

# **THE 4<sup>TH</sup> REGIONAL CONFERENCE ON THE NATURAL RESOURCES IN THE TROPICS, 2012 (NTrop4)**

***SUSTAINING TROPICAL NATURAL RESOURCES THROUGH INNOVATIONS, TECHNOLOGIES & PRACTISES***

## **PROGRAMME & ABSTRACTS**

**19 - 20 September 2012**

**DeTAR Putra,  
Universiti Malaysia Sarawak**



**ORGANIZED BY:  
FACULTY OF RESOURCE SCIENCE & TECHNOLOGY,  
UNIVERSITI MALAYSIA SARAWAK**

## The 4<sup>th</sup> Regional Conference on Natural Resources in the Tropics (NTrop4)

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**MESSAGE FROM THE VICE CHANCELLOR UNIVERSITI MALAYSIA SARAWAK**



Assalamualaikum and Greetings to all participants of the 4<sup>th</sup> Regional Conference on Natural Resources in Tropics (NTrop4)2012.

On behalf of Universiti Malaysia Sarawak (UNIMAS), it gives me great pleasure to welcome all the distinguished guests and participants of the 4<sup>th</sup> Regional Conference on Natural Resources in Tropics (NTrop4) 2012.

Firstly, I would like to thank the Organizing Committee for their efforts in bringing together experts from various fields of study in Natural Resources to share their findings and experiences. This year conference is regarded as part of UNIMAS event in tandem with UNIMAS 20<sup>th</sup> Anniversary. And I hope this gathering will allow all participants to exchange ideas that will lead to establishment of research collaborations and partnerships.

Malaysia, in particular Sarawak is endowed with rich biodiversity of flora and fauna. Borneo, the third largest island in the world is one of the world's twelve mega centers of biodiversity. The vast area of native rainforest, forest reserves, wildlife sanctuaries that have yet to be explored will form a good setting for the advancement of scientific knowledge through research innovations.

I believe that UNIMAS and other cooperating institutions could play a major role to utilize the resources in a sustainable manner that will benefit the whole nation in general and specifically to the local communities. This conference is an excellent platform for researchers to interact and share ideas and research findings while fostering long term linkages. Over the last decade we have seen the need manage our resources in a sustainable manner through innovation in management and technologies. It is my hope that universities, research institutions and the private sectors are work together and continue to do so in their effort to ensure that the objective of sustainable management are realized.

Finally, I trust that this gathering will see much dissemination and free exchange of ideas and knowledge, as well fruitful discussion amongst participants, contributing to a better understanding and appreciation of our tropical natural resources.

**PROF. DATUK DR KHAIRUDDIN AB. HAMID**

**Vice Chancellor, Universiti Malaysia Sarawak (UNIMAS)**



**MESSAGE FROM THE DEAN  
FACULTY OF RESOURCE SCIENCE AND TECHNOLOGY, UNIMAS**



Assalamualaikum Wrh. Wbt. and Salam Sejahtera.

I would like to express my warmest welcome and gratitude to all participants of the 4<sup>th</sup> Regional Conference on Natural Resources in the Tropics (NTrop4) 2012.

The theme of the conference is “Sustaining *Tropical Natural Resources through Innovations and Technologies*”. The chosen theme clearly explains that the exploration and conservation of our natural resources should be managed in a sustainable manner using latest innovations and technologies. While celebrating UNIMAS 20<sup>th</sup> birthday, this year NTrop4 conference is aiming to provide a broad and deep understanding of science, technologies, management and utilization of natural resources through sharing and exchanging ideas. A natural resource base tends to be fragile and highly vulnerable to overexploitation and mismanagement. The latter's impact are

too evident not only in most developing countries but also in several developed countries. Issue of natural resources-based commodities and products are now being encumbering upon sustainable management and utilization of the natural resource especially in the tropics. This is a huge challenge that we are facing, and I call upon learned individuals in the academia and professional industry players to present revolutionary innovations or technologies to attain sustainable use of our natural resources.

Agendas of this conference are to encompass broad issues in sustainable utilization and management of existing natural resources to support and enhance the national and regional economic developments. I appreciate your presence and participation here in the conference. I am sure that we will be able to share current knowledge during the presentation and discussion, and to better understand how we can fully utilize our natural resources in a wise and sustainable basis for future generations. I am convinced that this 4<sup>th</sup> Regional Conference on Natural Resources in The Tropics (NTrop4) is an excellent platform, as proven by previous three conferences, for researchers, academicians, managers of natural resources, industrialists and policy makers in Malaysia and the regional countries to present their R & D findings, innovation and ideas on issues of tropical natural resources.

I take this opportunity to wish all participants the enjoyable time and stay here in Kuching.

**PROF. DR SHABDIN MOHD LONG**

**Dean, Faculty of Resource Science & Technology, UNIMAS**



**MESSAGE FROM THE CHAIRMAN OF NTrop4 2012 ORGANIZING COMMITTEE**



Assalamualikum Wr. Wbt. and Salam Sejahtera.

It gives me a great pleasure to extend, on behalf of the Organizing Committee, a warm welcome "Selamat Datang" to all distinguished guests and participants of the 4<sup>th</sup> Regional Conference on the Natural Resources in the Tropics (NTrop4) 2012, organized by the Faculty of Resource Science and Technology (FRST), Universiti Malaysia Sarawak (UNIMAS).

NTrop was first held in 1994 at Riverside Hotel, Kuching with participants mainly from Malaysia and neighboring South East Asian countries. Following the successful event, the 2<sup>nd</sup> and 3<sup>rd</sup> NTrop was held in 2006 and 2009 respectively. This year conference coincides with UNIMAS 20<sup>th</sup> Anniversary. This year theme "*Sustaining Tropical Natural Resources through Innovations and Technologies*" will be focusing on issues in sustainable utilization and management of existing natural resources, which support and will enhance the national and regional economic developments.

The conference is a stage where scientists and expertise will discuss in broad spectrum of knowledge of interests and share concerns about natural resources in this region. This year we received over 100 participants from several agencies and organizations in Malaysia, Indonesia, Iran, the Philippines and Japan.

On behalf of the Organizing Committee, I take this opportunity to thank the Vice Chancellor of UNIMAS and the Dean of FRST for their supports and encouragement. Our sincere thanks go to all local and international participants for their commitments on the cause. Last but not least, I would like to extend my gratitude to the organizing committee, support staff and students for your dedication and hard works to make this event a successful one.

Thank you.

