ABSTRAK

UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

PRPi09
PAMERAN REKA CIPTA, PENYELIDIKAN DAN INOVASI 2009

Pameran Reka Cipta, Penyelidikan & Inovasi

MELESTARI PENYELIDIKAN INTEGRATIF BERIMPAK TINGGI

28 - 30 Julai 2009

KANDUNGAN

Maklumat PRPI 2009

Abstrak PRPI 2009

MAKLUMAT PRPI 2009

Pengenalan

PRPI 2009 kini telah memasuki tahun penganjurannya yang ke-7. Pameran penyelidikan di UPM telah bermula sejak tahun 1997 semasa *Exhibition & Seminar Harnessing for Industry Advantage*. Pada tahun 2002, Pameran Reka Cipta dan Penyelidikan (PRP) buat pertama kali telah diadakan dengan menggunakan konsep pertandingan hasil projek penyelidikan yang telah dijalankan oleh para penyelidik UPM.

Kejayaan penganjuran PRP 2002 telah merintis usaha untuk menjadikannya sebagai aktiviti tahunan UPM dan ianya terus berkembang sejajar dengan nama baharunya yang ditukar kepada Pameran Reka Cipta, Penyelidikan dan Inovasi yang bermula penganjurannya pada tahun 2005. Sebagai kesinambungan daripada kejayaan penganjuran PRPI 2006, 2007 dan 2008 yang lalu dan status UPM sebagai salah sebuah Universiti Penyelidikan, PRPI 2009 kali ini yang merupakan pameran penyelidikan yang terbesar di UPM terus dilaksanakan dengan aspirasi dan semangat yang lebih jitu. Pameran ini juga menjadi pelantar kepada para penyelidik untuk mengenengahkan hasil penyelidikan yang dijalankan dan penemuan baharu kepada umum. Di samping itu ianya juga menjadi penanda aras terhadap kualiti sesuatu projek penyelidikan bagi melayakkan para penyelidik UPM untuk menyertai pameran di peringkat kebangsaan dan seterusnya antarabangsa. Adalah diharapkan pelaksanaan PRPI 2009 ini akan dapat menyemarakkan budaya penyelidikan di kalangan staf dan juga pelajar UPM sekaligus menjadikan UPM sebagai Universiti Penyelidikan yang cemerlang di negara ini.

OBJEKTIF

1. Mempamerkan pencapaian penyelidikan, inovasi dan reka cipta yang berkualiti dan berimpak tinggi di dalam pelbagai bidang di UPM;

2. Mengenal pasti hasil penyelidikan, inovasi dan reka cipta yang boleh diketengah dan dikomersialkan;

3. Mengiktiraf sumbangan penyelidik UPM dalam menjalankan aktiviti penyelidikan, inovasi dan reka cipta;

4. Mencungkil bakat penyelidik-penyelidik baharu di UPM;

5. Memberi sokongan dan dorongan kepada penyelidik baharu bagi meneruskan jejak-jejak kegemilangan penyelidikan universiti; dan

6. Sebagai persiapan dan persediaan bagi penyertaan ke pameran di peringkat kebangsaan dan antarabangsa.

MAKLUMAT AM

Nama Pameran	Pameran Reka Cipta, Penyelidikan dan Inovasi (PRPI) 2009
Tarikh	28 hingga 30 Julai 2009 (Selasa, Rabu dan Khamis)
Tempat	Dewan Besar (PKKSSAAS), UPM
Masa	8.30 pagi hingga 5.00 petang
Tema	“Melestari Penyelidikan Integratif Berimpak Tinggi”
Anjuran	Pejabat Timbalan Naib Canselor (Penyelidikan dan Inovasi), UPM
Sekretariat Pameran	Pusat Pengurusan Penyelidikan Pusat Inovasi dan Pengkomersilan Pusat Kebudayaan dan Kesenian Sultan Salahuddin Abdul Aziz Shah Pusat Pembangunan Maklumat dan Komunikasi Pusat Kesihatan Universiti Bahagian Pentadbiran Pejabat Timbalan Naib Canselor (P&I) Pejabat Pembangunan dan Pengurusan Aset Pejabat Bendahari Bahagian Komunikasi Korporat Bahagian Hal Ehwal Pelajar Bahagian Keselamatan Taman Pertanian Universiti Perpustakaan Sultan Abdul Samad Penerbit Putra FM

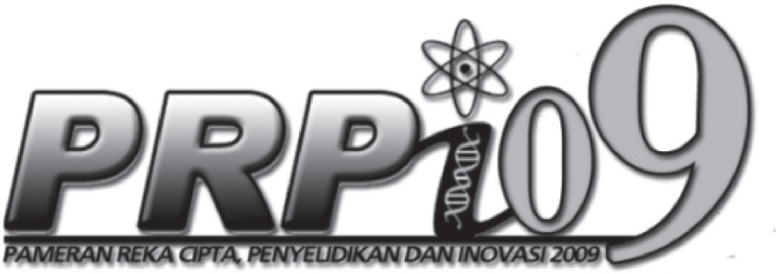
Kategori Pertandingan

a)	Fundamental	(A)
b)	Penyelidikan Gunaan	(B)
c)	Produk / Inovasi	(C)

Kluster Penyelidikan

a)	Pertanian	(AG)
b)	Makanan	(FD)
c)	Kesihatan	(HE)
d)	Perhutanan dan Alam Sekitar	(FE)
e)	Sains Sosial	(SS)
f)	Sains, Teknologi dan Kejuruteraan	(STE)

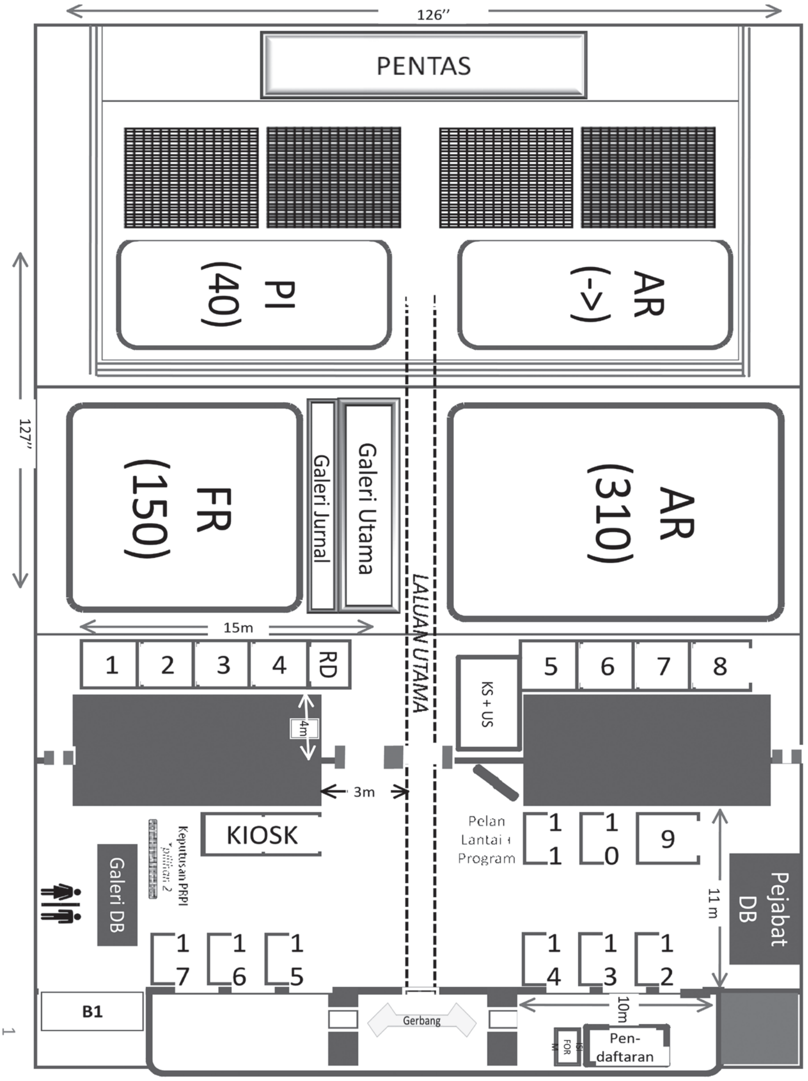
RASIONAL LOGO



1. Huruf PRP mewakili **PAMERAN REKA CIPTA, PENYELIDIKAN**.
2. Huruf i (*italic*) mewakili **INOVASI** dan **ILMU PENGETAHUAN** yang menjadi teras kepada pelaksanaan penyelidikan di UPM.
3. Nombor ‘09 mewakili ringkasan penganjuran PRPI bagi tahun **2009**.
4. Simbol ‘DNA’ diletakkan pada huruf i (*italic*) bagi mewakili **BIDANG AGROBIO** yang menjadi teras kekuatan UPM sejak penubuhannya.
5. Simbol ‘atom’ mewakili **BIDANG SAINS DAN TEKNOLOGI** yang turut menjadi teras kekuatan UPM dan enam (6) penjuru atom mewakili **ENAM KLUSTER PENYELIDIKAN** di UPM iaitu **PERTANIAN, MAKANAN, KESIHATAN, PERHUTANAN DAN ALAM SEKITAR, SAINS SOSIAL; DAN SAINS, TEKNOLOGI DAN KEJURUTERAAN**.
6. Warna kelabu mewakili warna perisai pada logo UPM yang ingin gagah melangkah jauh menjadi universiti bertaraf **DUNIA**.
7. Warna emas mewakili kejayaan yang dikecapi oleh UPM di dalam bidang penyelidikan dan inovasi sehingga diiktiraf sebagai **UNIVERSITI PENYELIDIKAN**.

Logo Dicipta Oleh:
Azuandi Md. Kasa
Pusat Pengurusan Penyelidikan (RMC)

PELAN *BOOTH* PAMERAN PRPI 2009



Pelan *Booth* Pameran PRPI 2009

PETUNJUK

***Booth* Pameran (3m x 3m)**

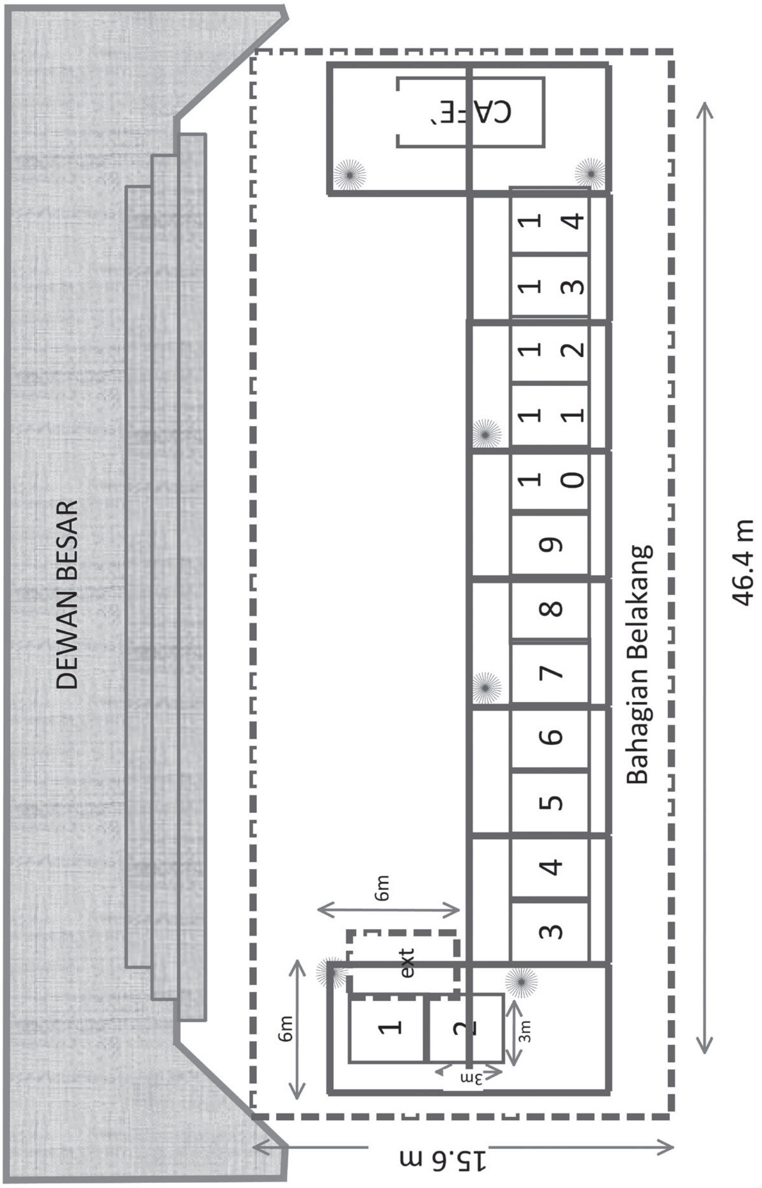
Dalam Dewan

1 ☞ UPM Holding
2 ☞ Penerbit UPM
3 ☞ Perpustakaan Sultan Abdul Samad
4 ☞ Bahagian Komunikasi Korporat
5 ☞ Ejen Paten Klinik Paten
6 ☞ Perbadanan Harta Intelek Malaysia (MyIPO)
7 ☞ Kaunter SPK
8 ☞ iDEC
KS+US ☞Kaunter Sekretariat + Urusan Sijil PRPI
RD ☞ Ruang Diskusi

Foyer Dewan

9 ☞ Adv. Composite Engineering Sdn. Bhd.
10 ☞ Q-Plus Sdn Bhd.
11 ☞ PalmGen Sdn. Bhd.
12 ☞ Orchid Life Sdn. Bhd.
13 ☞ Ecocillus (M) Sdn. Bhd.
14 ☞ Xenolab Sdn. Bhd.
15 ☞ Kempen Kesedaran Kanser
16 ☞ IBS – FPSK – Hospital Serdang
17 ☞ Kempen Kesedaran Kanser
B1 ☞ Bilik Pemeriksaan

BOOTH LUAR DEWAN BESAR



***Booth* Pameran (3m x 3m)**

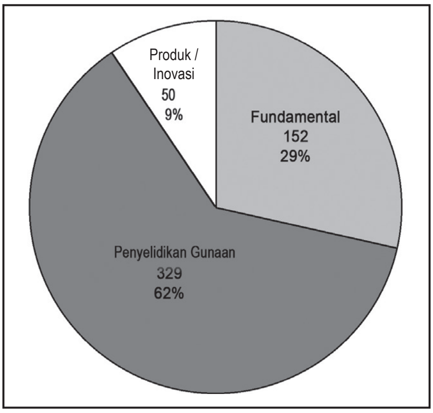
1 & 2 ☞ Satiri Sdn. Bhd.
3 & 4 ☞ Hospital Veterinar Universiti, FPV
5 & 6 ☞ Akademi Sukan - *Fitness Test*
7 ☞ Koperasi UPM
8 ☞ Fakulti Pertanian
9 ☞ Fakulti Sains & Teknologi Makanan
10 ☞ SMK Aminuddin Baki
11 ☞ SMK Seri Puteri
12 ☞ FOSTEC - FSTM
13 ☞ Jabatan Kejuruteraan Kimia & Alam Sekitar
14 ☞ Pameran Pelajar Fakulti Sains
✺ ☞ *Water Mist Fan*

Café (6m x 3m)

STATISTIK PENYERTAAN

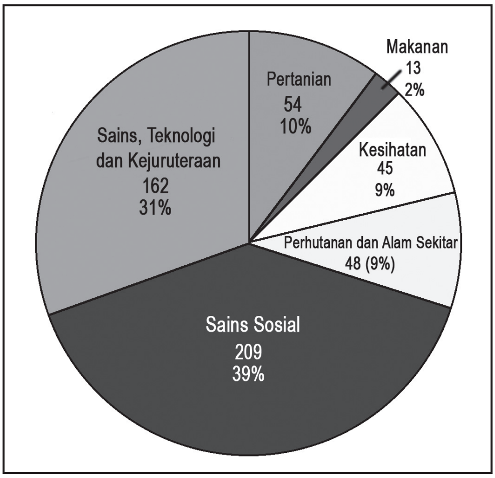
Statistik Penyertaan PRPI 2009 Mengikut Kategori

Kategori	Jumlah
Fundamental	152
Penyelidikan Gunaan	329
Produk / Inovasi	50



Statistik Penyertaan PRPI 2009 Mengikut Kluster

Kluster	Jumlah Penyertaan
Pertanian	54
Makanan	13
Kesihatan	45
Perhutanan dan Alam Sekitar	48
Sains Sosial	209
Sains, Teknologi dan Kejuruteraan	162



Stastistik Penyertaan PRPI 2009 Mengikut Kluster

No.	PTJ	Bilangan	Fundamental (A)	Applied Research (B)	Product / Innovation (C)	Agriculture (AG)	Food (FD)	Health (HE)	Forestry and Environment (FE)	Social Sciences (SS)	Science, Technology and Engineering (STE)
1	Fakulti Pertanian	**15**	4	9	2	14				1	
2	Fakulti Perhutanan	**17**	7	8	2				14	1	2
3	Fakulti Perubatan Veterinar	**7**	3	2	2	5					2
4	Fakulti Ekonomi dan Pengurusan	**103**	12	91						103	
5	Fakulti Kejuruteraan	**42**	3	20	19	2			1		39
6	Fakulti Pengajian Pendidikan	**25**	10	13	2			1		24	
7	Fakulti Sains	**69**	46	22	1	2			11		56
8	Fakulti Sains dan Teknologi Makanan	**12**	3	7	2		10				2
9	Fakulti Ekologi Manusia	**11**		11						11	
10	Fakulti Bahasa Moden dan Komunikasi	**20**	8	12						20	
11	Fakulti Rekabentuk dan Senibina	**1**			1			1			
12	Fakulti Perubatan dan Sains Kesihatan	**27**	13	10	4		2	25			
13	Fakulti Sains Komputer dan Teknologi Maklumat	**23**	4	18	1						23
14	Fakulti Bioteknologi dan Sains Biomolekul	**12**	3	7	2	3		1			8
15	Fakulti Pengajian Alam Sekitar	**17**	2	12	3	2			11	3	1
16	Fakulti Sains Pertanian dan Makanan	**5**	3	1	1	4			1		
17	Institut Biosains	**21**	6	13	2	10		10	1		
18	Institut Teknologi Maju	**6**		3	3	2					4
19	Institut Gerontologi	**12**	2	10				2		9	1
20	Institut Penyelidikan Matematik	**22**	12	9	1					5	17
21	Institut Penyelidikan Produk Halal	**1**	1				1				
22	Institut Kajian Dasar Pertanian dan Makanan	**9**		9		4				5	
23	Institut Perhutanan Tropika dan Produk Hutan	**11**	4	6	1				6		5
24	Institut Penyelidikan Sains Sosial	**7**	2	5						7	
25	Institut Pertanian Tropika	**6**		6		6					
26	Sekolah Pengajian Siswazah Pengurusan	**24**	3	21					3	19	2
27	Akademi Sukan	**5**	1	4				5			
28	Pusat Pembangunan Maklumat dan Komunikasi (iDEC)	**1**			1					1	
	Jumlah	**531**	**152**	**329**	**50**	**54**	**13**	**45**	**48**	**209**	**162**

Pertanian

Consumer Attitude and Perception Toward Purchasing of Marine Fish in Malaysia

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ABSTRACT

This study analyses the frequency of fresh fish purchases and buying pattern through consumer survey in the Klang Valley, Malaysia. Seven hundred respondents were randomly interviewed with regard to their buying behaviour pattern, attitude and perception on fresh marine fish consumption. Logistic regression was used to analyze the effect of demographic and attitudinal characteristics on fresh fish purchasing behavior more that one time per week. Majority of the respondents state their preference of fish. The study reveals that taste and nutritive value of fish are factors that the consumers consider when making fish purchases. Thus the fish marketers should take advantage on the nutritive and medicinal value of fish as alternative to conventional medicine in preventing and curing of diseases. In regard to demographic factors such as household income, number of household and martial status, some kind of promotional afford should be made to encourage not only higher income bracket or consumer with a large number of household but also to those in lower income bracket. Thus price will play an important role in attracting more consumers to consume more fish or to purchase fish more frequently. It can be hypothesized that consumers are willing to pay more for fish, but if the price is too much higher in comparison to poultry, beef, mutton, and pork, consumers will find alternative to satisfy their needs and wants. In addition, housewife plays a major role in purchasing decision making of food items in the family. Education and awareness of the benefit of fish eating should be inculcated among the housewives in general. Increases in demand for fishery products not only benefit the marketers but also the fishermen as a whole. Thus the two prong policies to eradicate poverty and to increase income among the fishermen can be achieved as more people consume more fish.

Keywords: fresh fish, purchasing behaviour, logit, demographic, malaysian consumer, fish consumption

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Polyunsaturated Fatty Acids Delay the Onset of Insulin Resistance

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ABSTRACT

Insulin resistance happens when the body cannot use insulin effectively. Insulin resistance is a common feature 10 – 20 years before the onset of diabetes and its complications. Therefore, delaying or prevention of insulin resistance represents a significant step in the prevention and control of insulin resistance-related disorders. The current study illustrated that it is possible to induce insulin resistance using “bad” fats, and subsequently to delay its onset in the rat model through the use of polyunsaturated fatty acids – the “good” fats. Generally, this approach worked as dietary fats progressively alter the lipid biomembrane characteristics and the signaling capacities of cells during glucose metabolism. Our team have successfully re-engineered the lipid biomembrane composition in animals using oil palm-based agriculture by-products to produce “healthy meat” for human consumption and in the rat model. Therefore, the current research is just an extended application of our earlier findings on the modification of cellular membrane compostions. The knowledge gained from this study will enable animal agriculturist to re-engineer dietary lipid content appropriately to prevent or delay the onset of insulin resistance in human populations. Signaling properties explored in the current research in also relevant in understanding the events and mechanisms of cancer cell pathologies. Through this research, the team has come up with an early concept of lipid prediction index for insulin resistance. This prediction index in itself is a major intellectual property and will represent a major milestone in diabetic and lipid research, as it is expected to play significant role in the dietary management and prevention of diabetes.

Keywords: fatty acids, insulin resistance, rats

Comparison of the Efficiency of Capillary Electrophoresis and Metaphor Gel Electrophoresis in Separating Microsatellite Alleles

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ABSTRACT

Capillary electrophoresis and metaphor gel electrophoresis are fragments analysis methods for separating polymerase chain reaction (PCR) amplified products. The latter method is the method used in microsatellite analysis in Malaysia, although many studies elsewhere currently use the capillary electrophoresis due to its higher sensitivity and precision. This study aimed to compare the efficiency of capillary electrophoresis and metaphor gel electrophoresis in separating the amplified microsatellite fragments and thus aiding the estimation of the allele sizes. DNA from 30 Kedah Kelantan cattle were amplified using PCR for three microsatellite loci. The alleles amplified were that separated using the two methods and the allele sizes estimated with reference to the respective DNA size markers. The estimated allele sizes from the two methods were compared with each other as well as with the reported allele size ranges for these loci. The results of this study shows that the fragment sizes estimated using capillary electrophoresis were within the reported range, whereas the sizes estimated based on the metaphor gel electrophoresis had a wider range. It is, therefore, recommended that capillary electrophoresis be used for separation of PCR products and allele size estimations to ensure higher accuracy.

Keywords: capillary electrophoresis, microsatellite, metaphor gel electrophoresis

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Carbon Dioxide Enrichment for Growth Enhancement of Oil Palm Seedlings

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ABSTRACT

As the need to replant oil palm area in Malaysia increased, demand for oil plam seedlings has soared tremendously, creating shortage in supply of planting materials. The situation becomes more challenging as normal production of oil palm seedlings in the nursery takes longer period of about 12 months before seedlings are ready for field planting. This has also increased the cost of nursery management and maintenance, and risk to the propagators. Recently, with the development of CO_2 enrichment technique, has exhibited enhanced growth in 8-month old seedlings under CO_2-close top chamber system, similar to that of 12-month old seedlings from conventional nursery. Four-month old oil palm seedlings when exposed to 800 μmol/mol CO_2 for four months had demonstrated higher basal palm diameter (92%) and total leaf area (6%) compared to nursery raised seedlings of 12-month old Although CO_2-enriched seedlings (8 months) registered relatively lower frond numbers (6%) and plant height (19%) compared to nursery-raised seedlings (12 months), yet when compared to the non-enriched 8-month old seedlings, the former had registered significantly greater values at 16% and 32% for both frond numbers and plant height, respectively. As observed, CO_2 enrichment technique had successfully speeded up the growth of oil palm seedlings equivalent to that of nursery-raised ones as manifested by the superior vegetative responses of enriched seedlings *vs.* 12-month old nursery raised or non-enriched 8-month old seedlings. The enrichment technique, hence, has important implication in the national oil palm seedling industry as a means to shorten seedling age, thus reducing the cost of nursery management and maintenance, and nursery risk, and a way of improving the overall oil palm seedling growth performance ready for transplanting. The technique is now being perfected for precise procedure of enrichment.

Keywords: oil palm seedling CO_2 enrichment technique, oil palm seedling management, oil palm nursery industry

A New Improved PCR-based Method for Identification of Plant Pathogenic Bacteria in Soil Samples

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ABSTRACT

Epidemiological and ecological studies of soilborne plant pathogenic bacteria are usually hindered by the lack of efficient detection method especially when the concentration of the pathogen is either very low or is present in a latent, dormant or non-culturable state. Many different molecular methods have been used for the detection of plant pathogenic bacteria in soil samples, but most of these methods are not very reliable because of the inhibition of the amplification reaction by compounds contained in the crude bacterial extracts, which gave false negative results or low detection sensitivity. Therefore direct, fast and reliable detection method of soilborne plant pathogenic bacteria in soil samples is one of the challenging areas for many plant pathologist. Thus, this study was undertaken to develop and compare several procedures to overcome PCR inhibition problems and to propose a set of standard protocols for the reliable detection of soilborne plant pathogenic bacteria in soil samples.

Keywords: soilborne bacteria, detection, PCR, plant pathogen

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First Report of the Occurrence of Anthracnose Disease Caused by *Colletotrichum gloeosporioides* on Dragon Fruit in Peninsular Malaysia

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ABSTRACT

A study was conducted to investigate the distribution of anthracnose disease on dragon fruit and to correlate its occurrence with weather and cultural data. Survey and sampling of diseased plants were conducted on dragon fruit growing areas in Peninsular Malaysia since December 2007 until August 2008 to measure the disease Incidence (DI) and disease severity (DS). The diseased stems and fruits were sampled and brought to laboratory for isolation and identification. DI data were plotted with DS and then correlated using Pearson correlation with weather and cultural data. Of the 43 surveyed farms in 11 states, DI and DS were successfully recorded on three dragon fruit species from 36 farms (83.72%). The infected stems and fruits had reddish-brown lesions with chlorotic haloes symptoms. The lesion had brown centers and coalesced to rot. Based on its whitish-orange colony, septated hypae and capsule-like conidia and the pathogenicity test, the pathogen was identified as *Colletotrichum gloeosporioides*. One way ANOVA with DMRT test highlighted that the most disease occurrence was found in Malacca (mean of DI and DS, 57.30 and 21.20%), whereas the lowest in Kelantan (mean of DI and DS, 6.70 and 4.30% respectively). Pearson coefficient correlations were around 0.107-0.261 for relationships between disease occurrence and age of crops and acreage of farm, from -0.049 to -0.237 for disease prevalence with relative humidity and rainfall and around -0.012 -0.173 for disease occurrence with monthly temperature, wind velocity and altitude. The occurrence of anthracnose on dragon fruit in Peninsular Malaysia was more influenced by environmental conditions and agricultural practices rather than climatic factors.

Keywords: anthracnose, disease incidence, disease severity, pitaya

Novel Broiler Feed Additive Derived from Metabolites of *Lactobacillus* sp. Isolated from Malaysian Foods

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ABSTRACT

In modern animal farming, various methods have been explored to improve animal health and growth performance, such as better husbandry management, nutrition and utilisation of feed additive. Growth promoting antibiotic is the commonly used feed additives due to their positive effects on growth and the reduction of incidence of certain diseases. However, the extensive use of antibiotic may cause animals to develop resistance in a number of pathogenic bacteria species. Some countries already imposed prohibitions on the use of antibiotics as growth promotants and this have drawn attention to possible alternatives. The present study provides novel and environmental friendly approach for improving animal agriculture, in particular in the production of meat producing livestock. Four combinations of natural metabolites produced by probiotic strains of *Lactobacillus* sp. isolated from Malaysian foods were used to study the performance of broiler chickens. A total of 432 male Ross broilers were raised from day old to 42 days of age in deep litter house pens. These birds were divided into 6 groups and fed with standard corn-soybean based diets containing different combinations of probiotic metabolites. Higher final body weight, weight gain, average daily gain and lower feed conversion ratio were significantly ($P<0.05$) found in all treated groups. Metabolites combination supplementation also increased faecal lactic acid bacteria population, small intestine villus height and faecal volatile fatty acids, and lowered cholesterol and faecal Enterobacteriaceae population. Compared to live microorganism, metabolites have advantages in storing, transporting and handling. Therefore, the findings of this study indicate that the metabolites of *Lactobacillus* sp. posses vast potential to replace antibiotic as feed additive.

Keywords: *lactobacillus* sp. metabolite, broiler, feed additive

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Immunoglobulin-producing Cell in the Reproductive Tract during Follicular and Luteal Phases in Ewes

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ABSTRACT

The level of uterine Secretory-IgA (S-IgA) and numbers of plasma cells was measured to observe the differences between two stages of oestrous cycle (follicular and luteal phase) in the healthy cycling non pregnant ewes. Twelve ewes were used in this study and they were divided into two groups of 6 animals each according to the stages of oestrous cycle. All ewes were subjected to oestrous synchronisation and allowed to undergo one natural oestrous cycle after the removal of the sponge. All animals were then slaughtered at the end of the experiment. The uterine mucus was harvested by flushing with a mixture of protease inhibitor cocktail in distilled water. For both stages, the level of uterine S-IgA was quantified by using ELISA and stained using Methyl Green Pyronine staining was used to observe the plasma cell in the tissues of the uterine horn and oviduct of ewe's genital tract. The protocol of the study was approved by the Faculty's animal care and use committee (animal utilisation protocol number: 08R26/Jun 08-May 09). The S-IgA level and the presences of plasma cells numbers in the reproductive tract of ewe were statistical significant higher ($p<0.01$), ($p<0.01$) in the follicular phase compared to those values in the luteal phase. The main reason for the immunosuppression during the luteal phase did not fully justified, especially with the presence of potential acquired infection during coitus in the follicular phase and in the same time immune system should decrease accordingly to prevent newly attached fetus rejection by the mother immune system.

Keywords: immunoglobulin, reproductive tract, estrus cycle, ewes

First Report of a Phytoplasma Associated with a Disease of Coconut Palms in Malaysia

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ABSTRACT

Coconut palm (*Cocos nucifera* L.) is a versatile tree that has many uses. A large number of coconut palms grown in the plantations have been showing general yellowing symptoms of the fronds. In addition, the lower canopy foliage initially turns light yellow and eventually to light-brown color and the symptoms spread rapidly to the younger leaves. Severe chlorosis of the emerging spear leaf occurs, causing the inflorescences to develop necrosis and causing premature nut fall. Most of the fronds on diseased coconut palms gradually collapse. Immature coconut palms generally die within 5 months of initial symptom appearance. On the basis of disease symptoms, the disease has been named coconut yellow decline. Samples were collected from symptomatic and symptomless Malayan red dwarf and Malayan tall coconut ecotypes. Total DNA was extracted and assayed in a nested PCR with universal primer pairs P1/P7 followed by either R16F2/R16R2 or fU5/rU3. Products of the expected size (ca. 1200 and 880 bp) were amplified from coconuts with symptoms but not from symptomless coconut palms. The phytoplasmas 16SrDNA obtained from the Malayan red dwarf and Malayan tall coconut palms were cloned and sequenced and showed the highest homology (99%) with comparable sequences of Bermuda grass white leaf phytoplasma from Thailand (AF248961) and Malaysia (EU294011), members of the 16SrXIV ‘Candidatus Phytoplasma cynodontis’ group. Coconut palms are known to be susceptible to the 16SrIV lethal yellowing phytoplasma group in the USA and Africa, but there are no records for their susceptibility to phytoplasma infection inside the 16SrXIV ‘Ca. P. cynodontis’ group. However, this is the first report of a 16SrXIV phytoplasma caused disease in coconut palm in the world and associated with yellow decline in Malaysia.

Keywords: coconut palm, phytoplasma, coconut yellow decline, nested pcr, cloning, sequencing

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The Secretory Cells of the Ewe Ampulla: Activities and Changes under Light and Electron Microscopy during the Oestrous Cycle

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ABSTRACT

The morphological changes and secretory activities at the peak of follicular and luteal phases have not been clearly established for ovine secretory cells in the oviductal mucosa. Thus, the features of the secretory cells from the ampulla were studied by light, scanning and transmission electron microscopy. Fourteen ewes were slaughtered at respective phases for sample collection. Blood samples were collected every alternate day to measure the concentration of estradiol-17β and progesterone using RIA. Under light microscopy, the epithelium is pseudostratified with prominent cilia during follicular and become simple columnar at luteal phase. During luteal phase, the secretory cells were numerous, distended and formed balloon-like bulges protruding beyond the tip of the cilia. Basophilic granules were present in the apical cytoplasm. From SEM, at follicular phase, the secretory cells were rounded, turgid with intact microvilli and some showed ‘grape-like’ appearances on the surfaces but at luteal phase, the surface was rough and the microvilli were hardly seen. Secretions of various sizes oozing out from its broken surfaces were evident at this phase. Some cellular fragments, which appear to be a ‘pinching off’ of the apical portions of the secretory cells, were seen. TEM observation revealed numerous secretory granules of various sizes and density at the apex of the secretory cells at follicular phase, but they were bigger and more electron-dense during luteal phase. Fusion of the secretory granules with the plasma membrane indicating maximum secretory activity by exocytosis was apparent at the latter stage. Cellular fragments released without the nucleus into the lumen may suggest merocrine mode of secretion. The present results demonstrate marked morphological changes and activity of the secretory cells in the ampulla, which is strongly associated with the hormonal influences during the estrous cycle.

Keywords: secretory cells, oviductal epithelium, follicular phase, luteal phase, ewes

N Fertigation by Sprinklers

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ABSTRACT

Manual fertilizer application in a field is non-uniform and causes large spatial variability. Fertilizer application together with irrigation water or Fertigation by sprinklers can provide a more uniform distribution. The impact of nitrogen fertigation through sprinklers on the spatial and temporal variability of soil properties was studied. This was to determine the relationships between fertigation distribution pattern and crop performance as well as field management strategy based on soil and crop spatial variability. The crop was sugar beet grown in the Fesaran village, east of Isfahan city, Iran. The response to the N fertilizer application by sprinklers was studied by analyzing 7 soil elements including N, P, K, CEC, OM, EC and pH as well as 6 crop properties including leaf N content, tuber sugar content, tuber moisture, tuber weight, tuber numbers and yield. N fertigation by sprinklers results in low variability of N leaf content (CV=10.3%) and tuber sugar content (CV=6.4%) through and across the study area. Low variability of soil N as well as leaf N content produces low variability in tuber sugar and yield. Higher sugar content of tubers was achieved compared to previous records of this field for average yield and tuber sugar content for the Isfahan area. Based on Pearson test results, it can be concluded that sugar beet only respond to N fertilizer during vegetative stage in this field and there was no significant effects of P and K on crop performance. Urea fertigation has direct impact on leaf N content, tuber numbers and indirectly on tuber sugar content. It indicates that sugar beet performance depends on factors other than P and K. Improved yield and tuber sugar content was obtained from N fertigation by sprinklers.

Keywords: precision farming, sprinkler irrigation, uniform distribution, crop performance

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The Impact of External Shocks on Comparative Advantage of the Malaysian Food Processing Industry

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ABSTRACT

Scheduled liberalisation of trade preferences under the World Trade Organisation and the Asean Free Trade Area has heightened the challenges faced by the Malaysian food producers. To penetrate a wider range of markets, Malaysian food processors have to identify food sub-sectors that are internationally competitive. These sub-sectors should not only withstand internal shocks but also external shocks such as the financial crisis in 1997. This article examines the levels of benefit-cost ratios for various productions of food products to analyze the comparative advantages before and after the 1997 financial crisis. The competitiveness of the food processing industry in Malaysia was determined using the Domestic Resource Cost (DRC) method. Twenty food sectors were assessed using the Malaysian food production and trade data from 1985 to 2001. Processed foods with a high comparative advantage sustained after the crisis can be considered as viable to compete with foreign products in domestic and overseas markets. Meat products in import substitutions, palm oil, kernel oil, sago and tapioca, and cocoa in traditional exports and fish products in emerging exports are examples of food sub-sectors that are gaining competitiveness in the post crisis period.

Keywords: comparative advantage, food processing industry, benefit-cost ratios, domestic resource cost ratio

Production of Omega-3 Enriched Chevon through Dietary Manipulation

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ABSTRACT

An investigation was carried out to determine the effects of dietary supplementation of different levels of oil palm fronds (OPF) on the fatty acid profiles of the plasma and edible tissues (*longissimus dorsi, bicep femoris, infraspinatus* muscles, liver and kidney), growth performance and carcass characteristics of the local Kacang crossbred goat. The results showed that the treatment diet containing 50% (w/w) OPF pellets and 50% (w/w) commercial goat concentrate produced a favourable increase in the omega-3 fatty acid content of the goat plasma and tissues after 100 days of feeding. Feeding of the dietary mixture resulted in changes in pH, volatile fatty acid (VFA) concentrations and protozoal populations in the rumen environment that appeared to reduce the lipid biohydrogenation process and more importantly, increased the amounts of omega-3 fatty acid passage for hindgut absorption in the goat. This had led to the extensive accumulation of omega-3 fatty acids and other unsaturated fatty acids with a proportionately lower saturated fatty acid incorporation in the goat tissues, compared to goats fed a predominantly 100% concentrate diet or a 25% OPF + 75% concentrate dietary mixture. The dietary supplementation did not affect the growth performance of the goats or the carcass characteristics and quality of the OPF chevon produced. Feeding the OPF chevon-based pellets to Sprague-Dawley rats for 12 weeks increased significantly the ‘good’ high density lipoprotein cholesterol by some 37-45% in the rat plasma. If this finding can be applied to humans, the OPF chevon possess a huge health benefit against cardiovascular disease risks. The fact that the dietary manipulation did not produce any adverse effects on both the growth performance of the animals as well as their carcass traits and qualities indicates that the oil palm fronds which are abundantly available agricultural byproducts can be successfully used as feed supplements for the goat. From an economical point of view, this would also represent huge cost savings in the production of these feeds, especially if the goat production is carried out on a large commercial scale.

Keywords: dietary manipulation, oil palm fronds, chevon, omega-3 fatty acid, health benefit

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Protective Capacity of an Inactivated Recombinant Vaccine Expressing the Fimbrial Protein of *Pasteurella Multocida* B:2 against Haemorrhagic Septicaemia

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ABSTRACT

Haemorrhagic septicaemia (HS) is an acute and economically important disease of cattle and buffaloes caused by *P. multocida* B:2. Previously, the gene encoding antigenic fimbrial protein of *P. multocida* B:2 eventually cloned, sequenced and expressed in *E. coli* in order to develop recombinant vaccine expressing the fimbrial protein. The study was carried out to determine the antibody responses and protective capacity of the recombinant vaccine following intranasal (i.n) vaccination against HS in goats as an experimental host. During the course of study, both serum and lung lavage fluid from all groups; vaccinated, control and unvaccinated were collected to evaluate the antibody levels via enzyme-linked immunosorbent assay (ELISA). Overall, it was found that goats immunized with an inactivated recombinant vaccine through intranasal route developed a strong specific and significantly higher ($p<0.05$) IgG response in both serum and lung lavage fluid as well as IgA response when compared to the control and unvaccinated groups. Experimental intratracheal challenge showed the discovery rate of isolates were 16%, 66% and 100% from the lung of group vaccinated, control and unvaccinated, respectively. However, none of the goats from vaccinated group had *P. multocida* B:2 in their liver, tonsil and heart. Thus, the study showed that an inactivated recombinant vaccine significantly provided high degree of protection against high dose challenge and managed to enhance stimulation of the local and systemic immunity which appear to be an important role in the mucosal immunity against infections.

Keywords: *P. multocida* b:2, fimbrial protein, inactivated recombinant vaccine, intranasal, goats

Forest Conservation through Honey Hunting and Ecotourism in Malaysia

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ABSTRACT

This study attempts to explore the economic potential of honey hunting from *Apis Dorsata* and ecotourism activities in the Gelam (*Mellaleuca spp.*) forest of Terengganu. The primary data were collected from several surveys in Mercang and Marang during the honey harvesting season of 2007. The result indicates that the return to labor and management from honey hunting is estimated to be RM1618 per month for the whole harvesting season of about 6 months. If the return from ecotourism is included, honey hunting has greater reward to offer economically. Additional income earn by rural farmers through ecotourism activities includes providing transportation, food and lodging and a small fee for participating in the gelam forest honey collection. The study has demonstrated that honey hunting and ecotourism can be used as an instrument for poverty eradication among the rural poor.

Keywords: honey hunting, *apis dorsata*, *gelam* (mellaleuca spp), return to labour and management, ecotourism and poverty eradication

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Group Farming Development in Muda Agriculture Development Authority (MADA) Paddy Farming Area

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ABSTRACT

During the period of the 5th Malaysian Plan (1986-1990), group farming project has been positively progressed in Malaysia. Through the formation of individual farmers into the group farming, the economics of scale could be achieved as well as their productivity. Given the responsibility in the development of Muda Area paddy farming, Muda Agriculture Development Authority (MADA) has took the group farming project as the main project to be extended to the local farmers since 1979. At present, there are three forms of group farming in Muda Areas which consists of *Kelompok*; Mini Estate or *Projek Separa Perladangan* (PSP); and, Estate or *Projek Sawah Secara Perladangan* (PSSP). Farmers were called to practice their farming in group form in order to solve their field irrigation and drainage problem with respect to increase their productivity. The other objective was to recommend some better solutions to the extension agencies regarding their process in transferring new technologies and know-how in farm management effectively to the farmers. This study examined the role of the group farming project and its categorization, organization structures and management styles. This study also attempted to find the changes of the farmer's technical practices and their farm management after joining the group. The results indicated that the transforming of the group form is still maintaining the three styles of management. But the number of the new *Kelompok* was reducing by MADA and the focus was given to form more PSP and increase the number of PSSP. While the each type of *Kelompok* management system is remaining the same.

Keywords: group farming, *kelompok*, mini estate, estate, farm management

Rhizospheric Sugars for Enhanced N_2 Fixation in Rice

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ABSTRACT

Biological nitrogen fixation (BNF) is an energy involving process. Diazotrophs utilise root exudate carbon substrates as energy and form natural associations with plants. An experiment was conducted under glasshouse condition to determine the effect of addition of sugars found in root exudates (glucose, galactose and arabinose) on nitrogen fixation by diazotrophic strains Rhizobium sp. Sb16 and Corynebacterium sp. Sb26 in two rice genotypes (Mayang Segumpal and MR219). Mayang Segumpal inoculated with Rhizobium sp. Sb16 applied with galactose significantly increased plant N content (4.2%) and fixed 42 % of atmospheric N (Ndfa). About 40 % atmospheric N was fixed by MR219 inoculated with Corynebacterium sp. Sb26 amended with arabinose. The associations of Mayang Segumpal with Rhizobium sp., and MR219 with Corynebacterium sp. increased about 64 - 77 % of plant biomass compared to non-inoculated control, and an increased of 35.5 – 55.5 % plant biomass over 60 kg ha^{-1} equivalent of inorganic N fertilizer treatment. In general, the diazotrophs showed specific preference for sugar utilisation and plant association. Rhizobium sp. preferred galactose, while Corynebacterium sp. preferred arabinose. Application of 10 mM of soluble sugars either galactose or arabinose to the respective rice genotype as available carbon sources enhanced the growth and N_2 fixation activity of these two diazotrophs. The diazotrophic association with rice plants significantly increased nitrogen fixation, plant N content, leaf area, photosynthesis activity and plant biomass compared to non-inoculated and inorganic N fertilizer (60 kg N ha^{-1}) treatments. The availability of specific soluble sugars in plant rhizosphere can improve the biological nitrogen fixation in rice.

Keywords: biological nitrogen fixation, diazotrophs, rice genotypes, root exudates, sugars

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Seed Health Determination and Movement of Huanglongbing (HLB) Disease Pathogen in *Citrus reticulata*

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ABSTRACT

Citrus greening or Huanglongbing (HLB) disease is a fastidious phloem limited bacteria in citrus. A PCR method has been develop previously, and two specific primers (OI1 and OI2) permits the detection of the two liberibacters in citrus leaves by amplification of an 1160 bp fragment of their 16S rDNA. The PCR method has been assayed in many Asian, African and USA countries for the detection of the HLB disease. Citrus greening pathogens could be transmission via psyllid vectors, grafting and dodder. However there is very little information on seed transmission and HLB pathogen movement to find a way to control or reduce the severity of HLB on the field. This study was conducted to detect HLB pathogen in seeds of Citrus, to determine pathogen movement in citrus seedling after infection and to detect the HLB pathogen in citrus roots. Seeds of *Citrus reticulate* cv. Limau Madu were collected from infected orchard and were germinated in screenhouse condition. The seeds of *Citrus reticlata* cv. L. Madu were planted in screenhouse too for HLB pathogen movement and HLB detection in roots. The seedlings were inoculated using infected grafting methods. HLB was not amplified in new seedlings after germination. HLB moved slowly reaching up to 1.5 cm after 2 weeks, 1.5-4.5 cm after eight weeks and detected on 4.5-9 cm after 14 weeks below the grafting area. HLB was also detected up to 9-15 cm after 16 weeks, 15-24 cm after twenty weeks, 24-28.5 cm after 22 weeks and 28.5-30 cm after 24 weeks below the grafting area. HLB disease in citrus is not seed borne and it can reach to the roots 26 weeks after inoculation. Currently based on conventional PCR, HLB disease in citrus is not seed borne and it can reach to the roots 26 weeks after inoculation.

Keywords: citrus greening disease, huanglongbing, pathogen movement, seed borne

Herbal Plant as a Growth and Health Promoter in Poultry

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ABSTRACT

Two studies were conducted to determine the effects of *Euphorbia hirta* as a feed additive on growth performance, gut microflora and resistance to Salmonellosis. In Experiment 1, the effects of dietary E. hirta supplement on performance, nutrient digestibilities, digesta pH, and ileal microbial population were determined in broiler chickens. For comparison, we used virginiamycin and organic acids as positive control groups to evaluate the efficacy of *E. hirta* supplementation. Day-old chicks were randomly assigned to six dietary groups; (i) basal diet (control), (ii) basal diet + ground 2.5 g/kg *E. hirta* (EH2.5) (iii) basal diet + ground 5.0 g/kg *E. hirta* (EH5.0), (iv) basal diet + ground 7.5 g/kg *E. hirta,* (EH7.5), (v) basal diet + 0.02 g/kg virginiamycin (VM), and (vi) basal diet + 1.5g/kg organic acid (OA) from day 1 to 42. The experimental result showed that supplementing boiler chickens with EH7.5 improved feed conversion ratios (feed/gain), and energy and protein digestibilities as compared to other groups. Besides the lower gut pH in the EH7.5 chickens, the supplement also resulted in lower total bacterial count but increased *Lactobacillus* count. Experiment II was conducted to determine the effect of *E. hirta* supplementation on resistance to *Salmonell enteritidis* challenge in broiler chickens. Day-old chicks were randomly assigned to three dietary groups; control, EH7.5, and OA. Equal number of chickens were either orally challenged with 10^8 colony-forming units of *S. enteritidis* at 3 days of age or not challenged (control). Birds were randomly sampled for cloacal swab, and collection of ceacum, crop, liver and spleen. Fourteen days post challenge, while the incidence of *S. enteritidis* isolation in the crops was not affected by dietary supplementation, the EH7.5 birds had the lowest number of Salmonella incidence in the livers. Following 17 days of challenge, birds supplemented with EH7.5 and OA had significantly lower number of positive cloacal swab for *S. enteritidis*. *E. hirta* may be considered as a more effective feed additive than virginiamycin and organic acids in enhancing growth and health.

Keywords: *Euphorbia hirta,* performance, nutrient digestibilities, gut microflora, *salmonellosis,* broiler chickens

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Precision Spatial Tools for Locating, Counting and Inventorying Oil Palm Trees

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ABSTRACT

There is a high demand for rapid and accurate oil palm tree counting in both private and public controlled oil palm plantations in Malaysia. Currently palm tree counting to determine stand per hectare (SPH) is done manually by estate labourers or visual digitisation of the palm trees from satellite imagery. These techniques are time consuming and are subjected to human errors. The researchers in this study have developed remote sensing based spatial tools for automatic oil palm tree counting for 5 palm age groups of 2, 5, 10, 15 and 18 years. The acquired Quickbird imagery was first treated with a specially designed 15 x 15 smooth filter for delineating the dome shaped palm tree crowns, subsequently with a 7 x 7 edge enhancement filter to delineate the inner high intensity diameter of the palm crowns and finally the individual palm centroids were marked out using an image threshold technique. It was observed that the centriods of the palms were well separated for all age groups except for the 2 year palms attributed to mixed reflections from both the palm fronds and the leguminous cover crops. The centriods were then vectorized for automatic counting in a Geographic Information System (GIS). The accuracies obtained for the 2, 5, 10, 15 and 18 age groups were respectively 96.4, 99.1, 98.8, 98.7 and 98.1%. In the GIS, these centriods were essentially point files of individual trees, where attributes such as age, plant condition, yield, and production cost were incorporated, thus establishing a palm tree inventorying system. This system is useful not only for more efficient plantation management particularly in determining stand, yield and production cost per unit area for decision making in replanting old stand but also for reliable and more rapid valuation of oil palm estate for the real estate, banking and insurance industries.

Keywords: low pass filter, edge detection filter, image threshold, palm tree counting, palm tree inventorying

Agriculture Land Suitability Evaluation based on GIS and Multi Criteria

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ABSTRACT

There is a pressing need to develop an optimal land evaluation method to identify in which part of a region selected crops could be grown successfully. It is very important to build Agriculture Decision Support System based on land evaluation to match the requirement of the landuse with the capability of the land, otherwise we may push production to levels beyond the ability of land to support it. The purpose of this study is to develop spatial agriculture decision support system based on land evaluation, Geographic Information System (GIS) and Multi Criteria(MC). The study also considers how to determine the weights of the parameters to be more accurate and objective rather than being subjective. This was based on Sensitivity Analysis. The FAO Framework was selected to conduct the land suitability assessment and modify to suit the local environmental conditions. The FAO framework is a set of guide lines rather than a classification system, and the model used builds upon this. The study area selected is the state of Terengganu in Malaysia. Fourteen land characteristics and their threshold values were determined and brought together in nine land qualities. Soil data and maps, flood potential area, erosion risk map, topographic map, and rainfall interpolation surface were prepared in order to create a land information system. A land information system was implemented. The land suitability model was constructed using GIS capabilities, and visual basic. The model shows how land suitability would change if land improvements were made or if other crops are introduced, the model have the flexibility to evaluate unlimited number of crops. This product will contribute in avoids subjectivity of weight, reducing wrongful and wasteful site selection for agricultural food production, which are then normally followed by an increase in inputs to make the land viable for planting a particular crop. In this respect unnecessary and wasteful application of inputs such as fertilizers and pesticides will be avoided.

Keywords: GIS, multi criteria, land evaluation, suitability, FAO

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IBDqxReal Check an Improved Diagnostic Kit for Detection and Differentiation of Infectious Bursal Disease Virus Subtypes

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ABSTRACT

Infectious bursal disease (IBD) is an acute contagious viral disease of young chickens characterized by high morbidity and mortality. Based on antigenic variation and virulence, serotype I IBDV can be divided into several subtypes; attenuated vaccine, antigenic variant and very virulent strains. Although there are many diagnostic methods available in detecting and/or differentiating IBDV subtypes however most of the methods have several limitations. A duplex TaqMan based real-time reverse transcription-polymerase chain reaction (RT-PCR) assay for detection and differentiation of infectious bursal disease virus (IBDV) subtypes was developed. Primers and two specific probes have been designed; probe labeled with FAM was specific for very virulent IBDV detection, while probe labeled with HEX was specific for classical IBDV detection. Beta-actin probe was included and use as a house-keeping gene for normalisation. The primers and probes were carefully designed and optimized in duplex real-time PCR formats for detection and differentiation of IBDV subtypes with and without quantitation of viral load (submitted to Malaysian patent). The developed assays were optimized and vigorously evaluated using two reference IBDV strains, more than 20 previously characterized field and commercial IBDV vaccine strains, 140 bursal samples from experimentally infected SPF chickens and 37 suspected cases of infectious bursal disease obtained from commercial broiler farms through Peninsular Malaysia from 2004 to 2005. The specificity of the developed assay in detecting different IBDV strains was confirmed by sequence analysis of VP2 gene. In addition, the developed assay was more sensitive, rapid and cheaper than ***IBDVReal check*** diagnostic kit which uses SYBR Green I based real-time PCR format.

Keywords: IBDV, duplex, TaqMan, real-time RT-PCR

The Effects of Sowing Depth and Flooding on the Emergence and Growth of *Fimbristylis miliacea* (L.) Vahl

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ABSTRACT

Glasshouse experiments were conducted from March to July 2003 to determine the effects of sowing depth, and the time, duration, and depth of flooding on the emergence, survival, and growth of *Fimbristylis miliacea* (L.) Vahl. The treatments that were evaluated in the first experiment were three seeding depths (0, 0.5, and 1.0 cm), while in the second experiment, three flooding depths (saturated soil with no standing water and soil with water depths of 5 and 10 cm) and three flooding durations (7, 14, and 21 days from sowing) were evaluated. In the third experiment, three flooding depths (saturated soil with no standing water, and soil with water depths of 5 and 10 cm) and four flooding regimes (7, 14, 21 or 28 days after sowing [DAS]) were evaluated. Surface seeding gave the highest emergence rate compared to the 0.5 cm and 1.0 cm soil depths. A significantly higher emergence rate was recorded with the saturated conditions than with the flooded conditions. A flooding duration of ε14 days showed a clear trend of reduced emergence with increasing flooding depth. A significantly higher survival rate, plant height, root length, number of leaves, and dry matter were recorded at soil saturation followed by the 5 cm and 10 cm flooding depths when flooding was simulated at 7 and 14 DAS. When the flooding was delayed to 21 and 28 DAS, the 10 cm flooding depth was required to suppress this weed. The results provide sufficient evidence to confirm that from deeper seed burial (1 cm sowing depth), flooding depths of ε 5 cm of durations of 14 and 21 days and at the onset of flooding within 14 DAS were effective in suppressing the emergence and growth of *F. miliacea.*

Keywords: emergence, *fimbristylis miliacea*, flooding, growth, sowing depth

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Genotoxicity Evaluation of ZER Towards Human Peripheral Blood Lymphocytes *in vitro* and Rat Bone Marrow Polychromatic Erythrocytes *in vivo*

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ABSTRACT

Zerumbone (ZER) is derived from *Zingiber zerumbet* smith from the Zingiberaceae family. It has been shown to have anti-cancer and apoptosis-inducing properties against various human tumour cells. The aim of our study was to assess the genotoxic effects of ZER in cultured human peripheral blood lymphocytes, Chinese Hamster Ovary (CHO) cells and rat bone marrow polychromatic erythrocytes (PCEs) using micronucleus test (MN) in comparison with the commercial anticancer drug cisplatin. All *in vitro* treatments were carried out in the absence of any exogenous metabolic activation system. Mitomycin C (MMC) was used as a positive control for *in vitro* treatments, while cisplatin was used as a positive micronucleus inducer in rat bone marrow PCEs. Only at high concentrations ZER induced an apparent significant increase in the frequency of micronuclei *in vivo* (1000 mg/kg b.w) and *in vitro* (40 and 80 μM) compared to concurrent control values. Our *in vivo* and *in vitro* cytogenotoxicity studies suggest that ZER can exert less harmful cytotoxic and genotoxic effect compared to cisplatin. These results will be used to further evaluate ZER in human Clinical Trials.

