalytic Degradation of N-Methyldiamine Compound Using Semiconductor Photocatalyst**
Mariami Alisa binti Sharifuddin (UTM)
- 1245-1400 Lunch

Session 2B

Chairperson : Mdm Amira Satirawaty Mohd Pauzan

- 1400-1415 2B-01 **Methanation Reaction Over Nickel Oxide Based Catalysts for the Purification of Natural Gas**
Susilawati bt Toemen (UTM)
- 1415-1430 2B-02 **Characterization of Compression Moulded PP/Kenaf Composite**
Bernard Maringgal (UPM)
- 1430-1445 2B-03 **Photocatalytic Activity of Zn/Osno₂ Coupled Photocatalysts on the Degradation of N-Methyl Diethanolamine**
Siti Sakinah Mislan (UTM)

- 1445-1500 2B-04 **Activated Carbon from Waste Palm Kernel Shell for Carbon Brush in Automotive Industries**
Nurul Aqmar binti Siam (UTM)
- 1500-1515 2B-05 **Physicochemical Studies on ETS-10 Supported Lanthanide Doped Nickel Oxide Nanoparticles**
Nor Najmah bt Abdul Mutalib (UTM)
- 1515-1530 2B-06 **Synergistic Effect of Cobalt-Molybdenum Catalyst Formulation for the Synthesis of High Quality Carbon Nanotubes**
Nooradilah binti Abdullah (UTM)
- 1530-1600 **Poster Session II**
PP-12 – PP-21
Venue : Foyer Level 1
Faculty of Resource Science & Technology
- 1600-1630 **CLOSING CEREMONY**
YBhg. Prof. Dr. Shabdin Mohd Long
Dean, Faculty of Resource Science & Technology
UNIMAS
- 1630 Refreshment

POSTER PRESENTATION

Venue : Foyer Level 1

Faculty of Resource Science & Technology

- PP-01 **Goniothalamine, A Styryl Lactone From The Stem Barks The Roots Of *Goniothalamus Velutinus***
Nur Khairun Nisa' Mohd Sallehudin (UNIMAS)
- PP-02 **Chemical Studies and Biological Activities of *Piper vestinum***
Mohd Alhafizh bin Zailani (UNIMAS)
- PP-03 **Phytochemical Studies and Biological Activities of *Goniothalamus* spp**
Christine ak Jinang (UNIMAS)
- PP-04 **Phytochemical and Biological Studies of *Cymbopogon nardus***
Aina Nabilla Bandah (UNIMAS)
- PP-05 **Chemical Constituents And Biological Activities Of The Bark Oil Of *Agathis borneensis***
Fouziah binti Alet (UNIMAS)

- PP-06 **Study of the Isolation of the Chemical Components from Methanolic Extracts of *Cymbopogon nardus***
Nabihah binti Hamdan (UNIMAS)
- PP-07 **Acetyl Cholinesterase Inhibitory Activity from *Mesua kunstleri***
Chan Gomathi (UM)
- PP-08 **Essential Oil Analysis and Antibacterial Activities of Two Closely Related Wild Species of *Alpinia***
Devi Rosmy Syamsir (UM)
- PP-09 **DPPH Radical Scavenging Effects on Crude Extracts from Different Parts of Three *Artocarpus* Species**
Noraini binti Jema'on (UTM)
- PP-10 **Organic Geochemistry of Asphaltenes in Crude Oil from Sarawak**
Zainah binti Adam (UNIMAS)
- PP-11 **Vertical Profile of Heavy Metals in Marine Core Sediments of Kuching Bay, Sarawak**
Abdul Hafidz bin Yusoff (UNIMAS)
- PP-12 **Synthesis, Structural, Characterization and Toxicity Studies of Novel Organotin (IV) Complexes Derived from Benzoylacetone**
Irene Foo Ping Ping (UNIMAS)
- PP-13 **Organotin (IV) Complexes with 2-Hydroxyacetophenone Carbohydrazone Ligand and their Biological Studies**
Foo Siong Wan (UNIMAS)
- PP-14 **Syntheses and Structural Aspects of Furan Carboxamido Styryl Biphenyls, B-Nitrostyrenes (Incorporating The Thiophenyl) Moiety and The A,B-Unsaturated Weinreb Amides**
Mohd Fadzli Bin Md Din (UM)
- PP-15 **Preparation and Characterization of Polycaprolactone/Clay Nanocomposites**
Then Yoon Yee (UPM)
- PP-16 **Aluminium Ketohydrazone Complexes as Emitter Materials in Organic Electroluminescent Devices**
Mohd Ridzuan bin Omar Sani (UTM)
- PP-17 **Synthesize Tungsten Carbide from Waste palm Kernel Shell by Intermittent Microwave Heating (IMH)**
Siti Zubaidah bt Hanapi (UTM)
- PP-18 **Synthesized Surface Modified Metal Oxide in Base-Catalytic Transesterification for Biodiesel Production**
Nur Syaziela binti Samadi (UTM)