**PROF. DR. HAMSAWI SANI**

**Chairman, NTrop4, 2012 Organizing Committee**

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**CONFERENCE PROGRAMME**

**The 4<sup>th</sup> Regional Conference on Natural Resources in the Tropics (NTrop4) 2012**

**DAY 1 (WEDNESDAY, 19 September 2012)**

Time 0800-0845	Registration of Participants and Poster setting/display Venue: Banquet Hall-C, DeTAR, UNIMAS							
0845-0900	Opening Remark by Vice Chancellor, UNIMAS Venue: (Banquet Hall-C, DeTAR, UNIMAS)							
0900-0945	Key Notes Paper on "Investment in Malaysian biodiversity: it's importance in sustaining tropical natural resources" by Prof. Emer. Dato' Dr. Abdul Latiff Mohamad, Universiti Kebangsaan Malaysia (UKM) Venue: (Banquet Hall-C, DeTAR, UNIMAS) Chairperson: Prof. Dr. Mohd. Tajuddin Abdullah							
0945-1020	Refreshment (Banquet Hall –B, DeTAR, UNIMAS)							
	Session 1A (Banquet Hall-A, DeTAR, UNIMAS) Chairperson: Prof. Dr Fasihuddin Badruddin Ahmad				Session 1B (Banquet Hall-C, DeTAR, UNIMAS) Chairperson: Dr Ho Wei Seng			
Time	No.	Presenter	Institution	Title of presentation	No.	Presenter	Institution	Title of presentation
1020-1040	1A-1	Prof. Datuk Dr A. Hamid A. Hadi	Universiti Malaya	Limonoids from <i>Chisocheton ceramicus</i>	1B-1	Prof. Dr Chan Lai Keng	Universiti Sains Malaysia	Production of tropane alkaloids from cell suspension culture of <i>Hyoscyamus niger</i> L.
1040-1100	1A-2	Dr Hanita Omar	Universiti Malaya	HMBC spectra of alkaloids from Lauraceae Species : Nine Stars Halo-N Theories	1B-2	Heng King Wey	Universiti Sains Malaysia	Effect of medium replenishment on cell biomass of <i>Artemisia annua</i> cultures of Vietnam origin
1100-1120	1A-3	Tan Pui Wan	Universiti Kebangsaan Malaysia	Screening for allelopathic potential of <i>Pennisetum purpureum</i> on <i>Eleusine indica</i>	1B-3	Zul Helmei b. Mohamad Sabdin	UNIMAS	In vitro propagation of <i>Aquilaria microcarpa</i> Baill. using shoot tips and lateral buds explant
1120-1140	1A-4	Wong Mui Hung	UNIMAS	Antioxidant activity of <i>Listea elliptica</i> Blume and <i>Litsea resinosa</i> Slume (Lauraceae)	1B-4	Norhashimah Abdul Razak	UNIMAS	A comparison of production of somatic embryo from three selected cocoa ( <i>Theobroma cacao</i> L.) clones.
1140-1200	1A-5	Chan Chi Hoong	Universiti Kebangsaan Malaysia	Production and characterisation of cellulose and nano crystalline cellulose from kenaf core wood	1B-5	Dr Thong Weng Hing	INTI International University	Effects of MS medium and macro elements on multiple shoot formation of <i>Lobelia chinensis</i> Lour.

1200-1220	1A-6	Siti Nur Akmar Mohd Yazid	UNIMAS	Encapsulation of curcumin by using starch nanoparticles for biomedical applications	1B-6	Dr Rebecca Edward	UNIMAS	Virus elimination in cocoa ( <i>Theobroma cacao</i> L.) through somatic embryogenesis.
1230-1400	Lunch (Banquet Hall –B, DeTAR, UNIMAS) & Poster Session (Banquet Hall-C, DeTAR, UNIMAS)							
Session 2A (Banquet Hall-A, DeTAR, UNIMAS) Chairperson: Prof. Datuk Dr Abdul Hamid Abdul Hadi				Session 2B (Banquet Hall-C, DeTAR, UNIMAS) Chairperson: Prof. Dr Chan Lai Keng				
Time	No.	Presenter	Institution	Title of presentation	No.	Presenter	Institution	Title of presentation
1400-1420	2A-1	Prof. Dr Saad Al-Jassabi	Royal College of Medicine Perak	Protective role of Anthocyanain and Taurine against microcystin induced pancreatic and testicular toxicity in Balb/c mice	2B-1	Leow E Shuen	Universiti Sains Malaysia	Morphological effect of <i>Sodium Azide</i> on <i>Artemisia annua</i> of Vietnam Origin
1420-1440	2A-2	Dr Hanita Omar	Universiti Malaya	Aporphine alkaloids and antioxidant activity of <i>Phoebe grandis</i> (Nees) Merr.	2B-2	Dr Alvin Chai Lian Kuet	Agriculture Department, Sarawak	An improved method for the determination of organophosphorus pesticides in soils and application to field study
1440-1500	2A-3	Mehran Fadaeinasab	Universiti Malaya	Biocative alkaloids from <i>Rauvolfia reflexia</i> (Apocynaceae)	2B-3	Dr Ho WeiSeng	UNIMAS	Applications of genomics to plantation forestry with Kelampayan in Sarawak
1500-1520	2A-4	Fiona Beragai Jimmy	UNIMAS	Size controlled synthesis of cellulose nanoparticles	2B-4	Mohamed Zaky Abdellatif Zayed	UNIMAS	Effects of length of soaking in 100°C water and EMS on germination of <i>Neolamarckia cadamba</i> and <i>Leucaena leucocephala</i> seeds.
1520-1540	2A-5	Aressa Azman	UNIMAS	Size controlled synthesis of starch nanoparticles by a microemulsion method	2B-5	Dr Micky Vincent	UNIMAS	Isolation and identification of oleaginous yeast from Kuching, Sarawak
1540-1600	2A-6	Farawahida Abu Zaharin	UNIMAS	Effect of extractives on wood density and durability of <i>Tristaniopsis whiteana</i>	2B-6	Assoc. Prof. Dr Noraaini Ali	Universiti Malaysia Terengganu	Effects of different inoculation concentration of <i>Chorella</i> sp. On sea bass, <i>lates calcarifer</i> wastewater phytoremediation
1600	Refreshment (Banquet Hall –B, DeTAR, UNIMAS) & Poster Session (Banquet Hall-C, DeTAR, UNIMAS)							
1930-2200	Welcoming Dinner (Venue: Hilton Kuching)							



**DAY 2 (THURSDAY, 20 September 2012)**

Day 2	Session 3A (Banquet Hall-A, DeTAR, UNIMAS) Chairperson: Assoc. Prof. Dr Zainab Ngaini				Session 3B (Banquet Hall-C, DeTAR, UNIMAS) Chairperson: Prof. Dr Lee Nyanti			
	Time	No.	Presenter	Institution	Title of presentation	No.	Presenter	Institution
840-0900	3A-1	Dr Sim Siong Fong	UNIMAS	A Rapid Computer-Assisted Method for Analysis of Lignocellulosic Biomass	3B-1	Dr Lim PoTeen	UNIMAS	Occurrence of three Alexandrium species, <i>A. affine</i> , <i>A. tamutum</i> and <i>A. tamiyavanichii</i> in Kuching waters
0900-0920	3A-2	Ain Nadirah bt Romainor	UNIMAS	Synthesis and characterization of cellulose Titania Composite	3B-2	Assoc. Prof. Dr Hideyuki Nagao	Universiti Sains Malaysia	<i>Pteridocolous discomycetes</i> in Bukit Bendera, the Penang Hill, Pulau Pinang, Malaysia
0920-0940	3A-3	Kathleen Michelle Mikal	UNIMAS	Isolation and identification of bacteria from Sarawak aquaculture environment	3B-3	Tay Ai Peng	UNIMAS	Molecular cloning of Prel2a gene in early vertebrate embryonic development.
0940-1000	3A-4	Mohd Nor Azman Ayub	Fisheries Research Institute, Malaysia	Determination of tetrodotoxin in puffer fish from East Malaysian Waters	3B-4	Jeffrine Rovie-Ryan Japning	Dept. of Wildlife & National Park, Pen. Malaysia	Population genetics of <i>Macaca fascicularis</i> (Cercopithecidae) from Penang, Malaysia inferred from mitochondrial control region segment
1000-1020	3A-5	Dr Homa Gharai	Ministry of Health & Medical Educations, Iran	Honey with coffee: A new finding in the treatment of Persistent Postinfectious Cough	3B-5	Louis Chin Vui Ngian	UNIMAS	Molecular cloning of Growth Factor receptor bound protein 14 (Grb14) gene in vertebrate ( <i>Danio rerio</i> ) development
1030-1100	Refreshment (Banquet Hall –B, DeTAR, UNIMAS) & Poster Session (Banquet Hall-C, DeTAR, UNIMAS)							
	Session 4A (Banquet Hall-A, DeTAR, UNIMAS) Chairperson: Dr Lim Po Teen				Session 4B (Banquet Hall-C, DeTAR, UNIMAS) Chairperson: Prof. Dr Sepiah Muid			
Time	No.	Presenter	Institution	Title of presentation	No.	Presenter	Institution	Title of presentation
1100-1120	4A-1	Dr Kamurudin Mohd Noor	Universiti Putra Malaysia	Facilitating community awareness on natural resource environment and issues – towards sustaining livelihood of Matang community	4B-1	Assoc. Prof. Dr Mohd. Hasnain Hussain	UNIMAS	Spectroscopy profiling of trunking sago palm ( <i>Metroxylon sago</i> ) using nuclear magnetic resonance (NMR)
1120-1140	4A-2	Khalizul Khalid	Universiti Pendidikan Sultan Idris	Utilizing tourism carrying capacity to depreciate environmental assets at tourism sites	4B-2	Assoc. Prof. Dr Zainab Ngaini	UNIMAS	Development of potential biodiesel from agricultural waste
1140-1200	4A-3	Haris Freddy Ismail	Universiti Islam Antarabangsa	Geographical Information System (GIS) application for evaluation and planning on rural tourism	4B-3	Millawati binti Gani	UNIMAS	Phylogeny of Malaysian Primates Inferred from Sequences of Mitochondrial DNA Cytochrome c Oxidase Subunit I (COI) Gene.