Keywords: CHO, genotoxicity, human peripheral blood lymphocytes, micronucleus, MNPCEs, zerumbone

A Sub-fraction from a Malaysia Herbal Plant *(Keladi Tikus)* Arresting Cancer Cells Proliferation through Programmed Cell Death in Leukemia

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ABSTRACT

The plant *Typhonium flagelliforme*, commonly known as ‘rodent tuber’ in Malaysia, is often used as health supplement and traditional remedy for alternative cancer therapies, including leukaemia. The aim of this study was to evaluate *in vitro* Anti leukemic activity of DCM/F7 fraction extracted from *Typhonium flagelliforme* tuber on CEMss cell line. The Dichloromethane extract of the tuber has been fractionated using column chromatography. The obtained fractions were evaluated for its cytotoxicity towards CEMss cells as well as Human PBL. Assessment of apoptosis produced by DCM/F7 fraction was evaluated using various microscopic techniques. Further confirmation of apoptosis was done by Tunel assay. Phytochemical screening was also done using GC-MS. Seven out of twelve fractions showed significant cytotoxicity against the selected cells line CEMss, in which 3 fractions namely, DCM/F7, DCM/F11 and DCM/F12 showed exceptional anti-cancer activities at 3, 5 and 6.2 µg/ml respectively. Further studies towards the non cancerous PBL exhibited significant selectivity of DCM/F7 compared to the other 2 fractions. Cytological observations showed chromatin condensation, cell shrinkage, abnormalities of cristae, membrane blebbing, cytoplasmic extrusions and formation of apoptotic bodies as confirmed collectively by double staining of AO/PI, SEM and TEM. In addition, DCM/F7 increases cellular DNA breaks on treated CEMss cells. GC-MS revealed that DCM/F7 contains Linoleic acid, hexadecanoic acid and 9-hexadecanoic acid. The current investigation showed that the DCM-7 fraction of *Typhonium flagelliforme* posses a promising antileukemic effect which was able to produce distinctive morphological features of cell death that corresponds to apoptosis.

Keywords: *typhonium flagelliforme*, leukemia, linoleic acid, apoptosis

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Feeding Habits and Seasonal Variation in Diet of Fish Larvae (*Osteichthyes: Sparidae*) in the Sungai Pulai Seagrass Bed, Johore, Peninsular Malaysia

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ABSTRACT

Diet composition of most common fish larvae of family sparidae was studied in the Sungai Pulai seagrass bed of Gelang Patah south western part of Johor, Peninsular Malaysia from December 2007 to May 2008. Larvae were collected by subsurface towing of a bongo net. In situ hydrographic parameters were recorded during the sampling cruises. Stomachs were removed from a total of 80 sparidae specimens during the study period and the stomach contents were examined. Analyses of prey in the stomach showed 24 important food items belonging to 8 major groups: phytoplankton, zooplankton, algae, insects, plant like matter, decapod appendages, debris and unidentified matters. The predominant food items found in the stomach were phytoplankton (60.85%). This was followed by algae (11.73%), zooplankton (9.35%), plant matters (7.84%), debris (4.60%), insects (2.84%), unidentified matters (1.96%) and decapod appendages (0.82%). Habitat in situ temperatures were recorded at 26.92-30.83 ^{0}C (Mean ± SD, 28.60 ± 1.38); Dissolved oxygen ranged from 4.73 to 6.24 mgL^{-1} (5.56 ± 0.53) and the salinity fluctuation was between 29.37 and 33.68 ppt (31.31 ± 1.68). Among the food items, phytoplankton was the first rank by Simple Resultant Index (60.85%) followed by algae (11.73%). Therefore it could be concluded that the fish larvae of family sparidae are mainly herbivorous.

Keywords: feeding habits, fish larvae, seagrass, Peninsular Malaysia

The Mechanistic Action of a Natural Compound from a Local Herbal Plant for Cervical Cancer Treatment

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ABSTRACT

Since cervical cancer is the second most common cancer among women worldwide, it continues to be a serious death-related health problem. Zerumbone, a sesquiterpene moncyclic compound isolated from the rhizomes of edible plant *Zingiber zerumbet* (Wild ginger) has been investigated for its chemotherapeutic effect towards HeLa cancer cells and cervical cancer induced female balb/c mice. The chemotherapeutic potential of zerumbone was compared with cisplatin, a commercial drug used to treat cervical cancer currently. A compilation of molecular techniques have been adopted and used in this investigation to evaluate the mechanistic actions of Zerumbone. These include flowcytometry, fluorescence, scanning and transmission electron microscopy and caspase-3 & 9 assays which were used on HeLa cancer cells treated with zerumbone. On the other hand, mouse cervical tissues were evaluated using histopathology (H&E), immunohistochemistry and laser capture microdissection microscopic isolation of genomic materials followed by RT-PCR to study the levels of mRNA. Anticancer properties of zerumbone were followed by toxicological evaluation for the safety of this compound as a pre-disposing stride for the development of new drug prior to human consumption. Collectively, results presented in this study demonstrated that zerumbone causes metaphasal blockage in HeLa cells, leading to growth inhibition and later, induction of apoptosis, confirmed to be through the mitochondrial pathway. *In vivo* results suggested the inhibitory effect of Zerumbone to be specifically towards BCL-2. As zerumbone exhibits similar pharmacological activity to cisplatin, it possesses the potential to be a reliable antiproliferative agent for cervical cancer but with lesser side effects, as the compound was shown to have no toxicological signs compared to the clinical complications of cisplatin. These results are useful for further evaluating this natural compound in human Clinical Trials.

Keywords: zerumbone, cervical cancer, apoptosis, mechanistic action

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Reproductive Biology of Planktonic Shrimp, *Acetes japonicus* (Decapoda: Sergestidae) in Coastal Waters of Malacca, Peninsular Malaysia

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ABSTRACT

Sex ratio, length at first maturity and spawning season of planktonic shrimp (*Acetes japonicus*) were investigated in the coastal waters of Klebang Besar, Malacca, Malaysia between April 2006 and March 2007. Klebang Besar waters are one of the main fishing grounds for *A. japonicus* in the Peninsular Malaysia. The overall annual sex ratio was found to be 1: 1.50 (male: female). The spawning season was March –July with peak in May, however there was also some spawning in October. The female attain sexual maturity at a minmimum size of 17.5 mm total length. The matured and near to spawn stages (II and III) occurred more than 50% in every month except in August. Therefore, it may be inferred that *A. indicus* breeds continuously throughout the year.

Keywords: spawning, sex ratio, maturity, sergestid shrimp, *acetes japonicus*

Ground-level Ozone: A Threat to Rice Crop in Muda Irrigation Area of Peninsular Malaysia

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ABSTRACT

It has been well-known that pollutant gases cause significant impacts on crops and forests in both developed and developing countries. Ground-level ozone (O_3) is recognized as the pollutant most likely to cause widespread crop damage. An AOT40 (Accumulative O_3 concentration above a threshold of 40 ppb) value causing 5% yield lost for all agricultural lost has been established as 3000 ppbh, which is applicable during daylight hours over a growing season (UN-ECE, 1996). In order to have a complete estimate of air pollution damage. In this study, data was gathered from tests in open-top chambers (OTCs), whereby for OTCs were fabricated; two of which were exposed to ambient air pollution (NF) of which ozone is the major perpetrator whilst the remaining were provided with clean air. The response of the popular local rice cultivar, MR-219 to current ambient air pollution of which O_3 is the overwhelming dominant pollutant was investigated for five successive seasons in Muda Irrigation Scheme Area (MADA). The results of the study indicate that at ozone concentration even lower then Malaysian air quality guidelines (60 ppb 8hr mean) level, there exists a significant impact on the growth and yield of the popular rice cultivar MR-219. Even though weeds, diseases, and insect pests were absent, water and nutrients were in abundance, no adverse soil conditions, and that no extreme weather even such as typhoon occurs; the physiological, growth and development performances of rice plants exposed to ambient ozone where found to be significantly ($P<0.05$) reduced by AOT40 compared to control rice plants in filtered chamber. This study discovered that the root was the most significantly affected component of MR-219 rice plant. Meanwhile, reproductive stage is the most vulnerable period of growth to ozone impact followed by grain filling and vegetative stages, respectively.

Keywords: air pollution, ground-level ozone, open top chamber, rice yield, MADA

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Assessment of Putative Bacteria as Probiotics Juvenile Tiger Prawn (*Penaeus monodon*)

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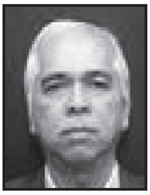

ABSTRACT

Currently, the use of probiotic biocontrol to overcome disease problems in shrimp industries is a well known remedy. Bacteria flora of digestive tract and hepatopancreas, body surface and muscles of juvenile *P. monodon* along with its rearing water and sediment was analyzed. Samples were collected aseptically and homogenized before being inoculated in TSA (Tryptone Soy Agar), TCBS (Thiosulphate Citrate Bile Salt Agar), MacConkey agar and *Pseudomonas*-Isolating agar. Eight different genera were isolated in which 7 genera were identified using conventional method followed by Biolog microlog software. Gram negative bacteria were dominant (72%)*Vibrio* was the most dominant genera followed by *Shewanell* and *Burkholderia*. *Clavibacter* followed by *Staphylococcus* were the most dominant gram positive bacteria. The antagonistic ability of 118 separated isolates from different parts of juvenile *Penaeus monodon* were screened against shrimp *Vibrio* pathogens; *Vibrio harveyi*, *Vibrio parahaemolyticus* and *Vibrio* alginolyticus. The most antagonistic effect was observed for an isolate that was primarily identified as *Shewanella algae.* Since production of antagonistic agents rely on cultural conditions, antagonistic ability of candidate probiotc against the mentioned *Vibrios* was assessed using Response Surface Methodology, with central composite design in which four independents variables were assumed: temperature (10 - 50°C), pH (6 - 10), NaCl concentration (0 - 50%) and time (12 – 60 h). The coefficients of multiple determinations (R2), for the responses of antagonistic effect of *S. algae* against *Vibrio harveyi, V. parahaemolyticus* and *V. alginolyticus* values were 0.807 and 0.805, respectively. Concentration of the NaCl exhibited least influence on the antibacterial effect of candidate probiotic while the other independent variables exhibited different degree of affect. The candidate probiotic revealed a reasonable antibacterial response in quite a wide range of temperature and pH in which the maximum levels were in the same range of optimum shrimp culture.

Keywords: probiotic biocontrol, digestive tract, hepatopancreas

The Broiler Chicken Industry in Malaysia: Some Evidences on the Structure, Conduct and Performance

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ABSTRACT

The broiler chicken industry in Peninsular Malaysia has undergone major structural changes in recent years, notably the increasing vertical integration in the industry, which has led to concerns over market power by wholesalers. This paper investigates the performance of the broiler industry by applying the Structure-Conduct-Performance (SCP) framework. Both primary and secondary data are used for the analysis. A nation-wide survey on various types of wholesalers was carried out in 2003 to solicit information on business profile, and market and marketing practices. A total of 240 wholesalers were interviewed. The study employs a number of statistical instruments to measure selected SCP dimensions; market concentration (Herfindahl-Hirshman Index), market integration (Engle-Granger method) and behavioural dimensions (descriptive statistics). The findings show that there is a high degree of concentration in most of the wholesale markets as evident by the high concentration ratio and Herfindahl-Hirshman Index. There are also several conditions that make the entry of new players very difficult. Wholesalers were also found to have considerable power over the price offered to farmers. Price discovery is made at the wholesale level particularly at the major terminal markets in the country, where large wholesalers operate. Despite these rigidities, the markets (wholesale and retails) are spatially integrated. However, the same cannot be said at the farm level. Hence, some structural adjustments are needed to rectify market rigidities and inefficiencies.

Keywords: structure, conduct and performance, market integration, cointegration, livestock, Malaysia

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Characterisation of *Candidatus liberibacter asiaticus* Isolated from C*itrus grandis* and *Citrus reticulata* based on 16S rDNA and Outer Membrane Protein (OMP) Genes in Malaysia

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ABSTRACT

Molecular characterisation of the local isolates of *Candidatus liberibacter asiaticus* was carried out based on morphological properties, 16S rDNA and outer membrane protein (OMP) genes. A transmission electron microscopic (TEM) study revealed that both GFB-Pummelo and GFB-Mandarin (PK) were morphologically similar, suggesting that this method is not suitable to differentiate them. A study on 16S rDNA genes of both isolates also showed no significant difference. Both isolates had very high nucleotide similarity (99%) and gave the lowest evolutionary value (0.30), suggesting that they are very close and conserve. However, significant difference was observed in their OMP gene sequences. Comparison of the nucleotide sequences of the OMP gene showed high nucleotide similarity (99%) but the evolutionary distance values was also high (0.68). Based on phylogenetic tree analysis, they were clustered in different groups, suggesting that some genetic variation occurred. Comparison of amino acids sequence also showed high amino acids similarity (98%) and high evolutionary distance value (3.41). They were clustered in different groups in the phylogenetic tree analysis. Further analysis of the amino acids sequence revealed 11 amino acids substitutions, which was further proved that they were belongs to different strain of *Candidatus liberibacter asiaticus*.

Keywords: citrus greening disease, huanglongbing (HLB), *candidatus liberibacter asiaticus*, molecular characterisation, 16SrDNA gene, outer membrane protein gene (OMP)

Ribonuclease Protection Assay as a Tool for Detection of Coconut *Cadang-cadang viroid* (CCCVd) Variants in Oil Palm

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ABSTRACT

The lethal *cadang-cadang* disease of coconut palm (*Cocos nucifera* L.), which is apparently confined to the Philippines, is caused by *Coconut cadang-cadang viroid* (CCCVd; family *Pospiviroidae*, genus *Cocadviroid*). Estimated total losses exceed 40 million coconut palms. Several species of palm and other monocotyledons in Oceania and South-East Asia have been shown by molecular hybridisation assay to contain CCCVd-related sequences. In African oil palm (*Elaies guineensis*) plantations in South East Asia and the South Pacific, CCCVd-related molecules were frequently associated with an orange leaf spotting disorder previously described as “genetic” orange spotting (GOS). Recent study conducted in commercial oil palm plantation in Malaysia confirmed that CCCVd variants with sequence similarity greater than 90 % compared with CCCVd from coconut was present in oil palm. However, the concentration was much lower compared to CCCVd in coconut. Some molecular techniques like polyacrylamide gel electrophoresis (PAGE) and hybridisation assay have been developed and reliable for CCCVd detection but were not definitive for the CCCVd variants in the oil palm because of their low concentration in oil palm. Ribonuclease Protection Assay (RPA) has been widely used as a powerful sensitive method to detect and quantify specific RNAs and its variations in nucleotide sequence of a RNA population. We have used RPA to show that the sequence of CCCVd (to an estimated accuracy of >99%) was present in twelve out of eighteen commercial oil palms sampled in Malaysia. Signal intensity varied between the positive oil palms, was generally lower than in CCCVd affected coconut palms, and a comparison of fronds of one oil palm showed it was strongest in the oldest frond assayed. Apart from allowing us to conclude that the CCCVd sequence occurs outside the known cadang-cadang area, RPA has potential as a sensitive, simple, robust and specific diagnostic method for studying the pathology, epidemiology and control of CCCVd.

Keywords: ribonuclease protection assay, coconut *cadang-cadang* viroid

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The Long Run Relationship between Petroleum and Cereals Prices

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ABSTRACT

In 2008, the world saw an unprecedented increase in the prices of crude oil and cereals (rice, corn and wheat). This is indeed a turning point for cereals, after experiencing price decline in real terms in the last four decades. The recent co-movement of the prices of the two commodities begs the question on the nature of the relationship between them. This study seeks to investigate the presence of a long-term relationship between petroleum or crude oil and cereals prices. To that end, the bivariate cointegration approach using Engle-Granger two-stage estimation procedure is applied. The study utilizes monthly data over the period of January 1980 through March 2008. The results show that there is a strong evidence of long-run equilibrium relationship between the two products prices. The estimated error correction models reveal a unidirectional long-run causality flowing from petroleum to cereals prices.

Keywords: cointegration, causality, crude oil, cereals

A Laboratory Culture System and Techniques for Studying the Growth and Development of Malaysian's Spoongrass, *Halophila ovalis* (R.B.) Hooker f.

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ABSTRACT

An aquarium culture system for the growing and studying of *Halophila ovalis* in laboratory was developed. Plugs or rhizomes with leaves or devoid of leaves were successfully grown in the native and tested substrates maintained in synthetic seawater of various salinity, with minimum aeration exposed in shaded out-door natural condition. The culturing of *H. ovalis* permitted observations on (i) the feasibility of using different forms of planting materials e.g. rhizomes with leaves and devoid of leaves were used as opposed to the usage of plugs or sods of seagrasses (ii) the morphological changes of the vegetative parts formed e.g. leaves, rhizomes in adapting to the created conditions (iii) sustain growth and the development of the population, reproductive biology (flowering, anthesis and fruiting) and (iii) the pattern of seedling development from seeds to mature plants. By manipulating the placement of substrates in the aquarium (i.e. the planting of seagrass materials into individual containers then submerged into the aquarium) facilitates observation, recording of data and moving a plant from one test condition to another. It also aids in the task of cleaning the aquarium without disturbing the sediment. The aqueous medium prepared from synthetic seawater permitted a standardisation of the medium as opposed to natural sea water which may be variable and altered by human through various activities. Some of our findings based experiments initiated in May 2008 till to date indicated that *Halophila ovalis* could be cultured on a sustain basis. Both planting materials-rhizome with leaves and devoid of leaves increased in density via vegetative propagation and sexual reproduction. Plants profusely produced male, female flowers and fruits. The presence of viable seeds and seedlings demonstrated the successful pollination and sexual reproduction of *H. ovalis* in the culture. Plants grow equally well in tested substrates i.e. fine beach sand and coarse river sand but better growth and development in the coarse beach sand. Plants exhibited good growth at salinity of 25 psu and maintained growth upto salinity of 40 psu. Light tend to fluctuates with times, day-light hours and weather condition and this as well occurred in the natural environment.

Keywords: culture system, *Halophila ovalis*, growing in laboratory

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Willingness to Pay Towards Conservation of Ecotourism Resources: The Case of Gunung Gede Pangrango National Park

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ABSTRACT

The objectives of this study are to determine the visitors' willingness to pay for conservation of the resources at Gunung Gede Pangrango National Park (TNGP), and to determine the satisfaction of visitors towards the use of the ecotourism resources of the park. The dichotomous choice Contingent Valuation Method (CVM) was employed to determine the willingness to pay (WTP). A total of 423 respondents were interviewed face-to-face to collect the data. The results show that most visitors are satisfied with the ecotourism resources in TNGP, many of the visitors have come to TNGP more than once. In order to sustain the benefits derived from the resources at the park, the visitors agree that various organisation involved must cooperate to conserve and protect the ecotourism resources. The economic benefit of conservation of the ecotourism resources at TNGP was measured using the visitors' WTP for higher entrance fee to the park. A logit regression model was used to determine visitors' willingness to pay. The results indicate that income, gender (male) and residential (urban) were the significant factors that influencing the visitors' WTP for the entrance fee to TNGP. The mean WTP is found to be RP 7629.77 per visit. It is estimated that in 2004 the benefits of conservation of the ecotourism resources in TNGP amounts to RP 452 million.

Keywords: willingness-to-pay, conservation, Gunung Gede Pangrango National Park

Provaccsis: Probiotics-enhanced Vibriosis Vaccine for Fish Health Improvement

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ABSTRACT

In the rapid expanding activities of aquaculture, a fastest growing segment in global agriculture sector, advancement in fish husbandry technologies is of utmost important for sustainable productivity. Among the critical husbandry aspects is fish health management and disease prevention. To support this industry in maintaing global competitiveness, innovation in product formulation for fish health maintenance is the focus of the present research. The research ultimate aim is product development that supports commercially important fish production through improving fish health with cascading impact on the subsequent aquaculture determinants, environmentally-friendly feeds, more efficient feeding strategies to increase production efficiencies, decrease production cost from treatment expenses, improve product quality, and minimize environmental impact. The innovation in product formulation encompassed vaccine components and preparation for application in hatcheries or farms to protect fish from a serious and detrimental haemmorhagic disease, vibriosis. Substantial economic loss from vibriosis is a worldwide aquaculture phenomenon affecting livelihood and income of farmers. Provaccsis, principally a probiotics-vaccine recombinant enhances fish health through dual roles of improving gut flora and elevating humoral immune response. Applying the fundamentals of healthy gut with specific immune response, oral feeding of Provaccsis to siakap has explicitly shown the efficacies as evidenced from elevated IgM titre, size increment, disease resistance and survival rates upon challenged with the virulent fish pathogen, *Vibrio alginolyticus*. Provaccsis warrants safety for animals and human upon exposure or consumption since the product comprised probiotics coupled immunogen. The scientific advancement in the technology of product preparation involved safe genetically attenuated vaccine component using natural product. In addition, GRAS bacteria application as a vaccine delivery vector is a safe added value. Incorporating Provaccsis in fish feed eased in delivery mode with substantially im provement in fish health resulting in impressive reduction of mortalities. The research portrayed application novelties of probiotics and vaccine principles of fisheries product formulation with commercial potential following future field trials.

Keywords: probiotics, vaccine, fish, disease, health, vibriosis

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Efficient Flower Induction in Orchids

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ABSTRACT

Orchidaceae can be considered as the king of ornamental plants as it has successfully diversified into an estimated number of about 25,000 species. An orchid flower has its very own aesthetic and intrinsic value which plays equally important roles both economically as well as biologically. *Dendrobium* hybrids conquer the foremost position in floriculture trade especially in ornamental cut flower industry because of its capability of flowering continously and a prolonged post-harvest life if compared with other orchid species. *Dendrobium* orchids are also well known in ornamental orchid cut flower industry due to its huge range of vibrant colours and high number of flowers per inflorescence. Under normal conditions, an average of two to five years is needed to breed *Dendrobium* hybrids due to its long juvenile period. Therefore, it is essential to develop a method that can induce earlier flowering in orchids. This on the whole is very essential so that the high demand for *Dendrobium* orchids in the market could be fulfilled in time. In this study, the potential effects of Benzylaminopurine (BAP) on induction of early flowering of a *Dendrobium* hybrid were investigated. Six months old plantlets of *D. Angel White* were acclimatized in the glasshouse before exposing them to sprays containing BAP at different concentrations. Results showed that plants treated with 200 mg/L BAP produced inflorescence stalk 9 and 19 days earlier than plants treated with 150 and 100 mg/L BAP respectively. Inflorescence production was the highest (85%) for plants sprayed with 200 mg/L BAP followed by 250 mg/L of BAP (75%) and 45% for 300 mg/L of BAP. BAP treatment used in this study had successfully induced flowering in just six months period. This study proved that BAP is a potential plant growth regulator that can speed up flowering process of *D. Angel White.*

Keywords: cytokinin, benzylaminopurine (BAP), inflorescence

Enzyme as Indicators for Anthocyanin Accumulation in Orchids

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ABSTRACT

Flower colour is an essential consideration for consumers as it is an important economic factor in determining the market price of commercial orchids. The colour in most orchid petals is due to the accumulation of anthocyanin pigments. Understanding the synthesis of anthocyanins will contribute to the identification of specific steps involved in its regulation. In addition, it helps in developing strategies for colour selections, genetic engineering and manipulation studies. So far, no such reports on orchid anthocyanin pigment evaluation and its relationship to biochemical pathways have been documented. The objectives of this study were: to examine the distribution of key enzymes of the phenylpropanoid pathway, phenylalanine ammonia lyase (PAL; EC 4.3.1.5) and tyrosine ammonia lyase (TAL; 4.3.1.5) in orchid flowers, and to establish their relationship with anthocyanin content. A wide spectrum of orchid hybrids with different flower colour from dark pink to white was examined. The results showed that the total anthocyanin content was found to be high in all the coloured petals of different orchid hybrids. No anthocyanin was detected in white or yellow orchids of the same genus. Likewise, the activity of PAL and TAL were found to be significantly high in the coloured petal extracts and this was found to be parallel with the accumulation of anthocyanin content. Both PAL and TAL activities were also observed to be high in their respective seedlings, protocorm-like bodies (PLBs) and leaves of orchids. The enzymes shared similar pH optimum, temperature, and incubation time. Their metal requirements and kinetics have also been determined. Our studies have indicated that these two enzymes, PAL in particular can serve as bioindicators for selection of colour intensity in orchids. In addition, early and rapid selection can be carried out since high enzyme activity in PLBs, leaves and seedlings is consistently correlated with high anthocyanin content in flower petals.

Keywords: phenylalanine ammonia lyase (PAL), tyrosine ammonia lyase (TAL), anthocyanins, orchids

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Alleviation of Aluminum in Acidic Soils and its Effect on Growth of Hybrid and Clonal Oil Palm (*Elaeis Guineensis*, Jacq) Seedlings

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ABSTRACT

Aluminum (Al) toxicity is an important factor in limiting crop production. The present study examined the aluminum (Al) alleviation effects on the growth of hybrid (breeding) and clonal (tissue culture) of D X P oil palm seedlings. The experiment was performed using calcium carbonate ($CaCO_3$) and ground magnesium limestone (GML) and magnesium Carbonate ($MgCO_3$) as soil-amendments at different rates in Colombia and Malaysia, respectively. The effects of the treatments were evaluated monthly on vegetative variables and visual symptoms. Chlorophyll concentrations were recorded in Malaysia at the fifth month growing stage. The different amendments improved the soil fertility and it was reflected on better performance of shoot and root growth. The chlorophyll content in the frond number 3 for both materials enhanced significantly when Al saturation was low (0 - 30%). The results from the experiment revealed the importance of neutralisation of Al in reducing its toxicity in oil palm.

Keywords: chlorophyll concentration, clonal, oil palm seedlings, plant growth, soil acidity, soil amendments

Novel Nutraceuticals from Supercritical Fluid Extracted *Kenaf* and Black Cumin Seed Cakes

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ABSTRACT

Supercritical fluid extraction (SFE) allows the extraction of valuable nutraceuticals such as kenaf specialty oil and thymoquinone rich fraction (TQRF) from kenaf (*Hibiscus cannabinus*) and black cumin (*Nigella sativa*) seeds in a solvent free, environmental friendly, cost effective and time saving manner. However, large-scaled SFE extraction of kenaf and black cumin seeds will produce enormous amount of defatted seed powder as agricultural waste after each extraction. These defatted powders are low in cost, safe to be consumed, organic solvent free and most importantly they contain a considerable amount of fiber, carbohydrate, protein and bioactive compounds (e.g. flavonoids) that are very suitable to serve as functional ingredients. The present study reveals that kenaf seed aqueous extract as well as phenolic rich fractions from kenaf and black cumin seeds exhibited excellent antioxidant capacity in multiple antioxidant assessments. Antioxidant compounds such as gallic acid, (+)-catechin, chlorogenic acid , hydroxybenzoic acid , syringic acid, *p*-cumaric acid and vanillin were detected abundantly in both defatted kenaf and black cumin seed powders. Besides, its low-fat and microbial-free feature will also lengthen the shelf-life of the defatted powder by minimizing the lipid oxidation and microbial spoilage during the storage. In conclusion, SFE defatted kenaf and black cumin seeds are new emerging and economical functional ingredients that are suitable for various food applications such as in bakery and meat products.

Keywords: *kenaf* seed, black cumin seed, antioxidant activity, functional ingredient

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Antioxidate Properties of Leaf Extracts of a Popular Malaysian Herb, *Labisia pumila* Benth

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ABSTRACT

Labisia pumila (Kacip Fatimah) products are widely available commercially as health supplements. In spite of the wide usage of this plant as a traditional herb no information on its chemical constituents has been documented. Plant antioxidants are believed to play a role in protection against a variety of diseases and delaying ageing processes. The antioxidative capacities of *L. pumila* plants have not been reported. A study was undertaken to examine the presence of antioxidative activities of two varieties of *Labisia pumila*; *Labisia pumila* var. Alata and *Labisia pumila* var. Pumila using DPPH, FRAP and β-carotene bleaching methods. The information will be useful in identifying the right variety for herbal formulations purposes.In addition, ascorbic acid, β-carotene, anthocyanin, total flavonoid and total phenolic content were also analyzed. The results obtained showed that *L. pumila* var. Alata contained higher antioxidative activities in all three methods applied compared to var. Pumila. In DPPH, FRAP and β-carotene bleaching methods, *L. pumila* var. Alata had high antioxidant activities with 299.84 μM trolox/g db, 164.16 μM trolox/g db and 89.22 %, respectively. The same pattern of antioxidant activities also can be observed in ascorbic acid, β-carotene and anthocyanin in *L. pumila* var. Alata compared to var. Pumila with 0.022, 3.175 and 0.328 mg/g FW, respectively. *L. pumila* var. Pumila had higher total flavonoid content than *L. pumila* var. Alata with 1.281 mg/g FW. For total phenolic content, no significant different was observed because amount of total phenolic content in the ranged of 2.53 to 2.55 mg/g FW. In summary there is a positive correlation between antioxidant capacities and individual antioxidative compounds in the following order β-carotene>flavonoid>vitamin C>total anthocyanins >phenolics. This is the first document reporting the presence of specific antioxidants in leaf extract of *L. pumila.*

Keywords: *labisia pumila*, antioxidant, non enzymatic, enzymatic

Antioxidant Studies in *Ficus deltoidea (Mas Cotek)* Accessions; Enzymatic and Non Enzymatic Approach

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ABSTRACT

Ficus deltoidea or known as *Mas Cotek* among Malaysians is an evergreen shrub or small tree used traditionally as an alternative medicine. It is believed that the mixture of male and female *F. deltoidea* extract can treat cardiovascular diseases, diabetes and as aphrodisiac. Although many research have been conducted and many on-going projects focused on *F. deltoidea* at present time, there is lack of documented articles on *F. deltoidea* found in cited and non-cited publications, especially on the differences between the male (M) and female (F) plants. Hence, this project was undertaken to document the antioxidative activities, both the enzymatic and non-enzymatic components, in leaf extracts of both plant types. The total antioxidant content was measured using 1,1-diphenyl-2-picrylhydrazil (DPPH) radical scavenging activity assay and ferric reducing antioxidant potential (FRAP). Total polyphenol and total vitamin C content were also evaluated to further investigate the antioxidative properties of the related compounds. Peroxidase and ascorbate peroxidase enzymes were measured to relate with non-enzymatic antioxidants. For DPPH method, total antioxidant content ranged from 2.73 to 9.92 mg Trolox/g FW for M10 and F3, respectively while M4 and F13 contain the lowest and highest using FRAP assay with 0.43 and 1.72 mg Trolox/g FW, respectively. The average total polyphenol content for female plant is 0.58 mg/g FW while 0.93 mg/g FW for male plant. The lowest total vitamin C content was recorded in F7 (0.61 mg/g FW) while the highest is in F8 (6.78 mg/g FW). Peroxidase activities was the lowest in M4 and highest in F13 with 0.07 and 0.94 nmol/mg/g FW, respectively, while F1 and F13 showed the highest and lowest activity of ascorbate peroxidase with 24.64 and 0.36 nmol/mg/g FW respectively. We now report the differences in antioxidative properties, both the enzymatic and non-enzymatic components, of male and female leaf extracts of *F. deltoidea.* This is the first report documented on such study.

Keywords: *ficus deltoidea*, antioxidant, non enzymatic, enzymatic

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Kenaf Seed Oil: A Novel High Antioxidative Specialty Oil from *Kenaf* By-product

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ABSTRACT

Malaysian government has intensively cultivated kenaf (*Hibiscus cannabinus*) as the fourth industrial crop in the nation in order to replace tobacco plantation. Kenaf has broad application in fibre board, biocomposite materials and high protein animal feed production. However, it is still not optimally utilised by the industry at the present time. For instance, kenaf seeds that contain considerable oil content (> 20%) with possible nutraceutical values are disposed as waste material during the harvesting or processing of kenaf. In the present study, kenaf seeds (Qui Ping and V36 varieties) were subjected to supercritical fluid extraction (SFE). Results from the study indicate that SFE is suitable for the solvent-free extraction of kenaf seed oil with more than 80% recovery. More importantly, SFE-kenaf seed oil also exhibited superior antioxidant activity in comparison to 7 types of synthetic antioxidant-supplemented commercial edible oils. Coupled with high level of unsaturated fatty acids and phytosterols, SFE-kenaf seed oil emerges as a novel solvent-free specialty oil with high antioxidant and potential cardio-protective activities. Besides generating revenue to the nation, kenaf seed oil also able to replenish the oil reservoir in the nation in order to meet the increasing oil consumption nationally and globally. In conclusion, kenaf seed oil is the hidden jewel from the kenaf cultivation that able to generate health and wealth to the community.

Keywords: *kenaf* seed oil, *hibiscus cannabinus*, supercritical fluid extraction, antioxidant activity

Reducing the Rate of Abnormality Index in Tissue-cultured Banana Cultivars

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ABSTRACT

Banana is a staple food for millions of people in the tropical and subtropical parts of the world. In most countries banana is grown on a plantation scale and the planting materials are largely obtained from tissue culture. However, banana micropropagation using shoot tip culture generally resulted in low multiplication rate, high somaclonal variation and even abnormalities. Among the components considered as abnormal were hyperhydricity, deformation and undifferentiated tissues. The use of plant growth regulators is believed to be one of the factors contribution to these conditions. Cytokinins are commonly used hormones in banana tissue culture. In this study we investigate systematically the effects of different cytokinins on the multiplication rate and the abnormality index of different banana cultivars. The objective of the study was to identify the most suitable cytokinin for a specific banana cultivar which will be mass propagated and exhibiting low abnormality index. The five banana cultivars used were Berangan, Berangan Intan, Rastali, Nangka and Baka Baling all of which have a big market in Malaysia. The results obtained showed that TDZ at 0.5 µM is suitable for rapid micropropagation and BAP at 22.2 µM is most effective for elongation of shoots and maintenance of cultures for both dessert and cooking bananas. We have, therefore, successfully identified the most suitable cytokinin to be used in mass propagation of banana and at the same time overcoming the problems associated with abnormalities.

Keywords: *musa* spp, abnormality, micropropagataion, benzylaminopurine, thidiazuron

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RT-MECa: Real Time Mapping of Apparent Soil Electrical Conductivity for Precision Farming

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ABSTRACT

Precision Farming requires the use of some high-tech equipment for assessing field conditions and applying chemicals, water and fertilizers. The technologies include Global Positioning System (GPS), Differential Global Positioning System (DGPS), electronic sensors, Remote Sensing, controllers, Geographical Information System (GIS), and other sophisticated software. The concept of precision farming is managing each crop production input on a site specific basis to reduce waste, increase profit and maintain the quality of the environment. An EC sensor is a useful tool in mapping bulk soil electrical conductivity (EC_a) in order to identify areas of contrasting soil properties. The existing soil EC_a mapping system is stored the acquired data in the logger and its map can be displayed only after transferring from the logger to the mapping software via a diskette which is available on the computer. The tractor driver or operator could not view the result in the field, but at the office. This can create missing data points and it needs to repeat the data collection. Real Time Mapping of Apparent Soil Electrical Conductivity (RT-MECa) involved two important parts namely, RT-MECa hardware and software. The RT-MECa software was developed on a control software known as labVIEW and the RT-MECa hardware was developed using current inverter and Data Acquisition (DAQ) hardware. The RT-MECa system comprised of Apparent Electrical Conductivity (EC_a) probe, RT-MECa hardware, DGPS and a robust computer installed with RT-MECa software mounted in a tractor cab. It allows the EC_a map to be plotted on real time basis and display on a robust computer system mounted on the vehicle according to the coordinates retrieved from DGPS. It also has the option to plot EC_a data based on column and row numbers when working without DGPS. The retrieved data can be classified and displayed in various color (class post map) so that the operator can observe the variability within a field directly. Moreover, RT-MECa can store EC_a and DGPS data into two different forms namely, image graphic and text forms. This data acquisition system will later on be processed using Management Zone Delineation using Apparent Electrical Conductivity (MAZDAEC) technique.

Keywords: site specific management, crop production, apparent electrical conductivity, robust computer, management zone delineation

Changing Competitiveness of Meat and Meat Preparation Sub-sectors in Selected Asean Countries

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ABSTRACT

The food deficits have been growing steadily over the years from a little over RM1 billion in 1990 to more than RM5 billion in 2007 (all in current prices). The major components of food imports are fish, vegetables, fruit and milk products whereas the main components of food exports are palm oil, cocoa, pineapple and pepper products. In view of the growing food deficit over the years, it is important for the policy makers and practitioners in Malaysia to find a long term solution on how to gradually reduce the food deficit. In order to do this, they need to determine the local commodities that are capable of replacing imported products and at the same time searching for varieties of products that can be exported. The export promotion is particularly important for food processing industry because the schedule liberalisation of trade under the World Trade Organisation and the ASEAN Free Trade Area would bring about greater challenges to the Malaysian food producers. Before penetrating a wider range of markets, Malaysian food processors have to identify competitive food sub-sectors. This study attempts to evaluate the competitiveness of 17 food commodities in the meat and meat preparation sector (division 01) in selected ASEAN countries (the Philippine, Indonesia, Singapore and Thailand) based on Revealed Comparative Advantage (RCA) indicator, for the period 1998 to 2007. The data cover commodities in the HS 6 digits group that include commodities in the sub-group of bovine and sheep. In order to make a meaningful comparison between selected ASEAN countries in terms of improvement or disimprovement in competitiveness, a time trend regression function was fitted to each commodity through out the period. The positive trends indicate improvement in competitiveness while the negative trends indicate disimprovement in competitiveness. Declining or increasing competitiveness position is considered only for trends with significant slope or time coefficient. Those with insignificant time trend are ignored even though their Export Performance Ratios are high.

Keywords: competitiveness, meat and meat preparation, revealed comparative advantage (RCA), and ASEAN

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A Candidate Marker for Oil Palm Tissue Culture

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ABSTRACT

Studies have shown that protein kinases play important roles in plant growth and development. In the present study, EgSAPK (EU805512), an oil palm transcript coding for a putative SAPK protein kinase, have been molecular characterized. The cDNA for EgSAPK isolated from an oil palm cell suspension culture is 1470 bp in length with a longest open reading frame (ORF) of 963 bp. No translation start codon could be identified so EgSAPK cDNA sequence is lacking the 5'-end. The deduced protein sequence shares 89% identity with the serine/threonine protein kinase SAPK9 from rice (AB125310.1). Real time PCR results showed that the expression levels of EgSAPK varied in different oil palm tissues and the EgSAPK gene shares a similar expression pattern with the SAPK gene of rice. Furthermore, the transcription of the EgSAPK gene in green embryo, white embryo and embryogenic tissues were higher than in non-embryogenic tissues. Southern blot analysis showed that the EgSAPK gene might be present as a single copy gene in the oil palm genome. These results suggest that EgSAPK may have a similar function as the SAPK gene of rice and also can be a candidate marker for oil palm somatic embryogenesis.

Keywords: oil alm, elaeis guineensis jacq. real time PCR, serine/threonine protein kinase, SAPK

The Impact of Asian Financial Crisis on the Trend of Comparative Advantage in the Malaysian Food Processing Industry

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ABSTRACT

This paper aims to examine the effect of the 1997 Asian financial crisis on the levels of competition for various productions of food products. The study is undertaken using the concept of comparative advantage and long term trend analysis. In the context of competitiveness of the Malaysian food processing industry the evaluation of comparative advantage has been undertaken with special reference to the prior implementation of the scheduled liberalisation of trade preferences under the WTO and AFTA. In order to penetrate a wider range of foreign markets, Malaysian food processors have to identify food sub-sectors that are internationally competitive. These sub-sectors should not only withstand internal shocks but also external shocks such as the Asian Financial Crisis in 1997-1998. The competitiveness of the food processing industry in Malaysia was determined using the Domestic Resource Cost (DRC) method and the trend estimates. Twenty food sectors were assessed using the Malaysian food production and trade data from 1985 to 2001. Processed foods with a high comparative advantage and positive annual growth sustained after the crisis can be considered as viable to compete with foreign products in the domestic and overseas markets.

Keywords: comparative advantage, asian financial crisis, food processing industry, benefit-cost ratio, trend analysis

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Utilisation of Wild Aquatic Macrophytes by Indigenous Population in Sarawak

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ABSTRACT

Wild plants are genetically pure natural foods, containing essentially complete germ plasma untampered by human hands. Our ancestors by trial and error have discovered which plants were edible and which plants were poisonous. In Sarawak, wild plants are commonly used by rural population as food, and usually when available in large quantities, they are offered for sale in local produce and native markets. The indigenous people are very familiar and have considerable plant knowledge with wild plants as they utilize them for their daily uses, diet, livelihood and culture. These are some of the observations noted based on field surveys over two years from 2007-2009 covering coastal areas of Bintulu, Miri, Mukah, Sarikei, Sibu, Betong, Sri Aman and Kuching, Sarawak. Wild aquatic macrophytes gain their importance as edible plants and ingredients that are being traded and available widely to urban populations. A total of 31 species of wild harvested aquatic plants are traded as vegetables for human consumption by various ethnics; the Malays, Chinese, Melanau, Iban and Bidayuh. Some species of wild aquatic plants e.g. *Limnocharis flava, Blyxa aubertii*, *Neptunia oleracea, Colocasia esculanta* are considered unique due to their edible young shoots, leaves, stems, inflorescences, tubers/corm or whole plant. Aquatic plants such as *Neptunia oleracea* have been domesticated for market continuous supply. Non local aquatic plants e.g. *Trapa bispinosa* and *Eleocharis dulcis* are imported from overseas and also traded in the local produce markets. These plants can be raw eaten as salad or cooked in various ways as dishes as they are rich source of micronutrients. More edible wild aquatic plants and ingredients are being traded and available widely to urban populations as people have become adventurous in their eating habits and are exploring new food resources, cooking styles, both in the home kitchen and in specialty restaurants. Wild aquatic plants as food once restricted to the rural and culture are spreading to other corners of the country.

Keywords: wild aquatic plants, vegetables, edible, indigenous people, Sarawak

Diversity and Etiology of *Fusarium* Species Isolated from Bakanae Disease of Rice in Malaysia and Indonesia

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ABSTRACT

Bakanae disease on rice is widespread in almost countries where rice is grown commercially, including Malaysia and Indonesia. During the 2004-2005 main growing seasons, the highest disease severity (5) of scale 0-5 and disease incidence at 12.5% was recorded in Rompin, Pahang. A total of 212 strains of *Fusarium* were isolated from bakanae-infected rice plants and they were initially identified using morphological characteristics for species delimitation. Among these strains, the highest number (127) of *Fusarium* were classified into five species in Section Liseola i.e. *F. fujikuroi* (the most frequent, 37.3%), followed by *F. verticillioides, F. proliferatum, F. sacchari* and *F. subglutinans*. The other species were *F. semitectum, F. oxysporum, F. solani*, *F. longipes*, *F. chlamydosporum* and *F. equiseti*. Published data showed that the bakanae disease of rice all over the world is caused by *F. fujikuroi* and some other *Fusarium* species from section Liseola and their allies. However, pathogenicity test showed *F. fujikuroi* was confirmed as the pathogen of bakanae disease on rice with varying levels of virulence. In crosses with seven standard testers of mating populations (MPs), 69.3% of the strains could be assigned to at least one of the *Gibberella fujikuroi* species complex (MP-A to MP-E) based on their ability to produce perithecia and viable ascospores. However, five fertile strains assigned as MP-C and have been identified morphologically as *F. fujikuroi* were also crossed-fertile with MP-D tester. Furthermore, 25 strains of *Fusarium* species in Section Liseola were tested for secondary metabolite production e.g. moniliformin, fumonisin B_1, fusaric acid and gibberellic acid (GA_3). Only strains of *F. fujikuroi* were able to cross-fertile with MP-C and produce GA_3. This phenomenon could be used as a main biological and physiological character in separating *F. fujikuroi* from the other four *Fusarium* species in Section Liseola.

Keywords: ***fusarium fujikuroi, gibberella fujikuroi, section liseola, bakanae disease, rice***

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Simple Techniques for Zero Ammonia Pollution from Ammonia Based Fertilisers

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ABSTRACT

Isolation of fulivic acids (FA) and humic acids (HA) from humified substances is labotrious and expensive. These acidic materials have a great potential of controlling ammonia volatilisation into soil, water and air. This work reports on simple techniques of isolating FA and HA from decomposed organic materials and the ability of these organic acids in controlling ammonia loss from urea. In the process of isolating FA and HA, series of extraction and fractionation periods were evaluated. Distilled water was used to purify HA. A closed-dynamic air flow system was used evaluate ammonia volatilisation from urea amended with FA or HA or FA or FA and HA. FA and HA were extracted, fractionated, and purified in less than 24 hours instead of the existing 2-7 days without compromising the chemical nature of these organic acids. HA alone was not effective in controlling ammonia volatilisation even though its soil exchangeable ammonium retention was found to be significantly higher compared to urea alone. FA significantly reduced ammonia volatilisation by 50% compared to urea alone. It also caused the highest retention of exchangeable ammonium and available nitrate. Interestingly, there was 100% ammonia volatilisation control i.e. no ammonia volatilisation upon amending urea with HA and FA. Exchangeable ammonium and available nitrate accumulation for FA was better than those of HA and FA. Ammonia loss could be reduced by improving ammonium retention. This may improve urea N use efficiency as well as reducing environmental pollution (soil, water and air). FA and HA can be isolated in less than 24 hours and these acids can reduce ammonia volatilisation by between 50 to 100%.

Keywords: humic and fulvic acids, decomposed organic materials, ammonia volatilisation, environmental pollution

Regulation of Lignin Degrading Enzymes to Control *Ganoderma Basal* Stem Rot of Oil Palm

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ABSTRACT

Oil palm plantations are under continuous threat due to losses caused by *Ganoderma* basal stem rot with no known effective control. Basal stem rot involves fungal attack to the lignin component of tissues leaving the white cellulose exposed. The fungus grows within palms by utilizing cellulose in the tree leading to severe infection. Thus, altering the lignin degrading activity of *Ganoderma* would be a possible approach to mitigate the spread of *Ganoderma*. Therefore, a study was conducted to determine the ability of *Ganoderma* spp to produce lignin degrading enzymes; lignin peroxidase (Lig PO), Manganese peroxidase (MnPO) and laccace (Lac) produced by. Six isolates (*G. boninense 1, G. boninense 2, G. lucidum G. zonatum, G. tornatum and G miniatocinctum*) were cultured on malt extract agar amended with 0.05% Remazol Brilliant Blue R (RBBR) to evaluate their lignolytic potential by decolorisation of the dye. All the isolates were able to degrade lignin with different efficacies with *G. boninense 2* being significantly higher ($P \leq 0.05$) (92.50%) followed by *G. zonatum* (90.25 %), *G. miniatocinctum* (76.25 %), *G. boninense 1*(58.32 %), *G. lucidum* (57.62 %) and *G. tornatum* (38.25 %). The isolates were then cultured on liquid medium (2% MEB) to determine the lignin degrading enzymatic activities. The maximum activities of Lig PO, MnPO and Lac were detected in *G. boninense 2* with values of 1.494, 1.188 and 1.105 U μg^{-1} protein, respectively. The effect of various enzymatic inhibitors (NaCl, EDTA, 2-mercaptoethanol, H_2O_2, Cu^{+2}, Fe^{+2}) on the production of lignolytic enzymes was also investigated *in vitro* as a possible effective chemical control of *Ganoderma* infection. Compounds giving high inhibitory activity can be used as soil and spray treatments in field applications for the management of basal stem rot.

Keywords: *ganoderma* sp, lignin peroxidase, manganese peroxidase, laccase, enzyme inhibitor, basal stem rot

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Variability of *Fusarium* Species in Section Liseola associated with Rice-based on Vegetative Compatibility Groups

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ABSTRACT

Vegetative compatibility also known as heterokaryon compatibility, is another functional tool for identifying fungi and it also reveals the genetic diversity of several genera, including *Fusarium*. A total of 127 strains of *Fusarium* species in Section Liseola were isolated from rice and initially identified based on morphological and biological characteristics for species delimitation i.e. *F. fujikuroi* (79 strains), *F. proliferatum* (13 strains), *F. sacchari* (13 strains), *F. subglutinans* (4 strains) and *F. verticillioides* (18 strains). The objective of this study was to investigate genetic diversity of the *Fusarium* strains isolated from rice by generating nitrate non-utilizing (*nit*) mutants, followed by phenotyping the mutants on diagnostic media, and pairing on minimal media. Results of the pairing experiment revealed that the strains of *F. fujikuroi, F. verticillioides, F. proliferatum, F. sacchari* and *F. subglutinans* were grouped into 26, 8, 8, 7 and 4 VCGs, respectively. About 97.6% of the strains were classified as heterokaryon self-compatible based on their ability to produce a stable heterokaryon while the remaining strains were classified as heterokaryon self incompatible based on their inability to form a heterokaryon, even after repeated attempts. The ratio of VCGs to strains of *F. fujikuroi, F. proliferatum, F. sacchari, F. subglutinans* and *F. verticillioides* in these samples were 0.29, 0.62, 0.54, 1.0 and 0.44, respectively. Based on these findings, it is concluded that the strains of *Fusarium* in Section Liseola associated with rice in Malaysia and Indonesia are genetically diverse.

Keywords: *fusarium fujikuroi,* section liseola, vegetative compatibility, heterokaryon compatibility

A Transient Assay to Evaluate the Expression of Polyhydroxybutyrate Genes Regulated by Oil Palm Mesocarp-specific Promoter

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ABSTRACT

The promoter of the oil palm metallothionein-like gene (*MT3-A*) demonstrated mesocarp-specific activity in functional analysis using transient expression assay of reporter gene in bombarded oil palm tissue slices. In order to investigate the tissue-specific expression of polyhydroxybutyrate (PHB) biosynthetic pathway genes, a multi-gene construct carrying PHB genes fused to the oil palm *MT3-A* promoter was co-transferred with a construct carrying GFP reporter gene using microprojectile bombardment targeting the mesocarp and leaf tissues of the oil palm. Transcriptional analysis using RT-PCR revealed successful transcription of all the three *phb*A, *phb*B, and *phb*C genes in transiently transformed mesocarp but not in transiently transformed leaf tissues. Furthermore, all the three expected sizes of PHB-encoded protein products were only detected in transiently transformed mesocarp tissues on a silver stained polyacrylamide gel. Western blot analysis using polyclonal antibody specific for *phb*B product confirmed successful translation of *phb*B mRNA transcript into protein product. This study provided valuable information, supporting the future engineering of PHB-producing transgenic palms.

Keywords: transient expression assay, microprojectile bombardment, transgenic plant, polyhydroxybutyrate, tissue-specific promoter

Makanan

HPLC Determination of Furfural in Crude Palm Oil

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ABSTRACT

A modified steam distillation method was developed to extract furfural from crude palm oil (CPO). The collected distillates were analyzed using high performance liquid chromatography (HPLC) coupled with an ultraviolet diode detector at 284 nm. The HPLC method allowed identification and quantification of furfural in CPO. The unique thermal extraction of CPO whereby the fresh fruit bunches (FFB) are first subjected to steam treatment at 140-145°C, distinguishes itself from other solvent-extracted or cold-pressed vegetable oils. The presence of furfural was also determined in the fresh palm oil from FFB (without undergoing the normal extraction process), refined palm fractions (palm olein and palm stearin), and the secondary oil products from the mill (condensate oil and sludge oil). Furfural was only detected in CPO, condensate oil and sludge oil. HPLC analysis showed that CPO contains the highest amount of furfural, 20.60 mg/kg, and follows by condensate oil, 7.14 mg/kg, and sludge oil, 5.42 mg/kg.

Keywords: crude palm oil, hemicelluloses, xylose, furfural, and HPLC

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Guava Pulp Composition: Moving from Industrial Waste to Useful Functional Food Ingredients

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ABSTRACT

Functional ingredients are one of the key areas for growth and development in food processing industry. Food industry generates huge amount of wastes or by-products that contain highly valuable bioactive compounds. Malaysia is one of the largest pink guava (*Psidium guajava*) puree exporter which supplying about 20% of the world guava puree. In the production of guava puree, by-products can be obtained during crushing, refining and sieving stages namely refiner, siever and decanter, respectively. Daily production of the industry produces huge amount of the by-products which can achieve up to 25 metric tonnes. Exploitation of the potential of these by-products as functional sources could reduce the cost and problem for managing the by-products disposal. Decanted by-product which does not contain seeds and peels was found as the most potential by-product for hydrophobic bioactive compounds. It exhibited the highest in lycopene content and antioxidants among the by-products. Further work was done in producing guava's lycopene-rich powder which involved thermal treatment to produce a product with high lycopene content and antioxidants. Steam blanching at 60˚C for 20 min was found to be able to increase the lycopene content by 13%. Optimisation of the oven drying conditions based on response surface methodology indicated that the maximum lycopene could be obtained at 43.8 ºC for 6.4 h. Supercritical fluid extraction (SFE) was also used to produce a high quality product. More than 4 fold of extract yield was successful obtained using SFE as compared to solvent extraction. For commercialisation purposes, SFE was demonstrated as a good technique to produce guava by-product with high level of hydrophobic fractions which directly contributed to their active components. The invention discloses the use of the pulp composition as starting material for obtaining guava lycopene, as antioxidant.

Keywords: *psidium guajava,* industrial waste, lycopene, antioxidants, functional ingredients

Dabai Oil: Promising Oil with Nutritional and Functional Properties

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ABSTRACT

There has been a progressive demand for new vegetable oil for nutritional, industrial and pharmaceutical applications. Vegetable oil offers an excellent source of fat with favorable fatty acid composition and also antioxidants which are both nutritionally and industrially important. Polyphenols and tocopherol are natural antioxidants that play an important role in human nutrition as protective agents against several oxidative stress-related diseases such as CHD and cancers. Besides health importance, they also contribute to stability of the oil against development of undesirable flavors and odors. Therefore, a new vegetable oil having twofold level of total polyphenol than virgin olive oil (202.7ppm vs 98.2 ppm) with tocopherol (253ppm) may guarantee extra nutraceutical and functional properties. Several assays (DPPH, FRAP, β-Carotene bleaching) that determine the antioxidant capacity of the various *C. odontophyllum* parts also confirmed the superiority of the oil having excellent antioxidant power. The balance fatty acids of the oil (44:43:13) allows an indispensable usage of the oil in various applications following appropriate fractionation process. Therefore, the new oil may offer wide applications for medicinal purposes and functional properties in food industries.

Keywords: phenolic content, vitamin E, scavenging activity, antioxidant, *Canarium odontophyllum*

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Keeping Quality of Roselle *(Hibiscus sabdariffa* Linn.) Seed Oils Extracted by Supercritical Carbon Dioxide during Prolonged Storage

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ABSTRACT

SFE using CO_2 is today a popular technology for rapid, contamination-free extraction in the food and pharmaceuticals industries. In a typical run (holding period of 30 min, continuous flow extraction of 3 h), results indicated that the oil recovery could be best obtained with a recovery of 102.61 % and phytosterol concentration of 726.28 mg/ 100 g at relatively low temperature of 40 ˚C, high pressure 400 bar and high supercritical fluid flow rates 20 ml/ min in the presence of 2 ml/ min EtOH as entrainer. All the obtained results were compared to those of solvent extraction: the oil yield and phytosterol concentration in the oil extracted with SC-CO_2 is higher than that obtained by solvent. The tocopherol was 49.62 mg/ 100 g. This project studies changes occurring in the content of fatty acids, phytosterols, and tocopherols in roselle seed oils during six months of storage at 4 ºC and room temperature in darkness. As expected, statistically significant differences in the content of fatty acids, phytosterols and tocopherols in roselle seedoils throughout the storage were observed. After storage, degradation parameters may change as a result of lipid oxidation. In general, this study provides vital information for the degradation profile of fatty acids and other bioactive compounds in extracted roselle seed oils during prolonged storage.