- PP-19 **Spectrophotometry Semiquantitation Method Benzoic Acid and Hipuric Acid in Urine for Demonstration of Toluene Abuse**
Mohamad Raizul bin Zinalibdin (UTM)
- PP-20 **Analysis of Phenolic Compounds in Selected Cosmetic Products Using HPLC**
Mohd Akkbik (UNIMAS)
- PP-21 **Synthesis And Antimicrobial Studies Of Hydroxylated Chalcone Derivatives With Variations In Chain Length**
Siti Muhaini Haris Fadzillah (UNIMAS)

ABSTRACTS FOR PLENARY LECTURES

Plenary 1

CHEMICAL RESEARCH BEYOND POSTGRADUATE

Prof. Dr. Lau Seng
Director, Centre for Water Research
Institute of Biodiversity and Environmental Conservation
Universiti Malaysia Sarawak
94300 Kota Samarahan, Sarawak, Malaysia

Research carried out in Malaysia is mainly done by postgraduate students. More often than not, these young researchers will conduct research projects on a proposal developed by their supervisors. Upon completion of the research and obtained their degrees, most of them would not be doing anymore research, except for a handful that are retained as academics or manage to be employed by some government research institutions. The question raised from this scenario would be how intensive is our Malaysian research beyond the postgraduate level? This paper will try to discuss and find possible reasons as to why only minimal research activities go beyond postgraduate level. One obvious reason is that there is just not enough research activities among the industries. Most of our local industries are too small to afford the cost of research while the bigger industries are subsidiaries of some multinational companies where their researches are done in scientifically more advance countries. This vicious cycle has to be broken. In addition, our young researchers should be trained not only with the skills but with the research mentality. Our industrial players need to change their mindset to develop their identities rather than just copying whatever released into the market. The synergies between universities and industries should be given better priority by the Ministry of Higher Education as well as the universities in this country. We have the human capital, what we need now is the industrial will to transform this resource into sustainable economic development.

Plenary 2

RESEARCH TRENDS IN POST-GRADUATE EDUCATION

Prof. Dato Dr. Laily Bin Din
Dean, Centre for Graduate Management
Universiti Kebangsaan Malaysia
43600 UKM Bangi, Selangor, Malaysia

Post-graduate education faces a lot of challenges in many aspects, such as quality, market demand as well as teaching, learning and research facilities offered by the institutions of higher learning. Today, a post-graduate student is expected to acquire the necessary skills to enable him/her to carry out research independently and also to acquire knowledge in preparation for the job market. Both the skills and knowledge are essentials in building a knowledgeable society. In this presentation issues such as disciplines in conducting research, courses in research programme, the use of ICT in research, supervisory issue, transferable skills development, networking, patents and publications of research findings are discussed.

Plenary 3**GLOBAL GREEN TECHNOLOGY: WATER-RICH AND
MICRO-EXTRACTION METHODS**

Prof. Dr. Mohd. Marsin Sanagi
Director, Ibnu Sina Institute for Fundamental Science Studies
Universiti Teknologi Malaysia
81310 UTM Skudai, Johor, Malaysia

Global green technology refers to global movement towards the application of the environmental science to conserve the natural environment and resources, and to reduce the negative impacts of human involvement. Green Technology is low-carbon technology and is environmentally friendlier than a comparable existing technology. Separation science has long applied greener extraction methods including the use of microwaves, ultrasound, and supercritical fluids in various fields including natural products from animal and plant materials that are widely employed as fragrance, insect repellent and traditional medications for coughs and stomach ache. Application of lower temperature extraction methods have great potential as alternative methods to traditional hydro-distillation and therefore may have promising use in Malaysia. More recently, microextraction methods have evolved to redress the limitation inherent in the traditional extraction methods that is the use of large amounts of organic solvents. Solid phase microextraction (SPME) was introduced where a small amount of extractant is dispersed on a solid support (fiber) and exposed to the sample. However, it has a few drawbacks, such as limited lifetime and linear range, fragility of the fibers, sample carryover and relatively expensive fibers and fiber assembly holder. Alternatively, liquid phase microextraction (LPME) methods have emerged as a powerful tool to pre-concentrate compounds from aqueous samples prior to chromatographic analysis. LPME is performed in which the analytes in their neutral form are extracted from aqueous samples, through a thin layer of an organic solvent on the top of the sample, and into an aqueous acceptor phase. Recent works in our laboratory includes the development of LPME using cone-shaped membrane and three phase hollow fiber LPME. Besides being simple, inexpensive, fast, and easily automated, LPME is virtually solvent free. It often results in increased sensitivity and because of the disposable nature of the hollow fiber, it also eliminates the possibility of carry-over between analyses.