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1200-1220	4A-4	Dr Abdul Rahim Abdul Samad	Universiti Putra Malaysia	The economic impacts of sustainable forest management policy on timber market in Sarawak, Malaysia	4B-4	Ngieng Ngui Sing	UNIMAS	Trial biodegradation of Pentachlorophenol (PCP) in soil using locally isolated PCP tolerant fungi
1220-1240	4A-5	Karmini Kasiman	University of Mulawarman, Indonesia/ UNIMAS	Planning matrix to increase paddy farm income in East Kalimantan, Indonesia	4B-5	Raja Nurul Nadia bt Raja Alang	Universiti Putra Malaysia	Insect species composition of Sungai Chukai mangrove forest
1240-1400	Lunch (Banquet Hall –B, DeTAR, UNIMAS) & Poster Session (Banquet Hall-C, DeTAR, UNIMAS)							
	Session 5A (Banquet Hall-A, DeTAR, UNIMAS) Chairperson: Dr Aida Shafreena Ahmad Puad				Session 5B (Banquet Hall-C, DeTAR, UNIMAS) Chairperson: Prof. Dr Cheksum Tawan			
Time	No.	Presenter	Institution	Title of presentation	No.	Presenter	Institution	Title of presentation
1400-1420	5A-1	Rosmini Ismail	Universiti Pendidikan Sultan Idris	Estimating tourism income through Environmental Accounting Approach for Pangkor Island, Perak	5B-1	Dr Amirrudin Ahmad	Universiti Malaysia Terengganu	Pattern of species richness and community structure before and after fish removal at Sungai Pur, Terengganu, Peninsular Malaysia
1420-1440	5A-2	Hartini Mahidin	Universiti Teknologi MARA	Tourists perception on conservation of natural resources at Bako National Park, Sarawak, Malaysia	5B-2	Karyati Kasiman	University of Mulawarman, Indonesia/ UNIMAS	Family composition of seedlings and saplings at early secondary succession of fallow lands in Sarawak
1440-1500	5A-3	Siti Hajar Abd Aziz	Universiti Sains Malaysia	Management of natural resources at Lenggong Valley in Deer Farming Facet	5B-3	Arianti Atang	Sarawak Forestry Corporation	Effect of thinning on growth performance of <i>Eucalyptus deglupta</i> and <i>Eucalyptus pellita</i> plantation in Kapit Division Sarawak
1500-1520	5A-4	Mary Buluh Balang	UNIMAS	Conservation value of golf courses in Sarawak	5B-4	Dr Noor Jalilah Jumaat	Universiti Putra Malaysia	Relationship between amount use and physical impacts on soil at a recreational area
1520-1540	5A-5	Kirupaliny Susiee Bhaskaran	UNIMAS	Wildlife utilization survey in selected areas in Sarawak	5B-5	Qammil Muzzammil Abdullah @ Meekiong Kalu	UNIMAS	Taxonomical review on the genus <i>Vatica</i> in Sarawak based on leaf morphological and anatomical aspects.
1540-1600	5A-6	Dr Eliseo F. Huesca, Jr.	Davao Oriental State College of Science and Technology, Philippines	Environmental Policy Implementation under decentralized Set-up: Experiences from Lakeshore Communities in Southern Philippines Mindanao	5B-6	Diana Abd Rasani	UNIMAS	The effect of rainfall and sediment changes on the polychaetes density of Santubong Beach, Sarawak
1600-1700	Refreshment (Banquet Hall –B, DeTAR, UNIMAS) Closing Remarks & Poster Competition Results (Banquet Hall -C, DeTAR, UNIMAS)							
21 SEPTEMBER 2012 POST CONFERENCE TOUR								

## LIST OF POSTER PRESENTATIONS

No	Poster No.	Name of participant	Institution	Title of presentation
1	P1	Cassandra Sully Jamau *	UNIMAS	Formulation and analysis of microbial inocula developed for use in composting of oil palm empty fruit bunch (OPEFB)
2	P2	Christy Chan	UNIMAS	Characterization of microbes from Palm Oil Mill Effluent (POME)
3	P3	Nur Azlan Yusuf	UNIMAS	The diversity of bacterial isolates from CMS Compost
4	P4	Hasma Mat Nor	UNIMAS	Effect of pH on the efficacy of potential antagonists against pathogenic <i>Ganoderma</i> in oil palm
5	P5	Rosmawati Saat	UNIMAS	Sustainability of plants with medicinal properties via DNA profiling
6	P6	Ho Wei Seng (Dr)	UNIMAS	Genetic diversity of <i>Duabanga moluccana</i> using dominant DNA markers based on Inter-simple Sequence Repeats in Sarawak
7	P7	Nurul Faseeha Zulkiffli / Cirilo Nolasco-Hipolito (Assoc. Prof. Dr)	UNIMAS	<i>Candida tropicalis</i> in ethanol fermentation at high temperature
8	P8	Samantha Siong Ling-Chee/ Cirilo Nolasco-Hipolito (Assoc. Prof. Dr)	UNIMAS	Removal of starch from starch solutions by tangential flow filtration
9	P9	Zahirunisa Abd Rahim	UNIMAS	Amplification profile for Avian Influenza A Virus (AIV A <sub>1</sub> ) detected based on Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)
10	P10	Yuzine Esa (Dr)	UNIMAS	Molecular characterization of fruit fly, <i>Bactrocera dorsalis</i> species complex
11	P11	Ling Teck Yee (Assoc. Prof. Dr)	UNIMAS	Water quality of Batang Ai River and Batang Ai Reservoir
12	P12	Masni Mohd Ali (Dr)	Universiti Kebangsaan Malaysia	Fatty alcohols: Biomarker of organic matter in Port Dickson, Negeri Sembilan, Malaysia
13	P13	Norfariza Humrawali	Universiti Kebangsaan Malaysia	Analysis of sterols variation along Port Dickson coastal area
14	P14	Nurasyikin Abdul Rahman	Malaysian Pepper Board	Green production of eco magical pepper crystals
15	P15	Ruzita Ahmad (Dr.)	Universiti Sains Malaysia	Cytotoxic effects of ginger aqueous extract on <i>Laryngeal carcicoma</i> (HEP-2) cells