Keywords: fatty acids, phytosterols, tocopherols, roselle seed oil, supercritical carbon dioxide

Essential Fatty Acids of Pitaya (Dragon Fruit) Seed Oil

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ABSTRACT

Hylocereus undatus and *Hylocereus polyrhizus* are two varieties of the commonly called pitaya fruits. The seeds were separated and the seed oil was extracted and analysed. Essential fatty acids, namely, linoleic and linolenic form a significant percentage of the unsaturated fatty acids of the seed oil extract. Both pitaya varieties exhibit 2 oleic acid isomers. Essential fatty acids are important acids that are necessary substrates in animal metabolism and cannot be in situ-synthesised. Both pitaya varieties contain about 50% essential (C18:2 (48%) and C18:3 (1.5%)) fatty acids. This poster details the process of recovering the pitaya seeds and determining the fatty acid of the extracted oil.

Keywords: pitaya, seed oil, essential fatty acids, linoleic, linolenic

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Optimisation of Binary Solvent Extraction System for Polyphenols and Antioxidant Capacity from *Mengkudu* Aerial Parts using Response Surface Methodology

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ABSTRACT

Objective of this study was to optimise extraction conditions for crude polyphenols from Mengkudu (*Morinda citrifolia*) aerial parts by using response surface methodology (RSM). A rotatable central composite design (CCD) was applied to the model to investigate the effects of three independent variables, namely ethanol concentration (%), extraction time (min) and temperature (°C) on four responses, total phenolic content (TPC), total flavonoids content (TFC), 2,2' –Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt (ABTS) radical scavenging capacity, and 2,2' –diphenyl- 1 –picrylhydrazyl (DPPH) radical scavenging capacity. These independent variables were coded at three levels and their ranges selected on the basis of preliminary experimental results. The rotatable central composite design consisted of 14 experimental points and six replications at the center point. The experimental results fitted well to the model, TPC (mg GAE/ 100 g DW) (R^2= 0.7279), TFC (mg CE/ 100 g DW) (R^2= 0.9557), ABTS (μmol TEAC/ 100 g DW) (R^2= 0.9554), and DPPH (μmol TEAC/ 100 g DW) (R^2= 0.9489) through multiple linear regressions with backward elimination. TPC, TFC, ABTS, and DPPH showed different patterns of extractability with significant variation in the linear, quadratic, and interaction effects of the independent variables. Desirability was higher to optimise single response or two responses originated from either polyphenols content or antioxidant capacity but not all four responses. The optimised conditions for recovery of high quality polyphenols were 73.78% ethanol, 66.16 min and 33.11°C while, maximum yield of polyphenols recovery were 51.25% ethanol, 40.27 min and 56.89°C. All the four responses (TPC, TFC, ABTS and DPPH) showed significant differences ($p<0.05$) with predicted values, thus indicating suitability of the model employed using RSM in optimising the extraction conditions for polyphenols from *M. citrifolia*.

Keywords: optimisation of extraction, *mengkudu* (*memorinda citrifolia*), response surface methodology (RSM),phenolics, flavonoids, polyphenols, 2,2' –Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt (ABTS), 2,2' –diphenyl-1 –picrylhydrazyl (DPPH), antioxidant capacity

Synbiotics Growth Optimisation of Bifidobacterium Pseudocatenulatum G4 with Prebiotics using Statistical Methodology

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ABSTRACT

Bifidobacterium pseudocatenulatum G4 was isolated from breast-fed infant. This strain was found to survive the gut environment and safe in animal test. This study demonstrated the optimum growth of *B. pseudocatenulatum* G4 with prebiotics via statistical model. Commercial prebiotics (inulin and fructo-oligosaccharide), together with sorbitol, arabinan and inoculum rate were tested by fractional factorial design to determine their impact on growth of *B. pseudocatenulatum* G4 in skim milk. At 48 h incubation, bacterial growth was mainly influenced by fructo-oligosaccharide (FOS) and inoculum rate. Growth reduction was observed in all samples incubated for 72 h. Central composite design (CCD) was adopted using FOS and inoculum rate at 48 h incubation to develop the statistical model for optimisation. The model predicted that 2.461 log CFU ml^{-1} produced the optimum growth increase of *B. pseudocatenulatum* G4. The combination that produced the optimum point was 2.86 % FOS (g/v) and 0.67 % inoculum rate (v/v). At optimum combination of inoculum rate and FOS, validation experiments recorded 2.40 ± l0.02 log CFU ml^{-1}. The application in 1L bioreactor for 24 hours showed higher growth increase of 2.95 log CFU ml^{-1}. Response surface methodology approach is useful to develop optimum synbiotics combination for strain G4 with FOS.

Keywords: *bifidobacterium,* prebiotics, synbiotic, RSM

Application of MPN-PCR in Biosafety of *Bacillus cereus S.L.* in Ready-to-eat Cereals

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ABSTRACT

Since availability of data on the contamination of spore formers such as *B. cereus* in ready-to-eat foods is scarce particularly from developing countries, this surveillance was conducted to address the issue. The preliminary findings from this study revealed a high prevalence of *B. cereus S.L.* Being detected using mpn-pcr in 76% of 111 samples of ready-to-eat cereals tested. The range of concentration was from 30 mpn/g to more than 24,000 mpn/g. Results indicated the differences in the level of contamination for *B. cereus S.L.*. In various products based on factors such as product types, ingredients added and location of manufacturer. The highest concentration of *B. cereus S.L.* Was found in samples with ingredients from weaning products which are, product made from vegetable origin. The concentration obtained from this study also reflects on the differences in the contamination level between infant food, raw cereals, cereal bars, ready-to-eat breakfast cereals and pre-mixed drinks appraised. Hence, the application of the MPN-PCR method was found to be useful to address the biosafety concerns of *B. cereus* in ready-to-eat cereals.

Keywords: biosafety, prevalence, enumeration, *bacillus cereus*, ready-to-eat cereals

Optimisation of Extraction Condition on Phenolic Compounds and also Antioxidant Capacity from *Phyllanthus Niruri* (*Dukung Anak*) using Response Surface Methodology

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ABSTRACT

Optimisation of *Phyllanthus niruri* (Dukung Anak) extracts was carried out to optimize extraction conditions on phenolic compounds and antioxidant capacity using response surface methodology (RSM). The ranges of the independent parameters include ethanol concentration (10-90%), extraction time (20-120 min) and extraction temperature (25-65ºC) were determined using single factor experiments. The effect of extraction parameters on extraction of phenolic compounds, flavonoid compounds, 2,2’-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid)(ABTS) assay and 2-2-diphenyl-1-picrylhydrazyl (DPPH) assay from *Phyllanthus niruri* (Dukung Anak) extracts were determined using central composite rotatable design (CCRD). The independent parameters were coded at five levels and their actual values were chosen according to the results obtained from single factor experiments. Result showed that the optimum conditions for highest total phenolic content were at 50% (ethanol concentration), 70 min (extraction time) and 65ºC (extraction temperature) of 6412.99mg GAE/100g DW. While for the optimum conditions for highest total flavonoid content, 1852.53mg CE/100g DW were at 50% (ethanol concentration), 120 min (extraction time) and 45ºC (extraction temperature). As for optimum conditions for the highest antioxidant capacities, 2,2’-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid)(ABTS) were at 74% (ethanol concentration), 40 min (extraction time) and 33ºC (extraction temperature) of 831.74µmol TEAC/100g. Meanwhile, for optimum conditions for maximum DPPH scavenging capacity (2480.46µmol TEAC/100g) were at 90% (ethanol concentration), 70 min (extraction time) and 45ºC (extraction temperature). The experimental values were compared with predicted values for validation of the models. The experimental values were found no significant difference ($p<0.05$) compared to the predicted values, thus indicating the suitability of the models employed using RSM for optimizing the extraction of phenolic compounds and antioxidant capacity of *Phyllanthus niruri* (Dukung Anak) extract.

Keywords: *phyllanthus niruri* (*Dukung Anak*), total phenolic content (TPC), total flavonoid content (TFC), 2,2’-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid)(ABTS) assay, 2-2-diphenyl-1-picrylhydrazyl (DPPH) assay, Response surface methodology (RSM)

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Health Promoting Anti-oil Absorption Additive for Fring Oil

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ABSTRACT

We developed the first anti-oil adsorption additive in the world that can reduce oil absorption in fried food by as high as 85%. It is for incorporation into frying oils and composed of specially formulated biophenolics from plants, that acts as natural fat antioxidants, and oil absorption inhibitor with other health benefits such as anti-hypertensive, anti-histamine, anti-spasmodic, antibacterial, anti-hypercholesterol, anti-inflammation, anti-cancer and can produce significant ($P<0.05$) improvement in crispiness, taste and overall quality of the fried products.   It makes the fried food less hazardous to health, and consequently, consumption of the prepared food is less likely to contribute to obesity and accelerated ageing due to less excessive intake of fat or calorie. The additive is scientifically proven to (i) reduce oil wastage during frying of food (due to absorption by the fried food and oxidation), making the oil more stable and resistant against thermal degradation, (ii) helps protect against degenerative diseases such as high blood pressure, allergy, hypercholesterol, inflammation and cancer.

Keywords: antioxidant, anti-oil absorption, fried food, health, cholesterol

Breast Cancer Treatment Potential by Tropical Red Seaweeds (*Eucheuma cottonii*)

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ABSTRACT

Breast cancer affects 10-25% of women globally. Effective new method to prevent and treat this malignancy is urgently needed, especially from local tropical sources. The present study was conducted to evaluate the therapeutic effects of Malaysian red seaweed, *Eucheuma cottonii* ethanol extract (ECE) on mammary gland tumor. Solid mammary tumors were induced within 6-8 weeks in female Sprague-Dawley rats by injecting CRL 2283 mammary cancer cell line into the breast. Tumor development was monitored by weekly palpation. Oral administration of ECE at a dose of 100 mg/kg body weight for four weeks significantly ($P<0.05$) regressed and inhibited the growth of tumors compared to untreated control rats and better than 10mg/kg tamoxifen. The levels of antioxidant enzyme and lipid peroxidation were measured in the rats erythrocyte and plasma, respectively, before and after treatment, and showed significant decrease ($P<0.05$) in lipid peroxidation with the ECE treatment. The ECE exhibited effective anti mammary carcinoma properties in this in-vivo model and may provide a potential alternative or complementary therapy for breast cancer treatments.

Keywords: breast cancer, CRL 2283 cell line, *Eucheuma cottonii* L., lipid peroxidation, antioxidant status, sprague-dawley rats

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Production and Characterisation of Phytosterol Nanodispersion for Food Application

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ABSTRACT

Phytosterols are well known for their cholesterol lowering effect. Due to their water insoluble nature, phytosterols fortification was limited to high fats food products. The purpose of this study was to optimize the production parameters involve in the production of water soluble phytosterol nanodispersion for use in food industry. In this study, response surface methodology (RSM) was employed to model and optimize three of the processing parameters namely mixing time by conventional homogenizer (t, 1 - 20 min), mixing speed by conventional homogenizer (v, 1000 – 9000 rpm) and homogenisation pressure by high pressure homogenisation (P, 0 – 80 MPa). All responses namely particles size (PS), polydispersity index (PDI) and phytosterol concentration in nanodispersion produced (Phyto, mg/L) were well-fitted into a reduced quadratic model by multiple regression after manual elimination. The coefficient of determination (R^2) and absolute average deviation (AAD) values for PS, PDI and Phyto are 0.9902, 0.9065, 0.8878; and 0.8785%, 0.2136%, 0.2177% respectively. The optimized processing parameters were 15.25 min of mixing time, 7000 rpm of mixing speed and 42.4 MPa of homogenisation pressure. The corresponding responses for the optimized preparation condition are particle size of 52 nm, polydispersity index of 0.339 and 336 mg/L of phytosterol concentration in nanodispersion produced. The chi-square test had verify the model whereby the experiment value of PS, PDI and Phyto agreed to that predicted values at 0.05 level of significant. The produced stable water soluble phytosterols nanodispersion is predicted to have better hypocholesterlemic effect due to their small particle size, and it is applicable to a wider range of food product included low fat and low calories food products.

Keywords: phytosterol, nanodispersion, response surface methodology, RSM, high pressure homogenisation, particle size

Extraction of PUFAs (Omega-3, 6) from Waste of *Kembong* (Rastrelliger kanagurta) using Different Techniques of Supercritical Fluids

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ABSTRACT

Fish oil especially eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are highly demanded in food and pharmaceutical industries due to their potential health benefits in reducing the risk of cardiovascular diseases, atherosclerosis, arrhythmia, thrombosis, cardiac hypertrophy and sudden cardiac death. Arachidonic acid (AA) and DHA, are important in normal neurodevelopment and visual function for infants. Solvent extractions are generally employed to obtain the fish oil, while often introduces contaminants into the yield that must be removed later. However, there is an increasing concern of the health and safety hazards associated with the use of organic solvents. Supercritical fluid extraction (SFE) is a potential alternative to the customary methods of producing fish oil. It offers the advantages of rapid, nontoxic, environmental-friendly, residue-free and easily manipulated conditions. The objectives of this study were to optimize the operating conditions of different techniques of SFE, to extract the highest yield with least amount of CO2 to make the product cheaper and healthy. The results showed that oil yield increased with pressure and temperature and the highest yields (g/100g sample) found in co-solvent (53.2), soaking (52.8), pressure swing (52.3) and continuous (24.7) techniques, respectively, at 35 MPa, 2 ml/min and 75 oC. The yields were almost similar to soxhlet extraction (53.6 g/100 g sample). The highest CO2 consumption was found in continuous followed by co-solvent, soaking and pressure swing techniques. The largest recoveries of PUFAs, especially the ω-3 family were achieved from the soaking and pressure swing techniques. Thus, the pressure swing and soaking techniques are the most effective at extracting the oil from fish wastes.

Keywords: ***ikan kembong*, PUFA, omega-3 family, supercritical CO2 extraction techniques**

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Kesihatan

Natural Memory Booster

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ABSTRACT

Memory is the ability of an individual to record sensory stimuli, events, and information, retainthem over short or long periods of time and recall the same at a later date when needed. Memory is perhaps the most vital of the aspects that differentiates human beings from other animals. Poor memory, lower retention and slow recall are common problems in today’s stressful and competitive world. Centella asiatica has a reputation to restore decline cognitive function in traditional medicine and in animal model. However, little evidence regarding the efficacy of Centella asiatica from clinical trials is available. Therefore, the present study investigated the effect of Centella asiatica on cognitive function of healthy middle age volunteer. Fourty one (22 females and 19 males) healthy 10~ middle age participants received the Centella asiatica capsules at various doses ranging 3 g to 4 g (according to body weight) once daily for 2 months. Cognitive performance was assessed using the Woodcock-Johnson Cognitive Abilities Test III (WJ CAT III) prior to the trial (baseline), 40 days, 60 days and 90 days (after treatment). The results showed that the Centella asiatica enhanced short-term memory and long term memory measured at different time between males and females. Therefore, the present findings suggest the potential Centella asiatica to attenuate the age-related decline in cognitive function in healthy middle age and elderly adults. However, the precise mechanism(s) underlying theses effects still require further investigation.

Keywords: memory, *centella asiatica,* middle-age adults

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SRAS. Self Retaining Anal Speculum

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ABSTRACT

Surgery procedure today often relies on intelligently designed technical equipment. Usability is increasingly of major importance and consideration when hospitals purchase new equipment. In anorectal surgery, I have identified the importance of self retaining for operation for the anal retractor, which in-turn could save time and labour, with additional concern for safety and reliability. Current retractors generally work well but are limited, and do not really meet all the requirements a surgeon might require. Surgeons and medical assistants face a problem maintaining position as well as making rotating movement on current retractors. With these issues in mind I am concerned with the design and usability considerations of this type of medical instrument. According to C. Keith Wilbur in his book Antique Medical Instrument, the modern rectal instrument started to be used in 17th century. The object went through an evolution with minor alteration. From my observation, there is only a slight changes on the mechanism and a leap to biocompatibility with new materials. The aim and objective of this project is to design a new anal retractor for anorectal surgery that have an ability of self retaining and rotatable. As a result, it will give an advantages for the surgeons and surgery assistants clinically, ecologically and economically.

Keywords: anorectal disorder, anal retractor, industrial design

Generation and Characterisation of Umbilical Cord Derived Mesenchymal Stem Cells: An Alternative Source for Stem Cells

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ABSTRACT

Mesenchymal Stem Cells (MSC) are multi-potential stem cells that possess ability to self-renew, differentiate into mesodermal lineage and exert an immunomodulatory activity. These qualities have made MSC as potential candidate for regenerative medicine, immunotherapy and gene therapy. The increasing demands for tissue regeneration and allogenic transplantation necessitate a readily available source of MSC as an 'off-the-shelf' product for quick and effective treatment. To date, MSC have been generated from human umbilical cord which was once considered as clinical waste. However, our study is aimed to establish an optimal method to generate and characterise MSC from human umbilical cord samples. The outer layer of umbilical cord, Wharton's jelly is separated from blood vessels and remnant cord blood prior to processing. We have attempted few isolation protocols to establish a novel generation method by combining mild-enzymatic digestion and mechanical dissociation. Wharton's jelly is either subjected to enzymatic degradation, mechanical disassociation or combination of both methods to obtain a single cell suspension. The cell suspension is further utilised to generate umbilical cord MSC (UC-MSC). Once UC-MSC expanded, they are subjected to immunophenotyping, gene expression analysis and differentiation assays. UC-MSC expressed common MSC cell surface markers, early embryonic transcriptional markers and differentiated into osteoblasts and adipocytes. Simultaneously, the growth kinetics of UC-MSC also evaluated in the presence of basic fibroblast growth factor (BFGF). BFGF supplementation significantly affected the morphology, growth kinetics, cell cycle and cellular functions of UC-MSC. Furthermore, BFGF enhanced the growth rate of UC-MSC by reducing the doubling time and skewed the cytokine secretion profile. Similar to bone marrow MSC, UC-MSC also exerted an immunomodulatory effect on T cells. In the presence of UC-MSC, T cell activation is preserved, however their proliferation was profoundly inhibited in dose dependent manner via cell cycle arrest at G_0 phase. Our study revealed that UC-MSC share similar characteristics with BM-MSC and potentially serve as future source of stem cells for clinical use.

Keywords: mesenchymal stem cells, umbilical cord, basic fibroblast growth factor

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New Integrated Imaging Modality: ^{18}F-FDG Positron Emission Tomography Computed Tomography and the 'Underground Map' Appearance in Imaging Horton's Arteritis

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ABSTRACT

Despite the rarity incidence of Horton's Arteritis[1,2,3,4,5,6], its clinical importance in detecting this disease at an early stage should be appropriately addressed to clinicians before complication resulting permanent non revearsible disability sets in . Application of fused hybrid imaging technique FDG PET CT in facilitating clinician in diagnosing arteritis in clinical set up has gain increasing importance. This technique is able to demonstrate high uptake in the wall of the arteries at an early stage even in cases of non infective or sterile inflammatory reaction[7]. This special feature of imaging using FDG PET CT can be recommended to be used as the first line investigating tools in patients with vague clinical presentation of low grade pyrexia of unknown origin[8]. In our case, we review the ^{18}F-FDG PET CT findings of a patient with generalized non specific clinical presentation with no other positive clues from other investigations which could lead to her final clinical conclusion of Horton's Arteritis.

Keywords: horton's arteritis, ^{18}F-FDG, positron emission tomography computed tomography (PET CT), inflammation

Mouse Mesenchymal Stem Cells Inhibit Microglial Proliferative Responses: Implications for Treatment of Neurodegenerative Diseases

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ABSTRACT

Microglia are the macrophages of the central nervous system (CNS). When activated, microglia assume an inflammatory phenotype that has been associated with the pathophysiology of various neurodegenerative diseases. Therefore, modulating the inflammatory responses of microglia may be key to limiting or treating inflammatory diseases within the CNS. Mesenchymal stem cells (MSC) have been proposed to have immunoregulatory properties and the potential to moderate inflammation. The main aim of this study was to determine the immunoregulatory function of MSC on microglia. MSC were cultured from bone marrow of three different strains of mice (CBA/Ca, ICR and Balb/c) and characterised via immunophenotyping with a panel of markers and osteogenic /adipocytic differentiation assays. Of the three strains studied, downstream experiments were performed using ICR and Balb/c animals as they proved to be ideal sources of MSC. MSC was co-cultured with the immortalised microglia cell line (BV2) at various ratios. MSC reduced BV2 proliferation in response to lipopolysaccharide (LPS)-stimulation in a dose-dependent manner. Significant inhibition of BV2 proliferation was observed at the MSC/BV2 ratio of 1:5 and 1:10 for both LPS-stimulated and unstimulated groups ($p<.05$). The anti-proliferative mechanism of MSC may be associated with both cell-cell contact and production of soluble factors such as nitric oxide (NO). Accordingly, in our study, MSC production of NO increased following co-culture with BV-2 cells. Interestingly, soluble factors secreted by stimulated BV2 was found to induce MSC to produce NO. The findings from this project indicate interesting immunoregulatory mechanisms of MSC on microglia proliferation.

Keywords: mesenchymal stem cells, microglia, immunosuppression

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Cocoa Flavonoids Procrastinate Cardiovascular Risk Factors and Diabetic Syndrome

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ABSTRACT

Studies have shown positive relationship between cocoa and cocoa products intake on cardiovascular and diabetes risk factors. The work was objectively carried out to investigate the effects of cocoa extract on diabetic syndrome and cardiovascular risk factors. Supplementation of cocoa extract at the dose of 600 mg/ kg body weight for 12 weeks significantly reduced formation of atherosclerotic plaque in hypercholesterolemic rabbit. Cocoa extract exerted hypolipidemic properties by reducing plasma total cholesterol and LDL-cholesterol compared to non-supplemented rabbits. The supplementation improved the antioxidant status. The same dose of cocoa extract significantly improved diabetic syndrome of obese-diabetic (ob-db) rats. Significant reduction was observed in total cholesterol, LDL-cholesterol, and triglycerides compared to non-supplemented rats. Cocoa supplementation significantly reduced oxidative stress (8-isoprostane) level. The results indicated that cocoa supplementation significantly reduced cardiovascular risk factors and diabetic syndrome particularly through reducing lipid profiles and oxidative stress level and with enhancement of antioxidant enzymes protection. The flavonoids present which were identified in cocoa extract as catechin, epicatechin, dimers and trimer, could significantly contribute to their health-promoting activities.

Keywords: cocoa flavonoids, cardiovascular, diabetes risk factors, obese-diabetic model, antioxidant status

The Effect of Human Mesenchymal Stem Cell on the Proliferation and Cytotoxicity of Natural Killer Cell

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ABSTRACT

Cancer is a life threatening disease that has victimised the entire community at an alarming rate. Since the discovery of natural killer (NK) cells in the early 1970s, NK cell-based therapy has serving as another possibility in cancer treatment. Human mesenchymal stem cells (MSC) are multipotent cells which can act as a delivery vehicle to cancer site and exert immunomodulatory properties towards neighbouring cell. Studies have shown that MSC exhibit anti-proliferative effects on cancer cell and that have opened a new perspective in cancer therapy. However, the recent studies also show that MSC express the similar effects on immune cells. Consequently, this would impair the efficacy of our immune system to fight the cancer. The objectives of this study are to evaluate the effects of MSC on the proliferative and cytotoxicity capacity of NK cell line, NK-92MI cells and to determine the killing ability of NK-92MI against cancer cell after being treated with MSC. The effects of MSC towards proliferation of NK-92MI cell were assessed using ^{3}H-Thymidine proliferation assay. It showed that MSC suppressed the proliferation of NK-92MI cells in dose-dependent manner. In order to explore the killing ability of NK-92MI cells, K562 cells were used as target. Effector cells were co-cultured in the presence or absence of MSC and cytotoxicity measured by CFSE/PI assay using flow cytometry. MSC profoundly inhibited the cytotoxicity of NK-92MI cell demonstrated by reduced lysing ability towards CFSE stained K562 target cells. Subsequently, we have tested the antagonist effect of α-galactocylceramide (α-GalCer), a drug that enhance NK cell cytotoxicity. Supplementation of α-GalCer has diminished the immunosuppressive activity of MSC whereby the cytotoxicity of NK-92MI cells were restored. However, the mechanisms underlies in restoring NK-92MI cell immune function is unclear whether the addition of α-GalCer ameliorate the NK-92MI cell function so they can overcome MSC mediated inhibition or α-GalCer has a direct effect on MSC by abrogating their immunosuppression.

Keywords: mesenchymal stem cells, umbilical cord, natural killer cells

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Prospective Pluripotent Full-term Amniotic Fluid Stem Cells

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ABSTRACT

Stem cells technology has been by far the most exciting discovery of the era which aims for cell therapy for various diseases ranging from genetically linked disorders to degenerative diseases as well as injuries. Recent finding discovers that amniotic fluid serves as an excellent alternative source of pluripotent stem cells, as they are not bound with ethical issues and are more primitive than adult stem cells, hence their potential is higher. However, amniotic fluid stem (AFS) cells have only been successfully obtained from second trimester pregnancy which involves an invasive procedure, amniocentesis. Here we aim to isolate and characterize AFS cells from mid- and full-term pregnant rat and human amniotic fluid. We began the work with optimisation of media used in culturing the amniotic fluid (AF) cells. The heterogenecity of amniotic fluid (AF) cells was observed upon culturing the cells under the optimized conditions prior to isolation of stems cell by immunoselection against c-kit, a marker for stem cell factor, using magnetic microbeads. A higher percentage of c-kit positive cells have been isolated from the cultured human and rat AF cells. Our results also demonstrated pluripotent stem cell-like morphology being isolated from both the mid- and full-term pregnant rats whereas Oct4, a marker for pluripotent cells, expression was detected in human c-kit positive cells suggesting the possibility of AFS cells being present during full-term pregnancy in mammals including human. Hence, giving hopes that full-term AFS cells would be the future alternative source for stem cell therapy.

Keywords: amniotic fluid stem cells, full-term amniotic fluid, amniotic fluid cells, immunoselection

Total Isoflavone Content in Soy Products and Urinary Isoflavone Excretion of Post Menopausal Malay Women Consuming *Tempeh*

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ABSTRACT

Isoflavones are substances that have antioxidant and radical-scavenging activity which could give health-promoting effects. Tempeh is a fermented soy product that is mostly consumed by the Malay population and it contains high amount of isoflavones. The quantitation of isoflavones in humans is important to establish the benefits of this compound to the populations. Equol is the most important metabolite of isoflavone since it has a greater affinity for binding to the estrogen receptor than its precursor (daidzein). It is necessary to estimate the isoflavone intake of the local foods in order to study the protective effects of isoflavone against the risk of chronic diseases. However, database for isoflavone content of Malaysian local soy foods is not available. Thus, this study was carried out to determine total isoflavone content in soy products commonly consumed by Malaysians. The isoflavone urinary excretions of 20 post menopausal Malay women consuming it were also evaluated. The findings of this study indicated that tempeh contained highest amount of total isoflavone compared to other local soy products. All post menopausal Malay women have consumed 240 g of tempeh (160 mg isoflavones) for three consecutive days and excreted significant amount of daidzein, genestein and equol concentrations compared to the baseline. Daidzein concentration was consistently higher than genestein in all the collected urine pools which showed that daidzein was absorbed faster compared to genestein. Nearly all women excreted equol but the amount was not high enough to define them as equol producer. There was only one subject who could be classified as equol producer. This study has showed that tempeh contained high amount of isoflavone (aglycone form), and the isoflavones were bioavailable among the studied post menopausal Malay women.

Keywords: *tempeh*, total isoflavones, daidzein, genestein, equol

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MT1-MMP Regulates Urothelial Cell Invasion via Transcriptional Regulation of Dickkopf-3

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ABSTRACT

Membrane type-1 matrix metalloproteinase (MT1-MMP) is a zinc-binding endopeptidase, which plays a crucial role in tumour growth, invasion and metastasis. We have shown previously that MT1-MMP has higher expression levels in the human urothelial cell carcinoma (UCC) tissue. We show here that siRNA against MT1-MMP blocks invasion in UCC cell lines. Invasion is also blocked by broad-spectrum protease and MMP inhibitors including tissue inhibitor of metalloproteinase-1 and -2. Membrane type-1-MMP can also regulate transcription. We have used expression arrays to identify genes that are differentially transcribed when siRNA is used to suppress MT1-MMP expression. Upon MT1-MMP knockdown, Dickkopf-3 (DKK3) expression was highly upregulated. The stability of DKK3 mRNA was unaffected under these conditions, suggesting transcriptional regulation of DKK3 by MT1-MMP. Dickkopf-3 has been previously shown to inhibit invasion. We confirm that the overexpression of DKK3 leads to decreased invasive potential as well as delayed wound healing. We show for the first time that the effects of MT1-MMP on cell invasion are mediated in part through changes in DKK3 gene transcription.

Keywords: MMP, urothelial cell carcinoma, Invasion, siRNA

Mesenchymal Stem Cell Mediated Tumour Cell Suppression: A Potential Therapy for Cancer

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ABSTRACT

Our past research works have shown that mesenchymal stem cells (MSC) profoundly inhibit growth of various tumour cells. However there is insufficient data to elucidate the molecular mechanisms that mediates this anti-proliferative activity. Therefore, we have explored the inhibitory effect of MSC on cancer cell cycle status and their respective signalling pathways. Adult human bone marrow aspiration was utilised to generate MSC and their immunophenotype profile and mesodermal differentiation ability were confirmed. Haematopoietic origin tumour cells BV173, K562, HL60 and Jurkat cell lines were purchased from ATCC and maintained in 10% fetal bovine serum supplemented RPMI media. In the presence of MSC, tumour cell proliferation was profoundly inhibited in dose dependent manner as measured by 3H-thymidine uptakes and quick cell proliferation assay. Transwell assays indicated that MSC mediated inhibition is mainly attributed to cell-to-cell contact. MSC did not induce apoptosis as their mode of anti-proliferation activity. Further investigation on tumour cell cycle revealed that, MSC induce an arrest in G0/G1 phase of cell cycle of tumour cells. In the presence of MSC, tumour cell were prevented from entering S phase (DNA synthesis). Cyclin molecules that govern cell cycle progress, their relevant kinases and kinase inhibitors; molecules that mediate signalling pathways have showed a generalised pattern of inhibition. Mainly the expression of cyclin D1, D3, A and E; PCNA and ERK signalling molecules were significantly reduced in the presence of MSC. CDK4 enzymes that control transition of G1-S check point were reduced in BV173, K562 and Jurkat cell line which is an indication of G1 cell cycle arrest. However, in HL60 cells CDK2 is severely reduced and this is consistent with HL60 growth arrest G2/M. Our results showed that, MSC exerted anti-proliferative effect is specifically targets the cell cycle and it could be confine to any cell cycle check points. The generalised tumour cell inhibition by MSC could be potentially exploited to treat various tumours. However, this anti-proliferative activity needs to be tested and verified with primary tumour cells for their better understandings.

Keywords: mesenchymal stem cells, tumour cells, cell cycle arrest

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The Effect of Human Mesenchymal Stem Cells on the Proliferation and Survival of K562 Cell Line

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ABSTRACT

Human mesenchymal stem cells (MSCs) are multipotent cells defined by multilineage potential, ease to gene modification and immunosuppressive ability. Recent studies show that MSCs exhibit antiproliferative activity on cancer cell lines while others have demonstrated the opposite effect. The objectives of this study are to evaluate the effect of MSCs on the proliferation of K562 a cancer cell line, and to determine the survival of the cancer cells when treated with MSCs. MSCs previously isolated from human umbilical cord blood, and K562 cancer cells were both cultured and the cancer cells' proliferation were assessed using ^{3}H-Thymidine proliferation assay. MSCs were found to inhibit the proliferation of K562 at lower MSC: K562 ratio in the direct co-culture and the effect decreases as the ratio increases. However, in the transwell co-culture, the inhibitory effect was significantly reduced, suggesting that MSCs requires cell to cell contact in inhibiting the proliferation of cancer cells. The Annexin V/PI apoptosis assay showed that MSCs protect the cancer cells from undergoing apoptosis, as indicated by the decreased number of cancer cells in the apoptotic stage as compared to control. We also found that MSCs inhibited the proliferation of cancer cells by arresting them in the G_0/G_1 phase of the cell cycle. Subsequently, cytokine profiling was done and out of the 36 cytokines profiled, higher level of VEGF and lower levels of TNFα and GM-CSF were noted in the co-culture supernatant as compared to MSCs culture supernatant. Thus, we discovered that MSC may have demonstrated antiproliferative activity, prevented apoptosis and arrested the growth of K562 in the early stage of cell cycle.

Keywords: mesenchymal stem cells, cancer cells, cytokines

Analysis of Genetic Polymorphisms as Risk Factors in Essential Hypertension and Type 2 Diabetes Mellitus in Malaysian Subjects

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ABSTRACT

Genetic polymorphisms are integral to the development of genetic marker to identify individuals at risk. They are associated with an increase in the risk of developing disease. To identify the common disease susceptibility loci, many studies such as, the genome-wide association mapping studies, linkage studies, and candidate gene association studies approach has been implicated in various loci and genes. Various genetic polymorphisms in candidate genes encoding proteins with known biochemical or physiological function for blood pressure regulation has been identified in various populations with contradictory results. Lack of information is available in Malaysia regarding the prevalence of genetic polymorphisms of candidate genes especially in hypertension and type 2 diabetes mellitus. In that way, a cross-sectional study was designed to detect the associations between the disease and specific alleles. Individual genotypes of insertion/deletion polymorphism of ACE and ADRA2B gene, G2350A of ACE gene and A6G variant of AGT gene provides adequate evidence on association and might be use as reliable markers of risk for developing with essential hypertension and type 2 diabetes mellitus in Malaysian subjects. This project was completed with eight international publications in both cited and impact factor journals and15 abstracts were presented in both national and international conferences in and around Malaysia.

Keywords: genetic polymorphism, essential hypertension, type 2 diabetes mellitus, Malaysia, angiotensin converting enzyme

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The Association between Kidney Function with Occupational Naphtha Exposure in a Tyre Industry

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ABSTRACT

The objective of this paper is to present a study on the effect of naphtha exposure in relation to kidney function among workers in a selected rubber tyre factory. Data on respirable exposure of naphtha and kidney function were obtained from 60 exposed workers in the study. The level of naphtha exposure in an individual worker for one hour of working was 29.8 mg/m3. Kidney functions in this study were assessed using a strip test and microscopic analysis of urine. Any associations between the naphtha level and kidney function parameters were assessed using the chi-square test. There was no significant association of naphtha exposure observed in all four kidney function parameters assessed in this study. However, smoking, which was a confounding factor in this study was found to have a strong correlation with a presence of protein in urine. Simple logistic regression and multiple logistic regression analysis showed that smoking workers were at higher risk of exhibiting protein presence. It was shown that those who smoke have 1.84 times the odds of having protein presence compared to those who did not smoke. In conclusion, control measures are crucial to make sure that the concentration of naphtha exposure is below the exposure limit as exposure to naphtha may give rise to irreversible chronic health effects.

Keywords: kidney function, tyre industry manufacture, urine analysis

Stage-dependent Activity of WNT1 during Neural Differentiation of Mouse Embryonic Stem Cells (mESc)

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ABSTRACT

In more than two decades since the first murine embryonic stem cells (ES) were derived, they have proved to be versatile enabling tool in unraveling the cellular mechanisms engaged during mammalian embryonic developmental process via the *in vitro* model setting. Thus, in this study, we aim to disentangle the role of secreted signaling molecule (Wnt1) in regulating differentiation of ES cells to neurons. The effects of stimulating Wnt1 activity during the early as well as the late stages of the neural differentiation process using an inducible expression system comparative to constitutive overexpression were evaluated. Wnt signaling is believed to inhibit the differentiation of ES cells into neural precursor cells (NPCs) and then may also stimulate the differentiation of these NPCs into neurons. Combining two techniques, *Cre/loxP*-based genetic recombination and ligand-dependent activation of Cre, we have utilized transgenic ES cell line that allows for the temporal control of expression and activity of Wnt1-epi tope tagged with heamagglutinin antigen (*Wnt1-HA*). This system would support a tightly controlled overexpression of Wnt in a temporally-controlled manner in analysing its effects during neural differentiation of ES cells. Constitutive expression of *Wnt1*-HA has been shown to inhibit both the formation of NPCs as well as neurons. The effects of inducing *Wnt1*-HA at early stages of differentiation (on day 2-4 embryoid bodies, D2-4 EBs) as well as during the late stages (on D7-9 EBs) were evaluated on the formation of NPCs and neurons, and only on neurons, respectively. Wnt1-HA was induced by treating the transgenic cells at indicated time points with 800nM 4'-OHT for 48 hours. Overexpression of *Wnt1*-HA induced on D2 was found to inhibit the formation of NPCs as well as neurons, whereas overexpression during the late stages (D7-9) was observed to increase the percentage of neurons formed. The understandings of the pluripotent and proliferative nature of these cells may provide the foundations for the pioneering work in human counterparts, including the overall leading edge of stem cell biology that aims to regenerate and restore neurons for neurodegenerative diseases particularly to those patients of Parkinson, Alzheimer's and spinal cord injury.

Keywords: mouse embryonic stem cells, neural differentiation, inducible expression system, WNT1, WNT signaling pathway

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Inhibition of Hyphae Formation and SIR2 Expression in *Candida albicans* Treated with Fresh *Allium sativum* (Garlic) Extract

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ABSTRACT

The aims of the present study were to determine whether Allium sativum (garlic) extract has any effect on the morphology transformation of Candida albicans, and to investigate whether it could alter the gene expression level of SIR2, a morphogenetic control gene and SAP4, a gene encoding secreted aspartyl proteinase. METHODS AND RESULTS: Candida albicans cells were incubated with a range of concentrations of fresh garlic extract, and the morphology was monitored via light microscopy. Garlic extract treatment caused the transition of yeast form to hyphal form to be obviated. The expression of SIR2 was down-regulated from 1.2- to 2.5-fold with increasing concentration of the garlic extract, as determined from relative quantitative reverse transcription-polymerase chain reaction. There was no difference in the SAP4 expression in control vs treated cultures. CONCLUSIONS: Garlic and its bioactive components have the ability to suppress hyphae production and to affect the expression level of SIR2 gene. SIGNIFICANCE AND IMPACT OF THE STUDY: Hyphal production is an essential virulence determinant of C. albicans for invasive infections, therefore garlic and its constituents can be effective not only against colonizing C. albicans strains present in mucosal infections, but also virulent strains causing systemic or invasive candidiasis.

Keywords: candida albicans, garlic (*allium sativum*) extract , SIR2

Salmonella Pathogenicity Islands (SPIs) Typing Kit and *Caenorhabditis elegans* as a Simple Model for *Salmonella enterica* Pathogenesis

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ABSTRACT

Infections with Salmonella are a major cause of bacterial foodborne infection in humans worldwide. It has been reported that there are over 1.3 billion foodborne diarrhea cases occurred worldwide annually, resulting in 3 million deaths. All species and strains of Salmonella are possible pathogens for man. Many of the virulence phenotypes of *Salmonella enterica* (*S. enterica*) are encoded by genes on Salmonella Pathogenicity Islands (SPIs). SPIs are virulence cassettes in the chromosome that essential for Salmonella pathogenesis. Outbreak investigation and volunteer studies have shown that certain Salmonella strains can cause disease even in a very low infective dose. Hence, it has become increasingly important for virulence identification of *S. enterica* by molecular technique to targeting SPIs genes. Three rapid set of optimized multiplex PCR (2 heptaplex & 1 hexaplex) assay was developed and patented which allowed the simultaneously detection of twenty virulence factors that located within SPIs in *S. enterica*. Each *S. enterica* isolates under this study were characterized as high virulence (up to 95% in total detected virulence genes). *Caenorhabditis elegans* (*C. elegans*) has been previously proposed as a suitable model of infectious diseases caused by a range of human pathogens. The high virulence of *S. enterica* which detected in local indigenous vegetables and poultry can be potential health hazards. This study aimed to investigate the host-pathogen interaction of various serovars *S. enterica* using *C. elegans* as a simple host model. Result showed that different serovar have different mortality rate. All *S. enterica* isolates were capable of colonizing the intestine of nematodes, causing a significant reduction in survival. The findings demonstrated that the virulence factors essential to mammalian pathogenesis also required for full pathogenicity in *C. elegans*.

Keywords: SPI typing kit, *C. elegans* model

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SRJ23, A Promising New Anti-prostate Cancer Agent

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ABSTRACT

Prostate cancer is the most common non-skin malignancy and age-related cause of cancer death in men worldwide. Nevertheless, scientific knowledge of the molecular mechanisms underlying the disease is still limited. SRJ23, a new semi-synthetic andrographolide derivative was found to exhibit selective anti-cancer activity against prostate cancer in the USA National Cancer Institute *in vitro* anti-cancer screen (Jada *et al.* (2008). *Br. J. Pharmacol* **155**: 641-654). Hence, SRJ23 was investigated for their effect in inducing cell cycle arrest and cell death. The microculture tetrazolium (MTT) assay was utilized in assessing the *in vitro* growth inhibition and cytotoxicity of SRJ23 against three different human prostate cancer cell lines, PC-3, DU-145 and LNCaP. Subsequently, cell morphological studies using DNA fluorochromes (acridine orange and propidium iodide) was carried out to determine the morphological cell death criteria of PC-3 cells. In addition, flow cytometry was used to analyze the cell cycle distribution of control and untreated PC-3 cells. SRJ23, in micromolar concentrations exhibited growth inhibition and cytotoxicity in all three prostate cancer cell lines, but displayed greater cytotoxic potency and selectivity towards PC-3 cells. SRJ23 induced G2/M arrest and predominantly apoptotic mode of cell death in PC-3 cells. In conclusion, SRJ23 can be considered a lead anti-prostate cancer agent to discover prospective clinical candidates.

Keywords: andrographolide, SRJ23, prostate cancer, apoptosis, cell cycle

Bioinfosys for Multiple-drug Resistant (MDR) Pathogens Control

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ABSTRACT

The ability to predict the treatment and patient outcome would be the key to successful infection control. This can be achieved by comparing the pattern profiles of the unknown pathogen with the complete profiles of the similar clone that was previously documented. The clonal profiles comprised a single multivariate observation or a set of observations, encompass classes of specific attributes, designed for a comparison with a knowledgebase data. In contrast to traditional subtyping based on phenotypic characteristics, such as serotype, biotype, phage type or antibiogram (susceptibility to antimicrobials), genetic profiling describes the phenotypic potential within the nucleic acid sequence with phylogenetic biasness. However, the establishment of genetic profiling for a single pathogen needs trained personnel, a huge amount of money and time to be completed. The handling of massive data compiled will overwhelm any personnel for effectively generating relevant information in a shortest time possible. In the advent of the computation system with biological information, the bioinformatics system is a principle approach utilized in the research with application in infection control management. The application of bioinformatics for the genotypic and phenotypic profiles database of multiple drug resistant bacteria (MDR) is incorporated in the Bioinfosys development. Bioinfosys is a "personalized medicine" approach for 4 local MDR pathogens with epidemiological data currently based on information available that were collected from local hospitals, the urban and rural communities. Bioinfosys has capability for expansion to include future database. Bioinfosys principally can ease in epidemiological information prediction of unknown pathogens with respect to MLST, antibiotic resistant potential, species specific detection, virulence genes details, source of strain and antibiotic management. The construction of Bioinfosys at the present status enable the prediction of the clones' with properties first set to the local data mining, before further analysis for confirmation to the worldwide data. The Bioinfosys will become more handy when in duality with Real-time system as the prediction can be more reliable.

Keywords: bioinformatics, pathogen MDR, infection, antibiotics, MLST, genotypic, phenotypic

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AURKA Overexpression Accompanies Dysregulation of DNA-damage Response Genes in Invasive Urothelial Cell Carcinoma

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ABSTRACT

Invasive urothelial cell carcinoma (UCC) is characterized by increased chromosomal instability and follows an aggressive clinical course in contrast to non-invasive disease. To identify molecular processes that confer and maintain an aggressive malignant phenotype, we used a high-throughput genome-wide approach to interrogate a cohort of high and low clinical risk UCC tumors. Differential expression analyses highlighted cohesive dysregulation of critical genes involved in the G(2)/M checkpoint in aggressive UCC. Hierarchical clustering based on DNA Damage Response (DDR) genes separated tumors according to a pre-defined clinical risk phenotype. Using array-comparative genomic hybridisation, we confirmed that the DDR was disrupted in tumors displaying high genomic instability. We identified DNA copy number gains at 20q13.2-q13.3 (AURKA locus) and determined that overexpression of AURKA accompanied dysregulation of DDR genes in high risk tumors. We postulated that DDR-deficient UCC tumors are advantaged by a selective pressure for AURKA associated override of M phase barriers and confirmed this in an independent tissue microarray series. This mechanism that enables cancer cells to maintain an aggressive phenotype forms a rationale for targeting AURKA as a therapeutic strategy in advanced stage UCC.

Keywords: urothelial cell carcinoma, cell cycle, microarray, aurora kinase, DNA damage response

Effect of Vitamin E Supplementation on Inflammatory Factors in Diabetic Induced Rats

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ABSTRACT

Diabetes Mellitus (DM) is a metabolic disorder manifested by chronic hyperglycemia and impairment of carbohydrate and lipid metabolism. Diabetes consists of two main forms, type 1 and type 2. Although the etiology of type 2 is not clear, chronic inflammation is postulated as important causing factor. Vitamin E appears to exert modulatory effects on both inflammatory and immune components of immune system. Alpha-tocopherol seems to be very important; also it is thought tocotrienols can inhibit the production of variety of cytokines. We have investigated the effect of 2-month supplementation of natural alpha-tocopherol and palm extracted tocotrienols on fasting blood glucose levels and mitogenic responses of spleenic T-cells in Streptozotocin-induced diabetic rats. 63 sprague-Dawley rats were subdivided into control groups (normal, diabetic and vehicle) and treatment groups (supplemented with 6 mg/ kg, 12 mg/ kg and two combinations of 6 and 12 of alpha-tocopherol or/and tocotrienols). Fasting blood glucose of rats was measured throughout the study and rats were sacrificed at end of study for spleen T cell proliferation assays. Our results indicated a significant decrease in fasting blood glucose level in two groups of rats which received combinations of both supplements compare with their baseline examination. In line with this T cell proliferation assay demonstrated that T cells at resting state from diabetic control were in raised excitement level compare to their normal control and treatment counterpart. However, once T cells were stimulated with LPS or PHA, T cell from diabetic control fail to response which an indication of T cell function impairment. Supplementation of alpha-tocopherol and tocotrienols at different concentration and combination has restored the T cell proliferation ability. Alpha-tocopherol 12mg/kg and combination of alpha-tocopherol and tocotrienols at 6 mg/kg showed significant difference between diabetic control in PHA and LPS stimulated T cell proliferation assays. In conclusion, diabetic condition raises the excitement level of resting T cells due to chronic inflammation; however when there is an external stimulation due to infection or inflammation, these cells were fail to respond. Supplementation of alpha-tocopherol and tocotrienols able to restore the diabetic T cell proliferative function and could serve as prophylaxis for diabetes associated infection and disorders.

Keywords: diabetes mellitus, inflammation, alpha-tocopherol, mix-tocotrienols

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An Alternative *Candida spp.* Cell Disruption Method using a Basic Sorbitol Lysis Buffer and Glass Beads

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ABSTRACT

Candida spp. and other yeasts have a cell wall that impedes rapid isolation of nucleic acids. Current protocols of cell wall disruption require the use of costly lytic enzymes for enzymatic cell lysis or homogenizers for mechanical cell lysis. Hazardous reagents may also be used to chemically lyse the cell wall. This report describes an alternative method of cell wall disruption for the yeast *Candida spp*., which employs the use of glass beads in a simple sorbitol lysis buffer and may be used in conjunction with a commercial RNA or genomic DNA isolation method to obtain high-quality RNA or DNA. This method requires neither expensive mechanical disruptors, homogenizers or enzymes, nor hazardous reagents in the process of cell wall disruption. The resulting purified nucleic acids are of equal yield and quality to those isolated using current cell disruption protocols. Briefly, the sample is washed several times before adding the sorbitol lysis buffer and glass beads. The mixture is then incubated (optional) and subjected to several vortex-chilling steps before centrifuging to obtain the pellet. This pellet is then subsequently used for nucleic acid isolation, which can be carried out using commercial RNA or DNA purification kits. This method therefore presents itself as an alternative cell wall disruption method for *Candida spp.* and other yeasts that is cost-effective, simple and non-hazardous.

Keywords: yeast, cell wall disruption, sorbitol lysis buffer, glass beads, total RNA isolation, genomic DNA isolation, candida

Malaria Therapy using Local Common Malaysian Plants with Anti Plasmodial Properties

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ABSTRACT

A recent paradigm in malaria research is on a systematic examination of indigenous plants used in traditional or complimentary medicine as potential sources of new antimalarial drugs. Ten Malaysian medicinal plants were screened for their antiplasmodial activities. These plants were selected based on their traditional claims for treatment of ailments or to relieve fever. For their *in vitro* antiplasmodial activities, the FCR-3 strain of *Plasmodium falciparum* was used as target while the cytotoxic activities were carried out against Madin- Darby bovine kidney (MDBK) cells using Mtt assay. The 7-day suppressive test was employed to determine the parasitemia suppression of the plant extracts against *P. berghei*. Four of these plants produced considerable antimalarial effects. Their percentage inhibition were more than 50% inhibition to parasite growth at the 0.03 ug/ml extract concentrations. *Tinospora crispa* showed the maximum at 90 % inhibition, followed by *Andrographis paniculata* at 80 % and *Anacardium occidentale* and *Punica granatum* both at 70 %. After 7 days of treatment with the methanol extract, mean parasitemia suppression in the *P. berghei*-infected mice ranged from 1.14±0.22 at day 1 to 50.73±1.32 at day 6. Mice that survived until the sixth day were those treated with *T. crispa* (n=3) and *Anacardium occidentale* (n=2). All these plants have traditional claims as to relieve fever and this study provides a preliminary scientific evidence for the claims. Logical extention of this research is in the isolation of bioactive compounds from these plants which potentially lead to the discovery of novel antimalarial drugs for both therapy and prophylaxis of the disease.

Keywords: malaria, chemotherapy, plants, parasitemia suppression

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Methicillin Resistant *Staphylococcus aureus* ST 9 in Pigs

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ABSTRACT

Methicillin resistant *Staphylococcus aureus* (MRSA) primarily causes human diseases and has recently been identified in pigs and pig handlers. In Malaysia, several studies reported the prevalence and characteristics of MRSA from clinical and community settings. However, no data were as yet presented on MRSA in pigs. We here investigated the prevalence and molecular characterisation of MRSA colonisation in pigs and pig handlers in Malaysia. Four hundred and fifty nasal swabs (360 from pigs and 90 from human) were taken from thirty randomly selected farms in Kuala Langat district. MRSA was isolated from 1.38% (5/360) pigs and 5.5% (5/90) pig handlers. Antibiotic susceptibility revealed 100% resistance to commonly used antibiotics and showed surprising pattern of clindamycin, quinupristin-dalfopristine and tigecycline resistance. All MRSA isolates subjected to staphylococcal protein A (*spa*) sequencing, staphylococcal cassette chromosome *mec* (SCC*mec*) typing and multilocus sequence typing (MLST) showed our MRSA isolates belonged to two STs: ST9 (spa type t4358) and ST1 (spa type t1784) and carried SCC*mec* V. Virulence gene analysis revealed the presence of enterotoxin genes such as *seb* (60%), *see* (10%), *seg* (90%) and MSCRAMMs that include cna (20%, only in ST1 isolates) and fnb (100%). None of the MRSA isolates carried the *pvl, eta, etb, tsst* or other enterotoxin genes. This is the first study to document MRSA in pigs and pig handlers in Malaysia, and to our knowledge, the first report on the isolation of MRSA ST9- t4358-SCCmecV from pigs as wells as humans globally. The clonal spread of multiresistant porcine MRSAs and transmission between pigs and human warns the possible emergence of ST9 as a cause of clinical infections in human. As pigs are food producing animals, there are inherent concerns about contamination of food. The prevalence of MRSA in farming animals and handlers needs to be monitored continuously as it may play a vital role in food safety and public health.

Keywords: MRSA in pigs, Malaysia, ST9- MRSA, SCCmec V, spa type t4358

Promoter Methylation Correlates with Reduced Smad4 Expression in Advanced Prostate Cancer

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ABSTRACT

Transforming growth factor-beta (TGF-beta) is a potent growth inhibitor in a wide range of cell types. A transducer of TGF-beta signaling known as Mothers against decapentaplegic homologue 4 (Smad4) is a known tumor suppressor found on chromosome 18q21.1 and is typically inactivated by deletion or mutation in pancreatic and colorectal cancers. The purpose of the article is to investigate Smad4 expression, gene copy number and methylation status in advanced cases of prostate cancer. We have employed Methylation Specific PCR (MSP) to identify methylation sites within the Smad4 promoter and combined this with quantitative real-time PCR to look for correlates between methylation status and Smad4 expression and to examine androgen receptor (AR) expression. Bacterial artificial chromosome-comparative genomic hybridisation (BAC-CGH) has been used to look for genomic amplifications and deletions which may also contribute to expression changes. We fail to find evidence of genomic deletions or amplifications affecting the Smad4 locus on chromosome 18 but show a correlation between promoter methylation and the loss of Smad4 expression in the same material. We confirm that the AR locus on the X chromosome is amplified in 30% of the advanced clinical samples and that this correlates with increased transcript levels as previously reported by other groups.: This indicates that epigenetic changes affect the expression of the Smad4 protein in prostate cancer and points to methylation of the promoter as a novel marker of and contributor to the disease.

Keywords: epigenetics, prostate cancer, promoter methylation, androgen receptor

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Innovative Diagnostic Tool to Simultaneously Identify Common Beta-thalassaemia Mutations in Malays

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ABSTRACT

Introduction: To institute a comprehensive thalassaemia control program in this region we characterized the beta-thalassaemia mutations in patients in Malaysia since 1984. Four beta-thalassaemia mutations make up over 90% of the mutations seen in Malays: CD 26 (G®A), IVS1-5(G®C), IVS 1-1 (G®T) and CD19(A®T). These mutations were identified by the amplification refractory mutation system (ARMS), a tedious process that requires each mutation to be identified by a separate reaction. Molecular analysis is important for genotype-phenotype correlation, designing treatment modalities, genetic counselling and prenatal diagnosis. Rapid genotype characterisation is imperative in a diagnostic laboratory offering these services.. Methods: As a model, we designed a protocol based on PCR based reverse dot blot hybridisation (RDBH) technology using our previous knowledge of the spectrum of common beta-thalassaemia mutations in the Malays to screen these mutations simultaneously. The RDBH strip-assay was designed to identify the following mutations: CD 26 (G®A), IVS1-5(G®C), IVS 1-1 (G®T), CD19(A®T), CD 8/9 and Cap site 1. Results: The protocol was standardised with known mutations. It was reliable in distinguishing the wild-type from mutant alleles. Subsequent screening Malay beta-thalassaemia heterozygotes with unknown mutations identified the mutations. The commonest mutation identified were CD 26 (G®A) and IVS 1-5 (G®C). Conclusions: The protocol based on PCR based RDBH technology can rapidly screen for common beta-thalassaemia mutations in Malays. It is appropriate for use in this ethnic group directing definitive mutation diagnosis produced locally with low cost per assay.

Keywords: beta-thalassaemia, malays, reverse-dot-blot-hybridisation

Disseminated Tuberculosis Infection – a ‘Super’ FDG PET / CT Appearance

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ABSTRACT

Introduction:Recent world wide alert on the increasing trend of new TB infection is closely related to delayed diagnosis. The main attribution to this failure are non specific clinical presentation, inconclusive diagnostic imaging study and high false negative bio-pathological laboratory findings. A new diagnostic approach is in demand for quick clinical identification to prevent further spread of active TB lesions. The important role of integrated imaging modality Positron Emission Tomography Computed Tomography (PET/CT) using 18Fluorine-Fluoro Deoxy Glucose (18F-FDG) in malignancy is expanded in our study to include its utilisation in identification of active TB infection which has not been published before. Methodology:We report a case of a defaulter with known diagnosis of disseminated tuberculosis infection. 18F FDG-PET CT examination was performed to demonstrate the appearance of active lesions and mapping the spread of the disease. A positive finding. is interpreted using semiquantitative evaluation method SUVmax (above 2.5) The diagnosis of TB infection was confirmed by isolation of Koch’s bacillus from sputum culture. Results: PET CT images demonstrated disseminated high SUVmax (>2.5) lesions dispersing through out whole body including intracranial, neck, thoracic , mediastinum, abdomen and pelvis. Conclusion : Our case illustrated the usefulness of FDG PET / CT in demonstrating active tuberculous lesions. This new information can be utilize as a new method in early identification of active tuberculosis infection.