ABSTRACTS FOR ORAL PRESENTATION

1A-01

STUDY OF CHEMICAL CONSTITUENTS FROM *WEDELIA BIFLORA* AND *WEDELIA TRILOBATA***Nuraqilah Othman and Kamarul' Ain Mustafa**Department of Resource Chemistry, Faculty of Resource Science and Technology,
Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak

A study was carried out to isolate, characterize and elucidate the chemical constituents from *W. biflora* and *W. trilobata* for the scientific usage of these species for the modern treatment regarding its value in the traditional medicine. *W. biflora* and *W. trilobata* was collected in disturbed environments in area of Kota Samarahan. The dried sample of whole plants was then been extracted with cyclohexane and followed by 95 % ethanol. The ethanol crudes from both species were fractionated using column chromatography and two pure components were isolated from each species. This component was expected to be triterpenes derivatives based on NMR and FT-IR spectra and for the time being, the structure of this components is still in the progress of characterization and elucidation.

1A-02

PHYTOCHEMICALS STUDIES AND ANTIMICROBIAL ACTIVITY OF *ARTOCARPUS LANCEIFOLIUS***Noor Safina Sulaiman and Shajarahtunnur Jamil**Department of Chemistry, Faculty Science,
Universiti Teknologi Malaysia, 81310 Skudai, Johor

Phytochemical studies on the leaves and stem barks of *Artocarpus lanceifolius* obtained from Terengganu have been conducted. Extraction of the powdered samples was carried out by cold extraction method. Purification of the chemical components was done by various chromatographic methods and their structures were determined spectroscopically by ¹D and ²D Nuclear Magnetic Resonance Spectroscopy, Infrared Spectroscopy and Mass Spectrometry. Four compounds were successfully isolated from the stem bark which were identified as 9,19-cyclolanost-24-en-3-acetate, cyclo-artobioxanthone, artonol B and 2', 4', 5', 5-tetrahydroxy-7, 8-(2,2-dimethylchromeno)-flavone. The antibacterial test performed on the crude extracts and pure compounds showed that several pure compounds and crude extracts have significant activity. 2', 4', 5', 5-Tetrahydroxy-7, 8-(2, 2-dimethylchromeno)-flavone showed the most significant antibacterial activity compared to other isolated compounds and crude extracts with MIC and MBC values of 62.5 to 31.3 µg/mL.

1A-03

PHYTOREMEDIATION OF SOIL CONTAMINATED BY HEAVY METALS

Aisyaidil Binti Hanri¹, Zaini B. Assim¹, Isa B. Ipor² and
Awang Ahmad Sallehin Awang Hussaini³

¹Department of Chemistry

²Department of Plant Science & Environmental Ecology

³Department of Molecular Biology

Faculty of Resource Science and Technology,
Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak

Phytoremediation includes all biological, chemical and physical processes using plants including rhizosphere for in situ or ex situ removal, transfer, stabilization or destruction of contaminants in soils, sludges, sediments and water. Plants mineralized some toxic organic compounds and accumulate heavy metals and other inorganic compounds from soil into aboveground shoots. Four native plant species, namely *Asystasia coromandeliana*, *Phyllanthus amarus*, *Kaempferia rotunda* and *Jathropa podagrica* were used to evaluate the ability of plants to accumulate heavy metals from contaminated soils. *K. rotunda* and *J. podagrica* showed potential as an accumulator for heavy metals from contaminated soil. This study also revealed that *A. coromandeliana* and *P. amarus* did not survive in heavily contaminated soils with heavy metals.

1B-01

**CHEMICAL CONSTITUENTS OF *ETLINGERA LITTORALIS* (RED FLOWER WITH
YELLOW MARGIN VARIETY)**

Siti Norsahidah Norhayat and Hasnah Mohd Sirat

Department of Chemistry, Faculty of Science,
Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor

Phytochemical study on the rhizomes of one of the variety of *Etingera littoralis* (Zingiberaceae) has been carried out. Soxhlet extraction of the dried rhizomes with chloroform followed by purification using several chromatographic techniques yielded three compounds comprising of phenylpropanoids and a ketone derivative. Their structures have been elucidated by various spectroscopic techniques as methyl eugenol, 3,4-dimethoxycinnamaldehyde and 5-(4'-methoxyphenyl)-4E-pentene-2-one.