16	P16	Chen Mei Yin	UNIMAS	In vitro propagation of <i>Cryptocoryne ferruginea</i> Engler.
17	P17	Fong Yin Mei	UNIMAS	Micropropagation of <i>Curcuma caesia</i> Roxb. ( <i>Kunyit hitam</i> )
18	P18	Hamsawi Sani (Prof. Dr)/ Rofiah Junaidi	UNIMAS	In vitro callus induction from leaf and petiole explants of <i>Aquilaria microcarpa</i> Baill.
19	P19	Zul Helmey b. Mohamad Sabdin	UNIMAS	Micropropagation of <i>Aquilaria malaccensis</i> Lamk. (karas) through somatic embryogenesis
20	P20	Belinda Ng Ling Nah *	Sarawak Biodiversity Centre	Method for identification of <i>Aglaia stellatopilosa</i>
21	P21	Suria Johari	Sarawak Biodiversity Centre	Development of clonal propagation method for <i>Aglaia stellatopilosa</i>
22	P22	Maznah Mazinol	Universiti Kebangsaan Malaysia	Leaching of thiram in an oil palm nursery ecosystem during dry season
23	P23	Ida Farah Ahmad	Univ. Tun Hussein Onn Malaysia	Ethnomedicinal plants indicated for management of malaria and its associated symptoms used by indigenous people of Malaysia
24	P24	Mohd Effendi Wasli (Dr)	UNIMAS	Ethnopedological knowledge by Iban farmers of Nanga Machan, Kanowit, Sarawak
25	P25	Ho Soo Ying	UNIMAS	Characterizing soils under various cash crops farming in Sarawak - a case study at Krui Area, Sabal, Serian
26	P26	Millicent Abdullah	Sarawak Forestry Corporation	The relationship between soil properties and tree growth of Eucalyptus in Sarawak plantation
27	P27	Nur Hanani Hanis Mohd Nawar	UNIMAS	Importance of topography and soil physical properties on the growth of <i>Shorea macropylla</i> under reforestation at Sampadi Forest Reserve
28	P28	Mugunthan Perumal	UNIMAS	Growth performance of planted <i>Shorea macropylla</i> under line planting technique
29	P29	Karyati Kasiman	UNIMAS/ Mularmawan University	Conceptual framework for the assessment of ecology and carbon sequestration at secondary forests in Sarawak
30	P30	Nurafiza Aman	UNIMAS	Ecophysiological of <i>Ischaemum magnum</i> Rendle: the effect of shading on the allocation of nutrients
31	P31	Sharifah Mazenah Binti Wan Yusuf	UNIMAS	Biomass and carbon sequestration of selected wild grown herbaceous species in UNIMAS campus
32	P32	Cheksun Tawan (Prof. Dr)	UNIMAS	An account of selected <i>Shorea spp.</i> of Lambir Hill National Park, Sarawak

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33	P33	Cheksum Tawan (Prof. Dr)	UNIMAS	Essential oil of <i>Neolamarckia cadamba</i> (Roxb.) Bosser
34	P34	Zinnirah Shabdin	UNIMAS	The species diversity of <i>Mapania aublet</i> (Cyperaceae) from Malaysia
35	P35	Isa Ipor (Prof. Dr)	UNIMAS	Ecophysiology of <i>Amorphophallus brachyphyllus</i> (Hett.)
36	P36	Isa Ipor (Prof. Dr)	UNIMAS	Notes on a new noxious weed, <i>Paspalum dilatatum</i> Poir. in Sarawak, Malaysia
37	P37	Karmini Kasiman	UNIMAS/ Mularmawan University	Planning matrix to increase paddy farm income in Kalimantan, Indonesia
38	P38	Mohd Hairy Ibrahim	Universiti Pendidikan Sultan Idris	The awareness of climate shange effect toward thermal comfort in Malacca school
39	P39	Siti Shuhada binti Mustaffa	Universiti Sains Malaysia	Effective management of Chepor deer grazing paddocks, Leggong, Perak
40	P40	Ainnul Hamidah Syahadah Azizan	Universiti Malaya	Chalcones isolated from <i>Mitrella kentii</i>
41	P41	Hairin Taha	Universiti Malaya	Phytochemical and biological studies on <i>Pseuduvaria</i> species from Malaysia
42	P42	Mohamad Syakir bin Mohd Sarib	UNIMAS	Bioactivities of <i>Jatropha curcas</i> Linn. latex
43	P43	Sim Shiang Ping	UNIMAS	Antifungal activities of dichloromethane and methanol extracts from <i>Eusideroxylon zwageri</i> heartwood
44	P44	Ismail Sahid (Prof. Dr)	Universiti Kebangsaan Malaysia	Contamination of tomato grown under rain-shelter and greenhouse conditions with cyfluthrin
45	P45	Nurhidayah Abd Rahin	Universiti Malaya	Antimicrobial activity and minimum inhibitory concentration (mic) of <i>A. angusticolia</i> , <i>H. diversifolia</i> and <i>C. xanthoriza</i> medicinal leaves extracts
46	P46	Putri Narrima Mohd Fauzi	Universiti Malaya	Antioxidant and cytotoxicity properties of crude extract and fractions of <i>Persea declinata</i> (Bl.) Kosterm
47	P47	Wan Nurul Nazneem Wan Othman	Universiti Malaya	Phytochemical studies of <i>Cryptocarya</i> species
48	P48	Shamsollah Ayoubi (Assoc. Prof. Dr)	Isfahan University of Technology, Iran	Temporal yield variability of sorghum using fractal analysis under traditional and improved managements
49	P49	Noraziah Nordin	Universiti Malaya	Phytochemical and biological screening of methanol extracts of <i>Ericosanthellum pulchrum</i>

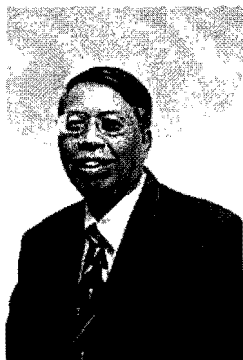
50	P50	Bettycopa Amit	Malaysian Palm Oil Board	Quantifying the diversity of avifauna in undisturbed and disturbed peat swamp forest at Betong Division, Sarawak
51	P51	Leong Sui Sien	UNIMAS	Isolation and characterization of pathogenic bacteria from <i>Aerodramus spp.</i> (swiftlet) droppings
52	P52	Lim Kiau Ceh	UNIMAS	Aerial flocking vocal repertoire of Black-nest swiftlet ( <i>Aerodramus maximus</i> )
53	P53	Mohamad Fizi Sidq Ramji	UNIMAS	Assuidity in nest building activity of the White-nest swiftlet ( <i>Aerodramus fuciphagus</i> )
54	P54	Nurul Ashikeen Ab Razak	UNIMAS	Habitat preferences of waders (Scolopacidae) in Sarawak
55	P55	Andrew Alek Tuen (Prof. Dr)	UNIMAS	Abundance and nutrient content of insect at the lake side of Sarawak Club Golf Course and Universiti Malaysia Sarawak campus, Kota Samarahan, Sarawak
56	P56	Jongkar Grinang	UNIMAS	Assemblages of freshwater snails in Benuk River of Padawan limestone, Sarawak (Malaysia, Borneo)
57	P57	Lee Nyanti (Prof. Dr)	UNIMAS	Colonization of artificial reef balls in Talang-Satang National Park, Sematan, Sarawak
58	P58	Mohd Nasarudin b. Harith @ Abdul Nasir	UNIMAS	Preliminary study on benthic microalgae assemblages of Asajaya mangrove, Kota Samarahan, Sarawak
59	P59	Mohd Nasarudin b. Harith @ Abdul Nasir	UNIMAS	Cyanobacterial composition and selected water quality parameters of Ranchan Pool, Serian, Sarawak
60	P60	Samsur Mohamad (Dr)	UNIMAS	Biology and toxicity of <i>Tetraodon nigroviridis</i> from Sampadi River, Sarawak
61	P61	Siti Zuraini Ismail	UNIMAS	Distribution of <i>Bactrocera dorsalis</i> complex in Lundu-Sematan, Sarawak
62	P62	Felicia Colick	UNIMAS	Characterization of bacteria isolated from fish and water samples from Sarawak River using GTG5 PCR
63	P63	Abang Azizil Fansuri Abang Abdulah	UNIMAS	Macrobenthos study in Sematan River Estuary, Sarawak
64	P64	Harold Tinggang Ngau	UNIMAS	The macrobenthos community at Sekambal River Lundu, Sarawak
65	P65	Nur Atiqah Mohamad Yusoff	UNIMAS	Water quality and heavy metals concentration of Batang Lupar River estuary, Sarawak
66	P66	Nursyuhaida Md Shahid	UNIMAS	Relationships among sea urchin <i>Diadema setosum</i> based on 16S rRNA gene analysis