Keywords: positron emission tomography computed tomography, disseminated, tuberculosis, 18 F-FDG, semiquantitative evaluation

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Potent *in vitro* Anticoagulant Properties of *Melastoma malabathricum* Linn. (*senduduk*) Leaf Extract on Human Plasma

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ABSTRACT

Blood coagulation system is a major host-defense mechanism consisting of two major pathways - the intrinsic and extrinsic pathways. These pathways encompass a cascade of zymogens which are activated stepwise to form the fibrin clot. However, certain pathological events in the process of coagulation can ultimately result in thrombosis. Hence, the use of anticoagulant agents to treat and prevent thrombus formation is undisputed. In recent years, the limitations of existing anticoagulant drugs have prompted a search for novel anticoagulant agents. Fundamental to this research is the observation that the leaf extract of *Melastoma malabathricum* Linn. (‘senduduk’) possesses potent anticoagulant properties. *In vitro* coagulation analysis showed that the activated partial thromboplastin time (aPTT) and prothrombin time (PT) were significantly prolonged ($P<0.01$) by the extract in a concentration-dependent manner at all concentrations (100-1000µg/ml) for respondents of both genders in comparison to the control. There was no clot formation observed for aPTT assay at extract concentrations of 900 and 1000µg/ml. Interestingly, thrombin time (TT) was only significantly ($P<0.05$) affected at the highest concentration of 1000µg/ml when compared with the control. Mixing studies were further carried out to determine the nature of action of this extract. Prolongation of aPTT was corrected when plasma spiked with extract was mixed with 50% of normal pooled plasma. Based on the data obtained, it can be concluded that the leaf extract of *Melastoma malabathricum* Linn. affects the common pathway of coagulation, and the amounts of factors in the blood samples spiked with different concentrations of extract (100-1000µg/ml) are decreased significantly ($P<0.05$)but are not inhibited by the addition of the extract. So, these attributes of the extract contribute to the anticoagulation of plasma samples.

Keywords: anticoagulant activity, *melastoma malabathricum* linn., *senduduk*

Thymoquinone Induces Apoptosis in Human Cervical Carinoma Cell (HeLa)

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ABSTRACT

Thymoquinone (TQ), the bioactive constituent of the volatile oil of *Nigella sativa*, has been shown to exert anti-inflammatory, antioxidant and anti-neoplastic effects both *in vitro* and *in vivo*. In this study, the cytotoxicity of TQ was evaluated on human cervical carcinoma cells (HeLa). Results showed that TQ exhibited cytotoxic and anti-proliferative activities towards the cells with IC50 value of 2.80±0.10μg/ml and 5.37±0.12μg/ml after 72 hours incubation time as being detected by trypan blue dye exclusion test and MTT assay, respectively. Significant decrease in the percentage of cell viability was observed after the treatment with 1.0, 3.0, 10 and 30μg/ml ($p<0.05$) indicating that TQ induced cytotoxicity in a dose-dependent manner. IC50 values determined by the trypan blue dye exclusion test were significantly decreased from 5.93±0.81μg/ml (24 hours) to 2.80±0.10μg/ml (72 hours) suggesting that TQ induced cytotoxicity in a time dependent manner. HeLa cells treated with TQ for 72 hours showed a significant decrease in cell population at G0/G1 phase and significant increase of cell population at sub-G1 phase at 6.0, 10 and 30μg/ml ($p<0.05$), suggesting that TQ inhibited cell proliferation by induction of apoptosis in the cells. Expression of p53 detected by using the Human p53 ELISA showed that HeLa cells incubated with 10μg/ml of TQ for 72 hours resulted in significant up-regulation of the expression of the protein ($p<0.05$) compared to the control untreated sample. It is concluded that TQ was cytotoxic towards HeLa cells in a dose- and time-dependent manner and induced apoptosis via p53-dependent pathway

Keywords: thymoquinone (TQ), cervical cancer, cell cycle arrest, apoptosis, p53

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The Effect of Human Mesenchymal Stem Cells on Neutrophil Mediated Immune Responses

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ABSTRACT

Mesenchymal stem cells (MSC) constitute a rare non-haematopoietic population in the adult bone marrow (BM) which can be defined according to its ability to self-renew and differentiate into tissues of mesodermal origin (osteocytes, adipocytes, chondrocytes). They are progenitors of bone marrow stroma and thus play a crucial role in supporting haematopoiesis. There is abundant evidence show that MSC not only affect the differentiation of haematopoietic progenitors, but also function of mature cells like lymphocytes and neutrophils. However the effect of MSC on neutrophil function and responses is very little known. Neutrophil consist a major population of polymorphonuclear cells (PMN). It plays vital role in eliminating invading bacteria and other pathogens by phagocytosis and initiate the acute inflammation. In this study, the effect of MSC on neutrophil nitric oxide production and proliferation is investigated. Neutrophils were isolated from human heparinised venous blood from healthy donor after the informed consent was obtained. Neutrophils were isolated by 3% Dextran sedimentation followed by centrifugation on Ficoll-Hypaque density gradient. Neutrophils were on average 97% purity, as determined by morphologic analysis of Leishman staining. MSC were generated from human bone marrow and characterised by immunophenotyping (monoclonal antibodies CD105, CD73 and CD34) using flowcytometer. In order to test the effect of MSC on neutrophil function, isolated neutrophils were co-cultured in the presence or absence of MSC at different ratio for overnight. At end of incubation, neutrophils were retrieved from assay and analysed for their oxidative burst activation and proliferation. These assays were measured by Griess assay and ^{3}H-thymidine radio-isotype based proliferation assay. The results uniquely indicate that, MSC profoundly inhibit the secretion of nitric oxide by neutrophils in all ratios along with reduced proliferation. In conclusion, MSC exert an immunomodulatory effect on neutrophil by suppressing the production of nitric oxide (NO_2) and this could be achieved by reduction in neutrophil proliferation.

Keywords: mesenchymal stem cells, neutrophils, oxidative burst

Preliminary Analysis of the Antinociceptive Activity of Zerumbone

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ABSTRACT

Zingiberaceae are widely used in Southeast Asia for flavoring and for its medicinal properties. In Peninsular Malaysia, approximately 160 species from 18 genera are found. *Zingiber zerumbet* Smith or locally known as 'lempoyang' or wild edible ginger, is one of the most important species of widely cultivated ginger used to treat various conditions like stomach ache, toothache, muscle sprain and as a cure for swelling, sores and cuts. Zerumbone (1) was identified as a major compound of *Zingiber zerumbet*. It has been reported that zerumbone possesses remarkable anti-inflammatory and chemopreventive potential. No pharmacological study has been carried out on the possible antinociceptive effects of zerumbone up to date. We have investigated the antinociceptive activity of zerumbone, a natural cyclic sesquiterpene isolated from *Zingiber zerumbet* Smith, in acetic acid-induced abdominal writhing test and hot plate test in mice. Zerumbone given by intraperitoneal route produced significant dose-dependent antinociceptive effect in all the test models. Accordingly, zerumbone given intraperitoneally also exerts significant dose-related prolongation in the latency response time in the hot-plate test. The effectiveness of zerumbone using the hot-plate test may indicate antinociception activity which could be centrally mediated. In addition, the antinociceptive effect of zerumbone in the hot plate test was reversed by the non-selective opioid receptor antagonist naloxone, suggesting that the opioid system may be involved in its analgesic mechanism of action. In conclusion, the present study provides convincing evidence indicating that zerumbone isolated from *Zingiber zerumbet* possesses significant peripheral and central antinociceptive effects in laboratory animals at the doses investigated.

Keywords: zerumbone, antinociceptive, acetic acid-induced abdominal constriction test, hot plate test

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Anti-fungal Activity of *Ardisia crispa* (Thunb.) A. DC. against Several Fungi Responsible for Athlete's Foot

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ABSTRACT

The body normally hosts a variety of saprotrophic micro-organisms that may cause infection. Athlete's foot is a skin fungal infection and is medically referred to as *tinea pedis*. Athlete's foot causes scaling, flaking and itching of the affected skin. Blisters and cracked skin may also occur, leading to exposed raw tissue, pain, swelling and inflammation. Secondary bacterial infection can accompany the fungal infection. This work examined the anti-fungal activity of *Ardisia crispa* (AC) against common fungi that cause Athlete's foot and several other pathogenic fungi.The antimicrobial activity of water, ethanol and chloroform extracts of AC was tested against fungal strains using the disc diffusion and microdilution methods. This antimicrobial activity was compared to standard antifungal drugs (griseofulvin, fluconazole and itraconazole). Results revealed that chloroform extract of AC had potent anti-fungal activity against *Trichophyton rubrum* ATCC 40051 and *Trichophyton mentagrophytes* ATCC 40004 which are the two most commonly cause of Athlete's foot. Moderate activity was observed against *Candida albicans* ATCC 14053, *Candida tropicalis* ATCC 14056, *Microsporum canis* (Clinical isolates and identified at the Department of Pathology and Microbiology, Universiti Putra Malaysia) and *Aspergillus fumigatus* ATCC 14109. The ethanol extract only had mild activity against the *Candidia spp* and the water extract was devoid of any activity. The anti-fungal activity of chloroform extract was statistically more potent than griseofulvin and fluconazole but less potent than itraconazole.Findings from current study support the use of AC in traditional medicine for the treatment of various fungal infections and may potentially used in the treatment of Athlete's foot.

Keywords: anti-fungal, athlete's foot, *ardisia crispa*

Relationship of Waist-to-height Ratio with Waist Circumference, Body Mass Index and Metabolic Risk Factors among Elderly Malays in Rural Areas

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ABSTRACT

With industrialisation and urbanisation there is a dramatic increase in the prevalence of obesity. Obesity and dyslipidemia are among the major risk factors associated with cardiovascular disease (CVD) leading to increased morbidity and mortality. Waist-to-height ratio (WHtR) has been proposed to be a sensitive indicator to assess central fat distribution and can be used to identify individuals who are at increased risk for metabolic disorders. The purpose of this paper is to examine the relationship of WHtR with indicators of obesity and dyslipidemia among elderly Malays from four rural areas in Peninsular Malaysia. Data were collected at selected health centers or through household visits using face-to-face interviews. Anthropometric measurements were taken using standard procedures and appropriate equipments. Fasting blood samples were analysed for lipid profile. WHtR greater than 0.5 was considered as a cut-off value to indicate risk for central obesity. A total of 351 subjects with complete data were included in this analysis. The mean WHtR for men and women were 0.53 and 0.56 respectively. About 68% of the subjects were classified with central obesity based on the WHtR>0.5, representing 68.5% of men, 67.4% of women, 47.4% with waist circumference at low risk and 58.4% in the normal BMI range. Based on five metabolic risk factors (hypercholesterolemia, hypertriglyceridemia, low HDL-cholesterol, high LDL-cholesterol and hypertension), 3.1% were without any risk factors while 44.8% had four or more risk factors. The prevalence of metabolic risks were significantly higher among those with WHtR>0.5. Waist-to-height ratio can provide a simple and practical indicator to identify higher metabolic risks in normal and overweight older adults. The usefulness of this indicator needs to be confirmed among the Malaysian population through future studies among different age and ethnic groups, gender and strata.

Keywords: waist-to-height ratio, central obesity, elderly

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Inhabition of Leukotriene Production by Compounds and Extracts of *Melicope ptelefolia*: Potential Role in the Treatment of Asthma

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ABSTRACT

Melicope ptelefolia (setenggek burung) is a medicinal species and traditional 'ulam'. In our previous studies we showed extracts and compounds of this plant had antioxidative and anti-inflammatory properties. The plant was then further evaluated and found to inhibit 5-lipoxygenase (5-LOX) activity which is involved predominantly in local inflammation, vascular smooth muscle cell migration and modulation of vascular tone. Through bioassay-guided approach of the active extract (ethanolic extract), two major bioactive constituents, tHGA and tHPA were successfully identified. tHGA was further found to inhibit the production of cysteinyl leukotrienes (cLTs) production in activated mice macrophages. Inflammatory cells (T-lymphocyte, mast cells, eosinophils and macrophages) are implicated in the pathogenesis of bronchial asthma. The maximum tolerated dose (MTD) for the ethanolic extracts of *Melicope ptelefolia* was found to be 200 mg/kg since there was >10% decrease of body weight on day 7 of rats given 300 mg/kg dose compared to control rats. The active ethanolic extract and compound will be further evaluated for anti-asthma property in a mouse model.

Keywords: *melicope ptelefolia,* tHGA, cysteinyl leukotrienes, anti-inflammatory, anti-asthma

Generation and Characterisation of Mesenchymal Stem Cells Derived from Human Myocardiac Tissues: A Potential Pool of Cardiac Stem Cells

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ABSTRACT

In last one decade, overwhelming research work has promised stem cells as an ideal tool for tissue regenerative therapy. In line with this mesenchymal stem cells (MSC) have been actively investigated on their role in repopulating parenchymal and mesenchymal tissues in organ specific diseases. To date, MSC been clinically applied to treat patient with osteogenesis imperfecta as tool for improve bone structure and density. Myocardial infarction is often become a fatal disease due to inability of local cardiac stem cells at side of injury to regenerate mature functioning mycoardiocytes. This underlying pathology could be reflection of persistent inflammation, insufficient stem cell pool or the demand of injury that supersede the supply of stem cell physiology. Therefore an ex-vivo expansion of cardiomyocytes derived mesenchymal stem cells serve an ideal reagent to treat heart diseases. To realise this notion, myocardial biopsy of stage III heart failure patients were collected and their ability of stem cell generation were assessed. Myocardial biopsy were minced and disassociated by enzymatic degradation to obtain a single cell suspension. Single cell suspension was added growth factor supplemented media and their colony forming ability were observed. Once the cells formed colony, they were grown till confluence and tested for their stem cell properties. After the first passage, cardiac stem cells showed an exponential growth pattern whereby the doubling time of cell reduced and consist with rapid populating stem cells. When these cells tested for the stem cell surface marker, 30% of the population were stro-1 positive which an indication of primitive stem cell population. Moreover, cardiac stem cells also share similar phenotype with MSC as both are positive for CD105, CD73, CD90 and CD29. Beside that, they also express early transcription marker for embryonic stem cells such as Oct3/4, Sox2, Rex-1 and Nanog. In term of their myocardial origin, cardiac stem cells express early cardiac lineage markers such as NKX2.5 and GATA4 which an unique pattern only found myocardium derived MSC. In conclusion, myocardium could potentially serve as cardiac stem cell source and can be exploited toward treating myocardiac infarct patients.

Keywords: mesenchymal stem cells, cardiac stem cells, myocardiac infarction

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Inclusion Complex of Zerumbone (ZII) with Hydroxylpropyl-β Cyclodextrin (HPβCD) for Aqueous-base Injections in Humans

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ABSTRACT

Inclusion complex of Zerumbone (ZER) with hydroxyl propyl β-cyclodextrin (HPβCD) was prepared in 0.01M potassium dihydrogen orthophosphate (KH_2PO_4) buffer pH 7 at 25.0, 37.0 and 45.0 C° ± 0.5. The stability constant (K_f) at these temperature values was determined by phase solubility method using high Performance Liquid Chromatography (HPLC). The solubility of ZER increases as a function of HPβCD concentration demonstrating an A_L phase diagram, indicating the formation of soluble complex at 1:2 stoichiometry. The K_f values were found to be in the order 25.0 C° > 37.0 C° > 45.0 C°. The solubilizing power of HPβCD with respect to study temperatures was found to be in the order 25.0 C° > 37.0 C° > 45.0 C°. The solubility of ZER was enhanced the most by HPβCD 120 times at 25 C°. The inclusion complex was tested in cytotoxicity experiment using cell lines model *in vitro*, in which the LC_{50} was found to be 30 µg/ml. The solubility of ZER as well as the stability constant of its complex with HPβCD is affected by the temperature of the medium. The inclusion complex was characterized in solutions using DSC, FT-IR, SEM, TEM and H^1-NMR.

Keywords: HPßCD, zerumbone, solubility constant, HPLC

Lemba (*C. latifolia*) as a Potential Low Calorie Sweetener with Antidiabetic Properties

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ABSTRACT

The emerging interest of using ethnobotanicals as antidiabetic agent in diabetes mellitus treatment especially type 2 diabetes has vigorously increased. *Curculigo latifolia* is a stemless herb that grows in Western Malaysia and their fruit has been eaten by the natives to sweeten the taste of sour foods. Interestingly, the *C. latifolia* fruit can exhibit both sweet-tasting and taste-modifying activities. However, there are no proper studies about their potential use neither as an antidiabetic agent nor as a sweetener since it has been shown that the fruit is 9000 times sweeter than sucrose. Currently, studies showed that artificial sweetener consumption like saccharine, aspartame and cyclamate have side effects. In order to overcome this problem, the search for non-carbohydrate sweeteners from natural sources has led to the discovery of many intensely sweet-tasting sweeteners. This is a new approach to the potential treatment of diabetes by using a low calorie sweetener with a antidiabetic properties. Hence this project was carried out to evaluate the antidiabetic potential of *C. latifolia* in high fat diet and low dose STZ induced diabetic model and also in cell lines. Oral administration of *C. latifolia* root, fruit and combination of fruit and root extracts were given at 100 mg/kg body weight dosage. Treatment was carried out for 30 days. Plasma levels of glucose, insulin, adiponectin, lipid profiles and toxicity test were measured before and after treatments. Result indicates that plasma glucose and lipid profiles levels are significantly decreased in rats treated with combination of fruit and root extracts compared to control group. Meanwhile, plasma insulin level is increased in rats treated with combination of fruit and root extracts. In addition, adiponectin level is significantly increased in rats treated with root extract. Furthermore, *C. latifolia* extracts also showed no toxicity through urea, creatinine, ALT and GGT tests. In conclusion, oral administration of *C. latifolia* extracts ameliorate diabetic problem and exhibit organ protection for liver and kidney are revealed.

Keywords: ethnobotanicals, antidiabetic agent, *curculigo latifolia,* non-carbohydrate sweeteners

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Anti-fungal Activity of *Drymoglossum piloselloides* L. Presl. against Several Fungi Responsible for Athlete’s Foot

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ABSTRACT

Athlete’s foot is a rash on the skin of the foot. It is the most common fungal skin infection. Athlete’s foot spreads easily. Infection is by touching the toes or feet of a person who has it. But most often, transmission is by walking barefoot near swimming pools or in locker rooms. *Drymoglossum piloselloides* (DP) or “Paku Sisek Naga”, “Paku Sakat Ribu-ribu” in Malay of the Polypodiaceae family is a small epiphytic fern is common in the wild of many Asian countries, commonly seen on trunks of older trees. The antimicrobial activity of water, ethanol and chloroform extracts of DP was tested against *Trichophyton rubrum* ATCC 40051 and *Trichophyton mentagrophytes* ATCC 40004 which are the two most commonly cause of Athlete’s foot, *Candida albicans* ATCC 14053, *Candida tropicalis* ATCC 14056, *Microsporum canis* (Clinical isolates and identified at the Department of Pathology and Microbiology, Universiti Putra Malaysia) and *Aspergillus fumigatus* ATCC 14109. The chloroform and ethanol extracts only had mild activity against the *Trichophyton spp* and the water extract was devoid of any activity. The anti-fungal activity was statistically less potent than griseofulvin and fluconazole or itraconazole. The anti-fungal activity of DP was minimal may be due to the testing of crude extracts. Future studies of purified or semi purified samples may produce better results and may potentially used in the treatment of Athlete’s foot.

Keywords: anti-fungal, athlete’s foot, *drymoglossum piloselloides*

Handgrip Strength and its Association with Nutritional and Functional Status among Rural Elderly Malays

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ABSTRACT

Handgrip strength is the most common assessment method for upper extremity muscle strength. It has been shown to be a powerful predictor of disability, morbidity and mortality and may be a useful indicator for nutritional status as well as functional ability among older adults. The purpose of this paper is to examine the relationship of handgrip strength with nutritional and functional status of elderly Malays from four rural areas in Peninsular Malaysia. Data were collected at selected health centers or through household visits using face-to-face interviews. Anthropometric measurements were taken using standard procedures and appropriate equipments. Handgrip strength was measured using a hand dynamometer. Arm muscle area (AMA) and skeletal muscle mass (SMM) was computed using appropriate formulae. Information on functional status and other health related characteristics were collected through questionnaires. A total of 658 subjects (men=371; women=287) with complete data were included in this analysis. The handgrip strength was significantly higher in men vs women (18.85±5.3 kg vs 13.35±4.2 kg). According to age categories, the handgrip strength tends to decline with increasing age in both sexes. Elderly who were underweight (BMI<18.5 kg/m^2), with calf circumference at risk for malnutrition and classified as 'severely malnourished' based on the subjective global assessment (SGA) had significantly lower handgrip strength. Handgrip strength was significantly correlated with selected nutritional status indicators including body mass index (BMI), SMM, AMA and percent body fat, in both men and women. For indicators of functional status, scores for instrumental activity of daily living (IADL) and mobility were positively correlated with handgrip strength. Poor nutritional and functional status is associated with poor handgrip strength in this sample of rural elderly Malays. Further studies and analysis is needed to identify which are significant contributors to the variation in handgrip strength among the elderly population.

Keywords: handgrip strength, nutritional and functional status, elderly

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Diuretic Properties of *Orthosiphon stamineus Benth*: Potential Use in Sports Medicine

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ABSTRACT

Orthosiphon stamineus or Cat's Whiskers or "misai kucing" in Malay from the family Lamiaceae is a native plant of South East Asia. This plant has been used in traditional medicine for centuries to improve general health, treatment of kidney diseases, bladder inflammation, gout and diabetes. *O. Stamineus* also being used to treat rheumatism, tonsillitis and menstrual disorder. Aim of the study: To investigate the diuretic activity, to elucidate its possible mechanism and evaluate the renal effects of *Orthosiphon stamineus* extract. Materials and methods: Water extracts were administered orally at doses of 5 and 10 mg/kg to Spraque-Dawley rats and the control groups were given commercial diuretic drugs either furosemide or hydrochlorthiazide at 10 mg/kg. Urine volume, urine pH, urine density and urine electrolytes were determined every hour for 4 hours. Blood was assayed for glucose, albumin, blood urea nitrogen (BUN) and creatinine. Results: *O. stamineus* extract exhibited dose-dependent diuretic activity. However, excretion of Na+ and Cl- was not markedly elevated, but urinary excretion of K+ was significantly increased. *O. stamineus* extracts slightly increased the serum BUN, creatinine and blood glucose level. Although, these levels were statistically significantly when compared to control but these levels were still within normal range. Conclusion: *O. stamineus* exhibited diuretic activity, but was less potent than furosemide and hydrochlorothiazide. Care should be taken when consuming this herb as slight increase of kidney function enzymes was recorded.

Keywords: diuretic, electrolytes, *ortosiphon stamineus*

In Vitro Cytotoxic Effects of Nonsteroidal Anti-inflammatory Drugs Piroxicam and Mefenamic Acid on Several Cancer Cell Lines

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ABSTRACT

The pathogenesis of colon cancer, one of the commonest fatal malignancies in the developed and developing countries, represents an important challenge for medical sciences. As the second leading cause of cancer deaths, colorectal cancer is a significant source of morbidity and mortality. The appreciation of the role of nonsteroidal anti-inflammatory drugs (NSAIDs) in human colon cancer represents an important recent development. Several NSAIDs were demonstrated to decrease the incidence of and mortality from colon cancer. Nonsteroidal anti-inflammatory drugs (NSAIDs) are heterogenous group of compounds used to cure and prevent inflammation. It was demonstrated that NSAIDs has the ability to inhibit the viability of colon cancer cells in vitro. We investigated the effects of Piroxicam and mefenamic acid on the viability of 4 cancer cell lines in which 2 of them are colon cancer cell lines (HCT 116 and Caco-2). Cell viability was determined using MTT assay. Both NSAIDs was observed to markedly decrease the cell viability of both cell lines (HCT 116 and Caco-2). Piroxicam was statistically more cytotoxic towards the cancer cell lines when compared to mefenamic acid. However, the cytotoxic effect of NSAIDs was less potent on breast cancer cells (MCF-7) and liver cancer cells (Hep G2). In conclusion, piroxicam and mefenamic acid showed selective cytotoxic effects against colon cancer cells but not against liver or breast cancer cells.

Keywords: piroxicam, mefenamic acid, colon cancer

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The Potential Anticancer Effect of Rice Bran Phytic Acid in Colonic Cancer Development

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ABSTRACT

This research is carried out to study the potential of rice bran phytic acid in the suppression of colonic cancer through *in vivo* experiment. 72 male *Sprague-Dawley* rats were divided into 6 groups with 12 rats in each group. Rats received two intraperitoneal injections of azoxymethane (AOM) at (15mg/kg bodyweight) over a 2-week period to induce colonic cancer. The treatments were given in two different concentrations of phytic acid; 0.2% (w/v) and 0.5% (w/v) via drinking water. The colons of the animals were analyzed for detection and quantification of aberrant crypt foci (ACF) after 8 weeks of treatment. Treatment with 0.2% (w/v) extract phytic acid (EPA) gave the greatest reduction in the formation of ACF. In addition, phytic acid significantly suppressed the number of ACF in the distal, middle and proximal colon as compared to AOM alone ($p<0.05$). In histological classification of ACF, treatment with 0.5% (w/v) commercial phytic acid (CPA) had the highest percentage (71%) of non-dysplastic ACF followed by 0.2% (w/v) EPA (61%). After 20 weeks of treatment, colons of the rats were excised and analyzed for tumor incidence. Administration of phytic acid reduced the incidence and multiplicity of total tumors and adenocarcinomas. For immunohistochemical analyses, proliferating cell using Ki-67 and modulating of ß-catenin and COX-2 expression were assessed. In Ki-67, there was a statistically significance difference in lowering the proliferating index between treatment groups as compared to AOM alone ($p<0.05$). For ß-catenin and COX-2 expression, there was a significant difference between groups. In the correlation test, results showed that there was a significant positive correlation between proliferation of Ki67 and COX-2 expression. Total ß-catenin had a significant positive linear relationship with total COX-2 expression. As a conclusion, this study found the potential value of phytic acid extracted from rice bran in reducing colon cancer risk in rats.

Keywords: phytic acid, aberrant crypt foci, rice bran

DVD – Application of Condom

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ABSTRACT

Visual and practical aspects in approaching students are proven to be more effective than theory. This video is an aid to students in understanding the proper technique of applying condoms. In this research it is use as an aid for the participant to learn the proper technique of applying condom, as they would be a facilitator later in this research. For medical students and future medical officers, they will be able to explain and demonstrate the correct technique of applying condoms. As for the public and other health providers, this video will help them in teaching their consumers the proper technique of applying condoms. The correct technique of applying condom will also prevent the spread of sexually transmitted diseases and HIV/AIDS. The Bahasa Malaysia version is more friendly approach which is relatively spoken by all and would also reach to a wider population.

Keywords: application of condom, technique, HIV/AIDS

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Mechanism of Liver Toxicity Induced by Anti-fungal Drugs Itraconazole and Fluconazole

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ABSTRACT

Itraconazole and fluconazole are triazole antifungal drugs, which are multiringed synthetic compounds containing three nitrogen atoms in the azole ring. The triazole drugs are broad-spectrum antifungal agents and are currently used to treat infections caused by various pathogenic yeast and molds. The drugs are shown to be effective in both animal models and clinically. Mechanistically, the drugs inhibit the synthesis of ergosterol, which is an essential component of fungal cell membranes causing abnormalities in the membrane permeability, causing death to the cell. The triazoles are thought to have greater antifungal potency, lower toxicity and a wider antifungal spectrum than the older imidazole antifungal drugs. However, there have been reports that itraconazole and fluconazole induced adverse drug reactions especially hepatotoxicity in patients. The mechanism underlying the hepatotoxicity is unknown. The present study was designed to investigate the role of cytochrome P450 inhibitors, SKF 525A and curcumin pretreatment on the cytotoxicity of anti-fungal drugs fluconazole and itraconazole. For 3 consecutive days, female rats were administered daily SKF 525A or curcumin (5 and 25 mg/kg). Control rats received an equivalent amount of dosed vehicle. The animals were anaesthetized 24 h after receiving the last dose for liver perfusion. Hepatocytes were then exposed to various concentrations of anti-fungal drugs. In vitro incubation of hepatocytes with itraconazole revealed significantly lower viability when compared to fluconazole as assessed by lactate dehydrogenase, aspartate aminotransferase and alanine aminotransferase activities. The cytotoxicity of itraconazole was enhanced when incubated with hepatocytes pretreated with SKF 525A. SKF 525A had no effects on the cytotoxicity of fluconazole. Curcumin failed to either increase or decrease the cytotoxicity of both anti-fungal drugs. ATP levels also showed significantly decreased in both itraconazole and fluconazole incubated hepatocytes. However, SKF 525A pretreated hepatocytes had significantly lower ATP levels after itraconazole incubations. Collectively, these results confirm the involvement of cytochrome P450 in the cytoprotection in itraconazole induced hepatocyte toxicity. Differences of the effects of SKF 525A on the cytotoxicity induced by itraconazole and fluconazole may be due to the differences on the metabolism of each anti-fungal drug in vivo.

Keywords: itraconazole, fluconazole, hepatotoxicity

Perhutanan dan Alam Sekitar

Economic Value of Water for Agriculture Uses

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ABSTRACT

Agriculture sector is the main economic activities in Cameron Highlands, Pahang. In order sustain the production of agriculture outputs, the amount of water supply needed by farmers should be provided. Farmers have been using water for farming activities from forest areas using water piping system that is not regulated by the government. In such situation, the market price of water is not reflected in the market price of agriculture output. As such, an indirect method is needed to value of water for agriculture production. In this study, a farm budget approach or residual value method was used to estimate the economic value of water for agriculture production based on data collected from 40 farmers in Cameron Highlands. Data were collected through personal interviews using a structured questionnaire prepared for this study. The analyses were conducted to determine the agriculture activities, cost of production, output, water usage, problems related to agriculture and farmers profile. The results of analysis showed that estimated production costs of agriculture activities vary by scale of operation, farming practices and agriculture products. The farmers are mainly involved in the production of vegetables and flowers. The average income per season for each farmer varies depending on the scale and agriculture outputs. An estimate of the value of the water is RM5.53 per m^3/year or RM5.28/ha/year. The total economic value of water is RM41,982 per farmer per year. The estimated total economic value of water is RM92,361,634. The annualized value of the water, at a 10% discount rate is RM923,616,340. This study suggests that the economic value of water for agriculture is substantial and the protection of forest for water supply is economically justified.

Keywords: water value, production method, water catchment, agriculture production, agriculture farmers

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Control of the *Tongkat Ali* Pest *Eurycoma longifolia* (Lepidoptera: Yponomeutidae) using the Fungus Beauvaria Bassiana

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ABSTRACT

Eurycoma longifolia, commonly known as tongkat Ali, is a widely used medicinal plant in South-East Asia. Due to the high demand for various parts of the plant, attempts have been made throughout Malaysia to grow *E. longifolia* in plantations. With the onset of commercial planting, *A. sciodoxa* populations have reached pest status and devastated seedlings and young plants wherever they grow. The potentially harmful effects of chemicals on medicinal plants intended for human consumption has led to research on more acceptable control methods. Seven isolates of the fungus *Beauveria bassiana* of different geographical origins were screened for pathogenicity and infectivity at a concentration of 5×10^7 conidia ml^{-1} against A. sciodoxa at 27±2ºC and 75±5% relative humidity with 12 h photoperiod. All isolates were pathogenic and the infectivity varied significantly ($p<0.05$) among the isolates. The most virulent isolate, Bba-Pp, caused 100% mortality with a median infective time (ET_{50}) of 3.6 days on day seven. Bba-Sl3 was the least infective isolate with 24.9% mortality and 15.3 days of median effective time. The median effective concentration (EC_{50}) of Bba-Pp was 9.89×10^5 conidia ml^{-1} while that of FS-11 was 3.85×10^6 conidia ml^{-1}. There was a strong negative correlation between inoculum concentrations and food consumption ($R^2=-0.99$). The infection by Bba-Pp and FS-11 resulted in 55.8 to 72.5% reduction in food consumption by *A. sciodoxa* compared to the controls. The results on mortality, time to mortality and food consumption showed that isolate Bba-Pp has good potential for control of *A. sciodoxa* on *E. longifolia*.

Keywords: microbial control, tiger moth, atteva sciodoxa, *tongkat ali, eurycoma longifolia*

Economic Value of Recreation Benefits

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ABSTRACT

Forest recreation areas provide many benefits to the community, which are difficult to measure using normal market approach. This study used an individual travel cost method (ITCM) to estimate the economic value of recreation benefits of Chamang Recreational Forest (CRF) in Bentong, Pahang. The activities involved include surveys on visitors to the forest recreation areas, derivation of recreation-demand function and computation of consumer surplus associated with the recreation demand curve. A total of 307 visitors were interviewed in Chamang Recreational Forest. Three recreation-demand models were used: semi-log, Tobit and Poisson. The average consumer surplus per visit according to each model was RM75.87 for semi-log, RM106.40 for Tobit and RM67.18 for Poisson. The total consumer surpluses per year based on 10,000 visitors were RM758,700, RM1,064,000 and RM671,800 for the semi-log, Tobit and Poisson models, respectively. Using a 10% discount rate with an assumption of no further change in future recreation demand, the total discounted present values of forest recreation in CRF were from RM6.7 million to RM10.6 million. Because the economic value of CRF was found to be substantial, this area should be conserved for recreation purposes. Conversion of this forest recreation area to other uses will involve opportunity cost which will burden the society.

Keywords: forest recreation, recreation demand curve, travel cost method, consumer surplus, regression analysis

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Developmental Biology of the Bamboo Borer, *Dinoderus minutus* (Coleoptera: Bostrychidae)

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ABSTRACT

In the study, various species of bamboo of commercial importance in Malaysia were collected and the species infesting bamboo were identified. The most common species encountered was Dinoderus minutus (Coleoptera: Bostrychidae). D. minutus characteristically degrade bamboo to a smooth powdery frass. The females oviposit eggs in bamboo culms. The adult female has a pre-oviposition period between eight to ten days and the mean oviposition period was 40.0±5.0 days. The mean fecundity of an adult female was 78±5.0 with 3.2±0.2 eggs per oviposition day. The eggs are cylindrical in shape with a truncated anterior tip. The mean length and diameter of the egg were 404.62±22.33 μm and 77.35± 7.77 μm, respectively. The mean duration of the egg stage was 4.83±1.24 days at a temperature of 27±1ºC and relative humidity of 75±5%. Out of 120 eggs obtained from 24 adult females, 92.5% successfully developed into first instar larva. To determine the number of instars in the larval stage, 250 exuviae head capsules were measured. From the results of the larval development and head capsule width measurements, it was found that there were five larval instar stages. The overall larval development period was 52.8±0.75 days. The mean duration of first instar was 8.04±0.12 days, followed by 9.74±0.20 days, 13.10±0.17 days, 16.20±0.15 days and 5.72±0.13 days, for the second to fifth instar stages, respectively. The longest instar stage was the 4th instar with a development time ranging from 14 to 18 days and the shortest was the 5th instar ranging from 4 to 6 days. The pupal duration ranged between 4 to 7 days. The adult female and male lifespans were 57.2±5 and 48.0±4.8 days, respectively.

Keywords: dinoderus minutus, bamboo borer, larval instars, head capsules

A General Model for Estimating Tropical Forest Biomass

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ABSTRACT

The quantity of biomass in a forest is a result of the difference between production through photosynthesis and consumption by respiration and harvest processes. Thus it is a useful measure for assessing changes in forest structure. Biomass density is also a useful variable for comparing structural and functional attributes of forest ecosystems across a wide range of environmental conditions, beside that biomass of forests is also very relevant for issues related to global change. Attempts to estimate the biomass density of tropical forests have been made by the scientific community for use in models that assess the contribution of tropical deforestation and biomass burning to the increase in atmospheric carbon dioxide and other trace gases. However, because so many different equations and techniques are needed to estimate various structures and compositions of tropical forest and it would be a huge and costly, improving biomass estimates by constructing new equations to present all tree species in all locations are necessary. The main goals of this study is to present simple methods that are available for estimating biomass density of tropical forests or tree formations using primarily existing data. Prediction equations for biomass were generated from easily measurable parameters such as diameter at breast height (D) and total height (H). Data on dry weight of all biomass components of sample trees were used to develop prediction equations. The power equations were used for biomass equation because these equations had proved superior to other equations as evident from its greater values of coefficient of determination as well as from lesser values of standard error for most of the biomass components. Equations were presented from destructive sampling of 250 sample trees of 19 species in Indonesia, Papua New Guinea and Vietnam, from 1.20 cm to 109.18 cm of D and from 1.9 m to 57.7 m of H. The study provided two steps of biomass estimation, i.e., (1) a multi step process that entails calculating volume and then converting volume to dry weight biomass and (2) a one-step process that calculate biomass directly from growth parameter of D or combination D^2H. Biomass density can be calculated from volume/ha by first estimating the biomass of the inventoried volume and then “expanding” this value to take into account the total biomass.

Keywords: diameter, general equation, estimator, biomass, tropics

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Peat Swamp Flora of Peninsular Malaysia

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ABSTRACT

Peat Swamp Forest (PSF) in Malaysia forms the largest wetland forest type in terms of area covered, totaling 1.54 million ha. Of this area, some 300, 000 ha are in Peninsular Malaysia distributed in the states of Selangor, Johor, Terengganu and Pahang. Approximately 160,000 ha are found in Pahang alone, making it the largest tract of PSF in Peninsular Malaysia and insular Southeast Asia. PSF is fast shrinking in Peninsular Malaysia due to massive destruction by indiscrimate human activities and with it many plant and animal species are also disappearing. The remaining PSF in Peninsular Malaysia harbours viable populations of many plant species that are restricted to the peat swamps only, and with special conservation status such as endemic, rare, uncommon, and threatened. A study carried out listed more than 90% of the species found from our PSF in Peninsular Malaysia. PSF is also the major supplier of the controversial ‘ramin’ (*Gonystylus bancanus*) cited by CITES, whose timber is highly sought and prized in the international market. Other timber species important to the country’s economy include *Shorea platycarpa* (meranti paya), *Tetramerista glabra* (punah) and *Koompasia malaccensis* (kempas) are also harboured in these forests. PSF will remain as an important *in situ* gene bank of these plant species. The future of the peat swamp forests is in our hands. What is lost cannot be replaced, but what remains deserved to be conserved

Keywords: peat swamp forest (PSF), flora, conservation

Plant Diversity and Conservation of Ayer Hitam Forest, Selangor

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ABSTRACT

The Ayer Hitam Forest, a logged-over lowland mixed-dipterocarp forest in the State of Selangor covers an area of 1217 hectares. It is the only remaining largest tract of lowland forest left in the Klang Valley. This forest was leased to Universiti Putra Malaysia (UPM) in 1996 for 80 years for the purpose of education, research and extension. Since then various efforts have been taken to know the biodiversity it houses. A database on the plants of Ayer Hitam Forest was started in 1998. Many plots have been established and plant collections were made to achieve this and still progressing. A total of 600 species of seed plants in 220 genera and 80 families occur here. 50 species of ferns and fern-allies, 130 timber species, 40 fruit tree species and 120 species with medicinal values were recorded from this forest. Of these taxa, 20 species which are endemic to Peninsular Malaysia are also found here besides 30 new records for the state of Selangor. Although Ayer Hitam Forest is still regenerating at the late seral stage, it is nevertheless a rich fragmented ecosystem that needs to be conserved for generations to come. For tree taxa alone, this forest contains nearly three-quarter the total number of tree families, about half and one-seventh the total number of genera and species found in Peninsular Malaysia, respectively. Diversity per hectare at Ayer Hitam Forest for trees greater than 5cm at breast height is high with an average of 212 species per ha. The species found here fall into eleven commodity groups.

Keywords: plant diversity, conservation, Ayer Hitam Forest

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Injection Moulded Door Frame Made from Wood Plastic Composites

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ABSTRACT

Wood plastic composite (WPC) is made of wood fine or flour compounded with plastic at different wood to plastic ratio. WPC is still a very new material relative to the long history of natural lumber as a building material but can be substituted in most instances. Currently, wood plastic composite is extruded to a doughlike consistency and then extruded to the desired shape. However, this extrusion profile has some constraint in design for products that require cross profile and different shape such as curve and bent. Therefore, injection moulded method was used to produce door frame in this study. A major advantage of injection moulded over extrusion is the ability of the material to be molded to meet almost any desired spatial conditions. It can also be bent and fixed to form strong arching curves. This study focus on using the injection moulded method to produce door frame. At the same time, the effect of coupling agents percentage and wood to plastic ratio on WPC were also evaluated to select the best formulation to produce door frame using two different commercial available coupling agents. In this study, commercial polypropylene wood fine and coupling agents premixed in dumper mixer for 30 minutes prior to extrusion process at temperature of 190 °C using 110 mm counter-rotating twin-screw extruder. The WPC boards with size of 150 mm x 150 mm x 3 mm were then injection moulded by 40-ton press moulding machine. From the result, WPC produced from coupling agents Exxelor PO 1020 at 4% significantly performed better in bending properties. Further study on the effect of Exxelor PO 1020 percentage and the wood to plastic ratio showed that, WPC with 65% wood fine performed significantly better in MOR and MOE than other type of WPCs. WPC with 60% wood fine had significantly lower thickness swelling and water absorption compared to those 65% and 70% wood fine WPC. Conclusively, WPC with 65% wood fine is optimum content for WPC to produce from injection moulded method. Higher coupling agent percentage used in WPC formulation gave higher bending properties. Therefore, door frame was produce using WPC with 65% wood fine and 4% Exxelor coupling agents.

Keywords: wood plastic composite, coupling agents, bending, physical, properties

Impacts of Recreation Activities on Growth and Physiological Characteristics of Upper Mountain Vegetation

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ABSTRACT

Understanding ecological consequences of disturbances to vegetation in high elevation vegetation communities, including disturbance from trampling and camping, is important as these environments are easily damaged and can require long periods to recover from even limited degradation. This study was conducted to assess the impacts of recreation activities on Mount Tahan (2187 m a.s.l.); the highest mountain in Peninsular Malaysia by determining the vegetation cover, tree diameter, height, leaf area and chlorophyll fluorescence (CF). Six plots sized 20 m x 20 m were established in camping sites and trekking trails to represent disturbed and undisturbed areas. Two dominant species which are *Tristaniopsis fruticosa* and *Baeckea frutescens* were selected as representative to examine the impacts on the vegetation growth and CF. The total number of plant species recorded was 29 in both camping and trampling areas but was found less in disturbed plots. The analysis of variance shown that there were significant differences between disturbed and undisturbed plots for vegetation cover, growth and CF parameters. For camping, the mean values of vegetation cover were found lower in disturbed plots compared to undisturbed plots but the mean values of tree diameter, height, leaf area and sapwood area were found greater in disturbed plots than in undisturbed plots. For trampling, however, all growth parameters taken in disturbed plots were found lower than undisturbed plots. In contrast, all CF parameters were found higher in disturbed plots for both camping and trampling areas, This study illustrated that some high elevation vegetation community was relatively benefited from camping and trampling activities but it may depend on the degree of disturbance and the nature of the surrounding environment.

Keywords: recreation activities, physiological characteristic, chlorophyll fluorescence, upper mountain

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Tool Wear Characteristics of Oil Palm Empty Fruit Bunches (EFB) Particleboard

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ABSTRACT

A series of machining experiments on Oil Palm Empty Fruit Bunch (OPEFB) particleboard were carried out using a CNC router, to evaluate its tool wearing properties, in comparison to the conventional wood-based particleboard. A single-fluted tungsten-carbide router bit (12mm ф, 18 000 rpm), with a rake angle of 15^{o} was used in this experiment. The depth of cut and feed speed used were 1.5 mm and 4.5 m min^{-1} , respectively. The router bit machined the edge of the board, moving along its full length before returning to repeat the cycle. The tool was examined for the extent of wear after ever 100m of length of cut, by taking mould impressions of the tool. At final tool failure, the tool edge was examined under a stereo-microscope to ascertain the extent of wear and mode of wear. The result found that the tool wear pattern observed in this study, was similar to that obtained with the wood-based particleboard, but the former was twice more abrasive compared to the latter. Microscopic examination of the cutter edge revealed greater incidence of micro-fracture when cutting the oil palm based particleboard, indicating the presence of hard impurities, especially silica, in the OPEFB particleboard. The wear pattern reflected three distinct stages, an initial rapid wear state, followed by a steady wear state, and finally an accelerated wear state prior to complete failure. This tool wear pattern obtained from this study reaffirms the fact that the wear of tungsten carbide tools follows three distinct stages of wear. From an economic perspective, the tooling cost for machining oil palm based particleboard is shown to be twice of the cost for machining wood-based particleboard. This study shows that the machining properties of oil palm based particleboard will be a primary concern, if the board is to find widespread application as a potential substitute for wood-based particleboard.

Keywords: oil palm, particleboard, tool wear, micro-fracture, process economics

Evaluating the Suitability of Oil Palm Empty Fruit Bunches (EFB) Particleboard As a Furniture Material

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ABSTRACT

Empty fruit bunches (EFB) is a readily available waste fiber resource from the oil palm industry and is suitable for particleboard production. However, the lack of information on its working properties, especially machining and finishing, is limiting its use for value-added products manufacturing, such as furniture. Hence, to evaluate its market potential as a furniture material, a series of laboratory experiments and a detailed market survey were undertaken in 2007 – 2008. In evaluating the OPEFB particleboard's machining properties, a series of experiments were carried out using a CNC multi-function machine, to evaluate the sawing, routing and boring characteristics of the oil palm particleboard. The result found that the resultant machined surface of the oil palm particleboard was improved markedly when machining at high cutting speeds (> 20,000 RPM), which significantly reduced the incidence of machining defects such as tear out and chip out on the panel. Further, in evaluating the surface smoothness of the OPEFB particleboard, it was found that the inherent surface roughness of the material was almost 2X, more than the conventional wood-based particleboard. Hence, abrasive sanding processes using a three grit sequence of 120 – 150 – 180 was necessary, in order to achieve the desired level of surface smoothness on OPEFB particleboard. Further, in evaluating the finishing characteristics of the OPEFB particleboard, a series of finishing trials using nitrocellulose, acid-curing and polyurethane lacquers were used as the coating material. The results found that acceptable finish quality with the desired level of smoothness and sheen was obtained only when using poly-urethane lacquer at a dry film thickness of 350 microns. This was due to the uneven surface profile and the inherent roughness of the OPEFB particleboard. From the market survey carried out during the Malaysian International Furniture Fair (MIFF), it was found that although OPEFB particleboard was acceptable as an environmental friendly material, its poor machining and finishing properties limits its application to unexposed areas, such as upholstered furniture. Therefore, the success of the OPEFB particleboard as a furniture material will be driven primarily by its cost competitiveness and its environmental friendly status.

Keywords: oil palm, particleboard, furniture, machining, finishing, marketing, environmental friendly

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Disperg HEPACT

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ABSTRACT

This software can be used for assessing chemical released, dispersion of all types vapour behaviour and particulates. The code utilizes Visual Basic (VB) which purposely to simulate dispersion of toxic and hazardous gases such as dioxin, phosgene, hydrogen sulphide, chlorine methane etc. This software would be useful to assess the air quality and predict the impacts to the environment and health. Furthermore it capable in estimating the consequences of possible hazardous dense gas in a fast and reliable way. This software running under Windows operating system (95, 98, NT, XP and Vista) and the codes are built using Visual Basic language (VB).It is integrated using Google Map to create a flexible interface with the concerning location for better visualisation. This will be useful in process decision making for risk management, land-use planning, determination of exclusion of hazardous installations, locating suitable location of landfill, hazardous waste disposal area and for development of emergency response plan (ERP). Results of calculations using the software can be presented in tabularized form or in graphical presentation, can be saved and transferred (exported) to Excel, Image and Google Map for further analysis and assessment.

Keywords: dispersion, gas, particulate, virtual basic, google map

Resiliency of Insectivorous Birds to Edge Effect in an Isolated Tropical Rainforest

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ABSTRACT

Edge effect has great impacts on the persistence of bird species in isolated forests. Insectivorous birds are thought to be more specialized and thus, more sensitive compared to other groups of birds. We examined the abundance and density of insectivorous birds along with edge-interior gradient in an isolated lowland tropical rainforest in Peninsular Malaysia. A technique named Distance Sampling Point Count was used in the study conducted between May 2007 and April 2008. Results showed that there was a significant difference in overall insectivorous species abundance among different distances from edge. Among the five super-abundant species, Striped Tit-babbler showed a significant decrease in the number observed from forest edge to the interior. Among the four sub-guilds belong to the insectivores, the arboreal foliage gleaning insectivores showed a significant decrease in number from edge to the forest interior. Moreover, the terrestrial insectivores were significantly more abundant at the forest interior compare to the forest edge. Analysis of density showed that the density of insectivorous species was highest at 400m from edge. Among the sub-guilds, the density of arboreal foliage gleaning insectivore was highest while terrestrial insectivore was lowest. Striped Tit-babbler had the highest density among the insectivores. Our findings indicate the edge effect and habitat isolation affect bird community and that these factors threatened many species. With continue deforestation and habitat isolation in Peninsular Malaysia, we predict more bird species will be adversely affected by edge effects.

Keywords: edge effects, understorey birds, feeding guilds, abundance, density

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Reclassifying Forest Type to a New Forest Class based on Vegetation and Lithology Characteristics using Geographic Information System at Southern Johore, Malaysia

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ABSTRACT

Recently forest resources management with regard to precision forestry concept has been highlighted by forest managers in order to fulfill the demand on quality and reliable information about forest area. According to the Malaysian National Forestry Act 1984, forest is classified into several types by general classification which is based on vegetation types broadly into dipterocarp forest, peat swamp forest and mangrove forest. In applying precision forestry approach, details classification and information are required to render more accurate about managed forest. Therefore, this study was carried out to reclassify forest type to a new forest class based on vegetation and lithology characteristic using GIS technique. Ten new classes were successfully generated and mapped by fusing layer of forest vegetation types and lithology layer in Southern Johore, namely Dipterocarp-Igneous, Dipterocarp-Sediment, Dipterocarp-Alluvial, Peat-Igneous, Peat-Sediment, Peat-Alluvial, Mangrove-Igneous, Mangrove-Sediment, Mangrove-Alluvial and Limestone forest. In this study, Syzygium spp. (19.83 %) was found in abundance in two new forest classes; Dipterocarp-Igneous and Dipterocarp-Sediment forest in Hulu Sedili Permanent Forest Reserve (PFR). Beside that, Elateriospermum tapos (9.92 %) and family of Lauraceae (7.22 %) were found to be the most dominant species in the Dipterocarp-Sediment forest, while Macaranga spp. (11.21 %) and Elateriospermum tapos (11.02 %) found dominant in Dipterocarp-Igneous forest. From the sample plot, Dipterocarpaceae family constituted only 3.09 % whereas the non-Dipterocarpaceae family was 96.91 %. Hence, this study indicated that there is variation in species dominancy at different lithology of the same forest vegetation site.

Keywords: geographic information system, reclassify, new forest class, precision forestry, dominant species

Historical and Current Legislations of National Park (*Taman Negara*) Peninsular Malaysia

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ABSTRACT

The study was conducted to discuss the historical and current legislation pertaining to the establishment and administration of the *Taman Negara* National Park, Peninsular Malaysia. Established in 1938 and 1939 as King George V National Park, the park was named *Taman Negara* National Park after independent in 1957. Estimated to be 130 million years old and with an area of 4,343 sq kilometers, the highest mountain in the peninsular, Gunung Tahan (2,187 meter) is allocated in the area. *Taman Negara* National Park is a combination of three protected areas in three states, Taman Negara Pahang National Park, *Taman Negara* Kelantan National Park and *Taman Negara* Terengganu National Park. Currently all the three states has its own legislation, namely Taman Negara Enactment (Pahang) No.2, 1939 [En.2 of 1938], Taman Negara Enactment (Kelantan) No.14, 1938 [En.14 of 1938] and *Taman Negara* Enactment (Terengganu) No.6, 1939 [En.6 of 1358]. In Malaysia, some laws are federal legislation. Others are state enactments. Not all legislation enacted will apply to the whole Peninsular, the state of Sabah and Sarawak. To provide for the establishment and control of National Parks and for matters connected herewith, the Federal National Parks Act (Act 226) was introduced in 1980. This federal act shall not apply to the three states. Since this is the constitutional position, constraints especially on uniformity of laws either to promote or enforced, particularly in respect matters stated and List 1 Federal List (Ninth Schedule of Article 74, 77 Legislative Lists), List II – State List (Article 95B (1) (a) and List III – Concurrent List (Article 95B (1) (b) often exists. Thus, there are some matters which the National Parks fall under the legislative authority of both the Federal and State Governments. However, forestry and land fall under the jurisdiction and legislative authority of the state in accordance with the Concurrent List of the Ninth Schedule. The areas of jurisdiction of Federal and State Governments as defined in the Constitution lead to non-uniform implementation of rules and regulations between states. The objective of this paper is to review the laws and legislation pertaining to the management of the National Park in Peninsular Malaysia. Specifically the constraints arises between the federal and states jurisdiction toward the management of land and conservation of the protected area.

Keywords: *Taman Negara* National Park, protected areas, historical, legislations, gazettement

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Temporal Analysis of the Keetch-Byram Drought Index in Malaysia: Implications for Forest Fire Mangement

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ABSTRACT

In this study, daily KBDI values were calculated and temporal trends were analyzed at four selected stations; Kota Bharu, Kuching, Sandakan and Subang in Malaysia for the period 1990-1995 using a KBDI software. The highest monthly mean KBDI values were 1550 in February, 1120 in July, 1355 in April, 1370 in July and the lowest were 380 in November, 240 in January, 380 in December, 680 in December at Kota Bharu, Kuching, Sandakan and Subang, respectively. In the frequency analysis, Kota Bharu had 773 Moderate Fire Danger (MDD) days and 684 Low Fire Danger (LFD) days. Kuching had 1497 LFD days and 120 High Fire Danger (HFD) days while Sandakan had 1056 LFD days and a$@$ HFD days. Subang had 926 MFD days an 366 HFD days. In terms of forest fire management perspectives, the Kota Bharu station faces higher risk in January compared to the other stations in the same month. On the other hand, areas within the Kuching station faces the lowest risk of fire in January compared to the other stations in the same months.

Keywords: forest fire, KBDI, fire danger index, drought, fire risk

Short Run and Long Run Analysis of Domestic West Malaysian Log Market

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ABSTRACT

The global demand for timber products will continue to grow in line with increasing population and economic development especially in many developing countries. Simultaneously, forest ecosystem plays important roles in the environmental services such as carbon sequestration, recreational, water catchments, wildlife reserve and soil protection. Therefore, Malaysia is committed in implementing Sustainable Forest Management (SFM). The forest are harvested in a sustainable manner by adopting the method of reduce impact logging practices. This resulted to diminishing supply of logs to downstream timber industry. The West Malaysian log supply is in deficit since 1995. This has significant impact on major timber products. They have moved from resources surplus to one of deficit in Malaysia. Therefore, it is interesting to know the behaviour of West Malaysian log market with the implementation of SFM policy. The results indicate that full adoption of SFM could lead to substantial reduction of supply. Furthermore, a sustained price increase in the long run does not seem to have significant impact on the demand side. In conclusion, the ongoing adaptation of West Malaysian forestry to the standards of the SFM certification programs could have substantial effects only on the log supply. This will probably influence the scheme of forest plantation establishment in sustaining the West Malaysian forest sector.