1B-02**ENANTIOSELECTIVE ANALYSIS OF MODAFINIL IN PHARMACEUTICAL FORMULATIONS BY CAPILLARY ELECTROPHORESIS AND COMPUTATIONAL CALCULATION OF THEIR INCLUSION COMPLEXES**

Khaldun AL Azzam, Bahruddin Saad, Rohana Adnan and Muhammad Idiris Saleh
School of Chemical Sciences, Universiti Sains Malaysia, 11800 Penang

A capillary electrophoretic method for the separation of the enantiomers of modafinil is described. Several parameters affecting the separation were studied, including the type and concentration of chiral selector, buffer pH, voltage and temperature. Good chiral separation of the racemic mixture was achieved in less than 5 min with resolution factor $R_s = 2.51$, using a fused-silica capillary and a background electrolyte (BGE) of 25 mM H_3PO_4 -1 M tris solution; pH 8.0; containing 30 mg mL^{-1} of sulfated- β -cyclodextrin (S- β -CD). The separation was carried out in normal polarity mode at 25 °C, 18 kV and using hydrostatic injection. Acceptable validation criteria for selectivity, linearity, precision, and accuracy were included. The proposed method was successfully applied to the assay of enantiomers of modafinil in pharmaceutical formulations. The computational calculations for the enantiomeric inclusion complexes rationalized the reasons for the different migration times between the modafinil enantiomers.

1B-03**SULFIDE CONCENTRATIONS IN BATANG AI HYDROELECTRIC RESERVOIR**

Debbie Deborah Paka¹, Ling Teck Yee¹, Lee Nyanti¹, Norhadi Ismail¹ and Justin Jok Jau Emang²

¹ Faculty of Resource Science and Technology, Universiti Malaysia Sarawak

² Natural Resources and Environment Board Sarawak

Anoxic condition of reservoir often results in the presence of sulfide in the water. Warm water column in Batang Ai Hydroelectric Dam well-suited the production of sulfide in the water column. Temperature, pH, dissolved oxygen (DO) and hydrogen sulfide concentrations were measured at 5 locations at 3 different depths in the reservoir in April 2009. Highest temperature recorded was 30.31 °C (ST1) while the lowest been recorded was 24.75 °C (ST12). The pH values were found to range between 6.63 and 7.37. The sulfide levels were lower at the surface water compared to mid depth and bottom water. They ranged from 0.3 to 6.7 $\mu g/L$ of sulfide. Most of the stations (ST5, ST6, ST9 and ST12) were found to have higher concentration of sulfide at the mid depth compared to the bottom except at ST1. Sulfide concentration was measured highest at mid depth of ST9 (14.7 $\mu g/L$) and lowest at surface of ST5. The surface water concentration of sulfide at ST2 differ significantly with ST4 ($p=0.024$) while at both mid depth and bottom depth, the concentrations of sulfide at ST2 were significantly lower than ST5. One way ANOVA concludes that there were significant differences between stations at every depth (surface, $p=.028$; mid depth, $p=0.029$; bottom, $p=0.028$). Hence, the concentrations of sulfide were found to be different at every locations as well as different water column depending on the sampling sites.

1B-04**CYTOTOXIC PROPERTIES OF FLAVONOIDS ISOLATED FROM THE BARKS OF
*ARTOCARPUS FULVICORTEX***

Nur Azlin Othman¹, Shajarahtunnur Jamil¹ and Muhammed Taher²

¹ Department of Chemistry, Faculty of Science,
Universiti Teknologi Malaysia, 81310 Skudai, Johor

² Kuliyyah of Pharmacy,
International Islamic University Malaysia Kuantan Campus, Jalan Istana,
Bandar Indera Mahkota, 25200 Kuantan, Pahang

Three flavonoids, artonin E, catechin and artobioxanthone were successfully isolated from the barks of *Artocarpus fulvicortex*. The structures of these compounds were determined on the basis of spectroscopic data, including UV, IR, NMR and mass spectra as well as through comparison with data reported in the literature. The cytotoxic properties of flavonoids isolated were evaluated against several human cancer cell lines including esophagus cancer (TE-1), lung cancer (A549), breast cancer (MCF-7), cervix cancer (C33A) and colon cancer (CaCO₂). Based on their IC₅₀ values, artonin E showed strong cytotoxic activity against TE-1, MCF-7 and CaCO₂ cells.

1B-05**INVESTIGATION ON THE POTENTIAL USE OF SEVERAL ORGANIC WASTES AS
FEEDSTOCK FOR MICROWAVE PYROLYSIS**

R. Wahi¹, S. M. Abdul Aziz¹, S. Hamdan² and Z. Ngaini¹

¹ Faculty of Resource Science and Technology

² Faculty of Engineering

Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak

Prior to the microwave pyrolysis experiment, the thermochemical characteristics of the starting materials (palm oil wastes, sago wastes and wood wastes) were first studied in this work, including proximate analysis, ultimate analysis, gross calorific value and non-isothermal thermogravimetric analysis (TGA). The results indicate that the combustible matter of these wastes were found ranging from 75wt% to 86wt%, suggesting that these wastes contain high volatile matter which can therefore be converted into usable energy source when they are subjected to suitable process such as pyrolysis. The organic carbon content was found between 39 and 52wt% while the calorific value ranged between 18 MJ/kg and 22 MJ/kg, indicating that these organic wastes possessed the potential as a an energy source. Thermogravimetric analysis (TGA) results showed that the pyrolysis reaction will be completed in the temperature range of 250 - 450°C. Overall, it is shown that all organic wastes studied have a potential for reutilization as renewable energy sources through microwave pyrolysis.