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67	P67	Ruhana Hassan (Dr)	UNIMAS	Pandan Beach, Lundu. Sarawak: Epibenthos, fish and phytoplankton assemblages
68	P68	Chen Chee Dang	Universiti Malaya	Distribution and identification key for ten species of the <i>Simulium tuberosum</i> species-group (Diptera: Simuliidae) in Malaysia
69	P69	Doreen Chai	Sarawak Forestry Corporation	Insect pest of <i>Neolamarckia cadamba</i> plantation in Sarawak, Malaysia
70	P70	Karen Chia	Universiti Malaya	The diversity of the butterflies (Insecta: Lepidoptera) in Genting Highlands, Pahang, Malaysia
71	P71	Nurul Ashikin Ismail	Univ. Tun Hussein Onn Malaysia	Ethnoentomology among selected ethnic groups in Peninsular Malaysia
72	P72	Mogeret Sidi	UNIMAS	Identification species of bagworm on <i>Michelia champaca</i> trees at Faculty of Resource Science and Technology, UNIMAS
73	P73	Rizoh Bosorang	UNIMAS	Cuticular hydrocarbon analysis of three <i>Bactrocera</i> species (Diptera: Tephritidae) from Samarahan, Sarawak
74	P74	Nor Salmizar Azmi	UNIMAS	Morphological analysis of family Zosteropidae in Malaysia
75	P75	Dayang Syahreeny A.M	UNIMAS	Kenaf retting using <i>Ceratocystis paradoxa</i> UMAS –PG3
76	P76	Chai Suk Phin	UNIMAS	Heterologous expression of <i>Isochorismate synthase</i> gene in bacteria system
77	P77	Asso. Prof. Dr Retno Andayani B.M.	Universiti Islam Antarabangsa, Malaysia	In vitro Organogenesis of Ginger ( <i>Zingiber officinale</i> Rosc.)

\*poster not available

## ABSTRACT FOR KEYNOTE PAPER



**Prof. Emer. Dato' Dr. Abdul Latiff**  
**Universiti Kebangsaan Malaysia**

### INVESTMENT IN MALAYSIAN BIODIVERSITY: IT'S IMPORTANCE IN SUSTAINING TROPICAL NATURAL RESOURCES

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It is now about 14 years after the launching of the National Biodiversity Policy which had taken a centre stage in Malaysian environmental management and policy agenda. The government's agencies together with non-government organizations have been demanding that biodiversity be conserved and utilized for future socio-economic development. The country's tropical forest and the marine ecosystems are endowed with one of the richest biodiversity assets in the region and efforts to conserve and utilize the rich flora and fauna have been carried out in the country since the last decade through the establishment of National Biotechnology Policy and other commercial government and private initiatives. Today about 7.6% of the forest of all types had been set aside for the conservation of biodiversity but their inventories are yet to be carried out fully. The country has claimed that these protected areas have captured most of the diverse ecosystems and species of plants and animals found. Plants and animals including microorganisms biodiversity is represented by numerous species with flowering plants constituting about 80% whilst the diversity of fauna species is represented by more than 5,000 species excluding invertebrates. The investment in biodiversity objective should be to achieve a long term capital growth for subsequent investment of biodiversity asset in biotechnology especially medical and agricultural biotechnology, health care and ecotourism. To this effect Malaysia has just formulated the National Biotechnology Policy that envisaged the sustainable use of biodiversity. The genetic resources especially the seeds, DNA manipulation and microorganism cultur enhance both the medical and agricultural products and by-products and some salient features in potential products of biodiversity for commercial use and management would be discussed.



## ABSTRACT FOR ORAL PRESENTATION

### 1A-1: NEW LIMONOIDS FROM *CHISOCHETON CERAMICUS*

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Nowadays, research on medicinal plants, especially in tropical areas of the Ancient World, is of special importance from a therapeutic point of view, as compared with the search for new remedies by synthetic chemical means. Nature, both flora and fauna still gives us some interesting models of molecules, providing the chemist with lead compounds for the design and synthesis of more pharmacologically viable derivatives. The wide-ranging activities of limonoids are of interest in the field of natural products. Limonoids with insecticidal, insect antifeedant, antibacterial, antifungal, antimalaria, anticancer and antiviral activities are known to be especially bountiful in plants from the Meliaceae family. In continuation our study on metabolites from plants, we embark on the studies of *Chisocheton ceramicus* extracts which have yielded Ceramicines A – L. The isolation, structural elucidation and bioactivity of isolated limonoids will be discussed.

Keywords: Limonoids, *chisocheton ceramicus*, chisomicine A-C

### 1A-2: HMBC SPECTRA OF ALKALOIDS FROM LAURACEAE SPECIES: NINE STARS HALO-N THEORIES

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Four theories related to the field of natural products were discovered by Dr. Halo-N and was published in a book entitled *Al Fathun Nawa*, Volume 1, 2011. These theories are: 1) Nine Stars Halo-N Theory; 2) Nawiah 9 x 45 (1) Theory; 3) Nawiah 9 x 45 (2) Theory and 4) Halo-N 9.2 Homolength Theory. These theories have similarities with depiction of correlation spots in HMBC (Heteronuclear Multiple Bond Coherence) spectrum, which is obtained through the NMR (Nuclear Magnetic Resonance) machine. The HMBC spectra of various alkaloids isolated from Lauraceae species were studied and these spectra were used to prove these theories. The theories were experimentally proven based on the HMBC spectra.

Keywords: Lauraceae; Nine Stars Theory; HMBC spectra; alkaloids.

### 1A-3: SCREENING FOR ALLELOPATHIC POTENTIAL OF *PENNISETUM PURPUREUM* ON *ELEUSINE INDICA*

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This study was carried out to examine the possibility of utilizing *Pennisetum purpureum*, a weed widely distributed in the subtropics and the tropics, was selected for potential allelopathic phytotoxic effects on *Eleusine indica*. The allelopathic potential of these plants were elucidated by evaluating the inhibitory exhibition from their leaves, debris, and soil infested on germination and growth of *E. indica*. In a bioassay of the *P. purpureum* leaves aqueous extract, it shows strong inhibition effect as the concentrations increased, and were 100% inhibited germination and growth of *E. indica* at highest concentrations of 8% and 10%. Moreover in the *P. purpureum*-infested soil, both germination and seedling growth of *E. indica* were significantly reduced by >50%. Whereas for soil incorporated with *P.*

*purpureum* leaf and stem debris (amended soil), germination and growth of *E. indica* were significantly reduced too, as the proportion of the debris increased thereby estimated that there might be present some water-soluble, inhibitory phytotoxic compounds in the *P. purpureum* -soil infested, the amended soil and the leaf aqueous extracts which cause the direct involvement in the observed growth inhibitions. In conclusion, the present study revealed that *P. purpureum* exerted allelopathic effects on the growth and development of *E. indica* and can be further explored as having potential to be used as a herbicide in future weed management programmes.