Keywords: sustainable forest management (SFM), supply and demand of logs, autoregressive distribution lag (ARDL)

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Distribution and Sources of Polycyclic Aromatic Hydrocarbons (PAHs) in Core Sediment Samples Collected in South China Sea

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ABSTRACT

The South China Sea is the largest sea. It is rich in natural resources like oil and natural gases. It is also has a strategic location where is a busy traffic for many ships. Sediment is a great tool for the investigation of trace contaminants such as PAHs in aquatic systems due to their huge affinity for particulate and organic matter, and their relatively long persistence in the environment.30 core sediment samples were collected from South China Sea using Ekman Dredge. Those samples were extracted and fractionated before we analyzed them for polycyclic aromatic hydrocarbon (PAHs) by using Gas chromatography-mass spectrometry (GC-MS). PAHs are the most important persistent organic pollutant. They are introduced to aquatic environments through accidental oil spills, discharge from routine tanker operations. In other case, land based pollutant are contributed by rainfall and runoff waters. The possibilities to found the concentrations PAHs in core sediment samples are highest compared to other matrixes because PAHs are lipophilic and hydrophobic. PAHs are tends to particulate into sediment rather than water or air. Environmental forensic technique, molecular ratio is used to determine the link between pollutant and anthropogenic sources; petrogenic and pyrogenic. Molecular ratio consists of several types, generally Low Molecular Weight over High Molecular Weight (LMW/HMW) and methyl alkylated to parent. If the ratio of LMW/HMW is more than one indicates pyrogenic sources while ratio less than one shows petrogenic sources. The total PAHs concentration of the marine sediments range from 79.74 ng/g to 1481.09 ng/g dry weights. The concentration level of PAHs in the South China Sea is indicated as low to moderate contamination in relation to the global PAHs sedimentation records. These studies should be conducted from time to time to monitor the PAHs contamination in the marine environment.

Keywords: polycyclic aromatic hydrocarbons, South China Sea, persistent, molecular ratio

Sustainable Forest Management and West Malaysian Sawntimber Supply Analysis

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ABSTRACT

This paper examines the dynamic effects of sustainable forest management (SFM) on the West Malaysian sawntimber supply. Both short run and long run effects on sawntimber supply are studied using a multivariate cointegration analysis. The proxy of SFM variable is permanent forest reserve. It is expected as an exogenous negative shock in the sawntimber supply. In general, given the fact that West Malaysian sawntimber supply is decreasing since 1990s, the results show that sawntimber supply is statistically influenced by SFM practices. Furthermore, reducing of harvested area of forest has significant effect on sawntimber supply decreases. While in the short run, the results suggest that there are negative impacts of SFM practices on sawntimber supply at 10 percent significant level, in the long run, the result is significant at 1 percent level. This may to some extent pull down the West Malaysian sawntimber supply together by bringing the forest harvests to sustainable level.

Keywords: sustainable forest management, sawntimber supply, cointegration analysis

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Photodegradation of Polycyclic Aromatic Hydrocarbon Pyrene by Iron Oxide in Solid Phase

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ABSTRACT

Polycyclic aromatic hydrocarbons (PAH) are pollutants produced via natural and anthropogenic sources, generated during the incomplete combustion of solid and liquid fuels or derived from industrial activities. They are ubiquitous pollutants that occur in the nature and are harmful to living organisms in the environment and human being due to their high degree of mutagenicity and carcinogenicity. To better understand the photodegradation of PAH in solid phase in natural environment, this study examined the influencing factors, kinetics and intermediate compound of PAH pyrene photodegradation by iron oxides. The results showed that among the various iron oxides tested, the degradation rate followed the order of goethite (a-FeOOH) > hematite (a-Fe_2O_3) > lepidocrocite (γ-Fe_2O_3) > maghemite (γ-FeOOH) under the same reaction conditions. Lower dosage of a-FeOOH and higher light intensity increased the photodegradation rate of pyrene. Iron oxides and oxalic acid can set up a photo-Fenton-like system without additional H_2O_2 in solid phase to enhance the photodegradation of pyrene under UV irradiation. All reaction followed first-order reaction kinetics. The half life ($t_{1/2}$) of pyrene in the system showed higher efficiencies of using iron oxide as photocatalyst to degrade pyrene. Intermediate compound pyreno was found in the photodegradation reactions using gas chromatography-mass spectrometry (GC-MS). The intermediate compound was different from those reported for photodegradation efficiency for PAHs in this photo-Fenton like system was also confirmed by using the contaminated soil samples. This study, therefore, provides useful information to develop efficient and low cost photochemical remediation techniques for PAH contaminated soils under natural conditions since goethite, oxalate and light exist in natural environment.

Keywords: photodegradation, PAH, pyrene, iron oxide, solid phase

Public Attitudes and Perceptions Toward Forest Fire in Selangor, Malaysia

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ABSTRACT

This study attempted to assess the attitudes and perception of three groups of people affected by forest fire i.e public, fire fighters and villagers affected by forest fire. Likert questionaire is used to elicit repondents attitudes and perception by asking the degree to which the individual agree or disagree with the statement. Respondents from all three groups agreed that forest fire would cause air pollution, soil erosion, green house effect and thick haze, so indirectly cause disease like asthma, respiratory disease, skin infection. Villager affected by forest fire supported immediate fire suppression and agree that forest fire is a big problem in this country. However the public and fire fighter did not agree with this perception. The findings from this study will help the relevant authorities to formulate fire prevention and educational campaign.

Keywords: forest fire, attitudes, perceptions, fire fighters, forest fire management

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Microbial Study of Different Types of Sewage and Effluent as a Tool for Source Identification using PCR-DGGE

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ABSTRACT

The rapid growing of agriculture industry in Malaysia has brought a controversial situation to Malaysia watershed, especially pig farming, chicken farming and palm oil mill industry which have a high loading in organic pollutants. Langat River is flowed through States of Selangor which is a heavily populated area and the quality of the river continuously degrades by human activities. The direct discharging of livestock and poultry sewage to the river or drain can lead to non-point source pollution. The break down in Sewage Treatment Plants (STPs) and incomplete treatment processes may lead to discharging the low quality effluent into the river. Various bacteria are found in the digestive tracts and feces of wild and domestic animals and humans. Some of these bacteria, i.e. fecal coliforms, E. coli (the predominant member of the fecal coliform group), and Enterococcus spp., are used as indicators of fecal contamination in natural waters. The indicator bacterial are found in warm-blooded animals in high numbers, and their presence in natural waters generally indicates faecal pollution and potential presence of pathogenic microorganisms. However, the presence of these bacteria in aquatic environments does not provide definitive information regarding their possible sources. The sewage and effluent from different sources will then cross-contaminate the river and the problem causing sources are never known. Therefore, host-specific bacteria can be used as a genetic tool to detect microbial contamination sources by using PCR-DGGE analysis, through a process of screening nucleic acids from different sources to identify molecular targets. The present study is the first study on the application of microbial community based on 16s rRNA to assess the microbial contamination and determine the sources. The study is important to help in elimination of the microbial contamination and minimise the impact on human disease.

Keywords: sewage, PCR-DGGE, source identification

A Comparison Analysis of Logging Cost between Conventional and New Harvesting Operation

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ABSTRACT

The operational application of the ‘Logfisher’ technology and system were undertaken at Sungai Betis, Gua Musang Forest Reserve in 2007 as an alternative to existing logging technologies. It has since been widely accepted and acknowledged as an efficient and cost effective alternative to existing low and reduced impact logging technologies such as skyline, Mobile Tower Yarder and Helicopter. This paper examined the various committed new and improved logging activities ascribed in the Reduce-Impact Logging (RIL) particularly using ‘Logfisher’ rather than Conventional Logging (CL). The incremental cost of implementing this new logging system was appraised using cost accounting data gathered from the Telemont Sdn. Bhd project in Gua Musang, Kelantan, Malaysia in 2007. These activities contributed to substantial incremental costs of compliance were on road construction and ‘Logfisher’ timber harvester. While the remaining activities, represent huge deduction cost especially in skidding because there is no skidding activity needed in RIL area. The distribution of changes in cost by compliance with new logging system was also identified in the form of RM/ha and RM/m^3. Finally, the percentage of change in cost of both RIL and CL activities were presented.

Keywords: reduce impact logging (RIL), conventional logging (CL), ‘logfisher’, cost of harvesting activities

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Distribution of Ni and Zn in the Surface Sediments Collected from Drainages and Intertidal Area in Selangor

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ABSTRACT

Surface sediments were collected from 11 sampling sites in the intertidal and drainages of Selangor. The sediment samples were analysed for Ni and Zn. The metal concentrations ranged from 15.1 to 121 μg/g dry weight for Ni and 50.2 to 336 μg/g dry weight for Zn. The highest total (Ni and Zn) concentrations in sediments were found at an industrial site in Serdang. The Ni and Zn ranges found from this study were wider and higher than those reported previously from Malaysia. Generally, the ‘oxidisable-organic’ fraction contributed the largest percentages of metals among the other three anthropogenic-related fractions. This study shows that the non-resistant fraction dominated the total Zn based on sequential extraction technique. Some sites had higher percentage (>50%) of non-resistant fraction of Ni and Zn, indicating anthropogenic sources of these metals. Therefore, it is suggested that a continuous monitoring of the study areas should be implemented especially at industrial area at Serdang. Perhaps, the industrial waste must be treated before draining in the waterways.

Keywords: surface sediments, drainages, intertidal area

Assessment of Sewage Contaminants using Linear Alkylbenzenes (LABs) in Sediments Collected from South China Sea

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ABSTRACT

Linear alkylbenzenes (LABs), which have been proposal as markers of the hydrocarbon component of domestic and industrial wastes measured in sediment cores from South China Sea. This is to determine the concentration and compound in the samples. The LABs concentration in sediments collected from South China Sea ranged from 315.61 ng/g to 880.17 ng/g. Internal and external ratio can be used to determine the degradation rate of LABs compound. Low I/E ratio :low degradation rate, so I/E ratio increase during transport in aquatic environment.

Keywords: sewage contaminants, linear alkylbenzenes

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Knowledge-based System for River Water Quality Management

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ABSTRACT

River water quality refers to the physical, biological, and chemical status of water bodies. Urbanisation, population density, water shortages and pollution strongly influence the water quality (Cheng et.al. 2003). The water quality downstream is related to the proper management of the river basin and the adequacy of treatment plant within the basin concerned. Data on river water quality parameters are gathered consistently to enable the assessment of the status of the water quality be determine. However, an effective method of extracting value added information from these data to facilitate decisions on the implementation of cost-effective pollution prevention measurements to safe guard people, livestock and industrial development in a region remains a problem (Vrtačnik et.al 1992). Often deterioration of water quality caused by discharges from untreated industrial and municipal wastewater, surface and agriculture runoffs, spill of hazardous substances, illegal discharges of industrial waste and development activities in the water catchments area does not take into consideration the assimilative capacity of the river to self purified the pollutant that has been discharge into the river, thus incremental discharge of various pollutant from any sources will eventually lead to the ‘death’ of the river. Two extremes condition must be considered in managing river basin; disregard the generally severe damage to the aquatic ecosystems and the impairment of the utilisation of the water due to direct discharge of untreated wastewater, or treatment of all the wastewater streams discharging in the receiving waters, at the highest quality level. And in-depth knowledge in this area is crucial to develop an effective management tool for solving environmental problem. An effective knowledge management tool will enhance decision making process and employing computer based-technology to capture knowledge and human expert knowledge has moved knowledge management front and centre.

Keywords: knowledge-based system, water quality, load duration curve, pollutant load

Distribution of Alkanes, Hopanes and Polycyclic Aromatic Hydrocarbons (PAHs) in Selected Sediments of Sarawak River and Inanam River, East Malaysia

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ABSTRACT

Rivers in Malaysia are important for fisheries, recreational activities, tourism, and maintaining biodiversity. However, the rivers are under constant threat of various pollutions. One of the major threats is persistent organic pollutants such as polycyclic aromatic hydrocarbons (PAHs). Low molecular weight PAHs results in acute toxicity while high molecular weight PAHs results in chronic toxicity and may be carcinogenic and mutagenic. Sediments samples from total of 18 stations in Sarawak River and Inanam River were analyzed for alkanes, hopanes and PAHs. Street dust, asphalt, tire rubber, fresh crankcase oil and used crankcase oil were also collected as source materials. Sediments samples and other source materials were dried with baked anhydrous sodium sulphate and soxhlet extracted for about 9 hours using distilled dichloromethane. The extracts were purified and fractioned using two-step silica gel column chromatography. The samples were analyzed with gas chromatography equipped with mass spectrometer (GC-MS). The sources of pollution in selected sediments were identified based on methylphenanthrene to phenanthrene ratio (MP/P) and other diagnostic ratios by comparing with the source materials. The ratios were calculated to distinguish petrogenic and pyrogenic sources of PAHs.

Keywords: sediments, alkanes, hopanes, polycyclic aromatic hydrocarbons, sources

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Fungi as Bioremediators: An Alternative Treatment for Heavy Metal in Wastewaters and Soils

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ABSTRACT

Heavy metal (HM) contamination in soils and wastewaters is brought about by rapid urbanisation, industrialisation, technological innovations and anthropogenic activities. It is currently one of the world's major environmental problems which gives rise to health risks, ecosystem damage and may impair the human race in generations to come if left unchecked. Removal of HM from water-bearing wastewaters in major parts of the world is by physico-chemical process (ultrafiltration, electrodialysis and reverse osmosis) or the use of adsorption on activated carbon before discharging the effluents into natural water-body systems. Both systems are limited by high costs, process complexity and low removal efficiency of membrane processes. This leads to the search for an alternative method of treatment which is low-cost, non-hazardous and easily available sorbents of HM. Some fungi are able to survive and accumulate both heavy and toxic metals under conditions that are lethal for other biota, thus creating a niche for biological remediation (bioremediation). This investigation isolated such fungi based on toxicity tests on solid and in liquid media amended with heavy metals Zn, Cu, Pb and Cd. The EC_{50} and EC_{90} of the fungi were determined. Results showed isolates *Trichoderma atroviride*, *Trichoderma* sp. and *Aspergillus niger*, identified by molecular means, to consistently perform way above-average tolerance to Cu, Zn Pb and Cd up to 5000ppm per metal on agar media at 10 days incubation. The EC_{50} values for Cu(II) and Cd(II) for all 3 fungi were better than those reported for microfungi thus far. The lab studies currently focuses on the selection and formulation of an efficient, cheap and non-hazardous carrier of the selected fungi (or consortium of fungi) and use them at point of source whether in soil or at industrial point of discharge before they are released into natural water bodies.

Keywords: heavy metals, contamination, bioremediation, fungi

Revealing Padawan Rich Orchid Flora and What's Next?

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ABSTRACT

Padawan district is covered mostly by limestone hills and outcrops known as Padawan Formation. This limestone area is considered wet with the average annual rainfall of 4069.5 mm, humidity of 85.4% and mean 24 hours temperature of 26.2° C. The climatic features above combined with the well drained thin layer of humus covering the rock surfaces provides the unique and favourable condition for orchid's growth that contributes to its high diversity in this area. Our study for the past 10 years covers all the known limestone hills in Padawan, through random sampling along existing and newly made jungle trails. To date, a total of 285 species in 68 genera of orchids have been identified with 127 species are new to Padawan, 16 species new to Sarawak, 16 species are endemic to Padawan, 3 species are critically endangered in the wild and probably 2 species might be new to science which requires further investigation and confirmation. Due to the nature of sampling technique, the studied area merely covered about 20% of the total land area of Padawan which entice us to wonder further on how many more orchid species could there be if only we could study all the accessible area. Therefore our future work in Padawan are to include a systematic plot setting to determine diversity index, DNA barcoding for rare, endangered and endemic species, to access their population size and to propose mass propagation so that pressure on the wild population could be reduced. These future works are aimed to evaluate the conservation status of these orchids which could be utilized to ascertain their future existence either *in situ* or *ex situ* depending on which is more valuable to the authorities concerned, the limestone quarrying or the unique flora and fauna diversity in Padawan limestone area.

Keywords: Padawan, orchids, diversity, future and conservation

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Distribution of Linear Alkylbenzenes (LABs) in Selected Sediments of Kuching and Kota Kinabalu Rivers

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ABSTRACT

A study was carried out at some selected coastal areas of Kuching river in Sarawak to determine the concentration of linear alkyl benzenes (LABs) in coastal sediments. LABs have been used as a molecular marker to detect sewage pollution in aquatic environment. Nine surface sediment samples and 5 samples (Bitumen, street dust, tire rubber, fresh crankcase oil, and used crankcase oil) Were chosen for each point was analyzed. Also I still have number of samples from Kota Kinabalu River. The determination of types and concentration of Linear alkylbenzen were analyzed using Gas Chromatography-Mass Spectrometry (GC-MS). Linear alkylbenzenes (LABs), which have been proposal as markers of the hydrocarbon component of domestic and industrial wastes measured in sediment surface from Kuching river in Sarawak. This is to determine the concentration and compound in the samples. To quantitatively express the isomer composition, a ratio of internal to external isomers (I/E ratio) has been proposed as an index of the degree of LAB degradation.

Keywords: linear alkylbenzenes, sediments, Kuching and Kota Kinabalu rivers

Mangrove Sediments: The Source or Sink of Polycyclic Aromatic Hydrocarbons (PAHs) Contamination?

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ABSTRACT

Mangrove ecosystems in Malaysia especially along the coastline that facing the Straits of Malacca such as Rembau-Linggi estuary are exposed to anthropogenic contamination of polycyclic aromatic hydrocarbons (PAHs) from tidal water, river water and land-based sources due to the increasing of industrialisation and urbanisation. Moreover, anthropogenic activities in marine environment such as oil spill and leakage from boats and ships might harm and affect the mangrove ecosystems due to transportation of particulate matters that partition with the PAHs to the mangrove sediments which has unique features such as rich organic carbon and anoxic conditions. The results of the study will show the distribution and sources of PAHs in mangrove sediments thus explain the changes in PAHs mangrove surface sediments with time. In addition these will demonstrate the effect of PAHs on mangrove plant as PAHs being uptake from sediments to the mangrove plant through pneumatophore root, since used lubricating oil (petrogenic source of PAHs) could destroy conducting tissues, especially those in fine roots. These are important as it will ultimately help to quantify the current concentration of this compound in Malaysian mangrove ecosystems since mangrove have been given more attention after the tsunami tragedy.

Keywords: PAHs, mangrove, sediments, pneumatophore root, organic carbon

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Effects of Fertiliser on Growth and Physiology of *Hibiscus cannabinus* L. (*Kenaf*) Planted in Bris Soil

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ABSTRACT

Kenaf (*Hibiscus cannabinus* L.) is one of the most potential annual crops planted throughout the world. It is a highly productive, warm-seasonal C3 annual crop, fast growing and multipurpose. It has been utilized as a substitute of jute as well as for the production of pulp and paper. With strong and long fibre yield, mass production of Kenaf throughout Malaysia is critical. The utilisation of less fertile soils such as BRIS soils is important to increase the Kenaf production throughout Malaysia. Thus, the objective of this study was to examine the effects of different fertilizer applications on photochemical efficiency, growth and gas exchange parameters of Kenaf planted in BRIS soil in the dry and wet seasons. V36 variety was used and planted in three different plots treated with different rates of fertilizer namely high (1960 kg/ plot), medium (1260 kg/ plot) and low (700 kg/ plot) where each plot comprised 106,000 trees. The antagonistic effects of different rates of fertilizer application were found for photochemical efficiency (F_v/F_m) where higher application of fertilizer level resulted in lower value of F_v/F_m. However, contrasting results were found for growth and gas exchange parameters. Significant effects of fertilizer were observed for diameter, height, leaf number and area as well as biomass during wet season. The correlation analyses between diameter, height and total aboveground biomass were more pronounced in the wet season. The absolute growth rate (*AGR*), relative growth rate (*RGR*) and growth efficiency (E_G) calculated from the differences between the first and second readings for aboveground biomass showed that the higher rate of fertilizer application recorded greater values of *AGR* and *RGR*. However, no trend was observed for E_G. Overall results suggested that the medium fertilizer rate can maximize the production of Kenaf planted in BRIS soils effectively.

Keywords: *kenaf*, fertiliser, photochemical efficiency, growth, physiology and BRIS soil

Distribution of Heavy Metal Concentrations (Cd, Cu, Ni, Fe And Zn) in the Different Soft Tissues and Shells of Wild Mussels *Perna viridis* Collected from Bagan Tiang and Kuala Kedah

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ABSTRACT

Concentrations of Cd, Cu, Ni, Fe and Zn were determined in the *Perna viridis* populations collected in April 2005 from Bagan Tiang and Kuala Kedah. The ranges of Cd, Cu and Zn found in this study were lower than the maximum permissible limits set by Malaysian Food Regulations 1985 and other established guidelines. Therefore, the consumption of wild mussels collected from Bagan Tiang and Kuala Kedah should pose no acute toxicological risks of Cd, Cu and Zn to humans. Despite the apparently low concentrations of Cd, Cu, Fe, Ni and Zn in the different soft tissues of *P. viridis* collected from Bagan Tiang and Kuala Kedah, from a public health risk perspective, the data suggest the need for continued monitoring of heavy metal pollution in the mussels.

Keywords: heavy metal concentrations, soft tissues, shells, wild mussels, Bagan Tiang, Kuala Kedah

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The Orchids of Cloud Forests in Gunung Ulu Kali, Genting Highlands, Our Depleting and Vanishing Natural Heritage, and an Alarm from Global Warming

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ABSTRACT

Cloud forests in Malaysia are restricted to mountainous region of the country. The present paper reports on orchid’s species diversity in Gunung Ulu Kali which is within 1 km radius of the famous, most developed highland regions in the country. In 2006 alone, Genting Highlands was visited by a total of 18.4 million visitors, the loading that Genting Berhad needed to accommodate through constructions of new roads, hotel buildings and other entertainment infrastructures. The developments undeniably had affected the local climate and environment especially the areas within 2km radius of the resort. The most glaring fact is the raise of temperature that has directly affected the plant communities previously flourish in this area. Stone, 1978 reported that temperature ranges from about 10^0C at night to as high as 23^0C during the day as compared to currently recorded at 16^0C to 24 – 25^0C, a sign of global warming. Stone (1978) established nine sampling plots and we revisited and inventoried orchid species at all the sites. A total of 38 or (60.3%) from 63 species of orchids listed by Stone (1978) were recollected. Nevertheless, an additional 7 species were identified as new records from Gunung Ulu Kali. The missing taxa could be due to (i) the forest destruction occurred in 3 of the plots which are left almost totally barren or covered with piles of constructions debris, (ii) perished due to inability to adapt to environmental changes, (iii) over collected by orchid enthusiast, and (iv) trample upon by heavy traffic of nature joggers and trackers. The new additional taxa could be (i) those identified up to genus level by Stone, (ii) was not collected during his study, and (iii) species from lower elevation moving up as local climate becomes favourable for them to thrive.

Keywords: cloud forests, orchids diversity, climate change, Gunung Ulu Kali

A Model-based Approach for Mapping Rangelands Covers using Landsat TM Image Data

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ABSTRACT

Empirical models are important tools for relating field-measured biophysical variables to remotely sensed data. Regression analysis has been a popular empirical method of linking these two types of data to estimate variables such as biomass, percent vegetation canopy cover, and bare soil. This study was conducted in a semi-arid rangeland ecosystem of Qazvin province, Iran. This paper presents the development of a regression model for predicting rangeland biophysical variables using Landsat TM nonthermal bands original image data. The biophysical variables of interest within the rangeland ecosystem were percent vegetation canopy cover, bare soil extent, and stone and gravel which their correlation were analyzed in relation to Landsat TM original data. The results of applying stepwise multiple regression showed that there is a significant correlation between Landsat TM band 2 reflectance values and biophysical variables. The developed models were applied to Landsat TM band 2 and relevant maps were generated. We concluded that such problems as an inexact location of field samples on the image, small size of samples, vegetation heterogeneity may significantly affect modeling of real rangeland Landsat TM data relationships.

Keywords: biophysical variables, empirical model, multiple regression, rangeland, remotely-sensed data

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Anthropogenic Waste Indicators (AWI) particularly PAHs and LABs in Langat River: Application of Earthworms as Bio-indicators for Identifying Anthropogenic Pollution

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ABSTRACT

Environmental Forensics involves the identification and source apportionment of the compounds in environmental samples to Anthropogenic Waste Indicators (AWI). AWIs are man-made waste which consists of chemical compounds originating from pharmaceuticals, detergent metabolites, pesticides and industrial products. However, this project focuses on analyzing the utility of biomarker compounds, Polycyclic Aromatic Hydrocarbons (PAHs) and Linear Alkylbenzenes (LABs) in earthworms to gauge the sources of anthropogenic waste at the Langat River. PAHs are listed by United States Environmental Protection Agency (US EPA) as priority pollutants due to its toxicity and persistency in the environment. Determining the anthropogenic sources of PAHs is a frequent forensic task. Predominantly, there are two different anthropogenic sources (i.e. combusted/pyrolyzed fossil fuels versus spilled petroleum) or ‘pyrogenic’ and ‘petrogenic’. LABs are studied in this project as a molecular marker for municipal wastewater pollution. LABs are hydrophobic and will be accumulated in sediments and biological tissues. Earthworms are excellent bio-indicators of the relative health of ecosystems as they are: (1) large in number, relatively immobile and easy to sample, (2) full contact with the substrate and consume large volumes of this substrate, (3) high resistance to toxic chemicals but their growth, fecundity and behaviour are affected, (4) their ability to bio-accumulate some chemicals in their tissues. In addition, earthworms occupy a low trophic position in the food web and can facilitate the movement of organic soil contaminants into higher trophic levels by consuming soil particles. Sampling methodology of this study includes careful selection of sampling sites along riverbank of Langat River and usage of 0.2% formaldehyde as expellant for earthworms. Laboratory procedures would involve depuration, homogenisation, lipid determination and soxhlet extraction of earthworms followed by fractionation of PAHs and LABs using two-step silica gel-column chromatography. The extract is analysed with gas chromatography equipped with the mass spectrometer (GC-MS).

Keywords: earthworms, polycyclic aromatic hydrocarbons (PAHS), linear alkyl benzene (LABs), bioaccumulation factor (BAF)

Identification of Potential Ornamental and Medicinal Canopy Plant Species and Optimisation of Culture Media and Techniques for Mass Propagation

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ABSTRACT

Canopy plants or epiphytes are among the least studied plant communities in terms of their potential uses ad economic importance. Our study for the past years focuses on identifying species with ornamental demands and possible medicinal properties. A total of 30 species has been identified for mass propagation through tissue culture. Fifteen species are orchids, 7 species are ferns and lycophtes, 4 species are aroids, 2 species of gingers and 2 species of Rhododendrons. Living materials are collected from the jungle throughout the country except Sabah. Most of the plants are kept in UPM green house for raw materials of future phytochemistry and tissue culture research. Adaptation period and parameters are distinctly different among species and due to these samples for tissue culture are procured and cultured almost immediately upon collection. Phytochemistry study requires substantial amount of samples and many species identified with potential medicinal value were in small quantities, therefore not all species were screened for active compounds yet and screening will be done on the future unlimited tissue culture products. Ferns, lycophytes, aroids and gingers adapts faster and better than orchids to ex situ environment. Preliminary results shows that all plants responds positively to the same tissue culture media and procedure, a finding that would help to reduce costs of mass propagation of diverse species of plants. This culture media and procedure will be developed as universal tissue culture kit.

Keywords: canopy plants, ornamentals, medicinal, tissue culture media and procedure

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Determination of Contamination and Biodiversities of Heavy Metals (Cu, Cd, Zn, Pb and Ni) in the Serdang Urban Lake by using Guppy Fish *Poecilia reticulata*

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ABSTRACT

The guppy fish, *Poecilia reticulata* and the lake surface sediments were collected from the Serdang Lake in August 2005. Both the fish and the sediment samples were analyzed for Cu, Cd, Pb, Zn and Ni. The ranges of metal concentrations (μg/g dry weight) in the fish were 0.160-11.1 μg/g for Cu; 64.6-174 μg/g for Zn; 0.400-4.03 μg/g for Cd; 3.27-12.1 μg/g for Ni and 19.5-50.9 μg/g for Pb. In the sediment, the ranges of metal concentrations were 1.97-62.1 μg/g for Cu; 31.6-274 μg/g for Zn; 1.92-3.17 μg/g for Cd; 60.2-94.8 μg/g for Ni and 3.23-42.1 μg/g for Pb. It was found that the concentrations of Zn was the highest found in both fish and sediment samples, followed by Pb, Cu, Ni and Cd. The similar pattern of heavy metal occurrence found in the fish and in the sediment, indicated that the fish could be used as a potential biomonitor for metal contaminantion in the freshwater ecosystem. Since *P. reticulata* are widely distributed in lakes and in almost all of the urban drainages, this fish species is a very potential biomonitor of heavy metal bioavailability in the polluted freshwater ecosystem of Malaysia.

Keywords: contamination, biodiversities, heavy metals, Serdang Urban Lake, guppy fish

Discovery of Two New Orchid Species in Lanjak Entimau Wildlife Sanctuary, Ulu Ketibas, Sarawak

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ABSTRACT

Discovery of new species is not an impossible in unbotanized forested area. Two new species of orchid genus *Bulbophyllum* were discovered during the 2 weeks scientific expeditions to Lanjak Entimau Wildlife Sanctuary, Ulu Ketibas, Sarawak. The two species are both epiphytes and found in abundance along the riverine of Sg. Bloh and Sg. Ketibas. *Bulbophyllum ketibasensis* spec. nov. and *Bulbophyllum rafflesioides* spec. nov. *Bulbophyllum ketibasensis* was named after Sg. Ketibas where they are found growing in abundance, whilst *Bulbophyllum rafflesioides* was named after the genus *Rafflesia* due to the *Rafflesia*-like markings on the sepals and petals as well as its rotten flesh smell.

Keywords: orchids, new species, *bulbophylum ketibasensis, bulbophyllum rafflesioides*

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Heavy Metal Concentrations in *Nerita lineata*: The Potential as a Biomonitor for Heavy Metal Bioavailability and Contamination in the Tropical Intertidal Area

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ABSTRACT

The concentrations of Cd, Cu, Pb, Zn, Ni and Fe were determined in the gastropod *Nerita lineata* collected from 15 sites in the west intertidal area of Peninsular Malaysia (shell length 11.5–33.8 mm). The results of the present study showed that metal concentrations in the shells, operculums and soft tissues of *N. lineata* were distributed differently at different sampling sites. The mean concentrations (µg/g dry weight) of Cd, Cu, Fe, Ni, Pb and Zn in the samples were 2.99, 6.38, 35.05, 23.34, 48.22 and 16.59 in the operculum, 3.15, 5.59, 49.78, 24.18, 48.86 and 7.86 in the shells and 1.03, 2.65, 566.63, 5.85, 92.72 and 92.75 in the soft tissues. All the populations of *N. lineata* showed similar trends in the accumulation of Cd, Ni and Pb which decreased in the order: shell>operculum>soft tissue, Cu and Zn in the order: soft tissue>operculum>shell and Fe in the order: soft tissue>shell>operculum. In general, higher concentrations of metals were recorded in samples collected from the stations closed to the anthropogenic sites. In particular, samples collected from KSAyam accumulated high Pb concentrations when compared to other sites in the operculums, shells and soft tissues of the snails. This may indicate high bioavailability and contamination of Pb of the study site. The snail *N. lineata* is therefore suggested as a potential biomonitor of bioavailability and contamination of heavy metal in general and Pb in particular for the tropical intertidal area of Peninsular Malaysia.

Keywords: heavy metal concentrations, *nerita lineata*, bioavailability, contamination, tropical intertidal area

Locating Sediment Trap Using Hydro-GIS Process

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ABSTRACT

In any land development activities, installation of sediment trap is often a must to reduce the impact of downstream sedimentation. However, environmental planners and engineers faced with various options and subjective question in identifying the most suitable location of the sediment trap. In this study, a method for sitting sediment trap or basin for a new construction area was develop and tested to a 5 acre land. The method involved development and application of hydro-GIS process. Two main spatial input used in the process which are hydrological and land use data. Topography, soil erosion and drainage represents the input for hydrology while public property, distance to construction site and location of major stream represents input for land use. Initially DEM for the area was generated from topographic map using Arc GIS. The flow direction was determined using the pour point algorithm which then used to simulate the run off in the area and flow accumulation was calculated by summing the cell areas of all up slope cells draining into it. The soil loss was then estimated for cell using USLE within the GIS platform. The distance to construction site, public property and major steam was then spatially analyzed with the output of hydrological process to identify best location for installation of sediment trap. This method provides a more objective valuable tool for site selection of sediment trap in any environmental impact study involving land development activities.

Keywords: sediment trap, environmental impact assessment, hydro-GIS

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Comparison of Heavy Metal Concentrations (Cd, Cu, Fe, Ni and Zn) in the Shells and Different Soft Tissues of *Anadara granosa* collected from Jeram, Kuala Juru and Kuala Kurau, Peninsular Malaysia

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ABSTRACT

The concentrations of Cd, Cu, Fe, Ni and Zn were analysed in different parts (shells, mantle plus gills and foot plus visceral mass) of the red blood cockle Anadara granosa collected from an anthropogenic-receiving site at Kuala Juru, relatively unpolluted sites at Jeram and Kuala Kurau. The metal concentrations (µg/g dry weight) in the total soft tissues of A. granosa were 1.30-9.44 (mean: 4.69) for Cd, 91.9-203.5 (mean: 130.2) for Zn, 0.80-16.15 (mean: 7.67) for Ni, 455.91-1125.5 (mean: 715.3) for Fe and 5.41-7.39 (mean: 6.14) for Cu. Although the highest concentrations of Cu and Zn were found in the soft tissues of Kuala Juru’s cockles, these metal concentrations were lower than the maximum permissible limits established by Malaysian Food Regulations 1985 and WHO standard guidelines but the Cd concentrations from Jeram’s cockles, were higher than the maximum permissible limit established by the both guidelines. As suggested by many reported studies found in the literature, regular biomonitoring of heavy metal concentrations at these three sites is needed since the edible *A. granosa* is a popular commercial bivalve in Malaysia.

Keywords: heavy metal concentrations, shells, soft tissues, *anadara granosa*, Jeram, Kuala Juru, Kuala Kurau

An Integrated Multicriteria Decision Making Tool for Selecting an Appropriate Solid Waste Treatment Technology

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ABSTRACT

The task of decision making is intimately associated with every sphere of human life. In fact, the ability to make rational decision is a unique human characteristic. People have continuously devised means and ways to enlarge their abilities to cope with the growing complexity of their decision making problems. Based on Integrated Solid Waste Management approach, AHP has to used for structured the solid waste management problem into a muti-level hierarchical which consist of goals on the top level, followed by criteria, subcriteria, and alternatives. Expertise in AHP knowledge base was acquired from multiple sources such as textual sources, expert interview, reputed journal publication, and field observation. The acquired knowledge was formed into hierarchies; General Hierarchy Structure Model, and Specific Hierarchy Structure Model. Then, inputs from solid waste practitioners were used in pairwise comparison to ranking the technology. Thus to test the accuracy of the AHP analysis, consistency ratio must be 10% or less, otherwise the process must be re-evaluated. The overall performance was evaluated to be satisfactory based on two case studies in Malaysia. This integrated decision making tool is useful in avoiding ill-informed decisions where expertise and resources are scarce.

Keywords: solid waste management, analytical hierarchy process (AHP), integrated multi criteria decision making tool

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An Evidence of Pb Redistribution in the Different Soft Tissues of *Telescopium telescopium* Collected from A Pb-Contaminated Intertidal Site

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ABSTRACT

The different soft tissues (foot, cephalic tentacle, mantle, muscle, gill, digestive caecum and remaining soft tissues) of the mud-flat snail *Telescopium telescopium* were determined in snails from 5 geographical sites in the south western intertidal area of Peninsular Malaysia. This work firstly intended to investigate the Pb distribution in the different soft tissues of intertidal snail *T. telescopium* and interestingly, it is also found that Pb redistribution was evidenced in digestive caecum in the polluted population collected from Kuala Sg. Ayam. The high Pb contamination and bioavailability of Pb indicated by the different soft tissue of *T. telescopium* from Kuala Sg. Ayam population was also complemented by the significantly ($P< 0.05$) higher Pb level found in sediment samples. Therefore, Pb redistribution in the different soft tissues of *T. telescopium* be used as a potential indicator of bioavailability and contamination of Pb in the tropical intertidal area.

Keywords: pb redistribution, soft tissues, *telescopium telescopium*

Interspecific Variation of Heavy Metal Concentrations in the Different Parts of Tropical Intertidal Bivalves

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ABSTRACT

The concentrations of Cd, Cu, Fe, Ni, Pb and Zn in the different parts of six bivalves species were determined. From the study conducted, it was found that the byssus of *Perna viridis*, *Scpharca broughtonii* and *Trisidos kiyonoi*; the gill of *Polymesoda erosa* and *Donax faba*; and the foot of *Gelonia expansa* were highly accumulative of Cu. High levels of Cd were found in the gills of *Scpharca broughtonii* and the byssus of *Trisidos kiyonoi*; and also the shells of the four remaining bivalve species. As for Zn, the mantles of *P. erosa* and *T. kiyonoi*, and the gills of *D. faba*, *G. expansa* and *S. broughtonii* were highly accumulative of Zn. High level of Pb and Ni were found in the shells of all the species which indicated that the shells of the bivalves were highly accumulative of Pb and Ni. Elevated levels of Fe however were found in the different parts of the bivalve since Fe is an essential metal in metabolic activities and an abundant element in nature. The heavy metals in the total tissues and the different soft tissues of the bivalves were compared with the maximum permissible limits set by five different countries. From the comparison, it was found that most of the bivalves contained metal concentrations which were below the maximum permissible limits and should pose no toxicological risk to consumers.

Keywords: interspecific variation, heavy metal concentrations, tropical intertidal bivalves

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Over Expression of Gibberellin 20 Oxidase Gene Increase of Cellulose Fibre Length in *Kenaf (Hibiscus cannabinus L.)*

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ABSTRACT

Kenaf (*Hibiscus cannabinus* L) belongs to family Malvaceae. It is identified as a good biocomposite resource as well as an alternative raw material for pulp and paper production. Higher fiber length and cellulose content can add value to kenaf. Gibberellic acid (GA) is a plant hormone and its most obvious physiological function is the stem elongation by stimulating cell division and elongation.GA 20 oxidase is one of the key enzyme in biosynthesis pathway of Gibberellin. We hypothesized that by increasing the active gibberellins in kenaf can increase the cellulose fiber length and cellulose content (overall biomass). Therefore in this study we tried to over express the *Arabidopsis* GA 20 gene in Kenaf under 35S constitutive promoter. PCR verification for the transgene has done for few transformed lines. Observed different morphological characters among the transgenic plants.

Keywords: gibberellic acid, *hibiscus cannabinus l.*

Vegetation Assessment of Peat Swamp Forest Using Remote Sensing (Environmental Impact if Timber Harvesting System on Peat Swamp Forest in Sarawak)

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ABSTRACT

Peat covers 1.6 million hectares (13 %) of the 12.4 million hectares land area of Sarawak and some of peat swamp forests have been logged. So, it is important to assess the impact of logging operation on peat swamp forest in this area. The study used a remote sensing technique to assess vegetation cover in a peat swamp forest areas in Sarawak as result of logging practice and land clearing activities for oil palm plantation. Vegetation Index was used to assess impact of timber harvesting system and land clearing activities on remaining peat swamp forest in two sites which were logged previously and the possible relationship of change in hydrology. The timber harvesting system was a combination of rail system for log transportation and excavator crawler for log skidding. Drainage work was probably carried out prior to logging activities which was followed up by land preparation for the establishment of the oil palm plantations. There was a general decrease in the level of greenness from 2002 to 2007. The remnant logged peat swamp forest of the area declined due to a poor state of growth as shown by the dramatically decrease in the level of greenness. The peat swamp forest types strongly related to the hydrological conditions and the associated flow of nutrients and mineral elements. The surrounding hydrology was presumed to have influence the physical and chemical characteristics of the peat.

Keywords: peat swamp forest, remote sensing, logging, land clearing, environmental impacts

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Trichoderma atroviride as a Bioremediator of Cu Pollution: An *in vitro* Study

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ABSTRACT

Isolated *Trichoderma atroviride* from Cu-polluted river sediment at the Serdang Industrial Area was studied under in vitro conditions, to understand the mechanisms that allowed the fungi to thrive in the Cu-polluted freshwater ecosystem. From this study, adsorption was recognized as the main mechanism of Cu tolerance with 50 – 85% adsorption during the in vitro experiment. The uptake capacity of the isolate in liquid medium ranged from 0.8 to 11.2 mg/g in the potato dextrose broth medium with increasing Cu concentrations from 25 to 300 mg/L. It was found that 2.7–5.0% of Cu was lost due to washing. The high percentage of Cu adsorption and the high uptake capacity of Cu by *T. atroviride* suggest that it is a potential bioremediator of Cu. However, further studies are needed to confirm its practical use as a bioremediating agent for Cu under field conditions.

Keywords: *trichoderma atroviride*, bioremediator, pollution

Sains Sosial

Work-family Conflict among Employees and Family-friendly Policy Practices of Organisations

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ABSTRACT

This study examined the work-family conflict experienced by female employees in four different professions and compared the levels of conflict experienced between these employees and their husbands, as well as family-friendly employment policy practices in the government and selected private organisations in Malaysia. Two forms of work-family conflict were studied, namely work-to-family conflict (W~F conflict) and family-to-work conflict (F-7W conflict), and the differences were compared. Data were gathered from a total of 1705 employees consisting of 918 married female production operators, clerks, nurses and physicians in Malaysia, as well as their husbands which made up 787 of the respondents. Three broad categories of family-friendly facilities were studied including work arrangements, family care benefits, and child care facilities and related benefits. Policy practices in the federal government were examined through document analysis and interviews with human resource personnel. Data from eight private organisations were gathered using questionnaires and interviews with human resource managerial staff. The results reveal that the physicians experienced the greatest W~F conflict while the production operators experienced the greatest F~W conflict. The means of W~F conflict and F~W conflict across professions were significantly different, F=30.14, $p< .001$ and F=16.13, $p< .001$, respectively. The means of W~F conflict for both wives and husbands were significantly greater than F~W conflict indicating that the family boundary is more permeable than the work boundary (wives: t=24.12, $p< .001$, husbands: t=16.68, $p< .001$). Female physicians and clerks experienced significantly greater W~F conflict than their husbands (physicians: t=5.10, $p< .001$, clerks: t=2.13, $p< .05$). However, overall, significant differences of W~F conflict means for all professions were found (t=4.63, $p< .001$). F~W conflict means for all female samples were not significantly different from their husbands. Generally, the government has been more generous than the private organisations studied in terms of providing family-friendly facilities.

Keywords: work-family conflict, gender, profession, family-friendly employment policy

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Consumer Willingness to Pay for Locally Produced Pure Tualang Honey in Malaysia

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ABSTRACT

This study uses the dichotomous choice contingent valuation method to calculate the willingness to pay (WTP) for a bottle of locally manufactured pure tualang honey. The data for this study was obtained from a survey. Using the parameters from our logit model, we estimate that consumers are willing to pay approximately RM51.48 for 250g of pure Tualang honey.

Keywords: willingness-to-pay, logit model, probit model, tualang honey, dichotomous contingent valuation

Lead Malaysia-effective Community Leadership, Effective Public Sector Leadership, Global Leadership for World Class University

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ABSTRACT

Lead Malaysia is a project with research focusing on effectiveness of leadership in Malaysia It examines leadership in various contexts such as community development, public sector and the academic setting. Effective leadership is viewed from some theoretical perspectives. The dominant ideas on leadership initially began with the traits theory, followed by behavior theory, situational theory and integrative theory. The traits theory was proposed as early as the 19’” century and continued until the 20th century, first focusing on the idea that leaders were born and later focusing on identifying acquired traits of leaders. Both qualitative data and quantitative data were employed in the research. In the context of community development in Malaysia research findings indicated that there were traits, roles and competencies that were identified as important for community leaders. One of the key findings relate to leadership in a multi-racial community in Malaysia Among the trait identified that was emphasized is acceptability of leaders by all groups in the community. Also when they play their leadership roles they have to be sensitive to the needs and problems of the various groups representing the community. For them to be effective community leaders in Malaysia, they must posses multi-cultural skills. In the public sector, the research findings emphasized the importance of changing roles from the command and control style of leadership to a more collaborative ‘style of leadership for the twenty-first century. Leading with integrity is also very important in public sector leadership. Among the human resource development leaders, the need for organisational citizenship behavior (OCB) also contributes to effective public sector leadership. Now the project also examed leadership in the academic settings. Data is in the process of being collected. The project conducted research through various collaborations with government and non-government agencies that include “Jabatan Perpaduan Negara dan Integrasi, Jabatan Perdana Menteri” , the Neighborhood Associations (locally known as Rukun Tetangga), the Public Service Department (PSD or JPA) and “Akademi Kepimpinan Pengajian Tinggi” (AKEPT). The findings of the research hope to improve policies and practices related to leadership in Malaysia and contribute to knowledge on leadership worldwide.

Keywords: leadership, effective leadership, leadership in Malaysla, community leadership, public sector leadership

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Use of Dichotomous Choice Contingent Valuation Method to Value the Putrajaya Wetland Park

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ABSTRACT

This study presents the application of dichotomous choice contingent valuation method (CVM) to value outdoor-recreational resources in Putrajaya Wetland Park. Both the logit and probit models were used to analyse the primary data obtained through personal interviews. The maximum likelihood estimates of this model showed that income and price are significant variables In determining one’s willingness to pay (WTP). This study has shown that visitors to the Putrajaya Wetland Park are willing to pay about RM3.77 fo the entrance fee. The estimated revenues that could be derived if the fees were charged can also be calculated according to the WTP framework.

Keywords: contingent valuation method, wetland, willingness to pay

ASEAN-5 Future Currency: Maastricht Criteria

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ABSTRACT

In this decade, many economists and policymakers have attempted to investigate the suitability of the East Asian region to form a currency union based on the European countries’ experience as a benchmark. This study aims to investigate the long-run real convergence in GDP per capita growth in Malaysia, Thailand, Singapore, Indonesia, and the Philippines, 1978 to 2004. The Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) unit root tests are conducted at first difference of GDP per capita for each country. The results demonstrate that all countries’ GDP per capita are stationary at first difference. The results of the Bound Testing Approach (Auto-Regression Distributed Lag (ARDL)) indicate that there is a long run relationship between variables in the Maastricht Criteria. The results also show that interest rate, inflation rate and the debt ratio experience negative relationship to the GDP per capita. However, the exchange rate and government surplus ratio is positively related to the GDP per capita. Therefore, the findings show that the ASEAN 5 countries have fulfilled the Maastricht Criteria consistent to expected sign(s) except for Singapore’ exchange rate and Indonesia’s debt ratio. Hence, the ASEAN 5 countries in this study have potential to form a single currency.

Keywords: monetary union (MU), bound test (ARDL), maastricht criteria, single currency

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The Influence of Buyer-Supplier Relationships on the Technology and Implementation Performance of AMT

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ABSTRACT

Advanced manufacturing technology (AMT) adoption in developing countries remains to be heavily dependent on the resource and commitment of the technology provider who are often located overseas. If the breath and depth of the technology being acquired is beyond the capability of the adopting firms, the new technology is more likely to fail as early as at the implementation stage. Issues of technology implementation continue to be an important part of the research agenda. In the context of a developing country like Malaysia, where the local technological capabilities are relatively low and most of the technology has been acquired from foreign countries, the problem of not fully realizing the benefits of acquired technology is even more apparent. More often than not the technology buyer is in a weak position, especially when dealing with a stronger and more experienced supplier from an industrialized country. This paper investigates the impact of technology buyer-supplier relationships (BSR) on the technology and implementation performance throughout the process of its acquisition and implementation. Dimensions that have been commonly used in the literature to denote BSR were used, these being: trust and business understanding, committed involvement, communication, information sharing, and knowledge acquired. Data obtained from 147 manufacturing firms in Malaysia was analyzed using structured equation modeling (SEM) technique. The result indicates although majority of the firms reported improvements in their performance since the use of AMT, firms demonstrating a closer relationship with the technology suppliers are more likely to achieved higher levels of performance than those that do not. The result of the study also provides useful insights that are especially pertinent to an improved understanding of buyer-supplier relationships in the procurement of capital equipment, about which the research literature currently is quite sparse.

Keywords: advanced manufacturing technology, buyer-supplier relationships, technology acquisition and implementation, developing countries, Malaysia

Demand for Fish in Malaysia

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ABSTRACT

Fish demand patterns in Malaysia was investigated using a multistage budgeting framework allowing a disaggregated approach to analysing fish consumption. This paper highlights the heterogeneity of fisheries products in terms of species, sources and cultural responses of consumers, factors that are important in fish demand under the malaysian setting. Specifically, fish demand by income groups were compared to determine how the low- and high-income households respond to price and income changes. Results showed that the estimated price and income elasticities of all fish types included in the study were relatively more elastic among the poorer households.

Keywords: fish demand, inverse mills ratio, multistage budgeting framework, price and income elasticity, quadratic AIDS model

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Transaction Attributes and Buyer-Supplier Relationships in AMT Acquisition and Implementation

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ABSTRACT

The means of acquiring new and advanced manufacturing technology is unique to each firm, which suggests they also exhibit different ways in which they rely on the technology suppliers during the process of its implementation. A technology that is advanced for one firm may not be considered the same by others. In any new technology adoption, implementation remains the biggest issue, having been recognized by practitioners and widely reported by researchers, as a major source of project failure. This research investigates the connections between transaction attributes and buyer-supplier relationships (BSR) in advanced manufacturing technology (AMT) acquisition and implementation. The study drew upon and integrated the literature of transaction cost economics theory, buyer-supplier relationships, and advanced manufacturing technology and used this as the basis for a theoretical framework and hypotheses development. Data were gathered through a questionnaire survey with 147 companies and analyzed using a structural equation modeling technique. The results indicate that the higher the level of technological specificity and uncertainty, the more firms are likely to engage in a stronger relationship with technology suppliers. However, the complexity of the technology being implemented is d with BSR only indirectly through its association with the level of uncertainty. The result suggests that firms continue working closely with the suppliers to ensure efficiency in the entire process especially when the technology represents a core competence to them and when high degree of learning and training were invested in the technology. Firms are also more likely to depend on the supplier when they are less experienced in handling a technological innovation. The analysis also provides strong support for the premise that developing strong BSR could lead to an improved performance in acquiring and implementing AMT. The implications of the study are offered for both the academic and practitioner audience.

Keywords: advanced manufacturing technology, buyer-supplier relationships, technology implementation, transaction cost economics theory, Malaysia

Effect of Mergers on Efficiency and Productivity: Some Evidence for Banks in Malaysia

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ABSTRACT

The study investigates the extent to which mergers lead to efficiency. The data covers the period 1993-2004, which includes the pre- and post-merger years. This study attempts to evaluate technical efficiency, efficiency change, technical change, and productivity of commercial banks, finance companies, and merchant banks by using a non-parametric Data Envelopment Analysis (DEA) and Malmquist Index approach as the framework for the analyses. It is found that: (i) on an average, productivity across banking institutions increased at an annual rate of 5.8% over the study period, (ii) the results also indicate that almost all of the productivity growth comes from technical change rather than improvement in efficiency change, which contributes to 6.1% of productivity growth, while the latter accounted for 0.2% decline, and (iii) the merger process led to productivity improvements whereby it is observed that the productivity of Malaysia's banking sector has been improved after the implementation of merger program

Keywords: mergers, efficiency, bank, Malaysia

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Revisiting the Cause of the East Asian Financial Crisis: Was it Predictable?

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ABSTRACT

This study evaluates two predictive indicators of the East Asian Currency Crisis using the balance of payment and interest rate parity model. The paper examines whether a continuous current account deficit and overvaluation of real exchange rate are able to predict the crisis. Six different countries which include Thailand, Philippines, Indonesia, Malaysia, South Korea and Singapore were investigated. All, except for Singapore, confronted a speculative currency attack and either abandoned their managed float rate regime or forced the monetary authority to surrender to the market and let the rate pass over their target level. The results from the analysis indicate that the current account of the balance of payment for Malaysia, Thailand, Indonesia, Philippines and South Korea were continuously in deficit from 1991 to 1996. The findings also show that the real exchange rates for the said countries were overvalued against the United State dollars.

Keywords: balance of payments, interest rate parity, currency over-valuation

Technical Efficiency of Small and Medium Enterprises in Malaysia: A Stochastic Frontier Production Model

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ABSTRACT

The small and medium enterprises (SMEs) play a vital role in the Malaysian economy and are considered as the backbone of industrial development in the country. However, SMEs' value added is very much lower than that of the large scales'. A low productivity of physical inputs or factors efficiency may be attributed to low level of value added. The objective of this study is to determine the technical efficiency of 7360 small and medium enterprises for the year 2004 using stochastic frontier model. Results show that the number of firms considered technically efficient is only 3.06 percent of total firms, while the total technical inefficiency varies from 0.30 to 97.10 percent. Thus, the policy makers have to play an important role in promoting the economies of scale and develop technical skills of labors, which will lead to a higher efficiency level among SMEs.

Keywords: small and medium enterprises, technical efficiency, stochastic frontier model

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Important of Branding for Malaysia's Property Developers

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ABSTRACT

The new purchasers of properties are more sophisticated now. They are searching for living environments for the 21st century, new standards in comfort and design. The new generation likes modern homes that allow the best of Man's technology to work harmoniously with Nature. Modern townships that are planned to be efficient and structured for the future with superb linkages and state-of-the-art support to create effective business environments are the latest trend in property development. Therefore, this paper is to study the brand conscious of property purchasers toward the property developers in Malaysia, a developing countries. This study uses survey of purchasers in Klang Valley and tested using a 5 point Likert scale on the brand awareness and the brand personality traits of property developers. 5000 questionnaires were distributed and finally 214 were used for this study. The results show that property purchasers are brand conscious on the property developers and they ranked developers based on the brand personality. Property purchasers look at trend, professionalism and investment as the top three priorities in the property brand. The conclusion is that all property firms, designers, real estates agents and stakeholders that are involved in property developments are to ensure that their products are design with brand consciousness in mind. The findings in this paper suggest that property designers pay attention to trend in the property development, property marketers to be professional in dealing with purchasers and the developers to ensure good location for investments.

Keywords: branding, property purchase, brand consciousness, brand personality, purchaser attitudes

The Effect of Financial Risks on the Earnings Response in Australia Bank Stocks

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ABSTRACT

Financial institutions are often treated differently from non-financial businesses. Therefore, this paper uses the concept from earnings response literature and extended with the banking risk management measures to find out whether the estimated financial risks have incremental content beyond earnings. This new procedure discovers that Australia investors priced the credit risk, which is measure by the provision for bad and doubtful debts, significantly in the earnings response valuation. This finding suggests the relevant of the credit exposure in the Australia banks using latest data.

Keywords: accounting earnings, abnormal returns, bank shares, earnings response coefficients, credit risk, determinants of abnormal returns

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Asian Financial Integration during the Pre- and Post Crisis Periods

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ABSTRACT

As the economies of Asian have moved towards closer economic ties and trade integration in recent years, the establishment of regional exchange rate arrangement is becoming an important regional policy concern, particularly in the wake of the Asian currency crisis of 1997. Financial integration in ASEAN+3 is assessed in this paper by examining the time-series stochastic behaviour and cointegration in a set of eight ASEAN+3 currencies in pre-crisis, crisis and post-crisis periods. Significant non-stationarity, and the presence of unit roots were documented for each currency in each sample period. The results of cointegration analysis showed that the currencies are not cointegrated during the pre-crisis period. Evidence of cointegration was found among a few Asian currencies in the crisis and post-crisis periods. These findings have important implications for understanding the potential of developing a common currency area.

Keywords: exchange rate, cointegration, granger-causality, Asian

International Reserves, Current Account Imbalance and External Debt: Evidence from Malaysia

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ABSTRACT

This paper examines the demand for international reserves in five ASEAN economies during the period of 1970-2005 using the autoregressive distributed lag (ARDL) bounds testing approach proposed by Pesaran, Shin, and Smith (2001). These countries had increased their demand for international reserves since after the 1997 Asian financial crisis. The majority of these countries had also experienced consistent current account surplus during the same period. Thus, the present study attempts to investigate the existence of long run relationship between reserve demand and the current account. The empirical results indicate that current account surplus leads to the rise in the demand for international reserves in Indonesia, Malaysia, and Singapore.