1B-06

ALKALOIDS ISOLATED FROM THE BARK OF *CRYPTOCARYA DENSIFLORA*

Wan Nurul Nazneem Wan Othman¹, Mohd Azlan Nafiah², Khalijah Awang¹, A.Hamid A.Hadi¹ and Mat Ropi Mukhtar¹

¹Chemistry Department, Faculty of Science, University of Malaya, 50603 Kuala Lumpur

²Chemistry Department, Faculty of Science and Technology, Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak

A phytochemical study on the bark of *Cryptocarya densiflora*, which belongs to the family of Lauraceae afforded pavine and benzyloquinoline alkaloids. The isolation of the alkaloids were achieved by using chromatographic methods, such, as ¹H NMR, ¹³C NMR, COSY, DEPT and IR.

1B-07

IMPACTS OF AQUACULTURE ON NUTRIENT CONCENTRATIONS AND DISSOLVED OXYGEN (DO) LEVEL IN SANTUBONG RIVER, SARAWAK

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Shrimp and fish aquaculture industries in Sarawak have been playing an important role as a supplier of animal protein and food to the growing population. The Santubong River is one of the important water bodies in the Sarawak River Basin where it accommodates shrimp farming and cage culture activities. However, there were no previous studies on the impact of these activities on the water quality of this river. Therefore, the objective of this study was to evaluate the impacts of aquaculture on the water quality of the Santubong River. In-situ parameters and water samples were collected in November and February at 7 stations. Ammonia-nitrogen (NH₃-N) obtained from the results showed that the average concentrations of November and February ranged from 0.14 mg/L to 1.99 mg/L. Phosphate (PO₄³⁻) were found to range from 0.26 mg/L to 0.85 mg/L. In average, both NH₃-N (1.99 mg/L) and PO₄³⁻ (0.85 mg/L) were found to be the highest at Station 3. The high nutrient values at Station 3 are most likely due to the discharge of shrimp farm nearby. The concentrated amount of these nutrients at Station 3 corresponds to the low dissolved oxygen (DO) value (3.42 mg/L) observed which falls into Class IV of the Interim National Water Quality Standards (INWQS). Bacterial activity occurred at Station 3 led to the low DO. Mean chlorophyll-*a* (Chl-*a*), which ranged from 1.82 mg m⁻³ to 124.22 mg m⁻³ was also the highest at Station 3. The high concentration of chlorophyll-*a* indicates that the tributary that received shrimp farm effluent contained high nutrient concentrations that supported the bloom of phytoplankton. Cage culture also gives an impact on the water quality of Sungai Santubong as indicated by the low dissolved oxygen (DO) (<3.00 mg/L) at Station 4. NH₃-N at Station 4 (1.40 mg/L) falls into Class III of the INWQS. It can be concluded that nutrient concentrations and DO level at the tributaries that received the shrimp aquaculture discharge, cage culture activities, urban residential and construction areas has elevated nutrient concentrations.

1C-01**A NOVEL METHOD FOR THE DETERMINATION OF UN-DERIVATIZED FATTY ACIDS USING REVERSED PHASE HPLC WITH CONTACTLESS CONDUCTIVITY DETECTION**

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A high-performance liquid chromatographic (HPLC) separation method with a capacitively coupled contactless conductivity detector (C4D) has been developed for the separation and quantitative analysis of underivatized free fatty acids (FAs) in vegetable oils. A reversed phase C₁₈ HPLC column with methanol/1 mM sodium acetate (78:22, v/v) eluent mixture with flow rate of 0.6 mL min⁻¹ was used for the separation the five FAs (myristic acid, palmitic acid, oleic acid, linolic acid, and stearic acid). The linearity of the calibration curves of the five FAs were well correlated ($r^2 > 0.999$) within the range of 5-200 µg mL⁻¹ for stearic acid, and 2- 200 µg mL⁻¹ for the other FAs. The proposed method was tested on four different oils; pumpkin oil, soyabean oil, rice bran oil and palm oil.