Keywords: allelopathic potential, *Pennisetum purpureum*, *Eleusine indica*, phytotoxic

#### **1A-4: ANTIOXIDANT ACTIVITY OF *LITSEA ELLIPTICA* BL. AND *LITSEA RESINOSA* BL. (LAURACEAE)**

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Antioxidant activity of *Litsea elliptica* Bl. and *L. resinosa* Bl. (Lauraceae) was determined by an *in vitro* method – DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay. The methanol extracts of *L. elliptica* roots and stems exhibited the highest antioxidant activity among of the samples studied, with EC<sub>50</sub> (50% DPPH free radical scavenging and effectiveness concentration) values of 23.99 µg/mL and 41.69 µg/mL respectively. The methanol extract of *L. elliptica* roots showed significant and stronger scavenging activity due to its lower EC<sub>50</sub> value than that of the standard BHT (butylated hydroxytoluene) with EC<sub>50</sub> value of 28.18 µg/mL. The activity increases as the concentration of the samples increases because of dose dependent.

Keywords: Antioxidant, *Litsea elliptica*, *L. resinosa*, DPPH, EC<sub>50</sub>

#### **1A-5: PRODUCTION AND CHARACTERISATION OF CELLULOSE AND NANO-CRYSTALLINE CELLULOSE FROM KENAF CORE WOOD**

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Natural fibres like kenaf has been studied extensively as a reinforcing phase which received major attention recently due to its renewability, biodegradability, and higher strength comparable to other synthetic fibres. In this study, nano-crystalline cellulose (NCC) was produced from kenaf core wood using acid hydrolysis method. Kenaf core was alkaline treated in 4 wt% of sodium hydroxide and subsequently bleached using sodium chlorite in acidic buffer. The resulting white, bleached kenaf core was hydrolysed in 64 wt% sulphuric acid to obtain NCC. The resulting NCC suspension was characterised using X-ray Diffraction (XRD), Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA), Scanning Fourier Transform Infra Red (FTIR) analysis and Transmission Electron Microscope (STEM). Hydrolysis in high concentration of acid further increases the crystallinity of kenaf core and reduces the dimension of cellulose to nano scale. FTIR results show that with each subsequent treatment, hemicellulose and lignin were removed while cellulose remains unchanged after hydrolysis treatment which was reaffirmed by DSC result. The diameter of NCC obtained from kenaf core were found to be in the range of 8.5 - 25.5 nm.

Keywords: Kenaf core, cellulose, nano materials, nano-crystalline cellulose

### 1A-6: FORMULATION OF CURCUMIN LOADED STARCH NANOPARTICLES

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Recently, various attempts have been made to overcome the limitation of poorly water-soluble drugs through loading in polymeric nanoparticles (10-100 nm) in order to permit drug to be more effectively delivered through the bloodstream which consists mostly of water. In this research, starch nanoparticles were synthesized from native sago starch powder and these starch nanoparticles were used as the loading agent, while curcumin was used as a poorly water-soluble model drug. Curcumin loading in sago starch nanoparticles was investigated by using a simple nanoprecipitation method in water-in-oil (w/o) microemulsion system as reaction medium. The types of reaction medium, types of surfactant, effect of surfactant concentration, oil/ethanol ratio and initial curcumin concentration affected the characteristics of the curcumin loaded starch nanoparticles in terms of particles size, morphology and loading efficiency (LF). Dissolution of 1% (w/v) curcumin in 1:3 ratio of oleic acid to ethanol microemulsion system and in the presence of 3% (w/v) Tween 80 surfactant in the formulation were found to be optimal in the preparation process. Curcumin released from prepared starch nanoparticles formulation was slow and sustained over four days.

Keywords: Starch nanoparticles, Curcumin, Loading efficiency, Accumulative release

### 1B-1: PRODUCTION OF TROPANE ALKALOIDS FROM CELL SUSPENSION CULTURE OF *HYOSCYAMUS NIGER* L.

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Friable callus could be induced from the leaf explants of the *in vitro* plantlets of *Hyoscyamus niger* on MS medium supplemented with 2.0

mg/L picloram. The leaf-derived callus subsequently sub-cultured on MS medium supplemented with 0.5 mg/L picloram became more friable with less granules but with higher growth rate. The cell suspension culture of *H. niger* was initiated by transferring 0.5 g of the most friable portion of the leaf-derived callus into 25 mL of the cell proliferation medium, MS liquid medium supplemented with 0.5 mg/L picloram, 30 g/L sucrose and 0.1 mg/L myo-inositol. The growth pattern of *H. niger* based on fresh and dried cell mass followed a typical sigmoid curve. Elicitations with calcium chloride, yeast extract and casein hydrolysate gave different effects on the cell growth and production of tropane alkaloids from the cell cultures of *H. niger*. Lower concentration of calcium chloride induced higher cell growth. Only the production of scopolamine was increased when the concentration of calcium chloride was doubled from the normal MS concentration (0.44 g/L). Elicitation with 3.0 g/L of yeast caused lower cell growth while elicitation with 2.0 g/L yeast extracts caused significant increase in the production of hyoscyamine and scopolamine. Elicitation with casein hydrolysate did not have any significant effect on the growth of *H. niger* cells nor the production of hyoscyamine and scopolamine.

Keywords: callus, cell suspension culture, tropane alkaloids, picloram, *Hyoscyamus niger*

### 1B-2: EFFECT OF MEDIUM REPLENISHMENT IN CELL SUSPENSION OF *ARTEMISIA ANNUA* OF VIETNAM ORIGIN

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Initial studies conducted on plant cell suspensions of *Artemisia annua* of Vietnam origin in shake flasks have proven to be a possible way of synthesizing artemisinin through plant cell culture technology. With the high demand of artemisinin in tropical countries where malaria is widespread, there is a need for the large scale production of this potent drug. However, *A. annua* suspension cultures cultivated in shake flasks would not be economically feasible for commercialization of the end product. Based on the same principles of cell culture techniques for secondary metabolite production on a larger scale in

cell culture tanks, process optimization is the key consideration in achieving desired culture conditions. With the growth index of cell culture greatly reduced from shake flasks to cell culture tanks, we investigate the possible factors to increase the productivity in large scale cultures through medium replenishment and sucrose consumption, which may lead to future fed-batch cultures in cell culture tanks.

Key words: medium replenishment, cell culture technology, cell culture tank

### **1B-3:IN VITRO PROPAGATION OF AQUILARIA MICROCARPA BAILL. USING SHOOT TIPS AND LATERAL BUDS EXPLANT**

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*Aquilariamicrocarpa* Baill., is of economic importance source of gaharu for cosmetic and medicinal purposes. Collection of these plants in forests has become very difficult and they are threatened with extinction due to their indiscriminate collection and over-exploitation to meet the high demand in the open market. The objective of this study is to develop an *in vitro* culture method for mass propagation of this species. Shoot tips and lateral buds from grown seedling were used as the explants. Shoots were cultured in modified Murashige and Skoog (MS) medium with 6-benzylaminopurine (BAP) at various concentrations rates. The MS medium supplemented with 0.25 mg/L BAP was the highest mean number of shoot formation for shoot tips (6.2 shoots), which is significantly higher than other treatment. For lateral buds, MS medium supplemented with 2.0 mg/L was most effective for shoot multiplication with 3.2 shoots, which is significantly higher than other treatment. The highest mean shoot length for shoot tips was obtained in MS medium supplemented with 4.0mg/L BAP (1.2 cm) and lateral buds in MS medium supplemented with 0.25 mg/L BAP (1.8 cm). Regenerated shoots transferred onto rooting media,

they rooted within 30 days. Rooted plantlets were acclimatized in "Jiffy-7" for four weeks before transferred in potting consisted of mix peat, soil and sand (1:1:1). The plantlets showed 80% survival rate and good growth.