Keywords: monetary union (MU), bound test (ARDL), maastricht criteria, single currency

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The Relationship between Stock Prices and Exchange Rate: Empirical Evidence based on the KLSE Market

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ABSTRACT

This paper investigates the relationship between the exchange rate of Malaysia Ringgit (RM) in term of US dollar and stock prices in Kuala Lumpur Stock Exchange using the single-index and multi index models. A total of 256 weekly observations spanning from September 1993 to July 1998 were used in the analysis. Our results of the regression analysis indicate the existence of a negative relationship between exchange rate and stock prices. The sectoral analysis of various industries also demonstrates a negative relationship. An empirically measurable distinction is also drawn between strong and week (RM) period. The result indicate that negative relationship is stronger during the weak RM period . Therefore we hypothesized that changes in exchange rate contain predictive power about movement of stock returns especially in weak RM period.

Keywords: exchange rate, stock prices, KLSE market

Performance of GARCH Models in Forecasting Stock Market Volatility

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ABSTRACT

This paper studies the performance of GARCH model and its modifications, using the rate of returns from the daily stock market indices of the Kuala Lumpur Stock Exchange (KLSE) including Composite Index, Tins Index, Plantations Index, Properties Index, and Finance Index. The models are stationary GARCH, unconstrained GARCH, non-negative GARCH, GARCH-M, exponential GARCH and integrated GARCH. The parameters of these models and variance processes are estimated jointly using the maximum likelihood method. The performance of the within-sample estimation is diagnosed using several goodness-of-fit statistics. We observed that, among the models, even though exponential GARCH is not the best model in the goodness-of-fit statistics, it performs best in describing the often-observed skewness in stock market indices and in out-of-sample (one- step-ahead) forecasting. The integrated GARCH, on the other hand, is the poorest model in both respects.

Keywords: forecasting volatility, GARCH, time-series, rate of returns

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Demand for International Reserves: Evidence from East Asia

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ABSTRACT

This paper examines the demand for international reserves in nine East Asian economies during the period 1970-2005 using panel cointegration and FMOLS. The panel cointegration tests find the existence of long run relationship between the demand for international reserves and its determinants. The panel group FMOLS results indicate that current account balance and total external debt are statistically significant and exert a positive and negative impact, respectively, on the demand for international reserves in East Asia.

Keywords: international reserves, current account, external debt, East Asia

Modelling the Volatility of Currency Exchange Rate Using GARCH Model

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ABSTRACT

This paper attempts to use GARCH models with some modifications, to capture the volatility of the exchange rates. The parameters of these models are estimated using the maximum likelihood method. The performance of the within sample estimation is diagnosed using several goodness-of-fit statistics and the accuracy of the out-of-sample and one-step-ahead forecasts is evaluated using mean square error. The results indicate that the volatility of the RM/Sterling exchange rate is persistent. The within sample estimation results support the usefulness of the GARCH models and the constant variance model can be rejected, at least within sample. The Q-statistic and LM tests suggest that long memory GARCH models should be used instead of the short-term memory and higher ARCH model. The stationary GARCH-M outperforms other GARCH models in out-of-sample and one-step-ahead forecasting. When using random walk model as the naive benchmark, all GARCH models outperform this model in forecasting the volatility of the RM/Sterling exchange rates.

Keywords: forecasting volatility, GARCH, time-series, exchange rates

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Vocabulary Distribution Patterns of Scientific English and English for Science and Technology (EST): Corpus Based Study of Prescribed Malaysian Secondary School Textbooks

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ABSTRACT

As language contained in textbooks used in classrooms is considered as one of the more important sources for a pedagogic corpus, this study will look at prescribed textbooks of all the Science subjects (General.5cience, Physics, Chemistry and Biology) and the English for Science and Technology (EST) subject used in both the lower and upper secondary classrooms in Malaysia. These corpora of prescribed textbooks would give an idea of what type of language is perceived by the writers to be typical of scientific English and English for Science and Technology. This work analyses the vocabulary loading and distribution in all the Science and EST textbooks from one textbook zone. As this study intends to look at lexical density and keyword distribution, the concordance software, WordSmith Tools is used for the purpose of text analysis in this study. The findings indicate a high lexical density in all the Science and EST textbooks. Only a small percentage of scientific keywords are included in the vocabulary lists provided in the syllabus thus being insufficient to help learners cope with the complex and confusing scientific vocabulary. This work has also uncovered the inadequacy of the EST textbook to cope with the language needs of the upper secondary Science students as only a small portion of the keywords of each Science subject is covered by the EST keywords. The preparation of the vocabulary lists seem to be based purely on intuition rather than on a corpus corresponding to the target language. This work has created the only corpus of Science used in textbooks for the lower and upper secondary in Malaysia and thus has prepared the platform for other studies to be carried out in the hope of improving the teaching and learning of Science and EST in Malaysia.

Keywords: corpus, science, textbooks, vocabulary lists, keywords, word lists

Markup and Market Power in the Malaysian Manufacturing Industries

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ABSTRACT

This paper examines the market power in 3-digit Malaysia manufacturing industries using cross-section data. Measure of market power is one of the prime concerns of industrial organisation economics because it can provide valuable information for the design of public policy towards monopoly and anti-competitive parties. Mark up ratio of price over marginal cost is an indicator for assessing the degree of market power. We applied Hall's model to document the disparity between price and marginal cost. Our results indicated that the Malaysian manufacturing industries at 3-digit level have market power hence in need of a competitive policy to check on abuses of market power.

Keywords: market power, mark up, Malaysia, manufacturing industries

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A Parametric Bootstrap Simulation Study in EGARCH Model

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ABSTRACT

We present a new application of the parametric bootstrap method to examine the characteristics of the unknown underlying populations of the parameters of the exponential Generalized Autoregressive Conditional Heteroscedasticity Model. This paper also studies the alternative method of parametric bootstrap to evaluate the standard errors and to construct the confidence intervals of the parameter estimates of the model. From the parametric bootstrap simulation study, we observe that the unknown empirical distributions of the parameters are skewed and leptokurtic. Hence, the parametric bootstrap estimation method, which does not rely on the normality assumption, is one of the reliable alternative approaches for standard errors evaluation and construction of confidence intervals.

Keywords: parametric bootstrap, percentile method, EGARCH, standard error, confidence intervals, time series

Effectiveness of a Drug Abuse Rehabilitation Module on Women Addicts' Self-concept

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ABSTRACT

Drugs abused has been proclaimed as a major national enemy since 1984. Although the Ministry of Home Affairs has continuously conducted various prevention programmes since then, the drug abuse problem remains unresolved. The Ministry of Home Affairs has targeted that our country shall be drug-free by the year 2015. However, it is already 2009 and efforts to achieve that goal seem far-fetched. Hence, to help our country combat the drug abuse problem, the present researcher has developed a drug abuse rehabilitation module for drug addicts undergoing treatment at a drug abuse rehabilitation center. This intervention module has been proven to be valid and reliable. The purpose of this experimental study is to determine the effectiveness of the module in improving self esteem. Subjects were 40 inmates of the Pusat Serenti Bachok, Kelantan which is a rehabilitation centre for female addicts. Subjects were randomly assigned to the experimental and control groups, with each group consisting of 20 inmates. Subjects' pre and post-test scores of the Tennessee Self Concept Scale (TSCS) were obtained as a measure of self-concept. Results show that overall, the rehabilitation module had a positive impact in improving subjects' self-concept by 10.5%. Specifically, increments in each sub-scale of the TSCS are as follows: self-identity (10.5%), self satisfaction (9.5%), behavioural self (11.6%), physical self (7.4%), moral and ethical self (13.1%), personal self (12,9%), familial self (10.5%) and social self (8.9%). In conclusion, the study has shown that the rehabilitation module effectively improved the self concept women addicts at Pusat Serenti Bachok, Kelantan.

Keywords: drug abuse, rehabilitation module, drug addicts, self-concept

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Cultural Dimensions among Malaysian Employees

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ABSTRACT

This study explores the similarities and differences of cultural values among the Malay, Chinese, and Indian management employees in Malaysia, mainly via a case study of Nestlé in Malaysia, one of the major multinational organisations in the country. Qualitative approach was taken where 13 management employees were interviewed. This study showed several new patterns of cultural values emerging among the employees of Nestlé in Malaysia. Primarily, it extends the literature, by providing further understanding on the issues of cultural values on the Malaysian society.

Keywords: culture, values, malaysia, nestlé, qualitative, management

Recycling of Prepositions in the Malaysian Secondary English Language Textbooks (Forms 1-5)

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ABSTRACT

The teaching of prepositions has always been an important concern and there are several methods and approaches which have been proposed. However, there is still a need to minimize difficulties faced by learners. One way to do so is by examining the representation of prepositions in a core resource used by learners in classroom, that of, English Language textbooks. As textbooks are used by students daily in their schools, it is the most appropriate discourse to analyze as the language contained in the textbooks would be the language that would challenge the students most (Mukundan & Menon, 2(07). Besides, it would also be the language that the students are most exposed to. This study looks at the recycling of prepositions in the Malaysian Secondary English Language textbooks (Forms 1-5). It will highlight firstly, the recycling of prepositions with other parts of speech and secondly, the recycling of prepositions with various functions or categories. This study is unique as it looks at the recycling aspects of both prepositions and other words that are listed in the first 2,000 words of the General Service List to present its findings. This study utilizes the General Service List (West, 1953), the Malaysian Secondary English Language textbooks corpus (Mukundan, 2(07) and the WordSmith tool version 4.0 (Scott, 2004). The findings hope to indicate the recycling of prepositions in the Malaysian Secondary English Language textbooks may allow both teachers and learners to be able to recognize the use of prepositions in a variety of contexts. Simultaneously, the exposure they gain through the use of prepositions in their textbooks will enhance their understanding of prepositions.

Keywords: prepositions, concordance-based evaluation, textbooks, 2000 high-frequency word list, recycling,

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A Cross-sectional Study of External Validity for Maternal Piety Scales: A Structural Equation Model Invariance Analysis

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ABSTRACT

Maternal Piety Scales was developed as a family counseling instrument that measures a domain of maternal spiritual characteristics. Particularly, maternal piety is considered a cardinal characteristic for functional Muslim mothers. The instrument has undergone four phases of study. The first phase was a focus group study from an Islamic Integrated Primary School (IIPS). The second phase was an ex-post facto study that involved 12 IIPS in the Klang Valley of Malaysia. Confirmatory factor analysis (CFA) was utilized to examine the construct validity of the instrument. Structural Equation Modeling (SEM) was used to investigate the relationship between maternal piety and mother-child attachment as supporting evidence for the criterion-related validity. The third phase was conducted to test the external validity of the instrument. A sample size of 1250 students from 4 states in Malaysia was selected in this phase. Finally, the forth phase was conducted to test group invariance of the measurement model of Maternal Piety Scales. A cluster sampling of 200 students of age 13, 14, 15, 16 and 17 were selected. The findings indicate that this instrument has succeeded the standard cronbach’s alpha > .70 for internal consistency and proportion variance explained > 50 % for the three dimensions of Maternal Piety, namely faith in the unseen, call for virtue and forbid evil. The criterion-related validity was supported with the findings of significant positive relationship between maternal piety and mother-child attachment. The goodness-of-fit indices GFI, AGFI, IFI, TLI, and CFI > .90 and RMSEA < .08 were evidences for construct validity in phase 2, 3 and 4. The results suggest that the instrument is valid and reliable across different population and different age groups. Finally, this paper suggests the implications for future study and practical implications on family and school counseling.

Keywords: maternal piety, spiritual characteristics, structural equation model, confirmatory factor analysis

Evaluating Efficiency of Commercial Coursebooks and Public School Textbooks for English Language Teaching using MATLAB 7.5 and WordSmith 4.0

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ABSTRACT

Course books or textbooks are indeed significant to learners who want to master a language. It is commonly assumed that commercially published course books are better than those produced for the public school system. The frequently revised and field tested commercial course books are considered superior as teachers believe they accommodate most of their needs. For this study, two distinguishable types of textbooks are compared, the public school textbooks (local textbooks used in Malaysian secondary schools) and commercial coursebooks (materials used in an international language centre). There are 2 phases in this study. The first stage involves the application of a new and innovative tool, MATLAB 7.5 to evaluate the percentage of white space in materials. The significance of white space is believed to have an impact on learners' anxiety, clarity and psychological state. The more white space there is on a page, the better the learners can absorb and acquire what is being taught. Hence, MATLAB 7.5 is used to study the word density and white space of the pages between the locally produced textbooks and commercially published cpursebooks. In the second stage, WordSmith 4.0, concordance software is used to evaluate loading and distribution patterns of words as well as repetition and recycling efficiency. The results of this study confirm the common assumption that commercially produced English language coursebooks meet more of the requirements of effective English language teaching than those produced for the public school system.

Keywords: concordance-based evaluation, textbooks, recycling, repetition, commercially published course books

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Stressors Experienced by Adolescent Orphans from Widow Families

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ABSTRACT

Adolescence is well known as a period of "storm and stress." Death in the family is a major life event stressor that may cause adversities in one's life. Lacking coping skills, adolescent orphans may develop symptoms of complicated grief and problematic behaviors. Orphans are a special population with unique challenges and needs. It is important for counselors to develop an understanding of this unique clientele's culture as advocated by experts in the field. This qualitative phase of a national study: (i) explored the bereavement experiences of adolescent boys and girls whose father had passed away, (ii) identified their unique stressors, and (iii) explored their preferences for counseling. Informants were 9 Malay secondary school orphans, aged between 13 through 16 years old . Their fathers' death resulted in changes in psychological well-being, family relationships, family functioning and family socioeconomic status. Apart from grief and yearning for their fathers, orphans experienced the following stressors: being teased by their peers, feeling inferior to peers, inability to concentrate on studies, lacking motivation, family facing financial difficulties, burdened by need to supplement family income, fear of losing mother through death or remarriage, and relationship problems with extended family members. Informants differed in their preferences for individual and group counseling. Based on the findings, strategies for counseling interventions and a problem checklist to assess adolescent orphans' needs are presented and discussed.

Keywords: adolescent orphans, parentally bereaved adolescents, adolescent bereavement

Career Aspirations of R&D Professionals in Government Research Institutes and Multinational Corporations in Malaysia: A Comparative Analysis

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ABSTRACT

One of the strategic HRD initiatives for research and development (R&D) professionals is by managing their career aspiration. The purpose of this study is to examine the dimensions of career aspirations of R&D professionals in GRls and MNCs in Malaysia, and to compare factors that influence career aspirations of their R&D professionals. Specifically, the research questions are: Is there any difference between career aspirations of R&D professionals in GRls and MNCs? What is the relationship between self-efficacy, organisational socialisation, CI practices and career aspirations of R&D professionals in both organisations? What factors contribute to the explanation of the variations of career aspirations of professionals in the two types of R&D organisations? The design of this study is a descriptive correlational research where the dependent variable is career aspiration and the dependent variable are self-efficacy (CA), organisational socialisation (OS) and continuous improvement (CI) practices. The data were collected from 164 respondents from GRI and 120 respondents from- MNCs. R&D professionals in both organisations aspired high in terms of sense of services, job security and lifestyle integration dimensions of their career aspiration. The two groups differed significantly in terms of their self-efficacy and organisational socialisation, and were not significantly different in career aspirations and CI practices. Self-efficacy of R&D professionals in GRls (M = 7.98) were found to be slightly higher than that of MNCs (M = 7.43). Organisational socialisation in GRls (M = 5.20) also reported higher score than that of MNC (M = 4.97). The regression results of MNCs reported higher explanatory power compared to that of the GRls with their respective values of 30.3 % and 19.2 % of the variance in career aspiration. One conclusion is that the explanatory power of career aspirations’ predictors using the three variables is higher in MNCs compared to GRls. Implications for HRD specifically in managing careers of R&D professionals from the two organisations in Malaysia are discussed.

Keywords: career aspiration, self-efficacy, organisational socialisation, continuous improvement practices, government research institute, multinational corporation, Malaysia

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Effect of Drafting, Peer Review and Tutor Conferencing on English Language Learners’ Narratives

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ABSTRACT

This study observed a group of Malaysian TESL bachelor students (N=30) in the process of their development through a writing course in English in Universiti Putra Malaysia (UPM). The researchers hoped to trace any sign of improvement in these learners’ narratives throughout a semester and throughout several procedures of drafting, peer reviewing, revising, tutor conferencing, editing and publishing. The Wong Scale (1989) was adhered to score the first, second and final drafts using two raters and a third in case of severe disagreement between the two raters to account for the reliability of the scores. The repeated measures analysis of variance (ANOVA) indicated a significant time effect on the (1) general effectiveness (2) content and (3) vocabulary of these narratives, however no significant improvement was observed in their language at .05 level of significance. The findings are in line with a large body of literature in the area that favors focus on meaning over focus on form *(e.g.* Krashen, 1982).

Keywords: process approach, drafting, revision, editing, peer review, tutor conference, narrative writing

Repetition and Recycling of the Most Frequent 1,000 Words in the Malaysian Secondary English Language Textbooks (Forms 1-5)

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ABSTRACT

Repetition and recycling are crucial when acquiring a language. It is noted that learners need to meet words in a wide variety of contexts (Schmitt and Carter, 2000) and exposing students to multiple contexts provides information on a variety of aspects of knowing a word (Nation, 2001). Hence, this study attempts to examine how repetition and recycling of words are presented in Malaysian Secondary English Language textbooks (Forms 1-5). Firstly, this study focuses on the frequency count of the most frequent 1,000 words in these textbooks. Secondly, this study distinguishes the parts of speech and the various meanings of these words as they appear in the textbooks. This study utilizes the General Service List (West, 1953), the Malaysian Secondary English Language textbooks corpus (Mukundan, 2(07) and the WordSmith tool version 4.0 (Scott, 2004). The findings hope to provide a clearer picture of the importance of students' exposure to the most fFequent 1,000 words in multiple contexts. Even though, this study looks at the first 1,000 words, it is appropriate to also accept that "knowing the most frequent 2,000 words in English delivers understanding of between 80-90 per cent of words likely to be encountered" (Carter, 1998:236). Additionally, multiple exposures or frequency of these words in itself are relevant as "it has been estimated·that, when reading, words stand a good chance of being remembered if they have been met at least seven times over spaced intervals" (Thornbury, 2002:24).

Keywords: concordance-based evaluation, textbooks, 2000 high-frequency word list, recycling, repetition

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The Construction of the Malaysian Educators Selection Inventory (MEdSI): A Large Scale Assessment Initiative

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ABSTRACT

The crucial role that teachers and schools play in the development of nation's human resource is undeniable. In Malaysia, teaching has always been perceived as a financially secure and relatively easy job by many, resulting in mass application for entry into teacher education programmes. Many of those who aspire and opto to go into teaching profession however do so regardless of their personal interests, potential, and values. Pursuing a program that does not fit a person's personality and interest despite initially having good academic credentials and excellent co-curricular involvement in school, may result in unsatisfactory academic performance, frustration, change of program and even withdrawal at college level. Hence, in the quest for selecting suitable teacher trainee candidates, a psychometrically sound instrument known as the Malaysian Educators Selection Inventory (MEdSI) was developed as a screening measure to filter the large number of teacher hopefuls. The intrinsic qualities that we measured in MEdSI fall under 4 components: Personality, Career Aptitude, Integrity and Emotional Intelligence.

Keywords: personality, career aptitude, integrity, emotional intelligence

Effective Teaching Approach Model Employed by Primary School Science Teachers

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ABSTRACT

Teachers are often urged to use a variety of modes of instruction to ensure that diverse student interests and abilities can be accomodated. Yet teachers can be limited in the instructional modes they can use because of insufficient background or knowledge. Teaching approaches are various in purpose such as to trigger students’ interest in science, to discover through inquiry approach, to build students understanding through contructivism approach, or to introduce a concept through demontration approach. Every approach has the strentgh and weakness in its useses. Although inquiry may not be the only way to teach science, many science educators belive that it may be the best way for students to learn science. Hence, constructivism is a mode of instruction that emphasises the active role of the learner in building understanding and making sense of information. Demonstrations by teacher can be used with students of all ages and across all subjects. The teacher is not only knowledgeable about the topic but uses a variety of aids to ensure that students understand what is being demonstrated. By studying their teaching approaches and methods, the actual practices could be analysed and the effectiveness status of their effectiveness could be determined. Specifically, this study aimed to answer these questions in terms of six approaches namely inquiry, mastery, guided, traditional, constructivism and demonstrations, How far is this approach effective in terms of teaching and learning and what is the correlation between these three approaches. Data were collected from primary school science teachers (N= 239) and the results shown that the teachers were agreeable with the six approaches. The result also shown that there are significant correlations between inquiry, demontration and constructivism approach. This finding shown that primary school science teachers not depend only on one type of approach and apply a various in teaching science. There are also positive and significant correlation between that approaches used by primary school science teachers.

Keywords: teaching approach, inquiry, demonstration, constructivism, mastery

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Coverage of the First 2000 High-frequency Words in Malaysian Secondary School English Language Textbooks (Forms 1-5)

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ABSTRACT

The most frequent 2,000 headwords in West’s General Service List (GSL) is the most cited initial goal for second language learners as it accounts for at least 80%-85% of the words on any page of any book on any subject matter (Nation & Waring, 1997, Nation & Newton, 1997, Schmitt, 2000). In this study the researchers studied the coverage of these first 2000 high frequency words in the Malaysian Secondary School English Language Textbooks for Forms 1-5 in terms of the patterns of loading, distribution and repetition, and investigated cases of words missing. The findings show that while most of the 2000 high frequency words are used in the secondary school textbooks, repetition and recycling is not efficient. The research also revealed that there are words in the 2000 high frequency word list which are not used at all in Malaysian English language textbooks.

Keywords: concordance-based evaluation, textbooks, 2000 high-frequency word list, recycling, repetition

Penggunaan Teknik Bercerita dalam Pengajaran dan Pembelajaran Bahasa Melayu

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ABSTRACT

Teknik bercerita telah lama wujud dan memainkan peranan penting dalam kehidupan sesebuah masyarakat. Oleh itu, kajian ini dijalankan untuk mengenal pasti penggunaan teknik bercerita pada zaman berteknologi kini. Kajian ini melibatkan 66 orang murid tingkatan satu daripada 441 orang populasi di sebuah sekolah daerah Pelabuhan Klang. Kaedah kuasi eksperimen digunakan iaitu dengan mengambil keseluruhan murid di dalam kelas yang terpilih sebagai sampel kajian. Keberkesanan penggunaan teknik bercerita diukur dengan menggunakan ujian penulisan karangan naratif untuk kumpulan kawalan dan kumpulan eksperimen. Marka.h penulisan karangan pra ujian dan pasca ujian kedua-dua kumpulan dibandingkan. Ujian-t menunjukkan terdapat perbezaan yang signifikan antara markah penulisan karangan naratif kumpulan kawalan dengan kumpulan eksperimen iaitu, $t(33) = 5.36$, $p = 0.0001$, $d = 0.92$. Dapatan kajian ini membuktikan teknik bercerita masih sesuai digunakan dalam pengajaran dan pembelajaran mata pelajaran bahasa Melayu.

Keywords: teknik bercerita, pengajaran dan pembelajaran, mata pelajaran Bahasa Melayu

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Impact of Laptop on Teachers’ Professional Development

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ABSTRACT

Vast technology advances over the millennia has developed digital communities all over the world. Recognized as a vehicle that can elevate the education system to a higher level in a technology driven world, many countries are exploring the potential of Information and Communications Technology (ICT) as a means of improving and enhancing the learning of the e-generation as well as achieving efficiencies in classroom instructions. A matrix of ICT initiatives were carried out in many countries global wide since the last decade with the governments investing massive expenditure to harness and entrench ICT into the education system. New initiatives and innovations have been introduced to elevate Malaysian educational system to fulfill the national aspirations as well as to meet the international challenges. The milestones of ICT development in Malaysia are accomplished in two phases: The Smart School Concept which was rolled out for about a decade ago, followed by the English for the Teaching of Mathematics and Science (ETeMS) programme. This study attempts to assess the impact of laptop endowment initiative under the ETeMS programme on the professional development of teachers who received them. Teachers’ professional development was measured in three dimensions: teaching and learning, lesson preparation and planning and laptop competency. The Theory of Individual Innovativeness by Rogers, Four Stage Technology Use Model by Madinach and Cline, and Theory of Cognitive Constructivism served as the foundation of this study. A set of questionnaire developed by the researcher was used to collect data. Data were analyzed using descriptive and inferential statistics. Analysis of the data suggests that the laptop integration has a moderate impact on the teachers’ professional development. Further analysis revealed that age and gender do not have an effect on the levels of the laptop impact on teachers’ professional development.

Keywords: laptop, teacher professional development, age, gender

Measuring Marine Ecotourism Resources: A Mixed Logit Approach

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ABSTRACT

This paper reports the findings from choice experiment (CE) study designed to estimate the economic value of marine ecotourism attributes in Redang Island Marine Park, Malaysia. The mixed logit (ML) models were used in order to estimate visitors’ preferences and personal interviews were made on a total of 298 respondents. Respondents were asked to select the best among the alternatives of the marine ecotourism resource attributes which categorized by Marine Parks and Area (MPA) and Ecotourism Facilities and Services (EFS) attributes. The MPA marine ecotourism attributes investigated were ecological management (EM), recreational activity congestion (RAC), provision of employment opportunity to local people (ELP) and conservation charge (CC). Meanwhile, the EFS attributes are accessibility (AC), providing interpretive trails (PIT), providing information (PI) and extra package price (EPP). Results of the study found that the visitors are preferred the highest changed in MPA attributes levels compared to EFS attributes levels according to their willingness to pay. As such results of this study can assist policy makers in the developing and managing plan for marine ecotourism facilities and services.

Keywords: ecotourism, marine park, choice modeling, mixed logit, conservation

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Computer Games Development and Appreciative Learning Approach in Heighten Students’ Creativity

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ABSTRACT

The study conducted engaged students with computer games development within appreciative learning approach environment in order to heighten their creativity, in terms of creative perception. Computer games development corresponds with the young generation’s habits and interests while appreciative learning approach recognizes the best in people and their relevant world. Experimental research methodology was applied with 34 and 35 form one students in treatment and control group respectively. Creative perception was being assessed using Khatena-Torrance Creative Perception Inventory (KTCPI) which consisted of two separate tests, What Kind of Person Are You? (WKOPAY?) and Something About Myself (SAM). The Creative Perception Index (CPI) was then calculated by adding both WKOPAY? and SAM scores. It was found that after going through computer games development within appreciative learning approach environment, students in treatment group gained the mean score of 71.82, which was significantly higher at .05 level of significance compared to the mean score of 50.49 exhibited by the control group. There was a significant increase in pre-to-post test scores for control group too. Each dimension within WKOPAY? and SAM subtests were also analyzed in detail as it would give a better picture of students’ creative perception. As a conclusion, computer games development and appreciative learning approach is an ideal combination in heightens form one students’ creativity.

Keywords: appreciative learning approach, computer games development, creativity, form one students

Enhancement of Self-regulated Learning in the Interactive e-Learning Community (*i*ELC)

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ABSTRACT

Increased attention on the development of Smart Schools surfaced increased attention to effective practice of self-regulated learning. Self-regulated learning (SRL) covers a wide range of basic skills inherent in a learning process, self-regulation, task strategies and self-motivational beliefs. While practice of SRL has achieved sufficient attention in the field of non-technology enhanced learning environment, attention is still lacking particularly to the practice of SRL in e-learning community discussion. In the Malaysian educational context, this lack of attention is also supported with numerous similar-interest studies conducted in Smart Schools, but rarely in regular national secondary schools. There is also a strong need to improve understanding of this association between SRL and e-learning communities given the socially and technologically varied characteristics of these online learning environments. Thus, it was based on these evidences that this study was undertaken to investigate practice of SRL in the randomly identified regular national secondary schools. Findings of the study indicate that participation in the interactive e-learning community was effective in enhancing practice of SRL [F(1, 98) = 17.92, p = .00].

Keywords: smart schools, self-regulated learning, e-learning community, regular national secondary schools

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Marine Ecotourism Development and Local Economic Benefits

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ABSTRACT

One of the objectives of sustainable ecotourism development is providing benefits to local communities. However, how much the local communities benefit from the ecotourism development needs to be studied in detail. This paper is an empirical study to estimate the local economic benefits of the ecotourism development in a small island, one of the marine parks in Malaysia. The Redang Island Marine Park (RIMP) was selected as a case study in order to estimate the local economic benefits in terms of employment opportunities provided by the ecotourism sector and other related sectors. Sixteen ecotourism operators were interviewed to elicit their financial information, while 82 employees involved in the ecotourism sector were also interviewed in order to determine their expenditure patterns. The results show that the development of ecotourism in RIMP has definitely generated local employment opportunities. However, a higher percentage of leakages was found in the expenditures of ecotourism operators and their employees had contributed to the low multiplier effects.

Keywords: ecotourism, marine park, conservation, economic impact, multiplier

Noise in Accounting Information: The Signal Detection Theory Perspective

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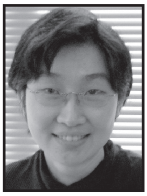

ABSTRACT

Accounting information constitutes a “noisy” representation of economic reality due to the spectrum of accounting alternatives available to meet a diversity of information needs. Extant accounting literature suggests that the presence of noise in accounting information can compromise decision-makers’ performance. This paper seeks to apply a cognitive science theory—i.e. the signal detection theory—to assess how decision-makers fare in discriminating accounting signals from noise. This study demonstrates that decision-makers can arrive at four decision outcomes—two positive and two negative outcomes—due to the presence of noise. The two positive decision outcomes are: (1) decision-makers can respond to the correct accounting signals, i.e. *hits*, and (2) decision-makers can dismiss noise appropriately, i.e. *correct negatives*. The two negative decision outcomes are: (1) decision-makers can misconstrue noise as signals and thus respond to noise, i.e. *false alarms*, and (2) decision-makers can overlook and thus fail to respond to accounting signals altogether, i.e. *misses*. Decision-makers’ performance is compromised when they arrive at either one of the two negative decision outcomes – i.e. *false alarms* and *misses*. This study sheds light on how decision-makers’ performance can be compromised as a result of using “noisy” accounting information and helps to inform both research and practice of the adverse influence of noise. Further, this study offers solutions by demonstrating how accounting knowledge and decision-makers’ biases in setting their decision thresholds can mitigate the hostile effects of “noisy” accounting information. In addition to validating the signal detection theory and enriching the accounting literature with the adaptation and application of the cognitive science theory in a knowledge intensive domain like accounting, the anecdotal evidence provided also serves as a platform for future empirical work on how best to present accounting information to facilitate decision making.

Keywords: accounting signals, noise, accounting representation, signal detection theory

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Design and Development Framework of the ELC Discussion Platform

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ABSTRACT

Online learning community is becoming the more prevalent alternative to the effective integration of technology and instructional theories. However, extensive review of literature clearly indicates the lack of proper guideline to the design and development of these online learning communities. Noticing the seriousness of this gap in literature, a study was thus undertaken to design and develop an online learning community, highlighting the design and development aspects. These aspects were cautiously aligned to the needs and interests of necessary instructional theories such as constructivism and the social learning theory. Emphasis of these theories is then used to draw attention to effective utilisation of instructional tools significant to participation in online learning community such as forum discussion, chat dialogue and Real Simple Syndication (RSS).

Keywords: online learning, learning community, forum discussion, real simple syndication (RSS)

Developing Future Entrepreneurs: Improving Science Students Entrepreneurial Participation

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ABSTRACT

The current Malaysian education system encourages school students to be involved in entrepreneurial activities. A study based on Theory of Planned Behavior was conducted to investigate entrepreneurial intention and behavior between 'science' and 'art 'students in Malaysian secondary school. Data were collected via questionnaire. A group of one thousand there hundred and fifty seven students participated in the study. Findings illustrate that 'art' students following commerce and entrepreneurship subject scored higher means for all construct such as intention, subjective norm, social support and specific entrepreneurial efficacy. The study suggests that students with strong academic background especially in 'science' program should be given proper entrepreneurship education and training to improve their active participation in the global economy as future entrepreneurs. Science background students should be given equal opportunity to participate in entrepreneurial activities in order to create future entrepreneurial human capital.

Keywords: developing entrepreneurs, entrepreneurial human capital, entrepreneurship education, secondary schools, entrepreneurship program

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Strategising the Outsourcing Industry in an Emerging Knowledge Economy: A Critical Perspective

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ABSTRACT

Developing countries in Asia are in the process of transitioning from a production economy to a knowledge economy. Various new knowledge and information communications technologies mega-projects are being designed and executed to sustain competitiveness. The structures and processes underlying the development of knowledge economy projects are complex economic-social-political decisions. An in-depth understanding is illustrated and assessed using an interpretive case study concerned with formulating and implementing an outsourcing and contact centre industry programme to propel the knowledge economy. From the analysis based on the structurational framework, implications are drawn for success strategies and implementation.

Keywords: contact centres, outsourcing industry, knowledge economy, structuration theory, asian developing country

Potential Orang Asli Medicinal Plants for General Health and Drug Screening

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ABSTRACT

Plants have been used for many thousands of years to treat human disorders and pains. To the aborigines, plants which are found in their surroundings are not only important sources of food and materials for shelter but also valuable sources of medicines. Preliminary results of a study on the use of medicinal plant species by the indigenous people from the Temuan Tribe at Ayer Hitam Forest are presented. Although this forest is surrounded by rapid socio-economic development, it is ironically a substantial pharmacopoeia for the Temuans. The total of 99 medicinal plant species with 140 different uses were recorded and grouped into seven methods of application namely drink, eat, chew, poultice, rub, bath and shampoo. Medicinal plant resources can be used directly as pharmaceuticals (plant extracts and products), serve as templates for chemical synthesis of related medicinal compounds and used as investigative or evaluative tools in the drug development and testing process of chemical compounds.

Keywords: medicinal plants, application, temuan tribe, drug screening

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Science and Engineering Students: Are They Entrepreneurial?

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ABSTRACT

The intention on becoming an entrepreneur has been known to be the best predictor of an actual undertaking. Hence the Malaysian government has embarked on many programs to ensure that entrepreneurship is moving in the right direction. Thus, a study was conducted to determine entrepreneurial intention of science and engineering students in Malaysian educational system. Data were collected via questionnaire. Sample of the study comprised of seven hundred and fifteen students from normal secondary schools and technical secondary schools. The instrument has a high reliability values. Findings indicate that the students’ entrepreneurial intention is in the moderate to low category. They perceived that they have moderate support to be an entrepreneur and their attitude towards self-employment is moderate. This study suggests that science and engineering students need to be exposed to business management and entrepreneurial competencies so as to increase their entrepreneurial intention and efficacy.

Keywords: entrepreneurial intention, entrepreneurial self efficacy, social support, science students, engineering students

Modelling HRD Practices in Manufacturing Firms in Malaysia

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ABSTRACT

Theorizing and modelling Human Resource Development (HRD) worldwide is a complex task and varies between countries due to the economic, political, culture, labour market and educational systems of each individual country. Specifically, Malaysia, a developing country in the midst of achieving knowledge-economy status with a knowledge-based workforce, is likely to differ from other developing countries in terms of modelling its HRD practices. Therefore, the aim of this paper is to examine the extent and nature of HRD and to model HRD in manufacturing firms in Malaysia. This study employed a mixed-method approach of questionnaires and interviews for data collection. The findings showed that HRD practices in manufacturing firms in Malaysia are strongly d with the size of firms. Theoretically, HRD in manufacturing firms in Malaysia is strongly influenced by and d with Government interventions and economic and market changes, such as the requirement for ISO certification to compete in business, which influences the way human resources are managed and developed.

Keywords: human resource development, training and development, practices, models, manufacturing industry, Malaysia

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Entrepreneurial Intention of University Students

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ABSTRACT

A study was conducted to determine the perception of university students towards entrepreneurial intention. Four hundred and thirty nine students participated in the study. They comprised of university teacher preparation students from three leading research universities in Malaysia. The purpose of this study was to measure education students' entrepreneurial intention by using the Theory of Planned Behaviour. Findings indicated that there was a significant difference on entrepreneurial intention of the respondents. Those who are positive in entrepreneurial career aspiration scored higher in means intention compared to those who have no aspiration towards entrepreneurial career. This study suggests that an entrepreneurship course and proper entrepreneurial teaching strategies should be developed to create positive entrepreneurial intention and aspiration among teacher trainees. The implication of the study is to develop future teachers' entrepreneurial values so as to infuse entrepreneurship among secondary school students.

Keywords: entrepreneurial intention, entrepreneurship education, entrepreneurial aspiration, teaching strategies, university students

Revenue Recognition Policy of Malaysian Commercial Banks on Interest Income

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ABSTRACT

This paper discusses commercial banks’ accounting policy choice on suspension of interest on non-performing loans. Based on 2005’s annual reports of all commercial banks in Malaysia, the study finds that ownership and size of banks are significantly related to choice of whether to comply with GP3 guideline or to be more prudent than the 6 month cut-off.

Keywords: commercial banks, internet income, accounting policy choice

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Measuring and Managing Performance Improvement in the Manufacturing Sector

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ABSTRACT

Training and development (T&D) in the manufacturing companies in Malaysia are rapidly increasing as there are strong driving forces from the Government. The manufacturing companies are seen to be providing its employees with the training and development required by the organisation’s needs to improve and enhance the employees’ performance in their workplace. Hence, this paper reports how HR practitioners manage and evaluate employees’ performance after being provided with training and development activities. A combined data collection method of questionnaire survey and face-to-face interviews were employed on HR managers and personnel responsible for HRD in the manufacturing companies. It was indicated that HR managers and HRD practitioners assessed and measure mployees’ performance informally through direct observation and line managers or supervisors report rather than the more formal systematic process of performance appraisals. These HR managers and HRD practitioners report that they are aware of the importance of measuring performance improvement after training and development activities but the complexity of the measurement and evaluation processes and resources required are issues of concerns.

Keywords: training and development, evaluation, performance improvement, human resource development, Malaysia

Higher Education Entrepreneurship Programmes and Entrepreneurial Leadership Development of Students

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ABSTRACT

Higher education entrepreneurship program play fundamental roles in developing entrepreneurial qualities of students particularly their entrepreneurial leadership capabilities. A qualitative research has been conducted to investigate the roles of entrepreneurship programs of University Putra Malaysia in developing entrepreneurial leadership capabilities of students. A student entrepreneurial leader who is actively involved in entrepreneurial leadership activities through holding the leadership position of the university entrepreneurial club as well as university entrepreneurship development programs was purposefully selected as the participant. The semi-structured interview analysis indicates that the university entrepreneurship development programs facilitate entrepreneurial leadership development of students in many different ways including social interaction, opportunity recognition, and incubation. Suggestions for improving university entrepreneurship programs are presented

Keywords: entrepreneurial leadership, university students, entrepreneurship development programmes

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Disposition of HRD Structure in Manufacturing Firms in Malaysia

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ABSTRACT

Problem statement: Human Resource Development (HRD) is rapidly gaining importance in manufacturing firms in Malaysia, as there are strong driving forces such as legal, financial and infrastructural support from the Government. This is because the Government believes that investment in human capital is key to the success of the country's economy. However, this strategy may not be effective without the availability of a properly implemented HRD structure. **Approach**: The aim of this paper is to examine and report on the disposition of HRD structure in manufacturing firms in Malaysia. Its specific focus is the desirability and existence of separate HRD departments within organisations, as well as the size of these departments, the terms used to label them and the location of HRD within the organisational structure. This study employed a mixed-method concurrent research design, combining a questionnaire survey with personal interviews with HR managers from manufacturing firms in Malaysia. **Results:** The findings revealed that HRD in large firms is structurally strategically aligned, whereas small to medium firms are active in training and development and tend to focus on output rather than structure and strategy. **Conclusion:** Nevertheless, the findings of this study will enable employers to understand the importance of structure for the effective implementation of strategic HRD practice.

Keywords: human resource development, separate HRD department, reporting structure, labels, staffing and training centres

Corporate Reporting Quality, Audit Committee and Quality of Audit

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ABSTRACT

The study investigates the effectiveness of audit committee in terms of the quality of reporting. Characteristics examined include financial literacy, multiple directorships and independence of audit committee members of Malaysian listed companies. The quality of reporting is based on the selection criteria for the National Annual Corporate Report Award2002. Using logistic regression the results of 54 good annual reports matched with 54 poor reports show that only multiple directorship of audit committee members is significantly related to reporting quality.

Keywords: corporate governance, audit committee, financial literacy, multiple directorships

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The Efficiency of Stock Market based on the Inclusion-Exclusion Exercise of the Kuala Lumpur Syariah Index (KLSI)

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ABSTRACT

Much empirical work has evaluated stock price reactions of companies to a single type of event, such as public announcements on mergers, dividend payments, or security issue announcements. Less attention has been directed to the question of how news about a continuing event, like the news on the inclusion or exclusion of stocks from the Kuala Lumpur Stock Exchange Syariah Index (KLSI) that occurs twice a year, affects the security prices and trading volume of the companies involved. This study examines the price and volume effects on stocks after the announcement of their inclusion or exclusion from the KLSI during the period April 1999 to October 2007. This study finds that, in general, there are some significant differences in the average returns of stocks and the trading volume of Syariah-compliant counters for both the inclusion and exclusion of stocks from the KLSI in almost every year during the study period April 1999 to October 2007. This is an indication that the announcement of inclusion-exclusion of stocks from the KLSI does convey some good or bad news to investors and, as a result of that the stock price and trading volume react either positively or negatively.

Keywords: syariah-compliant stocks, market efficiency, event study

Human Resource Development Practices in Malaysia: A Case of Manufacturing Industries

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ABSTRACT

The national HRD policy in Malaysia is highlighting the importance in providing its human resources with the skills, knowledge and expertise to enhance the innovativeness and creativity of its workforce, which support the nation's vision in achieving a fully developed nation status by the year 2020. Most of the initiatives, incentives and support provided by the Government are towards the manufacturing industry for the reason that it accounts for the country's major exports and economic growth. With the government emphasis and support towards HRD in the manufacturing industry, this paper examines the degree and nature of HRD activities being practiced and implemented within this industry. A mixed-method combining questionnaire survey and personal interviews were employed. The results indicated that HRD is strategic in nature with the involvement of other levels of management in the different practices of HRD despite the various setback and factors impeding the effective implementation of HRD. And it was clearly evident that employees are developed for short term rather than longer term development.

Keywords: human resource development, training and development, manufacturing industry, Malaysia

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Learning Styles of University Students: Implications for Improving Entrepreneurial Learning Paradigm

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ABSTRACT

Learning is considered central in the process of entrepreneurial development. Learning styles play an important role in learning entrepreneurship at university. The main purpose of this study was to determine the university students' learning styles as a whole and in particular, the preferred learning styles of the students who had taken entrepreneurship related courses. A total of 1,554 university students from three research universities in Malaysia were selected as respondents of the study. The findings showed that university students preferred active, sensing, visual and sequential learning styles compared to reflective, intuitive, verbal, and global learning styles. The findings may guide policy makers, educators and lecturers at universities to understand how students learn and thus, provide facilities and instructional activities to foster entrepreneurial learning. This paper also presents suggestions towards improving entrepreneurial learning paradigm.

Keywords: learning style, entrepreneurial learning, university students 5/7

Case of Public Reprimands

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ABSTRACT

The study investigates the relationship between the contents of PN9 and receipt of public reprimands by Malaysian listed companies. Based on a matched sample of reprimanded and non-reprimanded companies for the first three quarters of 2005, the study finds no difference in the contents of the PN9 statements of both companies.

Keywords: corporate governance, audit committee, financial literacy, multiple directorships

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The Determinants of Financial Development: Institutions, Openness and Financial Liberalisations

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ABSTRACT

This study provides new evidence that sheds light on the influence of institutional quality, trade openness and financial liberalisation on financial market development, using data from 27economies (the G-7, Europe, East Asia and Latin America) during 1980-2001. The dynamic panel data analysis results demonstrate that real income *per capita* and institutional quality are statistically significant determinants of banking sector development and capital market development. The trade openness, however, is more prominent in promoting capital market development. In terms of financial liberalisation, the empirical results suggest that domestic financial sector reforms tend to promote banking sector development, whereas stock market liberalisation is potent in delivering stock market development. Nevertheless, the financial liberalisation programmes are more responsive in developed economies. Even though there are some signs that financial liberalisation does generate benefits to financial development in emerging markets, the significant level is weak in these markets. Nevertheless, the finding seems to support some specific role for the emerging markets in fostering the development of financial market via financial liberalisation. On the other hand, capital account liberalisation is the element that most consistently and significantly promotes financial development in developed economies, but the removal of capital account restrictions is ineffective in increasing financial depth in the case of emerging markets.

Keywords: financial development, institutions, openness, financial liberalisation, panel data analysis

Human Resource Development Strategies: The Malaysian Scenario

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ABSTRACT

The socio-economic development of Malaysia is greatly influenced by human resources activities in both the private and public sectors. But the private sector, particularly the industrial sector is the key player for the country's economic growth. In acknowledging human resources importance in this sector, the country's developmental plans developed thrusts that support the development of human resources to become skilled, creative and innovative. This article examines the concepts and nature of human resource development (HRD) at the national level in Malaysia. In examining HRD from the national perspective, a review of documentary evidence from relevant Governmental reports and documents was utilised. The plans, policies, strategies, roles and responsibilities in HRD at the national level were discussed.

Keywords: human resource development, national HRD, Malaysia

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Institutional Infrastructure and Economic Development

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ABSTRACT

This study attempts to empirically investigate the link between institutional quality and economic performance in a group of 72 countries during 1980–2001, using dynamic panel data analysis. Five institutional indicators that represent the overall institutional infrastructures of an economy are employed, namely corruption, rule of law, bureaucracy, repudiation of contracts and risk of expropriation. Using the large panel data set and more advanced panel data techniques, which control for country specific effects and endogeneity, the empirical results demonstrate that higher institutional quality is d with higher economic performance. The findings suggest that institutional development has statistically significant positive effect in all stages of economic development. Nevertheless, institutional quality is more responsive in low-income and middle-income economies, and the effects of institutions in high-income countries are smaller than these two groups. Among the various formal institutional infrastructure indictors, the rule of law has the largest economically significant positive effect in all income groups. Besides the rule of law, corruption, bureaucratic quality and risk of expropriation also demonstrate statistically significant impacts on economic development in middle income and low-income countries.

Keywords: institutions, laws, regulations, economic growth, dynamic panel data analysis

Environmental Variables and Performance: Evidence from the Hotel Industry in Malaysia

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ABSTRACT

This paper identifies the relationships between external environmental volatility and industry performance of hotels in Malaysia. Environmental uncertainty as the root cause of this volatility has been looked upon as the extent to which the future cannot be anticipated. An organisation affected by the external environment has to make adjustment in order to keep-up with the changing flow of resources. Survey questionnaires were distributed among selected five, four and three-star hotels throughout Malaysia. Data were collected for a six-year period extending from 1998 to 2003. Results suggested that there are significant relationships between environmental externalities and hotel performances. The Malaysian hotel industry went through drastic changes due to a greater extent of volatility in the environment and the increasing level of uncertainties in the world’s economy.

Keywords: environmental externalities, industry performance, hotel, Malaysia

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Managing Employees’ Career Progression: A Strategic Level in Human Resource Development

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ABSTRACT

Managing and planning for employees’ career progression is often touted as a strategic lever for developing individual capabilities d with human resource development (HRD) in organisations. Nonetheless, many organisations still lack a well-defined career planning process or fail to apply it consistently. The purpose of this paper is to describe the provision of career planning, training programmes and career progression evaluation as a strategic lever in HRD. The methods used for determining these factors in employees’ career progression are questionnaire surveys and interviews with human resource managers in manufacturing firms in Malaysia. Firms may need to understand that a comprehensive career planning and development process is a philosophy to be embraced by individuals as well as by organisations, and are recommended to design and implement the process effectively in order to achieve the objectives and goals of human resource development in manufacturing firms. This is because the career planning process is a tool to help employees examine their careers, evaluate their training and learning and enhance and reevaluate the relevance of their professional and managerial skills in a work environment that values rapid change and adaptation as well as valuing the importance of retaining human capital.

Keywords: career progression, career planning, HRD, manufacturing firms

Financial Liberalisation, Trade Liberalisation and Financial Development in Malaysia

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ABSTRACT

This paper examines the impact of trade liberalisation and financial liberalisation, especially in their combined effect, on the financial development in Malaysia. Using ARDL bounds testing approach, the empirical findings demonstrate that trade liberalisation and financial liberalisation are positive and statistically significant determinants of Malaysian financial market development. However, the results provide limited support to the hypothesis that the simultaneous liberalizing of both trade and capital flows is necessary to promote financial development in Malaysia. Moreover, the balance of the evidence also suggests that trade liberalisation and financial liberalisation may have been considerably more effective in promoting banking sector development than stock market development in Malaysia. The findings relate to every indicator of financial development employed (both banking and stock market).

Keywords: financial development, trade liberalisation, financial liberalisation, ARDL bounds test

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Outcomes of Human Resource Development Interventions

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ABSTRACT

Problem statement: In Malaysia, Human Resource Development (HRD) plays an important role in the economic development of the country. Despite government policies encouraging the implementation of HRD activities, as well as the substantial infrastructural and financial support provided, the benefits or outcomes of the HRD activities being implemented and provided to employees have not been examined. The aim of this study was to examine the outcomes of HRD interventions using the fundamental aspects of HRD's definitions. **Approach:** This study utilised a mixed method approach, combining questionnaire surveys and interviews with HR practitioners. **Results:** The findings suggested that HRD programs and activities being implemented and provided to employees in manufacturing firms in Malaysia generate individual and team development as well as work process improvement, but do not support HRD strategic planning for organisational change. **Conclusion/Recommendations:** This study implied that HRD programs and activities implemented had not been strategically planned and aligned with organisational goals and objectives. The limitations of the study and recommendations for further research were discussed.

Keywords: outcomes of HRD, individual development, work process improvement, organisational change

Is Malaysia Exchange Rate Misalignment before the 1997 Crisis?

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ABSTRACT

This study seeks to use the flexible-price monetary model in the cointegration and vector error correction model (VECM) contexts to determine whether there was misalignment in the Malaysian ringgit - U.S. dollar before the 1997 currency crisis. Unit roots, cointegration and weak exogeneity are tested to validate the monetary exchange rate model. Generally, it is found that all the series are I(1) process and there exists significant cointegrating vectors. Using the cointegrating vector and the final parsimonious VECM, out of sample predictions for Ringgit exchange rate are generated. The estimates from cointegrating vector suggest that the Malaysian ringgit was substantially overvalued on the eve of the financial crisis. And the results of VECM indicate that the Malaysian ringgit was overvalued from 1995Q2 – 1996Q2. Thus, evidence do support that the exchange rate overvaluation might be one of the causes contributed to the 1997 financial crisis.

Keywords: exchange rate misalignment, Malaysia, monetary model

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Asymmetric Adjustment of Commercial Bank Retail Rates in Malaysia

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ABSTRACT

This study provides an empirical analysis of symmetry versus asymmetries in adjustment between the wholesale money market rates and the lending and deposit interest rates in an emerging economy – Malaysia. Using a sample period from January 1980 to April 1995, we employed the two threshold cointegration tests proposed by Enders and Granger (1998) and Enders and Siklos (2001) – the TAR and M-TAR model, to investigate whether adjustment in interest rate is asymmetric in nature. Our results suggest that asymmetric adjustment is rejected at the conventional level and conclude that the adjustment is symmetric in nature. Furthermore, our results support the earlier findings by Scholnick (1996) that the loan markets in Malaysia are more sluggish than the deposit markets.

Keywords: asymmetric, interest rates, Malaysia’s money markets, threshold cointegration

Employee Resistance on TQM Implementation

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ABSTRACT

The aim of this paper is to discuss the theoretical and research evidence related to the issue of people barriers concerning problems and pitfalls in TQM implementation. The people-based and service-oriented nature of higher education institutions leaves the university leaders and managers for quality projects to look seriously into the cause of the problems, and apply a strategic approach to ensure successful quality initiatives. A qualitative survey on seven universities in Malaysia suggests that the main reasons for people resistance are lack of knowledge and information on the quality progranmme, lack of motivation and complacency attitudes, and the quality programme being perceived to cause more burden rather that benefit. The relevant human resource management practices and approaches are discussed to overcome the problems.

Keywords: human resource management, higher education, people resistance, quality management, qualitative methods

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Price Convergence and Market Integration: Evidence from Malaysia

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ABSTRACT

The pricing situation in Malaysia has always been of great concern for individuals as well as the Malaysian government. The purpose of this paper is to identify whether there are significant differences in price level across Peninsular Malaysia, Sabah and Sarawak by testing the consumer price indices convergence for various types of goods and services. Disaggregate monthly price data for 9 types of goods or services in Peninsular Malaysia, Sabah and Sarawak were utilized. Panel unit root test of Levin and Lin (1993) was employed to test whether the price of various types of goods among 3 provinces/states in Malaysia are stationary. The result of panel unit roots test showed that in more than half of the cases, we are able to reject the null hypothesis of unit root. In conclusion, we found considerable evidence in support of intra-national purchasing power parity (PPP) for majority of price groups in Malaysia. With regard to the degree of persistence of deviations from PPP after a shock, our empirical estimates showed a half-life of 6.75 years for Malaysia. Among the commodity/price groups, half-life for the tradable goods is roughly 1-2 years and for nontradable good is about 10 years.

Keywords: panel, price

Teachers’ Readiness to Use Technology In the Classroom: An Empirical Study

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ABSTRACT

The growing body of literature d with educational computer use has examined numerous variables and interrelationships in order to gain a better understanding of computer beliefs and use of computers within education. Teachers’ computer acceptance is an important factor to the successful use of computers in education. Thus there is a need to examine the factors affecting teachers’ computer use and its implications to teachers’ professional development strategies. This article reports a research on the relationship between actual usage of computer (AUC) and technology acceptance constructs among secondary school Mathematics, Science and English language (MSE) teachers in Malaysia. Overall, the study found that the AUC among MSE secondary school teachers were at the moderate level. Meanwhile, the constructs of attitude, perceived usefulness, perceived ease of use, job relevance, and computer compatibility showed significant positive relationship with AUC. Practical recommendations for school administrators and teachers been discussed.

Keywords: information technology, secondary schools, classroom, teachers, Malaysia

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The Asymmetric Effects of Monetary Policy in Four Asian Economies

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ABSTRACT

The idea that the effectiveness of monetary policy measures may depend on the state of the economy is examined for four Asian economies using a generalized Hamilton Markov Switching (MS) model of output due to Garcia and Schaller (2002). The null hypothesis of symmetry is rejected for these economies and monetary policy is seen to have larger effects during downturns than during upswings.

Keywords: monetary policy, asian economies, generalised hamilton, markov regime-switching, symmetry

The Effects of Personality and Cultural Intelligence on International Assignment Effectiveness: A Review

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ABSTRACT

Problem statement: Studies on cultural intelligence (CQ) have been recently initiated dramatically in an effort to determine how they were related to positive life outcomes. While past findings showed positive correlations to various aspects of life outcomes, clear establishments of the theoretical and empirical connections of CQ on cross-cultural adjustment and job performance among expatriates was still remain elusive in the literature. Approach: The literature was explored to acknowledge the accessible relationships among CQ, cultural adjustment and job performance of expatriates. Results: This article proposes a research framework that intends to cover several gaps and weaknesses identified in the literature. The sway of personality traits on CQ and expatriate assignment effectiveness were also discussed. In offering a new research approaches, total of eight research propositions were established. Conclusions/Recommendations: This article provides an updated review of the literature on CQ. The practical implications as well as academic contributions were also presented. Thus, anticipate more empirical studies on CQ and at the same time substantiate the proposed research framework.