1C-02**TIDAL EFFECT ON THE AMMONIA – NITROGEN DISPERSION ALONG BATANG SALAK**

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NH₃-N is an important parameter considered for water quality monitoring. High NH₃-N contents in the river system may lead into eutrophication. Tidal flushing in the river determines the assimilation capacity of the river system affected by the tide. Therefore, the objective of this study was to monitor the tidal effect on the NH₃-N dispersion in the Batang Salak. The study conducted along Batang Salak comprised eight stations during nebb tide. The first round of sampling started at 9:00 hr during low tide with the highest NH₃-N concentration found at station 8. NH₃-N ranged from 0.47 mg/L - 2.86 mg/L. The 9:00 hr trip corresponded with the decrease in tide level that brought the upstream farm discharge water of Loba Kara channel into Loba Bodoh where station 8 is located. NH₃-N recorded among station during 9:00 hr trip was significantly different. Second round started at 12:00 hr during low tide with station 6 showing the highest NH₃-N concentration. NH₃-N ranged from 1.17 mg/L – 3.03 mg/L. The high NH₃-N was likely due to the location of station 6 at Loba Kara estuary where the high tide water mixed with the prawn farm effluent. Third and fourth round started during high tide at 15:00 hr and 18:00 hr and NH₃-N concentrations ranged from 3.04 mg/L - 5.87 mg/L and 0.75 mg/L – 4.43 mg/L respectively. Station 6 and Station 4 showed the highest NH₃-N concentration during 15:00 hr and 18:00 hr respectively. Station 6 still had the highest NH₃-N as the previous round at 12:00 hr. The highest NH₃-N at Station 4 at 18:00 hr was due its at the upstream of the Loba Kara where the pond farm effluents discharged was brought back upstream by the peak high tide at 17:00 hr. NH₃-N concentration at 15:00 hr was significantly higher compared to NH₃-N recorded during 9:00 hr, 12:00 hr and 18:00 hr. This study indicated the possibility that the pond effluent was discharged during high tide. Tide level thus influences the NH₃-N content in the river where the 15:00 hr was the highest and slowly dropped following the tide level.

1C-03

**A PRELIMINARY STUDY ON POLLUTION AND WATER QUALITY IMPROVEMENT IN
SUNGAI SARAWAK**

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The Sg. Sarawak tributaries situated in Kuching City and the part of Sg. Sarawak, which is flowing through Kuching, is significantly polluted. The main source of pollution is raw and insufficiently treated wastewater, which is discharged to the open drains in the city. The Natural Resources and Environment Board (NREB), Sarawak has been appointed to coordinate Water Quality Data Management for Sg. Sarawak and some of its tributaries. According to the water quality data, the serious pollution was with faecal derived coliform bacteria. It poses health risk and pollution with organic matters and nutrients, leading to oxygen deficiency, deleterious impact on the bottom fauna and offensive odours. To further improve the situation, an efficient wastewater management in Kuching city is required. By implementing a recycling concept a highest possible environmental improvement for the least possible amount of physical and financial resources can be achieved. This approach combines long term economical and environmental friendly.

1C-04

**SYNTHESIS AND MOLECULAR STRUCTURE OF 3-BENZYL-7,7,8A-TRIMETHYL-5-
THIOXO-TETRAHYDRO-3H-OXAZOLO[3,2-F]PYRIMIDIN-2(5H)-ONE**

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3-Benzyl-7,7,8a-trimethyl-5-thioxo-tetrahydro-3H-oxazolo[3,2-f]pyrimidin-2(5H)-one was obtained from the reaction of 2-chloro-propionylchloride with ammonium thiocyanate and followed by phenylalanine. The compound crystallized in orthorhombic system with space group P_{212121} , $a=6.744$, $b=8.431$, $c=28.167$, and $Z=2$. The molecule consists of six-membered hexahydropyrimidine and five-membered oxazolidine rings fused together at C-N bond. The O2/C9/C8/N2/C10 oxazolidine ring is essentially planar with the maximum deviation of 0.048 (2Å for O2 atom from the least square plane). The benzene ring is vertical to oxazolidine ring with dihedral angle of 72.3(3)°. There is an intramolecular hydrogen bond C7—H7A ···S1 forming a pseudo-six membered ring [C7/H7A/S1/C13/N2/C8]. In the crystal structure, the molecules are linked by N—H ···S and C—H ···O intermolecular hydrogen bonds into infinite one dimensional chains along [1 0 0].

1C-05

SYNTHESIS AND CHARACTERIZATION OF CYCLOTRIPHOSPHAZENE BEARING SCHIFF'S BASE AND CHALCONE DERIVATIVES

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A series of mono- and hexa- substituted hexachlorocyclotriphosphazenes bearing 4-[(4-alkoxy-benzylidene)-amino]-phenol with different side chain has been synthesized. A convenient synthetic method was performed from the reaction of hexachlorocyclotriphosphazenes with one and six equivalents of 4-[(4-alkoxy-benzylidene)-amino]-phenol. The compounds differ in the length of alkyl groups, C_nH_{2n+1} , where $n= 10, 12$ and 14 . The yield percentage for all the compounds is ranging from 30 to 40%. Apart from Schiff Base, attempt was also made to incorporate chalcone derivatives onto hexachlorocyclotriphosphazenes. The spectroscopic techniques, FTIR, 1H NMR, ^{13}C NMR, and ^{31}P NMR, were employed to characterize the molecular structure.