Keywords: *Aquilaria microcarpa* Baill., *in vitro*, gaharu

### **1B-4:A COMPARISON OF PRODUCTION OF SOMATIC EMBRYO FROM THREE SELECTED COCOA (*Theobroma cacao* L.) CLONES**

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*Theobroma cacao* L. is currently in the third ranking important commodity in Malaysia after oil palm and rubber. As to increase the best quality of cocoa production with faster propagation, the study of tissue culture for cocoa was carried out. The objectives of this study were to compare between two protocols for three selected cocoa clones, to discover the best protocol for better multiplication of cocoa production and to compare which cocoa clones give the best response in somatic embryogenesis. This study is important in order to discover the best protocol to optimize the production of somatic embryos. Three cocoa clones, KKM 1, MCB C5 and MCB C8 were studied in this experiment. The staminodes were cultured on Pennsylvania State and Nestle protocol for the comparison of somatic embryogenesis. Based on the result, for 10% Clorox® treatment, the highest percentage of responsive explants producing somatic embryo is clone MCB C8 cultured on Nestle protocol with 87.2%. For 20% Clorox® treatment, the highest percentage of responsive explants producing somatic embryo is clone MCB C8 cultured on Nestle protocol with 25.5%. Overall, Pennsylvania State is the best protocol since it is suitable to produce somatic embryos for all selected clones.

Keywords: *Theobroma cacao*, somatic embryogenesis, somatic embryo, Pennsylvania State protocol, Nestle protocol

### 1B-5: EFFECTS OF MS MEDIUM AND MACROELEMENTS ON MULTIPLE SHOOTS FORMATION OF *LOBELIA CHINENSIS* LOUR.

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*Lobelia chinensis* is an important herb in traditional Chinese medicine. Due to over development and deforestation as well as infection by pathogen, it is now under the threat of extinction. Conventional vegetative propagation is too slow to achieve the commercial quantities required. Tissue culture could scale up the propagation rapidly and economically. This study was carried out to investigate the effects of Murashige and Skoog (MS) medium and major elements at different levels on the *in vitro* regeneration of *L. chinensis*. The nodal segments of *L. chinensis* were grown on MS medium and MS medium supplemented with different levels of phosphorus (0, 1.0, 2.0, 4.0 and 6.0 mM), calcium (0, 0.5, 1.0, 2.0 and 3.0 mM), magnesium (0, 0.5, 1.0, 1.5 and 2.0 mM), potassium (0, 12.5, 25.0, 50.0 and 75.0 mM) and different ratio of nitrate and ammonium ranging from 0.25:1 to 4:1. The MS medium induced 3.5 shoots per explants. The most number of multiple shoots, 11.7 shoots per explants, was achieved in MS medium supplemented with NO<sub>3</sub><sup>-</sup>/NH<sub>4</sub><sup>+</sup> at ratio 0.25:1. After acclimatization, the plants grew well in the field.

Keywords: Tissue culture, MS medium, multiple shoots formation, macroelements.

### 1B-6: VIRUS ELIMINATION IN COCOA (*THEOBROMA CACAO* L.) THROUGH SOMATIC EMBRYOGENESIS

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Cacao swollen shoot virus (CSSV) is a major pathogen that has seriously constrained cocoa production in West Africa, particularly Ghana and Nigeria. The aim of this study was to assess the efficacy of cocoa somatic embryogenesis to produce virus-free clonal propagation material both for replanting and to facilitate the safe international exchange of germplasm. Polymerase Chain Reaction (PCR)-based screening, is employed in this study because of its capacity for CSSV detection prior to the appearance of visual symptoms. Degenerate PCR primers were developed in order to improve the CSSV-strain dependence of earlier tests. The degenerate primers were capable of detecting 37 out of a putative 56 CSSV strains, four more than the sequence specific primers. For tissue culture studies, cocoa staminodes cultures were established from flowers of CSSV-infected cocoa genotypes CL 19/10 strain 1A and Amelonado Plant 2 to produce callus, primary and secondary somatic embryos, with genotype AMAZ 15 used as a virus-free control. PCR-based CSSV detection proved that virus could be detected at callus, primary somatic embryos and secondary somatic embryo stages, indicating that the progress of the virus was progressively impeded. These findings support the use of somatic embryogenesis as a mean of improving CSSV-free clonal propagation of cocoa.

Keywords: Cacao swollen shoot virus, cocoa, somatic embryogenesis, Polymerase Chain Reaction, staminodes.

### 2A-1: PROTECTIVE ROLE OF ANTHOCYANAIN AND TAURINE AGAINST MICROCYSTIN INDUCED PANCREATIC AND TESTICULAR TOXICITY IN BALB/C MICE

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Microcystins (MC-LR) are hepatotoxic cyanotoxins produced mainly by cyanobacteria family especially *Microcystis* sp. This hepatotoxin is reported as potent tumor promoter by inhibiting protein phosphatase activity. Oxidative stress has been implicated as one of the possible mechanisms in MC-LR induced toxicity. Although several studies on

the protective role of numerous antioxidants used as antidotes have been reported, to date, there is no effective chemoprotectant against the MC-LR induced toxicity. In the present study, MC-LR was isolated from cyanobacterial blooms from Simemia Lake, Malaysia and intraperitoneally injected (34.5mg of MC-LR/kg bw) to BALB/C mice in order to assess MC-LR effect on pancreas and testis. Biochemical studies were conducted to explore the protective effect of orally pretreatment for 10 days of mice with 32.1mg/kg bw of anthocyanin extracted from pomegranate and 100mg/kg bw of taurine separately against the induced toxicity in those organs. MC-LR toxicity in testis and pancreas was confirmed by the inhibition of phosphatase activity. The biotoxin induced significant increase in marker of cytotoxicity levels (lipid peroxidation end product and protein carbonyl content formation) in those organs. Hyperglycemia, raised serum  $\alpha$ -amylase activity, increased liver glucokinase activity and decreased pancreatic and liver pyruvate kinase activity suggested a pancreatic injury which could induce diabetes. Also, alteration in the activity of testicular enzymes superoxide dismutase, lactate and sorbitol hydrogenases were reported in MC-LR treated groups. Data showed an important protection against MC-LR toxicity following the separate preadministration of antioxidants (taurine and anthocyanin) to animals. Comparing the antioxidant capacity of the used chemoprotectants, anthocyanin afforded a better protection than taurine against MC-LR injury.

**Keywords:** Microcystis aeruginosa, Microcystin-LR, Anthocyanin, Taurine, Antioxidants

#### **2A-2: APORPHINE ALKALOIDS AND ANTIOXIDANT ACTIVITY OF *PHOEBE GRANDIS* (NEES) MERR. O. Hanita<sup>1,2</sup>, M.M.Azrul<sup>1</sup>, A.H.A. Hadi<sup>1</sup>**

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The genus *Phoebe* of the family Lauraceae is of wide tropical occurrence but has been little studied chemically. Antioxidant activity was determined by two methods – reducing power (FRAP) and DPPH. The present study of the hexane, dichloromethane, methanol and

alkaloid extracts from the leaves of *Phoebe grandis* (Nees) Merr showed that these extracts have shown a good scavenging activity. The antioxidant activity was higher for alkaloids compared to other fractions. Activity-guided fraction led to the isolation of four compounds and these compounds were lysicamine 1, N-methylitsericinone 2, N-methylitsericine 3 and dicentrinone 4. Compounds 1 and 4 belong to the oxoaporphine type alkaloid and compounds 2 and 3 belong to proaporphine type alkaloid.