Keywords: personality traits, cultural intelligence, expatriate adjustment, job performance

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Financial Crisis and the Efficiency of the Malaysian Banking Sector

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ABSTRACT

In the mid-1990s, the East Asian countries experienced severe financial crisis that were followed by deep economic downturns. A variety of methodologies have been used to explain the Asian financial crisis. However, the impact of the Asian financial crisis of 1997 on the efficiency of the financial industry has not been studied yet. The present paper investigates the performance of the Malaysian banking sector around the Asian financial crisis with the emphasis on the domestic versus foreign banks debate. The efficiency estimates of individual banks are evaluated using the non-parametric Data Envelopment Analysis (DEA) method. The analysis further links the variation in calculated efficiency scores to a set of explanatory variables i.e. size, profitability, and ownership. The results suggest that the foreign banks have exhibited higher technical efficiency compared to their domestic bank counterparts. However, the results suggest that the foreign banks were severely affected by the Asian financial crisis, implying that the foreign banks were not be insulated from unexpected events like the Asian financial crisis in 1997.

Keywords: financial disruptions, bank efficiency, data envelopment analysis, tobit regression, Malaysia

Measuring Transaction Costs of Fisheries Co-Management

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ABSTRACT

Fisheries co-management as an alternative to centralized command and control fisheries management is often suggested as a solution to the problems of fisheries resource use conflicts and overexploitation. Various researchers have talked of the importance of studying the role of transaction costs between different institutional arrangements for managing fisheries resources. This article provides an analysis of measurements of the transaction costs under a fisheries co-management system in San Salvador Island, Philippines. The results obtained for the period 1988–1996 indicate that the difference in the total costs of fisheries management between centralized government management and co-management is not that significant. However, the downstream or implementation costs are lower for a co-managed approach. This is because the cost of monitoring andenforcement are lower, and there is higher compliance with rules and regulations. This is important from a policy perspective as the implementation costs are the costs encountered on a perpetual basis as the management institutions are implemented. Thiscould result in an overall lower cost of managing the fisheries resources for the society.

Keywords: fisheries co-management, Philippines, transaction costs

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Facilitating Learning and Change for Performance Improvement

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ABSTRACT

A review of the literature reveals that learning organisation is likely to have significant impact on performance improvement. Nevertheless, a reduced amount of empirical research exists to support the significant relationship between learning organisation dimensions and performance improvement among Private Higher Learning Institutions (PHLIs). Thus to understand the relationship, managerial responses to the Dimensions of the Learning Organisation Questionnaire (DLOQ) together with perceived measures of PHLIs’ financial and knowledge performance were obtained. The exploratory models suggested that provision of strategic leadership for learning and, establishment of systems to capture and share learning are more likely to contribute positively to perceive financial and knowledge performance improvements. Additionally creation of continuous learning opportunities and, encouragement of collaborative and team learning have influenced the perceived financial performance and knowledge performance, respectively. This study also provides evidence on the reliability of the DLOQ in measuring the learning practices of PHLIs.

Keywords: learning organisation dimensions, private higher learning institutions (phlis), financial performance,knowledge performance, Malaysia

Ongoing Convergence within ASEAN

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ABSTRACT

This study provides evidence of ongoing real macroeconomic convergence of the founding members of ASEAN namely, Indonesia, Malaysia, the Philippines, Singapore and Thailand. Firstly, the long run macroeconomic relationship of ASEAN-5 is measured by their respective real gross domestic product. Secondly, the time-varying convergence of ASEAN-5 is examined. The empirical findings suggest that all ASEAN-5 are compatible where Malaysia, the Philippines and Thailand illustrate greater macroeconomic co-ordination. Hence, Malaysia, the Philippines and Thailand could be the driving force of ASEAN's regional co-operation. In order to accelerate regional co-operation efforts, Malaysia, the Philippines and Thailand should formulate reasonable and workable integration guidelines. As for Indonesia and other newer ASEAN members like Vietnam, Laos, Myanmar and Cambodia, ASEAN could draft special trade guidelines to boost intra-ASEAN cooperation. Besides outstanding macroeconomic performance, the realisation of a serious economic union would also depend on political stability and the sincerity of political leaders.

Keywords: ASEAN, time-varying convergence, cointegration

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An Examination of Educational Institutions' Knowledge Performance: Analysis, Implications and Outlines for Future Research

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ABSTRACT

Purpose – This study aims to explore the relationships between learning organisation dimensions, institutional characteristics and knowledge performance among Malaysian private higher learning institutions. Design/methodology/approach – The researchers sought managers' responses to the dimensions of the learning organisation questionnaire (DLOQ) together with perceived measures of private higher learning institutions' knowledge performance to determine relationships. Findings – It was discovered that there were positive, medium to high, and significant relationships between the seven dimensions of the learning organisation and the dependent variable, perceived knowledge performance. The three dimensions that demonstrated strong relationships were team learning, embedded systems and provision of leadership. The institutional characteristics that jointly affect the private higher learning institutions' performance were perceived level of institutional commitment to institutional/professional service and institutional level of commitment to effective teaching and learning. Originality/value – On the whole, the findings of this study provide empirical information, which supports the concept of the learning organisation and their positive influence on the knowledge performance, especially in the private higher education industry. Implications for research and practice as well as recommendations for future studies were highlighted to facilitate those who were involved in learning research.

Keywords: learning organisations, educational institutions, Malaysia

Growth and Convergence in ASEAN: A Dynamic Panel Approach

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ABSTRACT

This study investigates the issues of convergence and economic growth in the ASEAN. Preliminary graphical observations find strong evidence of β and σ convergence after the expansion of ASEAN membership. This results support the convergence theory that poor countries in ASEAN do catch up with the rich ones. The convergence and growth effects in the ASEAN integration is estimated by using the dynamic heterogenous panel approach namely Pooled Mean Group Estimator (PMGE). The empirical evidence supports unconditional and conditional convergence hypotheses in the ASEAN5 namely Indonesia, Malaysia, Singapore, The Philippnes and Thailand, for the 1960-2004 period. The ASEAN5 tends to converge to a steady state growth rate of per capita GDP with a speed of convergence of between 1.6% and 16.6%.

Keywords: regional economic integration, ASEAN, growth, convergence, dynamic panel approach

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Sarawak and Her Neighbours

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ABSTRACT

Whether poor economies tend to converge towards rich ones or else to diverge over time is an issue that has attracted the attention of policy-makers and academics alike for some decades. In Malaysia, the issue of economic convergence is also much debated. Despite the various Malaysia Plans for the past four decades, regional disparity between regions remains. The objective of the present paper is to address the question whether the state of Sarawak has been converging, catching-up or falling behind with her neighbouring countries/states/provinces. Using annual data for the period 1983 to 2003, our univariate unit root test result indicate that the state of Sarawak showing absolute convergence with Brunei Darussalam, while divergence with other neighbouring states and provinces. However, our robust panel unit root test strongly suggest that the growth of neighbouring countries does not have a key to play in explaining economic growth in the states of Sarawak for the period under study.

Keywords: Sarawak, convergence, divergence, catching-up, neighbouring countries

Border Effects of Malaysia’s Northern States and Southern Thailand

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ABSTRACT

Economists agree a country’s growth rate depends not only on domestic investment but also on the investment of its neighbouring countries. On the negative point, common shock such as wars and political instability can also have an adverse effect on growth of neighbouring countries. First, regional instability disrupts trade flows. Second, regional instability forces increases in military outlays, and will have a negative effect on economic performance. The purpose of the present study is to determine whether the growth rate of the neighbouring provinces of Southern Thailand has an effect on the economic growth of the Northern states of Malaysia. Using annual data from 1981 to 2003, our results using the long-run Granger causality in the vector error correction model setting suggest that Songkhla and Yala Granger cause Kedah, Songkhla Granger cause Perlis, and Narathiwat Granger cause Kelantan. On the other hand, while Perak and Yala indicate Granger cause in both directional, Perlis and Satun are independent of each other.

Keywords: border effects, Malaysia, northern states, southern Thailand, cointegration

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The Design and Use of Performance Measurement Systems in the Malaysian Electrical and Electronics Industry

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ABSTRACT

Data from a questionnaire survey covering 149 electronics and electrical manufacturing companies in Malaysia are used to identify the design and use of performance measurement systems (PMSs). Factor analysis identified the characteristics of PMSs that include: (1) four dimensions of design of PMS—well roundedness, extensive coverage, balanced measures and ad-hoc basis, (2) four dimensions of use of PMS—speedy, purposefulness, simplicity and objectivity. Results are likely to be of interest to the academic community, practitioners, the Malaysian government and those in other developing countries within the region.

Keywords: performance measurement systems, factor analysis, design and use of PMS, developing countries

Government Expenditure and Economic Growth in ASEAN5 Economies

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ABSTRACT

In this paper, we examine the relationship between components of government expenditure and economic growth in ASEAN-5 using the autoregressive distributed lag (ARDL) approach developed by Pesaran, Shin, and Smith. Bound testing approaches to analysis of level relationship, and this test suggested that the all variables in functional form framework are bound together in long run. The results also show that there are possible long-run coefficient effects between the variables. Breaking down the components of government expenditure, we found that health expenditure (*he*), information and communication technology expenditure (*ice*), education expenditure (*ee*), and housing and community facilities expenditure (*hce*) have a positive effect on economic growth among the ASEAN5 countries. The military expenditure (*me*) has a negative significant effect on economic growth in Indonesia and the Philippines. These results support those of other studies that indicate that in the long-run coefficients of the variables are an important determinant of the real GDP.

Keywords: government expenditure, GDP growth, cointegration, autoregressive distributed lag model (ARDL)

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Factors Influencing the Effective Use of Technology among Malaysian Teachers

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ABSTRACT

Previous studies revealed that the socio-demographic factors are vital and would sway the actual usage of computer (AUC) among secondary school teachers. Nevertheless the outcome of previous studies had shown inconsistent results. Hence, it is pertinent to investigate further on the influence of socio-demographic factors of gender, age, teaching experience, main subject taught, and training in computer usage on AUC among secondary school teachers. The AUC means the intensity of the computer usage by teachers, which would be measured in terms of how frequently the computer is used for job related and personal tasks. Interestingly this study has been carried out in Malaysia seeing that numerous incentives and support were given to the Mathematics, Science and English language (MSE) teachers to use computer in schools but preliminary observations found that they are not fully making use of the investment in technology.

Keywords: technology, teachers, Malaysia

Trade Openness, Foreign Direct Investment and Economic Growth in Malaysia

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ABSTRACT

This study examines the role of trade openness and foreign direct investment in influencing economic growth in Malaysia during 1975-2005, using the Bounds testing approach suggested by Pesaran et al. (2001). The empirical results demonstrate that trade openness is positively d and statistically significant determinant of growth, both in short run and the long run. The result also suggested that foreign direct investment is positively d in the short run and negatively d in the long run, both significantly. Besides these two variables, the other control variable namely exchange rate is also significant in the short run as well as in the long run.

Keywords: trade openness, ARDL, Malaysia

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The Effect of Intra Regional Trade on the Expansion of ASEAN Membership

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ABSTRACT

This study aims to investigate the effects of trade creation by examining intra-regional-trade between the five original ASEAN members, namely Indonesia, Malaysia, Thailand, the Philippines and Singapore after the formation of free trade area as well as after the expansion of ASEAN's membership. This study exploited gravity variables with panel estimation from 1993 to 2003 between ASEAN and forty trading partners. The model predicts that GDP as a proxy for market size, the absolute difference in GDP per capita as a proxy for relative endowment and common language will be positively d with bilateral trade. Conversely, the distance and the population are negatively d with bilateral trade. The ASEAN dummies used to measure the intra ASEAN trade indicate that there was trade creation among the five ASEAN members, reinforced by the expansion of new membership to ten members. Among the new members, Vietnam is found to have a positive relationship with ASEAN bilateral trade reflecting the way in which a country that joined ASEAN in 1995 been able to take advantage of free trade agreement packages.

Keywords: regional economic integration, Intra trade, ASEAN, AFTA, gravity model

The Bond between Intelligences: Cultural, Emotional and Social

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ABSTRACT

Increasing interest in multiple forms of nonacademic intelligences in addition to the well established intelligent quotient (IQ) to explain individual success has triggered a need for clear establishment of the theoretical and empirical connection among these constructs. As such, this article explores the interrelationship that exists among three forms of nonacademic intelligences: cultural, emotional, and social. Theoretical and practical implications are also discussed.

Keywords: cultural intelligence (CQ), emotional intelligence (EQ), social intelligence (SQ)

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Fiscal Synchronisation in Sarawak Municipals

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ABSTRACT

In this study, different hypotheses can be considered to examine such problem. The so-called tax-spend hypothesis postulates that government raise tax revenues ahead of engaging in new expenditures (Friedman, 1978, Buchanan and Wagner, 1978). The spend-tax hypothesis, on the other hand, predicts that government spends first and then increases tax revenues to finance their expenditures (Peacock and Wiseman, 1979, Barro, 1974). There is also the fiscal synchronisation hypothesis that suggests that government take decisions about revenues and expenditures simultaneously (Musgrave, 1966, Meltzer and Richard, 1981). Lastly, there is the possibility of independence as regards the decisions to spend and raise revenues (Baghestani and McNown, 1994). Using annual data on revenues and expenditures for 22 municipalities in Sarawak for the period 1975 to 2003, our cointegration and vector error correction model analysis suggest that the results are at best mixed.

Keywords: convergence, Malaysia’s development plans, Kedah, panel unit root, catching-up

Market Competition and the Use of Performance Measures in Malaysia Manufacturing Companies

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ABSTRACT

This paper reports the results of an empirical study into the use of multiple performance measures in manufacturing companies in Malaysia. More specifically, it investigates how a performance measurement system is linked with the intensity of market competition. In this study, a multidimensional performance measurement system refers to a portfolio of performance measures which involve (1) financial and non-financial performance measures, (2) external and internal performance measures. To test this relationship, data were collected from 77 Malaysian manufacturing organisations, across a wide range of organisational size and sub-sectors. Two hypotheses were developed: H1: Companies facing intense competition is likely to make greater use of financial and non-financial performance measures, and H2: Companies facing intense competition is likely to make greater use of internal and external performance measures Analyses included the use of descriptive, chi-square tests and one-way ANOVA between and within groups. The findings indicate that greater emphasis on multiple performance measures is d with businesses facing intense competition.

Keywords: market competition, performance measurement, manufacturing, Malaysia

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Pre and Post Crisis Analysis of Stock Price and Exchange Rate in Malaysia

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ABSTRACT

The furore and chaos created by the Asian financial crisis have ignited many studies on numerous subjects, and it is believed that the crisis has changed the way nations being administered and policies formed and implemented especially those regarding monetary and fiscal policies. Johansen (1991) cointegration method was used and the period was divided into two sub periods, albeit pre crisis and post crisis. The results obtained are similar with a number of past literatures pointing to no long run relationship between stock price and exchange rate for both periods.

Keywords: financial crisis, stock market, cointegration

Explaining Malaysian Bilateral Trade using the Gravity Model

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ABSTRACT

This study is an empirical study that aims to explain Malaysian bilateral trade using the powerful method in trade model, namely, the Gravity Model. The fixed Effects model includes time and bilateral effects to account for unobserved country heterogeneity. From basic gravity equation, the GDP for both Malaysia and her trade partners and the distance between two countries are the main determinants in explaining the Malaysian bilateral trade relationship. This study also found that countries similar to Malaysia in terms of country size increased trade meanwhile countries that were dissimilar in terms of relative endowment would trade less, which supports the Linder Hypothesis. Finally, the empirical estimation suggests that the free trade agreements with ASEAN members foster the intra as well extra Malaysian trade.

Keywords: Malaysia, gravity model, ASEAN, AFTA, bilateral trade

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Factors Influencing the Design and Use of Performance Measurement Systems in the Malaysian Electrical and Electronics Industry

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ABSTRACT

Data from a questionnaire survey covering 149 electronics and electrical manufacturing companies in Malaysia are used to identify the factors influencing the design and use of performance measurement systems (PMSs). Factor analysis identified organisations' contextual factors as potential contingency variables that include: (1) two dimensions of organisational profile—company size and ownership types, (2) four dimensions of organisational culture—knowledge and innovation, learning culture, absorptive capability and employee's understanding and learning, (3) four dimensions of organisation strategy—stakeholder focus, pricing and distribution, marketing segmentation and growth, and (4) four dimensions of technology—information technology and customisation, volume and variety of product and process, information and technological advancement, and product complexity.

Keywords: performance measurement systems, factor analysis, organisational contextual factors, developing countries

Financial Liberalisation and Liquidity Constraints in Malaysia

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ABSTRACT

One important implication of financial liberalisation is to reduce liquidity constraints. The ability of households to borrow and adjust their financial portfolios has important implications for monetary aggregates and consequently for the conduct of monetary policy. We should observe that the relationship between monetary aggregates and current income will be weakened in financially liberalized economies. In this study we have estimated an Euler equation and our results suggest that the fraction of liquidity constrained consumers in Malaysia has increased to more than 50 percent of the population in the 1980s/90s. We therefore conclude that liquidity constraints have not been reduced as a result of financial liberalisation in Malaysia

Keywords: financial liberalisation, liquidity constraints, monetary policy, Malaysia

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Bargaining Priorities in the New Economy: A Survey of Malaysian Employee Unions

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ABSTRACT

Collective bargaining is seen as the instrument able to provide management and labour the means to achieve the ends. The understanding of how collective bargaining process and practice react under the pressure of change is of practical significant in the present trend in industrial relations and human resource management, which is placing greater concern on employee involvement, harmonious management-labour relations and on the practices that promote them. This article provides useful hints on what strategic choices to undertake when engaging in collective bargaining and achieving favourable bargaining outcomes as a response to the ever-changing bargaining environment.

Keywords: bargaining priority, employee unions, industrial relations, Malaysia

Supplier Development Framework in the Malaysian Automotive Industry: Proton’s Experience

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ABSTRACT

In a dynamic market, firms need to evolve from traditional to strategic purchasing which aims to reduce the cost of the purchase and that might imply standardisation of components, delivery time and levels of inventory. This effort will usually include key suppliers as joint problem solvers and with these problem-solving models to work with, the firm’s attitude towards suppliers may change from confrontation to trust and partnership. From the buyer-supplier relationship perspective, the procurement practice of the buyer is critical and acts as a window to nurture the supplier development effort. This article presents the result of a study on supplier development in the Malaysian automotive industry, which focused on PROTON, and its role in developing the suppliers’ relationships and development. This study indicates that PROTON and its suppliers’ development program plays a crucial role in developing and extending comprehensive support to its supplier’s firm such as supplier selection and appointment, development, match making, and promoting continuous performance development and improvement programs.

Keywords: supplier chain management, supplier relationship management

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East Coast Economic Region from the Perspective of Shift-Share Analysis

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ABSTRACT

The Malaysian government is promoting a new regional development method particularly by promoting a regional development corridor. Our paper tries to examine this new development from the perspective of regional shift-share analysis that covers the period of 1980-1990. For that purpose, we compile several data which is subdivided into three different sub-periods, aims at analysing the performance of ECER economy vis-à-vis national economy. The ECER region GDP data are accordingly collected by its major sectors sourced from the EPU and respective state’s EPU which is expressed in its real value by using the GDP deflator. The results revealed that there exist potential strategic advantage to prospective investors since the ECER regions are attractive locationally, potentially performed better as the national development improved and production structure change that benefits and facilitate investors’ production technology. As an alternative, this study offers a few policy recommendations for investment plans in promising lucrative returns to production and business sectors.

Keywords: ECER, shift-share analysis, national shift, regional shift, industry mix

Blockade for Career Advancement in Japanese Organisation Abroad: The Case of Malaysian Subsidiaries

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ABSTRACT

This study empirically examines the significance of demographic factors and organisational characteristics in influencing the perceived barriers to career advancement of local managers in Japanese subsidiaries. Moreover, significant relationship between stereotype and discrimination and the number of local managers in higher management positions also been analyzed. The perceived barriers were examined through an analysis of 317 local managers working in 41 Japanese subsidiaries in Malaysia. Overall findings suggest that perceived barriers do exist in Japanese subsidiaries in Malaysia and these barriers hinder local managers' career advancement opportunities. Suggestions to trim down the barriers for career advancement among local managers in Japanese subsidiaries have been discussed.

Keywords: Malaysia, career advancement, japanese subsidiaries

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Perceived Factors Influencing Information Technology (IT) Skills Development in Undergraduate Accounting Programme

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ABSTRACT

The impacts of a dynamic nature of IT advancements on accounting practices force accounting education to reform its programme. IT skills become another mandatory skill for accounting graduates, besides other generic skills such as leadership skill, communication skill and general business knowledge. This research attempts to understand the process of enhancing IT skills development in undergraduate accounting programme of one traditional university in UK. Using grounded theory methodology, it aims to gain an insight into the research area from the perspectives of accounting practitioners, accounting educators and accounting students including alumni. The primary data collection methods are focus group, personal interviews, documents reviews and observations. This paper discusses the findings on factors perceived to influence the development of IT skills in the programme. The findings suggest that university policy, expectation of employers, IT skills development practices in other universities, quality assurance review and professional examination exemption are the main external factors that influence the IT skills development. More to the point, the internal factors such as personal motivation and interest of educators, perceived to be more influential in the decision to include and develop IT skills in the teaching process. Educators seem to be the main actor in the process. These findings make significant contributions to Higher Educational Institution in formulating policy regarding IT skills development and teaching innovation in accounting education. The policy should consider boosting the motivation and interest of educators as the main players.

Keywords: accounting education, information technology skill, generic skills, grounded theory

The Implementation of Special Scheme Inspection under the Factories and Machinery (Amendment) Act 2006: A Proactive Approach for Safety Requirement in Technology Advancement

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ABSTRACT

In 2006, the Factories and Machinery Act 1967 has been amended and the amendment involved more than thirty provisions including the introduction of new provisions into the Act 2006. The rational for amending the FMA 1967 was *inter alia*, to provide for the provision giving the power to the Minister to issue licence to individual or company carrying out activities under the Act, to update, improve and clarify unclear or vague provisions in the Act, to ensure the relevancy of the provisions contained in the Act with the current development and to ease the enforcement of the law as well as to increase the amount of fine suitable to the current situation. The Act has been amended so much so that the inclusion of the new provision in it takes into account the development and advancement of technology, particularly on the latest procedure of inspection of plant and machinery in the industry. By inserting such provision, an option is provided for the industry to conduct its special scheme inspection that analyzes the likelihood of failure and the consequence of the same in its work. This will provide the economic benefits and safeguard the integrity of the plant in the industry that will eventually increase the productivity and competitiveness of the industry. This paper discusses the importance of the inclusion of the special scheme inspection into the statutory provision and how the safety and health at work legislation in Malaysia regulates the implementation of the system in the light of the development of technology in the industry.

Keywords: special scheme inspection, economic benefit, integrity of industry

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Regional Income Disparity among States in Malaysia

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ABSTRACT

This study test for stochastic convergence for 14 states in Malaysia for the period 1960 to 2003. Stochastic convergence implies that idiosyncratic country-specific factors cannot explain long-run economic growth and that shocks to relative regional real per capita GDP have temporary effects. In this case, real per capita GDP differentials between states are stationary. Thus, stochastic convergence implies that regional income disparity across states are not persistent and long-run movements in a state’s GDP are driven by common technology shocks. Our result indicates that the null of no convergence in GDP per capita across the fourteen states in Malaysia can be rejected. From the policy perspective, our study suggests that previous regional development policies are able to reduce income disparity between the fourteen states in Malaysia.

Keywords: regional income disparity, malaysian states, stochastic convergence, panel unit root

Halal Logo and Consumers' Confidence: What are the Important Factors?

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ABSTRACT

The food consumed by Muslims must meet the Islamic dietary code called halal. Halal is an Arabic word meaning lawful or permitted. Muslim consumers are found to be very concerned about the halalness of the foods they consume. The recent halal food crises and its diffusion through the media in Malaysia had as consequence, in general, reduced public confidence, and of the Muslims in particular, in the products that they purchase. The lack of enforcement in the monitoring of the halal food products has caused consumers to query the validity on the products or services claiming to be halal. These public outcries have triggered the interest of researchers to study the level of confidence on the halal food products and the logo which is d with it. This paper aims to assess consumers' confidence relating to halal logo on food products in Malaysia. Six hundred respondents were interviewed via structured questionnaires to gather information on their level of confidence and purchasing behavior towards food products with halal logo. Factor analysis was used to determine the factors which influenced consumers' confidence toward Halal food. The results indicate that socio-economic variables play an important role when explaining consumer behavior. The factors contributing to confidence, especially those related to safety and government involvement, as well as degree of awareness, trustworthy and manufacturing practice were found to be the major factors determining Malaysian consumers' confidence on Halal logo on food products.

Keywords: *halal* logo, food products, consumers, confidence, factor analysis

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Engine of Growth in China and India

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ABSTRACT

This study examines the meaningful relationship between economic growth, and service sector contribution and domestic investment in two major Asian economies, namely India and China. Autoregressive Distributed Lag (ARDL) bounds testing procedure is employed to analyze the impact of the selected variables namely (1) contribution by the service sector, (2) (4) domestic investment on economic growth and *vice versa*. The period of interest is 1960-2005 using annual data. The empirical results demonstrate that for the case of India, there is (1) a unidirectional causality from domestic investment to economic growth and (2) from economic growth to services. As for China, only unidirectional causality from services sector to economic growth is detected, while no meaningful relationship was found between domestic investment and economic growth.

Keywords: service-led, investment-led, China, India

The Linkage between Manufacturing Strategies and Strategic HRM Practices in Malaysia

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ABSTRACT

Rapid development and changes brought about by the global business environment should be accompanied by human resource management (HRM) practices which are progressive and forward looking to avoid failure for firms due to inability to properly manage their human capital. This study was undertaken in an attempt to identify which manufacturing strategies are significantly related to strategic HRM practices in Malaysia. This is based on the contingency theory which holds that certain HRM practices are implemented in accordance with type of competitive strategy adopted by the firms. The results of the study show that quality and flexibility based strategy is still a dominant concern for manufacturing firms. Through this study, the information gathered is useful for strategy formulation and how it leads to improved strategic HRM, specifically among Malaysian organisations and other parts of the world in general. Moreover the study is unique as it took place in a heterogeneous socio-political, cultural and economic environment.

Keywords: manufacturing strategies, human resource management, Malaysia

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Regulating High-risk Activities in Construction Industry in Malaysia: The Need for Legal Protection

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ABSTRACT

Construction industry is one of the important industries in Malaysia to register positive employment growth. With the progress of the industry, problem of industrial accidents are inevitable due to the nature of work involved in every phase within a construction project. As far as the hazards to the workers’ safety is concerned, the high-risk related activities including work at height and lifting operations are identified to have posed its own hazards to the workers that contribute to injury cases in construction. However, there are no specific Regulations and Approved Code of Practice for construction that provide further provisions to be followed by the duty holder to achieve the general safety duty, particularly for working at height and lifting operations. Thus, the discussion in this article seeks the reference from the regime of occupational safety and health legislation in other jurisdictions that provide for such protection, as a guidance or direction to improve the present legislation on occupational safety and health in Malaysia.

Keywords: construction, work at height, lifting operation, injury

Crime and Income Inequality in Malaysia

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ABSTRACT

This paper examines the causality between income inequality and crime in Malaysia for the period 1973-2003.Autoregressive Distributed Lag (ARDL) bounds testing procedure is employed to (1) analyze the impact of income inequality on various categories of criminal activities as well as to (2) analyze the impact of various categories of criminal activities on income inequality. Interestingly our results indicate that income inequality has no meaningful relationship with any of the various categories of crime selected, such as total crime, violent crime, property crime, theft and burglary. Crime exhibits neither long-run nor short run relationships with income inequality and they are not cointegrated. It cannot be denied that there is ambiguity in the empirical studies of crime economics regarding various income variables leading to often mixed and contradicting results, which might be a good explanation of this finding.

Keywords: Malaysia, bounds testing, crime, income inequality

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Liberalisation of Retail Sector and the Economic Impact of the Entry of Foreign Hypermarkets on Local Retailers in Klang Valley, Malaysia

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ABSTRACT

Since the mid-1990s, there has been an increasing trend of retail globalisation. This phenomenon has led to rapid expansion of large-scale retail multinationals into many countries across Southeast Asia, Central Europe and Latin America. This emerging trend has triggered a number of research interests on the issue of retail globalisation and its impact on host countries. The primary purpose of this research is to investigate the impact of liberalisation of retail sector via the presence of foreign hypermarkets in Malaysia on local retailers. Both quantitative and qualitative methods (survey and interviews) were used to collect and analyze the data. A total of 135 questionnaires were completed. The findings from the survey reveal that the entry of foreign hypermarkets in any particular town often affects the business environment of the local retail businesses. It is found that the newly established foreign hypermarkets tend to acquire much larger market share from the existing local businesses. The survey found that some businesses benefited from the presence of foreign hypermarkets (especially complementary type of retail businesses) while others do not (specifically those retail businesses that are related to groceries).

Keywords: globalisation, retail multinational, liberalisation, economic impact, Malaysia

The Effect of Manufacturing Strategy on Organisational Performance

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ABSTRACT

The research reported in this article investigated the effect of manufacturing strategy on organisational performance in the Malaysian electrical and electronic sector. It was revealed that a cost-based strategy greatly affected the performance of organisations participating in this study. This result implied that a cost-based strategy is still a dominant concern for manufacturing firms. The information gathered through this study is useful for strategy formulation and for understanding how a strategy can lead to improved organisational performance in general.

Keywords: manufacturing strategy, organisational performance, Malaysia

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The Effects of Trade on Changes in Relative Demand for Labour in Malaysia (1984-1997)

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ABSTRACT

This paper is concerned with the expansion of the trade has explained a little effects on relative labour demand for female workers in Malaysia during the period 1984-1997. Using set of data comprises micro-level data from the Household Income Survey (HIS) for several years during the period 1984 to 1997 this paper finds a some support for the prediction of the basic Heckscher–Ohlin and Samuelson (HOS) model in that trade can explain the changes in industry skill wage premia at higher levels of education. Interestingly, and not unexpectedly, further investigation under production allocation, trade is also found to have increased the relative demand for educated male and female production workers in the mid 1990s, but seems to have decreased the relative demand for this group during the mid 1980s and late 1990s.

Keywords: labour demand, wage differentials, trade and labor market interaction, technological change

The Transfer of Japanese-style Management Abroad

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ABSTRACT

Purpose – The purpose of this research is to empirically examine the extent to which the Japanese style human resource management (HRM) model is being transferred to subsidiaries, given the contextual characteristics of the Malaysian environment. Design/methodology/approach – The transferability of Japanese-style HRM is examined through an analysis of the policies and practices of 69 Japanese subsidiaries and focuses on the following specific areas of HRM: employment policies and practices, remuneration systems and career development policies and practices, and management strategies and workplace industrial relations practices. Findings – Overall, the findings suggest that the key elements d with the Japanese-style HRM as described in most of the literature are either present to a very limited degree or completely absent. It seems clear that the transfer of the distinctive Japanese-style HRM, and especially the ‘‘four pillars’’ is not a priority of management. To a certain extent, most companies seem uncomfortable with the characteristics of the local labor. However, the HRM policies and practices in the companies surveyed are not simply the result of the limitation of the local environment and resources, rather they are ‘‘opportunist’’ management strategies which, by taking account of these contextual limits, seek to control the subsidiaries’ operations.

Keywords: human resource management, subsidiaries, Japan, Malaysia

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An Input-Output Analysis of Sources of Growth and Key Sectors in Malaysia

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ABSTRACT

The paper examines the sources of growth and key sectors of Malaysia’s economy over 1978-2000 using a decomposition method and Rasmussen degree of dispersion within the input-output (IO) framework. The model uses three comparable IO tables for 1978, 1991 and 2000 as the main data sources and accounts for output changes from a demand side perspective. The chosen structural decomposition analysis (SDA) based on the comparison between two IO tables, allows us to decompose each sector’s and industry’s output growth. It decomposes output growth of each sector to domestic demand expansion, export demand expansion, import substitution of final goods, import substitution of intermediate goods, and changes in IO coefficients. The analysis by sub periods, 1978-1991 and 1991-2000 show that there was a switch in the role of domestic-demand and export-demand expansion. The constituent factors that contribute positively to change in the period, 1978-1991 are mostly domestic demand expansion (63.35%) and export demand expansion (33.33%). However in the second sub period, 1991-2000, export demand expansion increased by 12.43% and domestic demand expansion decreased to 48.11%. Taking the whole 1978-2000, domestic demand expansion appears to have been the major source of output growth, contributing about 82%, followed by export demand expansion 62%. Combining the source of growth and key sector through backward linkages, the study revealed that most of the sectors induced its supplying production strongly for domestic market.

Keywords: structural change, input-output, decomposition, domestic demand expansion, export demand expansion, linkages

Defense Spending and Income Inequality in Asia

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ABSTRACT

This paper examines the causality between defense spending and income inequality in selected Asian countries namely Malaysia, Indonesia, Singapore, Philippines, India and South Korea for the period 1970-2005. Autoregressive Distributed Lag (ARDL) bounds testing procedure is employed to (1) analyze the impact of defense spending on income inequality and (2) the impact of income inequality on defense spending as well. Interestingly our results indicate one way causality running from defense spending to income inequality only for the case of Malaysia and bidirectional causality for the case of Singapore. As for the remaining countries, no meaningful relationship could be detected and it can be seen as sign of good governance in these countries.

Keywords: defense spending, income inequality, asian, bounds testing

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Changes in Relative Demand for Labour in Malaysia using a Decomposition Approach

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ABSTRACT

This paper is concerned with the two main causes of wage differentials in the Malaysian labour market during the period 1984-1997. These are the impact of changes in trade patterns and technological change. The paper has employed set of data comprises micro-level data from the Household Income Survey (HIS) for several years during the period 1984 to 1997. The main finding of this paper is that changes in the relative demand for labour favour middle level of education (secondary levels of education) workers and that technological change is the main explanation for the changing pattern of employment in the Malaysian economy. The paper finds that changes in the pattern of trade have had only small effects in explaining the changes in the relative demand for labour.

Keywords: labor demand, wage differentials, trade and labor market interaction, technological change.jel classification codes: j21,j23,j31,o33

Natural Disaster Death and Sosio-economic Factors in Asia

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ABSTRACT

The purpose of the present study is to investigate the relationship between disaster fatalities with the level of economic development, years of schooling, land area and population for a panel of fifteen Asian countries over the sample period over 1970 to 2005. Our results indicates that the relationship between disaster losses and the level of economic development is nonlinear in nature suggesting that at lower income level, a country is more disaster resilience but at higher income level, an economy become less disaster resistant. Other disaster determinants of interest is the level of education which suggests that educational attainment reduces human fatalities as a result of disaster, larger population will increase death toll and larger land area will reduce disaster fatalities.

Keywords: natural disaster, asian, panel data analysis

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Influence of Brand Loyalty on Consumer Sportswear

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ABSTRACT

The purpose of this research is to investigate how the respondents are influenced by factors of brand loyalty towards sportswear brands. Previous research adopted seven factors to test in the Malaysian environment. The seven factors of brand loyalty are brand name, product quality, price, style, promotion, service quality and store environment. Brand name has shown strong correlation with brand loyalty. In order to increase customer satisfaction and drive them to be brand loyalists, markerters are encouraged to develop aggressive marketing programs. Questionnaires were distributed and self-administered to 100 respondents. Descriptive analysis, one-way ANOVA and Pearson Correlation were used in this study. The research results showed that there is positive and significant relationship between factors of brand loyalty (brand name, product quality, price, style, promotion, service quality and store environment) with sportswear brand loyalty. Study of more focused factors that are appropriate to the Malaysian environment is recommended in order to obtain accurate information.

Keywords: brand loyalty, brand switching, sportswear, Malaysia

Managing OSH at Construction Sites in Malaysia: Is There a Legal Duty?

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ABSTRACT

The article seeks to argue that given the special nature of construction industry there is a need to have specific regulations to deal with the management of safety and health matters at construction sites. Whereas mills or factories have fixed or permanent work sites, construction project are different, for example there are not just contractors but also sub-contractors. And the workers too have to move around from one site to another. What is particularly wanting about the law pertaining to occupational safety and health in Malaysia is the law which imposes the duty to manage safety and health in construction.

Keywords: OSH management, construction, legal duty

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Relationship between Strategic Human Resource Management and Organisational Performance: Evidence from Selected Malaysian Firms

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ABSTRACT

Based on the universal and contingency approach, the relationship between strategic human resource management (HRM) practices and organisational performance have been examined in the Malaysian electrical and electronic sector. The finding provides support for the universal perspective and the resource-based theory that a firm’s human capital pool that is embedded within a synergistic HRM practices will lead to a better organisational performance. It has also proven the idea propagated by institutional theorist that firms will adopt best practices to survive external pressures like economic uncertainty and the market environment.

Keywords: strategy, human resource management, organisational performance, Malaysia

Predictors of Technology Deployment among Malaysian Teachers

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ABSTRACT

Technologies advocate researchers had identified a number of factors that affect individual teachers' usage of computers. Nevertheless mix results were reported in literature. Hence, this study used personal characteristics and the technology acceptance constructs to understand the Actual Usage of Computer (AUC) among Malaysian teachers. The final model derived from this study was able to explain and predict approximately 54.5% of the variance in AUC. There were five variables significantly predicts the AUC and the strongest among them is perceived ease-of-use, followed by perceived usefulness, job relevance, computer compatibility and attitude. It is believed that the findings of this study would add new perspective on understanding the complexities associated with computer and learning among teachers.

Keywords: technology, teachers, Malaysia

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Wage Differentials, Industrial and Skill Structure in Malaysian Manufacturing, 1974-1996

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ABSTRACT

The objective of the present paper is to measure the proportional changes in salaries and wages and the impact of changing industrial structure on the employment of skill workers in Malaysian manufactures during 1974-1996. By using 5-digit MIC, 30 major groups of industries are chosen out of 129 sub-industries. The proportional changes in relative wage is ascribed to three district effects, namely distributional , differential and industrial ranking effects. The present paper found that during the overall period, there was a clear trend of skill widening ascribed mainly to distributional of skill among sub-industries while skill differences within sub-industry seem to be unimportant. Among all the industries, electrical machinery industry seems to be the most important industry that caused major skill differentials.

Keywords: skill differentials, wages, structure change

Practices of Working Capital Management Policies in Malaysia

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ABSTRACT

There is no doubt that working capital is important to a firm. The efficient working capital management is an integral part of overall management strategy to create shareholders’ wealth. Further, there is not a single working capital policy that is suitable for all firms. Each firm requires a policy which can maximised shareholders’ wealth. However, to have an optimal working capital a firm should strive to balance its risk and return, it is a trade-off between profitability and liquidity. Therefore, this study aims to investigate the working capital policies practiced among firms in Bursa Malaysia. Results for the degree of aggressive asset management show the sector had distinctive and significantly different policies. Further, the asset policies between sectors revealed significant stability over the twelve year study period. The results of this study also showed a high and significant negative correlation between sector of asset and liability policies. This is revealed when a firm applied aggressive working capital asset policies which followed by conservative working capital financial policies.

Keywords: working capital, asset management policies, liability policies, aggressive policies and conservative policies

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Willingness to Pay among Non-visitors of Taman Negara National Park

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ABSTRACT

Approaches such as the Contingent Valuation Method (CVM) have helped to assign dollar values to non-use values for non-market goods. This study uses the CVM, with Willingness to Pay (WTP) as the elicitation method to measure non-use value among non-visitors of Taman Negara National Park. This study also will help answer questions: Are there any difference in the WTP of various market segments based on nationality, gender, age, education and income among non-visitors? This study found that there is a difference between non-visitors willingness to pay. It is also found that non-visitors market segments such as nationality, income etc. differed. Although using WTP for this economic valuation cannot provide exact answers on the valuation of these natural resources, it can still provide a guideline on pricing strategy and give extra information for park management decisions especially about pricing.

Keywords: willingness to pay, contingent valuation method, sustainable tourism, national park, entrance permit

A Study of Optimum Currency Area in East Asia: A Cluster Analysis

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ABSTRACT

This paper studies the feasibility of ASEAN+3 Monetary Union by investigating the homogeneities of the countries. Utilizing techniques of cluster analysis on two sets of criteria, the Optimum Currency Area (OCA) and the adjusted Maastricht Treaty (MTC), reveals that homogeneities of ASEAN+3 are low and the immediate formation of a monetary union would entail serious potential costs. Furthermore, our findings suggest that grouping differ between pre-crisis and post-crisis periods which could be due to the different impact of the crisis on the economic structure of these countries.

Keywords: optimum currency area, cluster analysis, East Asia

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Are Entrepreneurs' Forecasts Unbiased?

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ABSTRACT

This study re-examine the forecasts unbiasedness property of REH in a panel data setting by using the expectational survey data as forecasted and reported by Malaysia's manufacturer in the *Business Expectations Survey of Limited Companies* (BESLC). The validity of the most familiar interpretation of rationality - that survey measures are unbiased forecasts of the actual future outcomes is investigated by estimating the Realized-Forecast-Regression for 18 manufacturing industries spans from 1984:1-2000:1. The findings of this study corroborate other studies that dealt with either manufacturing firms or micro-level expectations rejected the REH.

Keywords: economic forecasts, rational expectations, unbiasedness, manufacturing firms, Malaysia

The Demographics of Consumer Decision-making Style Dimensions in FMCG Purchases

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ABSTRACT

The study objective is to examine the relationships between demographic characteristics and the Malaysian consumer decision-making styles dimensions in Fast Moving Consumer Goods (FMCG) purchases. It is based on the modified Sproles and Kendall's (1986), Consumer Style Inventory (CSI) scale on 506 samples collected from the general public residing in the Klang Valley area. Using exploratory factor analysis, the findings indicate that there are between group differences as well as within group similarities in the consumers decision-making styles related to different demographic characteristics. This indicates the existence of demographic effects on consumers' decision-making styles.

Keywords: decision-making styles, demographic characteristics, fast moving consumer goods, consumer style inventory

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Towards Harmonisation of the Law of Guarantee in Malaysia

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ABSTRACT

Guarantee is regarded as the most common instrument used in the business of credits in the Malaysian commercial banks. Being the simplest and least expensive, the guarantee serves as the most acceptable for of security in credit transactions. However, due to the 'unfettered discretion' that the law gives to the creditor banker in cases of default, the attractiveness of the instrument has become diminished. This project seeks to clarify the above issue in the light of Islamic legal point vis-à-vis current position of the law of guarantee in Malaysia. Focus has been made to the rights of a creditor to sue a guarantor in cases of default. Methods of legal deduction as well as legal reasoning have been adopted to understand the values and meanings of the relevant laws. From the findings, we recommends that modifications be made to the current practice of the law of guarantee in Malaysia, and this could be done through the process of convergence of the rules in the classical Islamic law into current practice of the law of guarantee in Malaysia.

Keywords: guarantees, islamic law, harmonisation, contract act 1950

Industry Concentration in Malaysia

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ABSTRACT

For the last five decades, disparity in income across states in Malaysia continues to be a matter of concern. The existence of regional inequalities and the prospect that these inequalities may widen were recognized by the Malaysian government. The eight volumes of the 5-Year Malaysia Plan reflects the sincerity of the Malaysian government in eradicating if not elevating the problem of regional or states imbalances. The Ninth Malaysia Plan, the South Johor Economic Region (SJER) and the more recent North Corridor Economic Region (NCER) are to narrow the gap between regional income disparities in Malaysia. Using annual data for the period 1970 and 2000, and using the location quotient and the standard shift share method of analysis we found out that poor states (Kedah, Perlis and Kelantan) are characterized by economic activities concentrated in the Agriculture sector, while the richer states (Penang, Selangor and Wilayah Persekutuan), the Manufacturing sector are the main contributors to the economic growth.

Keywords: industry concentration, location quotient, shift share, Malaysia

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Corporate Real Estate Strategies and Financial Performance of Companies

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ABSTRACT

This study analyzes the relationship between Corporate Real Estate (CRE) strategy and the financial performance of major companies in the UK for two time periods, 1998 and 2003. The identification of specific CRE strategies is based on the seminal work of Nourse and Roulac (1993). The results indicate that more than 75% of the companies examined had a CRE strategy that could be mapped to the Nourse and Roulac framework and that certain CRE strategies made a contribution in enhancing the financial performance of companies. The relationship was stronger for companies in 2003 than for 1998. This was tested for both share price and profit margin as the dependent variable. This study concludes that CRE strategy can make a limited contribution to company financial performance.

Keywords: corporate real estate, financial performance, UK companies, multivariate modelling

The Influence of Classical Interpretation on the Law of Guarantees in the United Arab Emirates

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ABSTRACT

During the past four decades, the world has awakened with the reassertion of Islamic law in the Muslim world. At this point, the reassertion also means the embedment of classical interpretations in modern law as they are regarded as part of Islamic law. The question arises is how far these classical interpretations bind modern legislators and to what extent, if any, classical interpretations influence the development of modern legal principles. This project seeks to clarify these issues through the examination of the law of guarantees in the United Arab Emirates. Both classical and modern legal sources of the United Arab Emirates have been examined for the above purpose. The study demonstrates that classical interpretation has a profound influence in the development of the law of guarantees in the United Arab Emirates.

Keywords: classical interpretation, *ijtihad*, islamic law, *fiqh*, guarantees, United Arab Emirates, civil transaction code 1985

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The Effects of Emotional Dissonance and Employee’s Empowerment on Service Quality and Customer Satisfaction Perception: Customer Level Analysis

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ABSTRACT

The performance of customer contact employees is essential in ensuring the success or failure of the service exchange. Employee’s personal conduct and attitude play an important role in affecting customer’s awareness of the quality of service delivered. This study contributes to the current body of work in the service marketing area by investigating four major constructs, Empowerment, Emotional Dissonance, Service Quality and Customer Satisfaction and their relationships. The sample comprises of hotel customers. The data was collected using a qualitative interview technique. Findings indicate that empowerment has a relationship with emotional dissonance and empowerment may also have significant influence in managing employees’ emotion at a workplace. Results also reveal that there is a positive relationship between empowerment, service quality and customer satisfaction.

Keywords: empowerment, emotional dissonance, service quality, customer satisfaction

AFTA and Intra ASEAN Trade

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ABSTRACT

This paper examines ASEAN economic integration and its ability to promote intra-ASEAN trade, namely, Indonesia, Malaysia, Philippines, Singapore and Thailand. In order to achieve this goal, a modified gravity model is estimated within autoregressive distributed lag (ARDL) framework, or bounds testing approach for each of the five ASEAN countries based on data from year 1970 to year 2001. The empirical results indicate that the effects of the size of economy on bilateral trade flow in ASEAN are either trade-enhancing or trade-inhibiting dependent on the country-specific. There is evidence that AFTA preferential arrangements are important and prevalent in enhancing intra-ASEAN trade. However, ASEAN countries may not as a whole benefit from the formation of AFTA as the trade deflection might occur in the regional market.

Keywords: AFTA, intra ASEAN trade, trade creation, trade diversion

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Catching-Up and Convergence in the State of Kedah

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ABSTRACT

In Malaysia, the issue of economic convergence is also much debated. Despite the various Malaysia Development Plans for the past three decades, regional disparity between states remains. Thus, the objective of the present paper is to address the question whether the state of Kedah has been converging, catching-up or falling behind the other states in Malaysia. Using annual data for the period 1961 to 2003, our panel unit root test result suggest that the state of Kedah has been catching-up with other states. In this respect, the local government has an important role to play in enhancing growth by continuously providing stable economic environment for investment and other productive economic activities. This will ensure convergence can take place in the future.

Keywords: industry concentration, location quotient, shift share, Malaysia

How Integrated are Asean+3? Determinants and Implications of Intraregional Trade Integration in Asia

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ABSTRACT

This paper examines whether ASEAN (Association of South East Asian Nations) should include China, Japan and Korea (to form ASEAN+3 free trade area) by investigating the evolution of trade integration in Asia. Using a gravity model of bilateral trade in the region reveals that trade integration is significant in ASEAN+3 but not in ASEAN, which support the idea of including the three North East Asian countries in the regional trade integration. This paper also investigates the impact of ASEAN+3’s trade integration on regional business cycles’ synchronisation. The results suggest that the improvement in ASEAN+3’s intraregional trade integration does not impact upon the region’s long term plan for more serious economic cooperation, for example an Asian Currency Unit that requires high degree of synchronized business cycles.

Keywords: trade integration, gravity analysis, ASEAN, ASEAN+3, business cycle

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Performance in Malaysia Institute of Accountants Qualifying Examination: Towards a Holistic Understanding

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ABSTRACT

Since 2003, MIA has implemented the MIA Qualifying Examination (MIA QE) as an additional route for admission into MIA as Chartered Accountants. The low rate of MIA QE successful completion has been a concern to MIA and other stakeholders of MIA QE. This study was conducted to examine the MIA QE candidates’ performance in Advanced Financial Accounting and Reporting, Auditing and Assurance Services, Business and Company Law and Taxation over nine sittings from March 2003 until September 2007. The study also explores the reasons for the low successful completion rate of MIA QE. The research data were collected through a combination of methods such as, face-to-face interviews, review of the related documents and an on-line survey. Interviews with various stakeholders of MIA QE were conducted to attain a holistic explanation the performance of candidates. Analysis of performance by demographic profile for the September 2007 sitting showed that the candidate’s performance in MIA QE was affected by age for Business and Company Law, gender for Advanced Financial Accounting and Reporting and number of papers per sitting for Taxation. Factors affecting performance were grouped into three categories namely, candidate-related, curriculum and MIA administration. The candidate-related factors include their commitment in preparing for the examination, their English proficiency and work experience. The self-study mode was insufficient for the majority of candidates to prepare for their examination. The recommendations to improve MIA QE performance include refining the admission requirements, a closer monitoring of the candidates, especially, those who did not attempt any paper at all over the four years, providing more academic support and a more stringent procedure in granting approval for both the candidates’ admission into MIA QE and extension of MIA QE duration. It is imperative that candidates increase their commitment and perseverance to ensure the timely and successful completion of MIA QE.

Keywords: MIA QE performance, chartered accountants, factors affecting performance, recommendations to improve

Toy Safety Testing and Purchasing Behaviour amongst Parents

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ABSTRACT

The standards for toys in Malaysia have been developed as early as 1995 on mechanical and physical properties but the enforcement on sale of safe toys has been meager. Thus an empirical study utilizing multiple strategy approach that consisted of market survey, laboratory tests and survey was developed to identify the gaps that exist in the market and consumers regarding safety of toys for early childhood (0-4 years). Findings from 3 night markets surveyed in Subang Jaya Municipal Council showed that all the toys sold were made of plastic and originated from China, with price ranged from RM 2 to RM 10. Based on Malaysian/ Japanese testing standards, only 20% of the rattles and toy phones toys tested fulfilled the safety labeling requirements, all rattles posed choking hazard, all toy phones have straps that posed strangulation hazard and all the them did not pass noise hazard test. A survey among 800 parents indicted that respondents practiced a moderate level of safety purchasing behavior that includes safety assurance (53%), age suitability (60.9%) and physical-safety (64.4%). The toy safety knowledge was mainly acquired through television and newspaper. There were eight safety symbols tested and results showed that there majority of the respondents did not understand the meaning of CE mark (74.9%) and Kite mark (66.5%). For the general knowledge, the respondents demonstrated a limited understanding on chemical hazard (83%) and safety standards (53.9%). With the availability of unsafe toys in the market and lack of knowledge of consumers on toy safety, it is of urgent need for a formulation of comprehensive policy on toy safety by the government, development of suitable consumer educational programs by relevant ministries and practical guidelines for selecting safe toys among parents and child care providers.

Keywords: toy, safety, child, consumer

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‘Tagal System’ and Biodiversity Conservation in Sabah

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ABSTRACT

The key principle for indigenous river management system is sustainability and inter-relationship of all things. Indigenous communities understand that there is a limit to what can be extracted from the natural environment and they are only custodians of God’s gift. One example of the well-known practice of river management system among indigenous people is known as *Tagal* (*managal).* The ceremony of *managal* is proclaimed through a mutual understanding when the number of fish is on the decline in rivers. The practice of *managal*, originally meant as a collective responsibility to ensure the sustainability of the fish resource in the river. This *managal* practice can allowed the reproduce and increase in numbers of fishes. Therefore, the purpose of this paper is to examine the river management system via *Tagal* System among Sabahans and its contribution towards biodiversity conservation in Sabah.

Keywords: tagal system, biodiversity, indigenous people in Sabah, conservation, knowledge (IK)

What Malaysian Children Do During Out-of-School Time: Gender Differences

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ABSTRACT

The activities in which children participate after school provide a variety of developmental and socialisation opportunities. The current study investigates the activities performed during out-of-school time by boys and girls. Samples consisted of 970 secondary school children from selected schools in Peninsular Malaysia, Sabah and Sarawak. Multistage random sampling were applied and data were collected using self-administered questionnaire in the classroom involving 463 boys and 507 girls. The students were asked to tick the activities they frequently do during their free time from a list of 25 activities covering a wide range of hobbies, tasks, and social activities of interest. Chi-square tests and Spearman Rho rank-order correlation were used to test for the differences between gender for each activity. The results showed watching television ranked on the top of the list of activities for both genders. Whereas, playing with SMS ranked second by boys, it ranked third by girls. Chi-square analysis indicated that there were highly statistical significant differences between boys and girls in selected activities participated during free time. Boys participated more in the following activities, namely playing video games and surfing the internet. Girls, however, participated more than boys in activities such as listening to the radio and resting or relaxing. The Spearman Rho correlation coefficient of 0.74 indicated a strong positive correlation between the gender group rankings and support for the hypothesised similarities between rankings. Both gender were involved in similar activities and those activities are related to current technologies. This indicated that the gap in gender differences regarding free time activities has decreased in this generation. The activities they pursue did not reflect the traditional gender role. Thus, parents and educators should utilise these means in educating and delivering good and constructive educational program needed for their developmental and socialisation regardless of gender.

Keywords: gender, out of school time, school children, activities

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Perisian Fonik Tutor untuk Murid-murid Disleksia Visual

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ABSTRACT

Kajian ini bertujuan untuk memperkenalkan kaedah multisensori dalam peraturan mengeja untuk murid-murid disleksia visual. Metodologi kajian ini merangkumi empat fasa iaitu, Fasa 1: Latihan ,Fasa 2: Memilih Sampel Rintis ,Fasa 3: Mentadbir Perisian Fonik Tutor Bahasa Melayu danFasa 4: Pemilihan Sampel Sebenar dan Kajian Sebenar.Kajian ini dapat menghasilkan perisian fonik tutor bahasa Melayu untuk murid yang mengalami disleksia visual berasaskan *'Phonics Tutor Software'*. Perisian tersebut dapat menentukan peraturan mengeja daripada set fonogram Orton-Gillingham yang sesuai untuk murid disleksia visual.Melalui kaedah pengajaran dan pembelajaran yang sesuai kanak-kanak disleksia mampu meningkatkan penguasan dalam kemahiran asas seperti membaca, menulis dan mengira. Kanak-kanak disleksia yang dapat menguasai kemahiran asas ini akan lebih bersedia untuk berinteraksi dengan persekitaran sekolah, pekerjaan mahupun masyarakat sekelilingnya

Keywords: kaedah multisensori, disleksia visual, bahasa melayu, pengajaran dan pembelajaran

A Model for Measuring Consumers' Online Shopping Behavior

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ABSTRACT

Online shopping in Malaysia is a new technology breakthrough as only ten percent of Malaysians buys online. The purpose of this study is to develop a model for measuring online shopping behavior. The development of the model started with the content validation by an expert panel, followed by reliability test of the instrument. A pilot test was carried out using data collected from 35 postgraduate students in Universiti Putra Malaysia. For the development of the model, data reduction technique i.e., factor analysis was proceeded to determine the underlying constructs that explain significant portions of the variance in the items. Findings of the study revealed high Cronbach Alpha scores of between 0.80 and 0.93 implying high inter-item reliability for each of the multi-item variables. Eight components (ξ) namely, utilitarian orientation, hedonic orientation, fun, convenience, customer service, homepage, wider selection and price, were found to explain 97 percent of the variability in consumer online shopping behavior. This study revealed that the model to measure online shopping behavior should include these eight factors (ξ). The model could be applied to various consumer groups in Malaysia as the study demonstrated acceptable levels of internal consistent reliability, content validity and construct validity (factor analysis). This model will help policy makers and marketers to predict consumer behavior towards diffusion and adoption of online shopping in Malaysia.