1C-06

SYNTHESIS, CRYSTAL STRUCTURE, SPECTROSCOPIC STUDIES OF ALKYL-3-(3-HYDROXYPHENYL)-3,4-DIHYDROBENZO[E][1,3]OXAZEPINE-1,5-DIONEMohammad.A. Talaq¹, Hasnah Osmā¹, Guan-Yeow Yeap¹ and Masaki Kakeya²¹School of Chemical Sciences,

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A series of new 3,4-dihydrobenzo[e][1,3]oxazepine-1,5-diones have been synthesised from the reaction of 3-((alkylimino)methyl)phenol with phthalic anhydride. Their molecular structures were further ascertained through the 1H and DEPT135, ^{13}C NMR spectra along with two-dimensional COSY, HMQC and the long-rang connectivity as concluded from HMBC. The crystallography data of 3-((dodecylimino)methyl)phenol and 3-((tetradecylimino)methyl)phenol wherein the alkyl chains attached in both compounds were found to be fully stretched.

1D-01

POTENTIAL LIQUID CRYSTAL COMPOUNDS DERIVED FROM SUGAR- CHALCONES DERIVATIVES

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Liquid crystal studies have gained much attention and are of considerable importance in many applications due to its unique properties. Chalcone in liquid crystals has been reported. However, no report on sugar derivative in liquid crystals was described. In view of this, a synthesis of glycosides derived from chalcones and sugar derivatives has been carried out. A series of (E)-1-(4-alkyloxyphenyl)-3-(4-hydroxyphenyl)-prop-2-en-1-one and (E)-3-(4-alkyloxyphenyl)-1-(4-hydroxyphenyl)-prop-2-en-1-one bearing C7, C8 and C9 alkyls were synthesized via Claisen-Schmidt condensation reaction. These compounds were incorporated onto sugar derivatives to form glycosides in the presence of lanthanum (III) nitrate hexahydrate as a catalyst. The synthesized compounds were characterized using elemental analysis, infra-red and ¹H and ¹³C NMR.

1D-02

SYNTHESIS, CHARACTERISATION AND ANTI-PROLIFERATION STUDIES OF N-1-(2-HYDROXY-3-METHOXYBENZYL)-2-(2-HYDROXY-3-METHOXYPHENYL)-1H-BENZIMIDAZOLEMohammed Hadi Al-Douh¹, Hayder B. Sahib², Hasnah Osman¹, Shafida Abd Hamid³, Salizawati M. Salhimi² and Amin M. S. Abdul Majid²¹ School of Chemical Sciences,² School of Pharmaceutical Sciences,

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Since benzimidazoles have a similar structure to purines, whose derivatives play important roles in biological systems, substituted benzimidazoles show interesting biological activities. Many benzimidazoles are pharmaceutical agents and are used widely in biological system applications. *N*-1-(2-Hydroxy-3-methoxybenzyl)-2-(2-hydroxy-3-methoxyphenyl)-1*H*-benzimidazole, **3**, is one of the products of the reaction between two molecules of *o*-vanillin **1** with *o*-phenylenediamine **2** in dichloromethane. The benzimidazole **3** is obtained as single crystals in two forms, and their structures were determined and studied by X-Ray crystallography. It is also confirmed with using ¹H and ¹³C NMR and HRMS techniques. The aim of this study is to find whether **3** has the ability to inhibit the cell proliferation for breast cancer cell lines MCF-7 by using MTT assay. Compound **3** was found to be cytotoxic with the IC₅₀ value of 2.07 g/mL, suggesting that this compound has a good potential to be an anti-cancer agent.

1D-03

SYNTHESIS AND STRUCTURAL STUDY OF N-(3-CHLOROPROPIONYL)-N'-(FLUOROPHENYL) THIOUREA ISOMERS

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The N-(3-chloropropionyl)-N'-(2-fluorophenyl) thiourea (I), N-(3-chloropropionyl)-N'-(3-fluorophenyl) thiourea (II), and N-(3-chloropropionyl)-N'-(4-fluorophenyl) thiourea (III) isomers were synthesized from the reactions of 3-chloropropionyl chloride with ammonium thiocyanate and the succeeding reaction with 2-, 3-, 4-fluoroanilines respectively. Their crystal structures have been determined by X-ray diffraction methods. All the compounds crystallized in triclinic system with space group $P\bar{1}$. The compounds adopt *trans-cis* configuration with respect to the position of 3-chloropropionyl and fluorophenyl groups relative to the thiono sulfur atom respectively across their C-N bonds. The dihedral angles between the N_2SC_2 thiourea moiety and benzene ring in the compounds are 14.42(9), 25.80(10), and 12.68(7) $^\circ$ respectively. In the crystal structure, the molecules in I and III are stabilized by N-H...S, C-H...S and N-H...O intermolecular hydrogen bonds to form dimmers. However, in compound II, the molecules are linked C-H...S and C-H...O in one-dimensional chain.