**Keywords:** *Phoebegrandis*; Aporphine alkaloids; Antioxidant; FRAP; DPPH.

#### **2A-3: BIOACTIVE ALKALOIDS FROM *RAUVOLFIA REFLEXIA* (APOCYNACEAE)**

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The chemistry of the *Rauvolfia* species has been comprehensively investigated for the presence of indole alkaloids and their biological activity over a long period of time. For examples the clinical uses of *Rauvolfia* in arterial hypertension has been described in 1955 and the root and bark of *Rauvolfia yunnanensis* has been used for the remedy of snake bites, feverish illnesses and insanity in China and India. In this study, bioactive alkaloids have been isolated from *Rauvolfia reflexia* (Apocynaceae). Seven indole alkaloids were isolated from this species and the structural elucidation of the isolated alkaloids has been performed using spectral method such as UV, IR, MS and 1D and 2D NMR. The biological activity study was also carried out on the crude extracts and pure compounds.

**Keywords:** Indole Alkaloids, *Rauvolfia*, Apocynaceae, biological activity

## 2A-4: SIZE CONTROLLED SYNTHESIS OF CELLULOSE NANOPARTICLES

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Cellulose nanoparticles were synthesized from commercial facial cotton through nanoprecipitation method. Controlled precipitation was done through drop-wise addition of dissolved facial cotton to excess absolute ethanol to obtain cellulose nanoparticles. The effects of synthesis conditions such as concentration of facial cotton, duration of dialysis, ratio of solvent-nonsolvent, water/oil (microemulsion system) and ratio of present surfactant on the particle size and size distribution were investigated. Other than that, dialysis and water/oil emulsion method were used to produce homogeneous cellulose nanoparticles. Cellulose nanoparticles with particle size ranged from 206 to 683 nm were synthesized under various synthesis conditions. On the other hand, controlled precipitation with dialysis resulted in more homogeneous distribution of spherical cellulose nanoparticle as compared to direct precipitation method. Our studies shows dialysis can produce more spherical cellulose nanoparticles compared to precipitation and water/oil emulsion methods. The smallest cellulose nanoparticles with a size of 94 nm have been prepared by using water/oil microemulsion system. Our studies demonstrated that the cellulose nanoparticles can be produced by a simple nanoprecipitation. Furthermore, the particle sizes can be controlled by varying the synthesis conditions.

Keywords: Cellulose, facial cotton, nanoparticles, precipitation, microemulsion

## 2A-5: SIZE CONTROLLED SYNTHESIS OF STARCH NANOPARTICLES BY A MICROEMULSION METHOD

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This paper reports a simple, fast and cost effective green synthesis of starch nanoparticles through a water-in-oil microemulsion method. Starch is a favorable precursor material for nanoparticles synthesis as it is nontoxic, renewable, biocompatible, low cost and abundantly in nature. Synthesis of nanoparticles by microemulsion method has the advantages of ultralow interfacial tension, large interfacial area and thermodynamically stable. Synthesis parameters such as types of oil phases, types of co-surfactants, different ratios of (oil:co-surfactant), volume of aqueous phase and stirring rates were found to affect the particle size and size distribution of starch while types of surfactants and its concentrations was found not significantly affect the size of starch particles. Our results showed that, starch nanoparticles with average particle size of  $108.6 \pm 16.7$  nm were synthesized by a direct nanoprecipitation method without the microemulsion system. On the other hand, starch nanoparticles with smaller average size of  $82.5 \pm 12.4$  nm were obtained by using microemulsion method under controlled conditions. The nanoparticles obtained were spherical in shape and have uniform size particles distribution. This study showed that microemulsion system can be used to control the sizes of starch nanoparticles.

Keywords: Starch nanoparticles, nanoprecipitation, microemulsion, particle size controls.

## 2A-6: EFFECT OF EXTRACTIVES CONTENT ON WOOD DENSITY AND DURABILITY OF *TRISTANIOPSIS WHITEANA*

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Wood extractives are also known to be one of the most important parameters that contribute to wood durability. However, there is no information available about the influence of extractives in *Tristaniopsis whiteana*. Thus, the objective of this study was to determine the effect of extractives of *T. whiteana* on its wood density and durability.

Extraction was carried out by removing the extractives by using five organic solvents of increasing polarity sequentially. Extraction was performed firstly by n-hexane followed by dichloromethane, ethyl acetate, methanol and distilled water. Wood densities values were determined and compared before and after extraction. Extracted and unextracted wood blocks were exposed to white rot fungus namely *Trametes versicolor* and *Pycnoporus sanguineus* for durability test. Mean density value before extraction for *T. whiteana* was 1085 kg/m<sup>3</sup> while after extraction the density was 1011 kg/m<sup>3</sup>. The amount of extractive was similar between inner, middle and outer wood. However, amount of extractives did not show any consistent trend between height levels. T-test showed that extracted wood samples were significantly reduced while the correlation coefficient between extractives content and air-dry density was strong with  $r=0.77$ . Further analysis using regression showed that the relationship was strong with  $r^2=0.66$ . This indicated that extractive contribute to the air-dry density of *T. whiteana*. Strong inverse relationship was observed between extractives content and weight loss. This showed that the higher the extractives content the smaller the weight loss which suggests that extractives of *T. whiteana* are toxic to *T. versicolor* and *P. sanguineus*.

Keywords: *Tristaniopsis whiteana*, wood extractives, wood density, wood durability

## 2B-1: MORPHOLOGICAL EFFECT OF SODIUM AZIDE ON ARTEMISIA ANNUA OF VIETNAM ORIGIN

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The mutagenicity of sodium azide (NaN<sub>3</sub>) was studied on seeds of *Artemisia annua* (*A. annua*) for alteration in plant morphology. Seeds treated with 1-5 mM NaN<sub>3</sub> and untreated seeds were germinated on full strength Murashige and Skoog medium. Low percentage (<3%) of putative mutant plant had shown morphological abnormalities during the first two subculture cycles. However, these abnormalities subsided

through each cycle. The height, size of the leaves and internodes of putative mutant plants were recorded and no significant difference were observed after four subculture cycles. Nonetheless, the glandular trichome, which is the sole site for artemisinin production, had shown increased in trichome density when observed under scanning electron microscope (SEM). The highest glandular trichome density was found on the leaves of *A. annua* at 2mM NaN<sub>3</sub>. Therefore, NaN<sub>3</sub> is a potential mutagen to create variability in plant breeding of *A. annua* and hence producing new variety of *A. annua* with enhanced artemisinin.

Keywords: *Artemisia annua*; Morphology; Sodium Azide mutagenesis; SEM

## 2B-2: AN IMPROVED METHOD FOR THE DETERMINATION OF ORGANOPHOSPHORUS PESTICIDES IN SOILS AND APPLICATION TO FIELD STUDY

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The intensive use of pesticides in the agriculture sector may result in high levels of pesticide residues in the soil. Thus, the pesticide residues in soils need to be studied to ensure that they are used in a sustainable manner. A simple and rapid method has been developed to analyse the organophosphorus pesticides in the mineral and organic soils of Sarawak. The pesticides were extracted from the soil with acidified acetonitrile followed by the removal of water from the extract by salting out with sodium chloride and magnesium sulfate. The extract was cleaned up using 0.2 g primary secondary amine packed in a disposable Pasteur pipette. The pesticides were determined by gas chromatograph with flame photometric detector. The recoveries of the pesticides at 0.01-1.0 mg kg<sup>-1</sup> fortification levels were in the range of 79 to 120%. The relative standard deviations were below 9.8 % and the limits of detection were 2.0-5.0 µg kg<sup>-1</sup>. The advantages of this method are high sample throughput, small reagent usage and generate minimum waste. This modified method has been used to determine the pesticide residues in soil samples collected from the vegetable farms in Sarawak.