1D-04

SYNTHESIS AND CHARACTERIZATION OF ZEOLITE H-ZSM-5 FOR XYLENE ISOMERIZATION

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The zeolite, H-ZSM-5 has been synthesized in a tubular furnace under nitrogen flow at 425- 500 ($^\circ$ C) temperature via templating method. Sources used were alumina in basic media to form soluble $Al(OH)_4^-$ ions, silica (LUDOX HS-30 colloidal silica, 30 wt% SiO_2), and TPA as the template. The zeolite was characterized by various physico-chemical analyses such as XRD, FTIR, TGA, SEM/EDX, TEM and AFM. XRD pattern exhibited crystalline nature. FTIR spectra showed the vibrational modes at 1104.1, 801.2 and 449.9 (cm^{-1}) corresponding to internal vibrations of SiO_2 and AlO_4 tetrahedra, and at 550.3 and 1230.1 (cm^{-1}) due to the double-rings tetrahedral vibrations and the asymmetric stretching of SiO_2 and AlO_4 tetrahedra in the zeolite framework. Thermal data by TGA analysis exhibited removal of adsorbed water. The material is spherical and spheroidal grains crystal shape as observed by SEM. EDX analysis gave Al and Si as high contents. The particle size distribution of H-ZSM-5 observed as bell-shape graph. The roughness of the materials was studied by AFM. The root-mean-squared found to be 79.23 nm for H-ZSM-5 with height distribution as 262.05 nm. However, after calcinations, RMS increases to 141.19 nm with height distribution as 499.0 nm. Isomerization of xylene was carried out over the prepared H-ZSM-5 using the catalytic reactor of tubular furnace in the temperature range 425–500 ($^\circ$ C). About 14.27 % of *o*-xylene was isomerized to *p*-xylene and *m*-xylene. 1H NMR chemical shift (2.0 ppm for *o*-xylene and 2.1 ppm for *p*-xylene) confirms the successful isomerization of xylene over the synthesized zeolite, H-ZSM-5.

2A-01

SYNTHESIS AND MOLECULAR STRUCTURE OF METAL-EDTA COMPLEXES AS INORGANIC NUTRIENTS FOR FERTIGATION FARMING

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The EDTA complexes of Iron, Manganese, Nickel and Cobalt were synthesized and characterized by microelemental analysis and infrared spectroscopy. X-ray diffraction investigations agreed with the molecular formula of sodium[aquaethylenediaminetetracetato iron(III)]dihydrate, bis(μ_2 -hydrogen ethylenediamine-N,N,N',N'-tetraacetato)-hexaaqua-trimanganese(II)tetrahydrate, sodium [aqua-(ethylenediaminetetracetato)nickel(II)] monohydrate and bis(μ_2 -hydrogen ethylenediamine-N,N,N',N'-tetraacetato)-hexaaqua-tricobalt (II) dihydrate respectively. The geometry of the nickel-chelate complex is octahedral and the iron-chelate complex is pentagonal bipyramidal. The manganese-chelate and cobalt-chelate shows a bridging forming a dimer with geometry pentagonal bipyramidal. The application of iron-chelates complex as nutrient for the growing of RockMelon will be presented.

2A-02

SYNTHESIS, CHARACTERIZATION, ANTI-OXIDANT PROPERTY OF N'-(2-HYDROXY-4-METHOXY BENZYLIDENE)-BENZOHYDRAZIDE DERIVATIVES

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Antioxidants are chemical compounds which can donate an electron to a free radical and convert it to a harmless molecule. In our bodies, antioxidants protect us from free radicals and prevent diseases including coronary heart disease, cancer and cataracts. Phenolic compounds and their derivatives have been known for their potential antioxidant activities. The phenolic hydrazones and their derivatives were synthesized by condensing 2-hydroxy-4-methoxybenzaldehyde and benzohydrazides which had produced several Schiff bases with high antioxidant property. These phenolic hydrazones had coordinated to metals such Cd(II), and Cu(II) and their antioxidant property was also determined. The structure of ligands and complexes were elucidated by using spectroscopic data such as Infra-Red, ¹H and ¹³C NMR, UV-visible, Elemental Analysis (CHNS), thermogravimetry element analysis and x-ray crystallographic techniques. Anti-oxidant testing for the compounds was carried out by using free radical scavenging activity (DPPH assay).

2A-03