Keywords: online shopping behavior, model development

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Financial Well being Categories and Female-headed Households

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ABSTRACT

The numbers of female-headed households in Malaysia are increasing and it was estimated that there were 800,000 of families in Malaysia were headed by women in 2005. (Ministry of Women, Family and Development, 2006). Basically financial well-being is the measurement of happiness or general satisfaction of the financial satisfaction (Garman, 1997). The objective of the study is to classify the female-headed households into three financial groupings (disadvantage, risky and advantage) with regards of financial well being. The data was obtained from a nationwide study on "Economic wellbeing and human capital investment of female-headed household". Four states were selected using simple random technique with 68% response rate. A total of 681 respondents participated in the study. The data were analyzed using Multinomial Logistic Regression. Findings indicated that, 56% of respondents were in risky group, 30% in advantaged group and 40% in disadvantaged group. The reference group is the risky group. Among the disadvantaged group, families with lower education and younger are 69% and 67% respectively. Widowed families were 1.8 times more likely to be financially disadvantaged group. Then, among the advantaged group compared with risky group, the results indicated that the financial well being was positively related to household income of risky group families. In terms of ethnicity comparison, non-Malay was 1.7 times more likely to be categorized as financially advantaged group. Thus, the likelihood of being risky group was lower household income, lower secondary education and younger family. In conclusion, socio economics background played an important role in determine the financial well being among Malaysian female-headed household. This data can be use as basis to design integrated income generating programs for the widowers to improve their financial well being.

Keywords: financial well being, female-headed household

Development of Malaysian Coping Strategy Instrument (MCSI) to Measure Household Food Insecurity

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ABSTRACT

The aim of this study was to develop and validate the Malaysian Coping Strategy Instrument (MCSI) to measure household food insecurity. Both qualitative and quantitative methods were utilized in the study. In-depth interviews were carried out with 57 women from urban and rural areas in Selangor and Negeri Sembilan to identify coping strategies to food insecurity. The coping strategy items were then evaluated in a sample of 103 women to determine its construct validity and internal consistency. The developed MCSI was administered to 301 women to determine its criterion validity. Results indicate two major groups of coping strategies i.e., food- and non-food related coping strategies were identified. Food-related coping strategy consisted of four themes (food stretching, food seeking, food rationing and food anxiety) while the non-food related coping strategy comprised five themes (cloth purchasing behaviors, reducing school children expenditures, delaying the payment of bills, adjusting lifestyle, and increasing income and available cash). Sufficient variance was obtained for both the food (50.82%) and non-food (54.16%) related coping strategies. The final MCSI has an acceptable internal consistency for food ($\alpha=0.720$) and non-food ($\alpha=0.659$) items. The mean MCSI score increased with increasing household size ($p\leq0.01$), number of children ($p\leq0.01$), number of school-going children ($p\leq0.05$), and percentage of household income for food ($p\leq0.01$). The mean MCSI score was found to progressively decline with increasing household income ($p\leq0.001$), income per capita ($p\leq0.001$), total expenditure ($p\leq0.001$) and total food expenditure ($p\leq0.01$). The mean diet diversity score ($p\leq0.001$) and the number of meat/fish/poultry servings and legumes ($p\leq0.05$) significantly decreased with the MCSI tertiles. This study provides support that the MCSI, developed through in-depth understanding of coping strategies to household food insecurity, was valid and reliable to be used in identifying vulnerable or at-risk sub-groups and examining the consequences of household food insecurity (i.e., dietary intakes).

Keywords: food insecurity, development, validation, low income

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Children's Emotions and Its Social Meaning

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ABSTRACT

The word emotion refers to a broad repertoire of perceptions, expressions of feelings and bodily changes. Emotion is a feeling that is private and subjective, a state of psychological arousal an expression or display of distinctive somatic and autonomic responses and actions commonly "deemed", such as defending or attacking in response to a threat. This paper focuses on selected social stories to be story told to a group of asperger children in Malaysia. Social stories are a tool for teaching social skills to children with autism, asperger syndrome and related disabilities. The selected social stories would be based on Malaysian culture and the children's emotions and conversation were videotaped and analysed its social meaning by using the content analysis approach. There are six basic emotions grouped in three pairs of opposites, joy and sadness, acceptance and disgust and anger and fear. Four asperger syndrome subjects from a school in Malaysia were chosen for the purpose of this study. Three social stories were read to them repeatedly for two hours a day in three weeks. Subsequently, the children were able to use the social stories in their everyday lives.

Keywords: emotion, asperger syndrome, social meaning

Agriculture System and Biodiversity Conservation Among Indigenous People of Sabah

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ABSTRACT

Sabah's indigenous peoples have over the centuries developed unique indigenous systems that have safeguarded and established for their communities, a peaceful existence, a sustainable livelihood and use of the resources within their surroundings. The key principle in the agriculture system are also equivalent which they have harmonious relationship with nature, dignity of all things, subsistence and sustainability. Although rural communities continue to maintain and practice their own *adat* or traditional set of values, these are being threatened by the arrival of a new value system. This traditional knowledge has been lost or denigrated due to lack of the importance of indigenous system and their potentials. Moreover, there does not seem to be enough efforts in recording and applying indigenous systems. In this respect, the purpose of this study is to assess some practices in agricultural system that are still uphold by the indigenous people of Sabah such as rotational agriculture and planting fruit trees in hill rice cultivation and others. All these practices contribute to the conservation of biodiversity in their own locality.

Keywords: indigenous knowledge (IK), agriculture, biodiversity, Sabah

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Prediction of Consumers' Online Shopping Attitude: Utilitarian vs Hedonic Orientation

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ABSTRACT

In spite of rigorous marketers' efforts in promoting online shopping, consumers seem to confine to the accustomed way of shopping, where "physical" element of the market, product and interaction are of great consequence. The objective of the study is to predict factors influencing consumers' online shopping attitudes. Data were collected using self-administered questionnaire among 370 postgraduate students in Universiti Putra Malaysia. A five-level Likert scale was used to measure online shopping attitude. Multiple regression analysis revealed that among eight predictors that appear to explain 66% of variance in the consumers' online shopping attitude, utilitarian orientation, convenience, price, and wider selection were the strongest predictors. Further assessment of the orientations revealed that utilitarian orientations had higher effect on online shopping attitude compared to hedonic orientations. As a conclusion, consumers are more guided by an acceptable values and practical aspects when buying online.

Keywords: online shopping attitude, hedonic orientations, utilitarian orientation

Consumer Competency Among Low Income Residence in Kuala Selangor and Metropolitan Kuala Lumpur

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ABSTRACT

Consumers nowadays are constantly faced with wide variety and selection of goods and services to fulfill their need and wants. Therefore, they need to be equipped with consumerism knowledge to become a more competent consumer in the market. The objective of the study is to examine consumer competency among low income residences, and to determine predictors of consumer competency. The study was conducted in federal territory of Kuala Lumpur and Kuala Selangor using the systematic random sampling. Lists of residential areas were obtained from the respective local authorities. A total of 616 respondents participated in this study. The data analysis used was Hierarchical Multiple Regression. Four different models were tested, social economic status (SES), psychology factors, consumer knowledge and consumer redress. Findings indicated that the average score of consumer competency was high, which is a score of 32 out of 36. In short, most of the respondents in this study are competent consumer. The first model (SES) shows that only the household income has significantly contributed to the variance of consumer competency ($F^{616}= 1.895$, df=7, $p<0.05$). The second model found that those who with positive attitude towards social responsibility and those that with good personality (self-determination, self-efficacy, empowered, assertiveness, solidarity) tends to be a more competent consumer ($F^{616}= 5.533$, df=9, $p<0.01$). No significant variables were found in the last two models. In conclusion, consumer competency was not explained by an individual’s social demographic background but their economic background and psychosocial factor such social responsibility attitude and good personality. This calls for a more rigorous consumer education in to instill the right attitude and personality among the consumers so that they become more competent and empowered in the market.

Keywords: consumer competency, attitude, personality, low income

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Kekeliruan dan Ketidakpastian Penggunaan Bahasa Melayu dalam Penulisan Karangan Pelajar Tingkatan 6

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ABSTRACT

Pada masa ini masih banyak pelajar yang keliru dan tidak pasti dalam penggunaan bahasa Melayu yang betul dan gramatis. Pelajar masih keliru untuk memilih dan menggunakan perkataan yang tepat untuk mengungkapkan sesuatu dalam aspek morfologi seperti tanda bacaan, ejaan, Hukum DM, semantic dan sebagainya. Mereka tidak mempunyai pilihan melainkan menggunakan bahasa dalam keadaan yang tidak pasti. Hal ini dapat dikesan melalui aktiviti menulis karangan yang panjangnya 300 patah kata selama 60 minit. Analisisin karangan pelajar mendapati bahawa sebanyak 2 780 kesalahan bahasa dikesan dilakukan oleh 415 pelajar yang menulis karangan tesebut. Kesalahan terasebut ialah 589 ejaan, 497 imbuhan, 645 morfologi, 489 frasa, 149 sintaksis, 6 semantik, 102 tanda bacaan, dan 231 huruf besar. Kesalahan bahasa ini dikukan oleh semua peringkat pelajar, iaitu jantina (lelaki dan perempuan), ras (Melayu, Cina dan India). Latar belakang pendapatan keluarga (kaya dan miskin), dan Latar belakang tempat tinggal (Bandar dan luar Bandar).

Keywords: kekeliruan penggunaan bahasa

Age Moderates the Influence of Perceptions of Store Atmospherics on Mood

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ABSTRACT

The primary objective of this study was to examine the influence of perceptions of store environment towards in-store behaviours among young and old consumers. The framework of this study suggests that a variety of objective environmental factors are perceived by consumers/customers and that may respond emotionally (mood was chosen for the present study) to the environment. The study used Baker's (1986) typology in which she has divided the physical environment into three components, i.e., ambient factors, design factors, and social factors. Then, the mood may mediate the responses to the environment influence the behaviour of individual consumers and may, in turn affect their in-store behaviours. Young and old consumers were involved in this study as the moderating factor in order to see the similarities or differences with regards to the influences of their perception of store atmospherics on mood. Using a mall intercept technique, which used a self-administered questionnaire, a survey of shoppers in clothing and apparel stores at selected shopping malls was carried out. The sample size for this study consisted of 500 respondents. Hierarchical multiple regression and structural equation modeling were conducted to test the hypotheses of this study and the mediating effect of mood in the relationship between store atmospherics' perceptions and in-store behaviours. The results indicated that music, lighting, colour, and store layout have significantly influenced mood, which in turn, mood was found to significantly affect respondents' time spent, money spent, and repatronage intention. While partial mediation model was accepted in this study, the results revealed that there were factors of store atmospherics which have a direct impact on certain dimensions of in-store behaviours. This study gave some important implications to marketing managers and retailers with regards to the importance of store atmospherics factors to attract more shoppers to patronise their stores, with comfortable, yet exciting and satisfying experiences.

Keywords: store atmospherics, mood, in-store behaviour

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Role of Interracial Contact Towards Positive Interracial Attitudes of University Students

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ABSTRACT

Although interracial contact is expected to contribute towards positive interracial attitudes, it is not clear how much interethnic contact that are occurring among the university students contributes towards positive interracial attitudes in contexts where there is "no real majority." The data for this study come from a self-administered survey involving 379 Malay and 381 Chinese-Malaysian university students in large public universities. As predicted, interracial contact contributes significantly towards regarding different ethnic groups positively. Although the effect is small, it holds for both ethnic groups. The present findings improve the generalizability of the predictions of contact theory regarding interracial, interethnic and intergroup attitudes, which have been mainly observed in studies conducted in the Western world, as well as extend the theory beyond the majority-minority and host-immigrant contexts. The practical implication is academicians need to innovatively provide intervention educational program that promote richer interracial contact and dialogue among the students in class and outside classroom.

Keywords: interracial contact, interracial attitudes, Malay, Malaysian-Chinese, university students

Do We Tell Stories to Our Children Anymore? Teenagers’ Perspective

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ABSTRACT

Story telling is a very valuable asset to embark on because the mental image perceived by the stories could enrich our lives transcends time. We believe that despite technological advances story telling is still practiced by many culture and tradition across the globe. Cultural diversity has made us sort to telling stories by changing characters and location although at most times the plot, theme and genre remains the same. That was those days but what about this digital age? Do we tell stories to our children anymore? What kind of stories and in what ways could stories be told? In this digital age the way we tell our stories need to accommodate the borderless world. Most reports of story telling activities are from annual and departmental reports from libraries and related divisions in the education ministry. This is a research on teenagers aged 12 till 24 that are frequenters of two public libraries, the National Library of Malaysia and the Library of Kuala Lumpur. The teenagers are asked about their experience with story telling activities. The findings has helped in getting the correct perspective whether what we have or are still practicing now is relevant amidst the new paradigm shifts in teaching methodologies for our techno-savvy generations of today. These new approaches are important to capture students’ interests especially the “wild ones” to our literature, culture and heritage. We need to find a mechanism to integrate literature, education and technology using new technologies. This paper is a fundamental study. Findings from the study will be used to revamp current storytelling practices in schools and libraries in Malaysia.

Keywords: story telling, digital story telling, library, literature, educational technology, education policy

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Groups in Context: A Model of Group Effectiveness

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ABSTRACT

The primary aim of this paper is to determine the factors influencing group effectiveness in student-based groups. This study also develops a model of group effectiveness based on literature reviews of organisational work teams and group effectiveness. Qualitative research methods, interviews and document review, were employed to achieve the objectives of this study. The framework integrates two sets of factors influencing group effectiveness: group structure and individual characteristics. The model fills a gap in the group effectiveness literature review by developing research propositions that take into account different theoretical perspectives to study group effectiveness.

Keywords: group effectiveness, facilitator, work team

Financial Management Practices and Financial Well-being of Families

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ABSTRACT

The study investigates the associations of financial management practices' dimensions with family financial well-being. Financial management practices that predict good financial well-being and socioeconomic characteristics related to it are identified in this quantitative study. Quota sampling that was based on the ethnicity ratio of 60 percent Malay, 30 percent Chinese and 10 percent Indian was employed to gather data through questionnaire forms from 800 samples. Respondents were the reported family financial manager from families residing in Peninsular Malaysia. Financial well-being was measured by integrating the perceived financial well-being and financial ratios. The binary logistic regression analysis revealed investment, risk practice, cash-flow and financial planning as significant predictors of good financial well-being. A family that was financially stable was from the Chinese ethnicity, having high household income and with the family financial manager attaining high education. These findings provided evidence that specific financial management practices and socioeconomic characteristics did have impact on financial well-being. This study resulted in recommendations of specific financial management practices that enabled the family to manage their financial matter effectively. The socioeconomic characteristics identified for families with good financial well-being and the financial management practices carried out by them would assist interested parties to help families who are at most risk of financial instability. Handling financial matters effectively by the families will not only benefit the families themselves but also the community and the financial industry. A less problematic family will contribute to a good community. Financial institutions on the other hand will experience better loan recovery and will be able to develop suitable financial products tailored to the needs of the public. By having the information on the profile of successful individual or family in managing their financial matters, this would help the financial institutions to decide on the eligibility of applicants for financial support.

Keywords: financial management practices, financially stable, financial well-being, families

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Konflik Bahasa dan Budaya dalam Kalangan Kanak-kanak dan Remaja Di Malaysia

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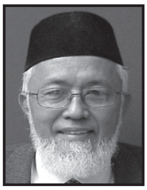
ABSTRACT

Konflik bahasa dan budaya wujud apabila timbulnya pertentangan pemahaman tentang bahasa dan budaya antara dua kelompok masyarakat. Konflik dalam bahasa dan budaya yang dialami oleh kanak-kanak dan remaja di Malaysia ada kaitannya dengan amalan gaya hidup yang kontemporari serta persekitaran kehidupan dan budaya. Justeru kertas kerja ini akan membincangkan konflik bahasa dan budaya yang dialami oleh kanak-kanak di Malaysia. Kedua, menghuraikan aspek bahasa dan budaya yang didapati boleh menimbulkan konflik antara kanak-kanak dengan masyarakat di Malaysia. Sampel kajian terdiri daripada 332 orang kanak-kanak dan 317orang remaja yang sedang belajar di sekolah rendah dan sekolah menengah dan kolej. Data dikumpul menggunakan teknik rakaman, temu bual, dan soal selidik. Data yang diperoleh akan dianalisis menggunakan pendekatan sosiolinguistik dan pragmatik .

Keywords: konflik, bahasa dan budaya, kanak-kanak, remaja, Malaysia

The Core Malay Psyche: 26 Fundamental Character Traits As Main Pillars of Past and Future Malay Civilisation



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ABSTRACT

“Hati budi” or psyche (in gestalt psychology) forms the basis of a man’s individual character, and if they are found collectively in a society, they form the basis of social character of that group. “Hati” or the heart is where feelings, faith and drive exist, while “budi” or the mind is the mental capacity to understand things whether concrete or abstract, the practical or the theoretical, and also the ability to argue and rationalize ideas, in which separates man from beast. The heart and the mind would act in an integrated manner in a person until what emerge is his behavior, disposition, traits in character, speech, values and norms. This emergence gives forth to personal characters and when they emerge in a collective form among most members of a society, it is then seen as social characters belonging to that society. As Eric Fromm (1942: Appendix, 1-2) has asserted “social character comprises only a selection of traits, the essential nucleus of the character structure of most members of a group which has developed as the result of the basic experiences and mode of life common to that group… Character in its turn determines the thinking, feeling and acting of the individuals.” In this study traditional Malay sayings and poems such as proverbs, maxims, pantoums, and other such poetic verses, considered to embody Malay treasure house of wisdom, were collected and analyzed. These Malay poetic forms are constructed in compact sentences, are rhythmical in tone, and beautiful and appealing in diction, symbolism and meaning, contain either advices, admonitions, prohibitions or quotes on pearls of wisdom. They were created by members of the society in an anonymous, collective and accumulative manner throughout their passages of history and stages of society’s evolution. These creations were based on their observation, reflection and perception of their natural and cultural environment and practical experiences which mirrored wisdom, thought philosophy, ethos, norms and values of the society. Thus by examining and analyzing the contents, massages and descriptions of those poetic verses, the researcher is able to discern and identify at least 26 core traits or elements of Malays social character that form their essential nucleus of the Malay character structure or psyche termed in Malay as “hati budi”. These 26 core character traits are described in this study.

Keywords: psyche, character traites, social character, heart, mind, perception, traditional poetic verses, symbolism, diction

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The Concept of Agriculture in al-Qur`an

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ABSTRACT

The importance and significant of agriculture concept have been emphasized in Islam through the al-Qur`an. Beside of the activity of human being, agriculture also could be a kind of our worship to The Creator of all creators, Allah. The evidence of the Almighty of Allah could be seen via His creations such as threes, mountains, animals, and the earth. Thus, this research try to analysis a concept of agriculture in al-Qur`an. According to the findings of that particular research, there are 83 sentences of 38 chapters or surahs in al-Qur`an that mentioned the importance of agriculture in human being life. The sentences or surah had been covered almost modern agricultural concept.

Keywords: agriculture, al-Qur`an

Isu Homograf dan Cabarannya dalam Usaha Pelestarian Tulisan Jawi

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ABSTRACT

Kajian ini bertujuan menjelaskan isu homograf dan cabarannya dalam usaha pelestarian tulisan Jawi berdasarkan penilaian semula terhadap sistem tulisan itu sendiri. Kajian sebelum ini lebih tertumpu kepada penjelasan tentang sistem tulisan Jawi yang sedia ada tanpa membuat penilaian semula, apatah lagi mengemukakan cadangan penambahbaikan terhadap sistem tersebut. Penilaian semula terhadap sistem tulisan Jawi yang ada sekarang perlu dilakukan demi memastikan ia tetap relevan sebagai alat komunikasi dalam era globalisasi. Hasil kajian ini menunjukkan bahawa ejaan Jawi yang ada sekarang masih terdedah kepada perubahan demi perubahan yang sedikit sebanyak telah menghalang usaha pelestariannya, terutama dalam masalah homograf. Dalam sistem yang ada sekarang, apabila berlaku homograf, maka salah satu perkataan tersebut akan mengalami perubahan untuk mengelakkan homograf. Dalam *Daftar Ejaan Rumi-Jawi* (1988) terdapat 40 pasangan kata KVKKV(K) yang homograf, dan dalam *Daftar Kata Bahasa Melayu* (2005) jumlahnya meningkat sehingga 143 pasangan kata dan dijangka akan terus meningkat dengan kemasukan perkataan baharu dalam bahasa Melayu. Pengguna pastinya berasa tidak selesa menggunakan sistem tulisan yang sentiasa berubah-ubah. Tambahan pula, langkah menambahkan *alif* pada suku kata pertama perkataan berpola KVKKV(K) untuk mengelakkan homograf ini agak sukar untuk menyelesaikan masalah menulis dan membaca Jawi. Apakah mungkin kesemua perkataan berpola KeKKV(K) yang homograf dengan KaKKV(K) itu dihafal? Oleh itu, aspek homograf ini akan dinilai semula dan diikuti oleh cadangan penambahbaikan dalam usaha melestarikan sistem tulisan Jawi sebagai salah satu daripada wahana komunikasi dalam era globalisasi.

Keywords: sistem tulisan Jawi, ortografi, homograf, komunikasi

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Developing A Socio-psychological Framework to Map Language Choice and Use in the Legal Workplace

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ABSTRACT

It would be wrong to argue that the dominance of English over Bahasa Malaysia in the Malaysian legal domain exclusively expresses a tendency towards being *Anglocized* and resulting in competing *lingua francas*. The use of English goes way beyond dealing with this challenge of competing *lingua francas*. In actuality, promoting or defending the national language in the legal system does not obviate the mastering of English as a *lingua franca* for the legal profession in Malaysia. In this paper, we critically examine the language issue by providing a systematic account of the ways in which both Bahasa Malaysia and English are used in the Malaysian courtroom. Adopting a comparative approach with reference to actual court proceedings evidence of language use are gathered from both the subordinate and superior courts in Kuala Lumpur. Findings suggest that English continues to be the *lingua franca* in the Malaysian legal domain. Bahasa Malaysia, at times, is subjugated in the Malaysian courtroom, even though it is constitutionally and by legislation, recognized as the national and official language in Malaysia. While there is this underlying 'competition' between languages, it would be inaccurate to stereotype the dominant use of English as an example of being *Anglocized*. More to it is to realize the competing forces as a pragmatic functional approach to language use.

Keywords: legal domain, national language, language choice, language use, lingua franca

Self Construal and Exposure to American Entertainment and News Programs Among Malaysian Youths

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ABSTRACT

This study examines cultural self-construal (self-independent/self-interdependent) of Malaysian youth, and its relationship with exposure to American entertainment and news programs. A total of 401 Malay, Chinese and Indian youth participated in the survey by completing the self-administered questionnaires. The results reveled that the respondents exhibited fairly balanced levels of self-interdependent and self-independent. The Malay respondents showed somewhat a higher level of self-interdependent than that of the Chinese and Indians. Respondents who described self primarily in independent rather than primarily in interdependent term are more like to have a higher level of exposure to American movies and music. No significant difference was observed in exposure to American news programs. The findings support the contention on role of cultural self-construal in explaining variation in consumption of American movies and music among the youth in a non-western country.

Keywords: self construal, cultural, american entertainment, youths, programs

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Exploring the Use of the Online Forum as CALL for Writing

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ABSTRACT

This research was an exploratory e-Learning project that was implemented as a CALL-based (Computer-Assisted Language Learning) approach to writing instruction for ESL (English as a Second Language) learners. The online forum, or discussion board was selected to provide the technological platform that could most effectively and practically serve a writing course that had a student enrollment in the range of 1500 to 2000. The e-Learning project was implemented over two semesters in tandem with classroom-based writing instruction in a university in Malaysia,. The development of the online forum instructional framework was based on insights obtained from the concept of e-Learning 2.0 (Downes 2005) which is about creatively putting to use technologies for social networking for education purposes. This new direction in CALL driven by e-Learning 2.0 was a natural development in response to the lack of CALL systems and materials that could teach writing effectively. Courseware-based CALL is unable to interact realistically and meaningfully with students and to provide the motivation for students to write. Students require human interaction, audience, free expression of ideas, and conviction to develop as writers. To date, there is no courseware-based technology that is able to meet these demands. The project demonstrated how the simple forum platform, a web-based social networking tool, can be applied to achieve language learning objectives, more specifically, to develop writing skills among ESL learners. Properly designed, it is a promising alternative to conventional CALL coursewares for the teaching and learning of writing skills. This paper presents the practical framework that guided the development and implementation of the online forum project, and presents examples of writing prompts and students’ writing from the project.

Keywords: writing instruction, computer-assisted language learning (CALL), e-learning 2.0, online forum

Rhetorical Analysis of Speeches of Prime Ministers of Malaysia 1957-2007

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ABSTRACT

A speech is a manifestation of the speaker's thought. Thus analysis of speeches reveals what the speaker thinks of the situation and his perception of the world surrounds him. This study is a rhetorical analysis of 121 speeches delivered by five prime ministers of Malaysia, during the first 50 years after independent (1957-2007). Specifically 29 speech texts analyzed were from the first premier, Tunku Abdul Rahman (1957-1070), 17 were from the second premier Tun Abdul Razak (1970-1976), 19 from the third premier Tun Hussein Onn (1976-1981), 46 from the fourth primier Tun Dr. Mahathir (1981-2003) and 10 from the fifth premier Tun Abdullah Badawi (20+603-2007). The analysis were performed on the speech texts in order to identify what has actually being said by the speakers when they were at the helm of the country especially on issues pertaining to the development of Malaysia and the Malays, to identify the rhetorical structures used by the speakers based on Aristotle's classical canon of *dispositio*, and to identify the types of argument, evidence and reasoning used by the speakers based on Aristotle's classical canon of *inventio*. The methodological designs of the analysis were based on Aristotle's classical method (dubbed neo-Aristotelian analysis) which focuses not only on what has been said by the speaker but also how the messages were being uttered. In order to understand the speaker's utterances, the situation in which the speeches were made should also be considered. This will help the researcher to relate to the *exigency* of the discourse (Wichelns, 1993, Hendrikus, 1991, Nash, 1989, Zulkifli, 1985, Thonsenn, 1981, Thonsenn, Baird, and Braden, 1970). The study found that the speakers had touched on the development of the country especially the Malays as the sons of the soil (bumiputera) from the broadest perspective in various aspects, politics, economy, international affairs and socio-culture. Tunku, Tun Razak, Tun Hussein and Tun Mahathir were more inclined to use causal structure in their speeches, whereas Tun Abdullah used more of chronological sequence in his speeches. All of them employed contast, serial examples and quantifications extensively in presenting their thoughts. Tunku and Tun Razak however used more inductive reasoning as compared to the other three premiers. Antithesis, alliteration and asyndeton were the most commonly used rhetorical techniques by the speakers.

Keywords: rhetoric, rhetorical analysis, speech analysis

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Collaborative Activities in the Classroom: Teachers' Perceptions

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ABSTRACT

This study focused on teachers' perceptions of collaborative writing and how this activity was enacted in the classroom. Data were collected from a questionnaire and semi structured interviews with 16 instructors who taught an academic writing course at Universiti Putra Malaysia. The findings revealed that collaborative activity is beneficial because it could enhance the development of cognitive and social skills and boost students' confidence in writing. The disadvantages of collaborative work are attributed by passive and uncooperative members as well as time factor. The findings also showed that the ways collaborative activities were enacted differed among the instructors. The choice of assigning groups and roles to students also varied. These insights from teachers' perceptions are useful in improving pedagogical applications of collaborative writing.

Keywords: collaborative activity, academic writing, teachers' perceptions, ESL learners

New Ways at Looking into Corporate Social Responsibility (CSR) Initiatives

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ABSTRACT

Today it is generally accepted that organisations have social responsibilities that extend well beyond what in the past was commonly referred to simply as the “business economic function”. This study sets out to find out the motivation of Shell Malaysia (SM) in practicing their CSR initiatives. Understanding that no metaphor is perfect and that the pyramid of CSR by Archie B Carroll is no exception, the four responsibilities: economic, legal, ethical and philanthropic is intended to portray that the total CSR of SM’s business comprising distinct components that, taken together, constitute the whole. Intensive interview was done within the sphere of SM’s Corporate Affairs (CA) Department directed to the senior management. Motivations that lead to CSR initiatives is the earning of goodwill which help SM optimise its portfolio and maintains its license to operate and grow, enhancement of reputation, retention of good employment talent, investor relations and access to capital, reduction and management of project risk through risk profile and risk management, encouragement of innovation inspired by society’s expectations, reinforcement of customer loyalty, and lastly, the gains of eco-efficiency through societal approval that increases overall business efficiency. The studied organisation practices CSR according to the four responsibilities in Carroll’s pyramid: economic, legal, ethical and philanthropic. In spite, having the ethical and philanthropic layers added only recently, SM’s CSR initiatives seemed to have gone beyond that, practicing strategic engagement into the field, which puts it in the lead compared to many organisations. Hence, imprinting a name for itself to serve as a benchmark or role model for other organisations to follow.

Keywords: corporate social responsibility, public relations, branding, image and reputation

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Nonexhaustive Syllabification in Temiar

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ABSTRACT

Syllabification is often assumed to be exhaustive. In Temiar, all words surface without consonant clusters. Only CV and CVC syllables are available in these languages. Yet, allomorphy paradigms in Temiar suggest that syllabification has to be nonexhaustive. I argue that a superficial inspection of syllable shapes of a language can provide misleading cues about its syllabic organisation. The reanalysis presented in this paper challenges the claims and assumptions presented in previous work on Temiar (for example, Itô, 1986, 1989), and the nuclear moraic theory proposed by Shaw (1994) in which exhaustive syllabification is assumed. I argue that three levels of syllabification may be operative in natural language—syllabification at the morphological, phonological, and phonetic levels. The vowels that have been assumed to be epenthetic in earlier analyses are, arguably, excrescent vowels that are inserted at the phonetic level (Levin, 1987).

Keywords: nonexhaustive syllabification, temiar language, phonology

Application of Photographic Survey in Scenic Beauty Assessment of Highland Environment

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ABSTRACT

Study was conducted at the Cameron Highlands, Malaysia. This paper evaluated the convergence of results obtained from the assessments of scenic preferences using two photography survey and interview. The aim was to determine the similarity in scenic preferences using two methods with different groups of respondent. The respondents of the photography survey were the tourists of Cameron Highlands, while the respondents of the interview were the local residents. An exploratory field observation was carried out in order to identify the possible scenic indicators. The scenic indicators identified were natural beauty and land use. Based on these indicators, photographic inventory was conducted. A pool of experts was asked to classify each scene in each photograph using these two indicators. 12 classified photographs were selected for the photography survey. Tourists of Cameron Highlands were asked to rank their scenic preferences using a ranking scale 1-12, from the most preferred to the least preferred. Results show that the tea plantation was the most preferred scene (rank 1), followed by natural hill (rank 2), waterfall (rank 3), and natural forest (rank 4). The least preferred scene was the commercial development (rank 12) followed by the residential housing (rank 11), vegetable farm on terraced land (rank 10). An interview was used to determine the scenic preferences of the local residents. Results show that the tea plantation was the most preferred scene (rank 1) followed by natural forest (rank 2) and hill (rank 2). The least preferred scene was the vegetable farm (rank 5) and followed by waterfalls and residential housing subsequently. The results indicate that the patterns of scenic preferences for highland scenes between the tourists and the local residents have close similarity. The results indicated both methods can be accepted for the future decision in the highland management.

Keywords: convergence, highland scenes, scenic indicators, scenic preference, local resident, tourists

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Computer Use and Cognitive Functioning among Older Malaysians

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ABSTRACT

Using the computer and the internet could yield positive effect on mental well being[1]. It also provides access to obtaining information, communicating with others and maintaining healthy social relationships towards promoting quality of life among older person. A study was conducted to investigate the correlate factors of cognitive ability among older Malaysian aged 60 years and over in Selangor, Kelantan, Pahang and Negeri Sembilan. The cognitive ability of respondents were determined using the 12 items measure of the Mini Mental State Examination, (MMSE) (Alpha Cronbach = 0.736). A total of 708 older Malaysians were successfully interviewed using the structured questionnaire. This study found that there were significant correlation between cognitive ability with age (r = -.419, p = .000) and monthly income (r = 0.213, p= .000). There were also significant difference in mean cognitive ability score for gender [t (706) = 7.646, p = .000], education attainment [F (1, 706) = 162.071, p = .000], self-rated health [F (4, 703) = 15.498, p = .000] and internet used [t (706) = 4.578, p = .000]. The findings of the study revealed that cognitive ability was related with internet usage, income, education, self satisfaction, marital status, health and gender. With knowing the correlate factors of cognitive ability will help the policy makers, planner and related authority in action plan to improve the cognitive level towards promoting the internet use among older Malaysians

Keywords: cognitive ability, internet use, older Malaysians, well-being

Wh-Questions in Malay: An Explanation for the Restriction of Extraction to Subject Position with *Yang*

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ABSTRACT

In *wh*-question formation in standard Malay, only extraction from the subject position is possible. This is in contrast to the English language, where extraction is possible from positions lower than the subject position. In fact, in Malay, any argument in a position lower than that of a subject has to be passivised to become a derived subject before extraction can occur. When an extraction occurs from an embedded clause in question formation, the verb in the matrix clause has to be passivised as well. In this paper, an explanation is offered to account for this phenomenon in standard Malay. The framework adopted to explain the phenomenon is based on the principles and parameters approach, (see Chomsky, 1981a and 1981b, 1986a, 1991) and the Minimalist Programme (See Chomsky, 1995). In particular, Rizzi’s theory of relativised minimality and its conjunctive notion of the Empty Category Principle (ECP) (1990) are referred to. Additionally, Shlonsky’s treatment of Palestinian Arabic relativisation (1992) is extended to Malay *wh*-question formation. The motivation for such an exercise is that this will have implications in terms of contribution to the body of literature in Malay linguistics, particularly form the generative perspective.

Keywords: *Wh*-questions, subject position, complementizer, Malay

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Access Auditing Towards Social Equity for Disabled People in Malaysia

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ABSTRACT

The United Nations estimates that around 20% of a country’s population is disabled. This means that there could be over 4 million persons with disabilities in Malaysia today. Hence, providing access for this often neglected but important segment of society is a national priority. Section IV of the Persons With Disability Act (2008) requires public accommodations to provide goods and services to people with disabilities on an equal basis with the rest of the general public. Inaccessibility in the built environment is often caused by bad designs, poor planning and lack of implementation and enforcement of policies and legislation. The removal of barriers can often be achieved by making simple changes to the physical environment. The process of determining what changes are readily achievable is not a one-time effort, access should be re-evaluated annually. The most effective way to establish the impact that a building has on disabled people is to undertake an access audit. An audit enables adjustments and aids the formulation of a plan of action for the future. Access auditing is based on the principles of Barrier-Free, and is now commonly done in many developed countries. In this country, however, access audits are almost non-existent. Therefore, we have developed access audit checklists based on overseas’ checklists and Malaysian building development guidelines for both technical and non-technical people. Our comprehensive and detailed checklists are suitable for all building types and functions. Thus far these checklists have been used by several clients including a UNDP-sponsored project.

Keywords: access audit, barrier-free, disabled people

Enhancing the Effectiveness of Maritime Law Enforcement for Sludge Disposal in the Strait of Malacca and Southern Johore

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ABSTRACT

The causes that transformed white sandy beaches at the southeastern coasts of Johore to blackish in colour and littered with tar balls, have not been extensively studied. Beyond these beaches, there are hundreds of ships of various types and sizes that have remained at anchor for a long time. Some of these ships are anchored within Malaysia's territorial waters while the others are outside. In this study, we evaluated the intricacies faced by the Malaysian maritime enforcement agencies to enforce proper disposal of sludge at ships' anchorages as provided in the Environmental Quality Act 1974 and the Merchant Shipping Ordinance 1952 in the Strait of Malacca and in the Southern Johore. Data were gathered to determine the sources of the pollutants, the processes involving the disposal of the sludge and slop water from ships, the laws and the legal processes governing the disposal of the schedule wastes and the capacity of the Malaysian maritime enforcement agencies to enforce the laws. Having analysed and scrutinized the data, it was believed that the pollutants were originated from ships, the existing laws and sludge disposal procedures are adequate but the maritime enforcement agencies are not adequately equipped to constantly monitoring the disposal of these scheduled wastes within the designated anchorage areas. The expected findings suggest that the capacity of the maritime enforcement agencies to enforce the national laws at sea is to be enhanced especially in terms of their *modus operandi*, human capacity and the availability of ships to provide all-year-round maritime surveillance and monitoring.

Keywords: sludge disposal, maritime enforcement agencies, marine pollutants, maritime law enforcement and territorial waters

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Malaysian Learners and Their Perceptions Towards Online English Language Courses

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ABSTRACT

With more emphasis given to the concept of lifelong learning, the number of learners who enroll for distance and online learning programmes in local tertiary institutions has increased. The flexibility of the online learning mode enables learners to prepare themselves to develop confidence and to learn with greater independence. This paper reports the findings of a study on the teaching and learning and technology factors of online English language courses at UNITAR (University Tun Abdul Razak), a virtual university in Malaysia. Both quantitative and qualitative approaches were employed in eliciting data via a questionnaire survey and in-depth interviews. Specifically, the paper reports on learners' perceptions towards the teaching and learning as well as technology factors during the online English course they were engaged in. The findings with regard to the perceptions of the learners brought more new perspectives which could be incorporated or taken into consideration for an online language learning programme.

Keywords: English language course, online learning, distance learning, perceptions, technology

Health Expenditure among Malaysian Elderly

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ABSTRACT

Life expectancy among the elderly has been improving for many decades, and there is evidence that health among the elderly is also improving in many countries including Malaysia. Since health is the major concern, more Malaysian's elderly spent their money on medication and health care. The purpose of this analysis is to determine the older person monthly household expenditure on medication d with socioeconomic. Data from a cross sectional nation wide study entitled "Economic and Financial Aspects of Ageing" funded by the Ministry of Science Technology and Innovation (MOSTI), Malaysia in 2004/ 05 was used. A sub sample of 1106 older persons (55-75 years) were successfully answered a monthly household expenditure on medication question. Variables examined included gender, stratum, marital status and self rated health. Almost half of the respondents (47.5%) were spending their money on medication monthly. The data showed that stratum were significantly d with household expenditure on medication. 60.3% respondents from urban area used to spend (M=103.6) on medication compared to only 39.7% of rural respondents (M=73.4). But there are more rural respondents with bad self rated health (20.6%) compared to urban (14.6%). The data also showed that more respondents with bad self rated health are more likely to pay for medication instead of respondent with good self rated health. This study concludes that health care accessibility and health awareness such as educational or promotional programs among rural elderly should be improved to efficiently increase the health status of rural elderly.

Keywords: health expenditure, household expenditure, Malaysian elderly

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Disability and Religiosity Among Muslim Older Women in Peninsula Malaysia

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ABSTRACT

Disability is a multi-faceted construct that can be studied from numerous perspective including biological, medical, psychological, social and cultural. Culture is believed to influence the perception of a disability, the manner in which it is assigned meaning. Comprehensive treatment must therefore take culture into consideration including the religious and spiritual beliefs related to disability as well as folk beliefs about the causes and treatment of disability (Salas Provance, Erickson and Reed, 2002). The purpose of this study was to examine the relationship between disability and religiosity of Muslim older women. Data for this study consisted of 722 Malaysian's older women aged from 60 to 100 years old with an average age of 70.3 (SD = 8.01)from the national survey (PSRPWO) that was conducted in 2007 until 2008 in Peninsular Malaysia. Intrinsic/Extrinsic Revised Scale and WHODAS - WHO Disability Assessment Schedule were used to assess Religiosity and Disability respectively. Pearson correlation shows that there is a significant relationship between disability (r= -0.119, p=0.001), stratum (r=0.081, p=0.033), education attainment (r=0.113, p=0.002) and age (r=-0.102, p=0.006) with religiosity. Regression analysis showed five predictors variables accounted for 14.7% of the variance in WHO-DAS score (F=23.419, df=5, p=0.000). The result of this study revealed that religiosity influenced significantly the older person's disability. It implies that religious beliefs could improve disability among women.

Keywords : disability, religiosity and muslim older women

The Reliability and Validity of the Philadelphia Geriatric Center (PGC) Morale Scale in Older Malaysians

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ABSTRACT

The Philadelphia Geriatric Center (PGC) Morale Scale developed by Lawton (1972) provides a multidimensional approach to assessing the psychological state of older persons. This study examines the reliability and factorial structure of a translated and revised PGC Morale Scale (interview version) among older persons aged 60 years or over in Malaysia. The modified scale consisted of 17 positively and negatively worded items in dichotomous response format. Data from the cross-sectional survey on 'Patterns of Social Relationships and Well Being among Older Persons in Peninsula Malaysia' were used for data analysis using SPSS 14.0 (n = 1857, Nurizan et al., 2008). A total of 32 cases were dropped due to missing item response values. Results showed that the overall reliability of the scale was high (Cronbach's Alpha = 0.763) but the items did not correspond to the three original dimensions as proposed by Lawton (1975, i. Lonely-dissatisfaction, ii. Agitation, and iii. Attitude to own ageing). Reliability of items by the dimensions was moderate, ranging from Cronbach's Alphas of 0.579 to 0.717. Principal component factor analysis found that four factors (instead of three) exceeded the eigenvalue of 1, which accounted for approximately 45% of the total variance. The exploratory factor analysis showed that the construct validity of the PGC Morale Scale requires further investigation as to address possible cross-cultural differences in the factor structure.

Keywords: psychology, older persons, factor analysis, psychometrics

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Income Adequacy and Financial Satisfaction among Older Malaysians

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ABSTRACT

Income adequacy is subjective assessment of one's financial satisfaction. This concept explains the economic means of affordability to purchase or save. The purpose of this analysis is to investigate the income adequacy and financial satisfaction among older persons in Malaysia. Data was obtained from a nationwide study entitled "Economic and Financial Aspects of Ageing" funded by the Ministry of Science Technology and Innovation, Malaysia in 2004/ 05. A total of 2327 older persons age ranged from 55 to 75 years were successfully interviewed through a face-to-face interview using enumerator-administered questionnaires. Financial satisfaction is measured by a three-item question (Alpha = 0.803) on a 5-point Likert Scale. Majority of the respondents are currently married (65.84%), residing in urban area (56.98%), of Malay ethnicity (55.69%) and received primary education (43.49%). Data shows a gender gap in monthly income, where males' income (RM 894.93) is almost doubled from their females (RM 496.24) counterpart. Most of the respondents (47.15%) reported that their income is adequate to meet basic necessities. Only 5% of them reported that they have adequate income to make purchase with surplus amount to save. Perceived income adequacy is significantly different by marital status ($\chi^2 = 31.03$, p = 0.000). This may due to cost of living being shared in the household. In general, the respondents are satisfied with their financial status. More than half are satisfied with their current economic situation (51.74%) and adequacy of monthly expenditure (50.52%). On the other hand, only 31.56% are satisfied with their retirement income adequacy (saving and investment). Findings from this data showed that only a few respondents afford to save and invest for retirement. This can be a strong evidence to propose for financial education programs to encourage saving behavior towards a better financial satisfaction in old age.

Keywords: income adequacy, financial satisfaction, older persons

Does Integration of Technology During Instruction Work: An Analysis of Students Perceived Efficacy during Mathematical Learning

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ABSTRACT

Disputes about the impact of technology-assisted instruction have been ongoing for at least the past half-century. There are those who advocate the use of technology in instruction thus providing evidence of its efficacy. On the other side there are those suggesting that learners should be provided with direct instruction via the conventional mode of learning. In mathematics learning direct instruction means providing information that fully explains the concepts and the procedures that students are required to learn. These assist learning which can be explained in the context of human cognitive architecture (Sweller, 2003). In this study, we explored the effects of integrating the graphing calculator (GC), Geometer’s Sketchpad (GSP) and Autograph software in teaching Algebraic Functions at the secondary level on students’ perception of their learning experiences. A quasi-experimental research design was used in which students were randomly assigned to one of the four groups viz-a-viz the GC, GSP, the Autograph and the conventional group. Each group was first introduced to the technological tools. Each student in the GSP and the Autograph groups was provided with one computer installed with the respective software and the GC group given a TI-84 graphing calculator. In this phase, the students were required to explore and be familiar with the software and its functions. In the second phase, students were introduced to the basic concept of the Quadratic Functions topic. This was followed by the `teaching and learning using the technological tools. This phase involves instruction using the constructivist approach where students actively explore and discover concepts of Quadratic Functions using the learning package. At the end of the learning sessions, students were given self-report questionnaire measuring their perceived efficacy of the technology-assisted instruction. Findings indicated that groups utilizing GC and GSP perceived positively on their mode of instruction as compared to conventional method and Autograph assisted instruction. In addition, students’ performance was correlated with their perceived efficacy of the instructional mode. Hence these findings suggest that technology may benefit and enhanced students’ learning. While technological tools may provide positive impact upon learners’ thus becoming potential tools in teaching mathematics in Malaysian secondary school level, much need to be explored on its efficacy, utility and feasibility.

Keywords: geometer’s sketchpad, autograph software, technology-assisted learning, mental load, instructional efficiency

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The Misconception of Some Statistical Techniques in Research

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ABSTRACT

In today’s society, statistical techniques are being used with increasing rate in applied sciences. Based on our observations, we noticed some statistics practitioners often misuse some of the statistical techniques in their researches. The easy availability of the statistical packages such as SPSS, has driven more researchers to use the packages in analysing their data without knowing statistics. Consequently, meaningless and misleading conclusions are obtained from an incorrect analysis. Due to the lack of awareness, the policy makers often rely on these results to make decisions. Therefore, it is imperative for the researchers to be aware of using the right statistical techniques so that a valid and objective conclusion can be made. We will draw attention to some incorrect practices on selected topics and appropriate suggestions are offered to tackle this problem.

Keywords: sampling frames, underlying assumptions, robust method, convenient sampling, central limit theorem, design and analysis of experiment

Instructional Efficiency of Geometer's Sketchpad and AutoGraph Technological Tools for Enhancing Mathematics Learning

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ABSTRACT

Educational researchers globally have articulated high expectations for the utilisation of technology in improving the teaching and learning of mathematics. Use of technology as a tool or a support for communicating with others allows learners to play an active rather than a passive role of recipient of information transmitted by a teacher, textbook, or broadcast. The student is actively making choices about how to generate, obtain, manipulate, or display information and solve mathematical problems given. This study was conducted based on evidence for the superiority of technology integrated instruction in the context of human cognitive architecture by John Sweller (2003), and his cognitive load theory (1988). In this study, we investigated the effects of integrating the Geometer's Sketchpad (GSP) and Autograph software in teaching Algebraic Functions at secondary level.. The Paas Mental Effort Rating Scale (PMERS) developed by Paas and Merrienboer (2004) was used to measure the instructional efficiency of the technological tools during learning in actual classroom settings. A quasi-experimental research design was used in which students were randomly assigned to one of the three groups viz-a-viz the GSP, the Autograph and the conventional group. Each group was first introduced to the technological tools. Each student in the GSP and the Autograph groups was provided with one computer installed with the respective software. In this phase, the students were required to explore and be familiar with the software and its functions. In the second phase, students were introduced to the basic concept of the Quadratic Functions topic. This was followed by the `teaching and learning using the software'. This phase involves instruction using the constructivist approach where students actively explore and discover concepts of quadratic functions at the Form Four level using the modular activity. A test phase was then conducted. Test performance scores and mental load assessment obtained were used to calculate the instructional efficiency index for each experimental group. Using the PMERS, the 2-D instructional efficiency index was calculated for each group. Findings indicated that groups utilizing GSP and Autograph was instructionally more efficient compared to conventional method. However, the use of GSP was found to be superior compared to use of Autograph and conventional method. Hence these findings suggest that GSP has enhanced learning conditions and has reduced extraneous cognitive load which in turn can create maximal learning condition. However, these findings also indicated that although technological tools may provide positive impact upon learners' thus becoming potential tools in teaching mathematics in Malaysian secondary school level, much need to be explored in its efficiency, utility and feasibility.

Keywords: geometer's sketchpad, autograph software, technology-assisted learning, mental load, instructional efficiency

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A Risk Calculator to Predict Functional Dependency in the Elderly

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ABSTRACT

Logistic regression is a statistical technique for predicting the probability of an event, given a set of predictor variables. The aim of the study is to develop a simple tool to calculate the probability that an older person in Malaysia is functionally dependent or independent. Data from the 'Mental Health and Quality of Life of Older Malaysians' study (Tengku-Aizan et al., 2005) were used.

Keywords: logistic regression, barthel index, functional status, older persons, Malaysia

Metacognitive Aspects of Mathematical Problem Solving

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ABSTRACT

Problem solving comprises of four elements, content understanding, problem solving strategies, metacognition and motivation (O’Neil & Schacter, 1997). Metacognition refers to the ability of individuals to reflect, understandand and control their own learning (Schraw & Dennison, 1994). Specific components of metacognitive processes were identified by Schraw and Dennison (1994) and these were the dimensions that they used in developing the Metacognitive Awareness Inventory (MAI). MAI that comprises of 52 items is a reliable measure of cognition and regulation of cognition (Sanchez-Alonso & Vovides, 2006). It measures eight specific components of metacognition, namely comprehension monitoring, procedural knowledge, declarative knowledge, conditional knowledge, evaluation, debugging strategies, information management strategies and planning. In O’Neil and Schacter’s (1997) study, metacognition was measured using three elements, planning, self-checking and cognitive strategy. In this study, MAI was used because it includes more elements that reflect one’s metacognitive strategies. Apart from MAI, subjects were also required to respond to the measurement used by O’Neil and Schacter’s (1997) to measure motivation. The elements in measuring motivation are effort, self-efficacy, and worry. The subjects of this study were 195 final year students majoring in mathematics education from four Malaysian universities. The study revealed that three dimensions of MAI, procedural, declarative and conditional knowledge were significantly correlated with students’ performance in university mathematics courses. Declarative and conditional knowledge were also found to be significantly correlated with students’ overall performance in the university. All three dimensions of motivation were also found to be significantly correlated with performance in university mathematics courses. Significant correlation was also established between level of metacognition with level of motivation. In conclusion, this study reveals some of the factors that influence one’s performance in mathematical problem solving.

Keywords: metacognition, mathematical problem solving, motivation

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A Complete Demand System of Food in Malaysia

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ABSTRACT

There has been notable success in Malaysian economy, with its countrymen getting wealthier and food consumption undergoing transitional changes. This study intends to analyze the complete demand system of food in Malaysia by using Household Expenditure Survey 2004/2005 via Linear Approximate Almost Ideal Demand System (LA/AIDS) model. As expected, the estimated own-price elasticities for all foods follow the law of demand. The empirical results show that demand for all foods in response to income is relatively positive, with expenditure elasticities of meat (1.110), fruits (1.341), vegetables (1.341), sugar and beverage (1.039), and other foods (1.115) are elastic. This study shows that Malaysian food consumption pattern is not only moving towards higher value food products (especially meats) but also functional foods (fruits and vegetables) as the per capita income of Malaysians increases.

Keywords: food consumption pattern, complete demand system, linear approximate almost ideal demand system model, expenditure elasticity, own price elasticity, demand

Pembilangan Melayu Semenjak Awal

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ABSTRACT

Sehingga kini kewujudan penghujahan serta data berkaitan pembilangan, pengiraan atau penghitungan Melayu adalah diketepikan atau "difosilkan'. Walau bagaimanapun beberapa bukti telah dihimpun dan dikupaskan oleh beberapa ahli penyelidik tempatan. Bukti ini telah dijadikan koleksi penulisan atau pendokumentasian yang merupakan maklumat yang amat unggul dan semestinya dipeliharakan. Maklumat ini juga terhasil berdasarkan bukti-bukti yang terdapat pada batu bersurat (prasasti) dan manuskrip. Manuskrip ini juga merangkumi manuskrip-manuskrip Eropah yang penulisnya datang ke Alam Melayu merekodkan pelbagai data dan dalam pelbagai Bahasa Eropah. Berbilang rekod telah ditemui, dihimpun dan direkodkan. Antara rekod yang telah dikumpul serta sedang dikaji ialah:

i. Prasasti Dong Yen Chau (Campa), sekitar kurun ke-3S/4M : tujuh (7) dan saribu (1000).
ii. Prasasti Kedukan Bukit (Sriwijaya), bertarikh 605S/683M : duaratus (200), sariwu tluratus sapulu dua (1312) dan dualaksa (20, 000).
iii. Prasasti Nhan-Bieu (Campa), bertarikh 833S/911M : dalapan (8), sapluh (10), tluv pluh (30), tluv pluh tijuh (37), nam pluh (60), tijuh pluh tluv (73), sa rtuh ban pluh dva (162) dan tluv rtuh sa pluh (310).
iv. Daftar Kata Bilangan Melayu Susunan Oe Tadafusa (Jepun), sekitar penghujung kurun yang ke-11M hingga tahun 1111M (tahun kematian Oe) : sasaa (1), toa (2), rima (5), namu (6) dan sa-i-bira (9).
v. Prasasti Mi-son (Campa), bertarikh 1079S/1157M : lima pluh (50), sa rutuh (100), sa rutuh lima pluh (150), kluv rutuh (300), kluv rutuh tijuh pluh (370) dan lima rutuh lima pluh (550).
vi. Prasasti Pagaruyung (Minangkabau), jangkaan bertarikh 1316-1347M : ampat (4).
vii. Kamus Antonio Pigafetta bertarikh 1519-1522M : vzza (1), dua (2), tolo (3), vpat (4), lima (5), onom (6), pitto (7), gualu (8), ciam (9) dan polo (10). Juga pada bahagian lain merekodkan satus (1), dua (2), tiga (3), ampat (4), lima (5), anam (6), tugu (7), duolappan (8), sambilan (9), sapolo (10), duapolo (20), tigapolo (30), ampatpolo (40), limapolo (50), nampolo (60), tuguppolo (70), dualappanpolo (80), sambilampolo (90), saratus (100), duaratus (200), tigaratus (300), anamparatus (400), limaratus (500)…

Pada kesempatan ini banyak usaha perlu dilaksanakan khususnya bagi meneliti lebih banyak prasasti dan manuskrip pendokumentasian yang sistematik dapat diwujudkan. Usaha ini juga akan menonjolkan keagungan Tamadun Melayu yang boleh dijadikan bahan sejarah tentang pembilangan, pengiraan atau penghitungan Melayu.

Keywords: pembilangan, pengiraan atau penghitungan Melayu

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Demand for Beef in Malaysia: Preference for Quantity, Quality or Lean?

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ABSTRACT

By using the Malaysian Household Expenditure Survey 2004/2005 data, this study investigates the Malaysian consumers' preference for beef quantity, quality, and lean. Demand and price models that incorporated consumer socio-economic variables are estimated via two-stage least squares (2SLS). This study shows that Malaysian consumers tend to demand for more quantity rather than quality of beef products. Malaysian consumers are also more responsive to the price change than fat reduction in beef products. It is more profitable for beef market players to increase their production as the Malaysian consumers are expected to consume more quantity of beef products.

Keywords: demand for food, household expenditure survey, estimated demande elasticities, LA/AIDS, Malaysia

Home Ownership among Older Persons in Malaysia: Towards Successful Ageing

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ABSTRACT

Housing is a forth pillar of a world Health Organisation framework for active ageing. Home ownership is one of the indicators for successful ageing. The objectives of this study are to identify the percentage of home ownership and characteristics of home owners among older persons in Malaysia. Data was obtained from Intensified Research Priority Areas (IRPA) grant title economic and financial aspects of ageing in Malaysia. The nationwide study was conducted in 2004/2005. A total of 2327 Elderly aged 55 to 75 years old were successful interviewed by trained enumerators using questionnaires. This analysis utilize a single question on home ownership (1 = yes and 2 =no). Results revealed that 64% of the total respondents own a house, 58% own traditional house, followed by 27% terrace house. Typical characteristics of house owners are male, Malays, young old (below 60 years old), married, attained secondary and tertiary education and those who are still working (Bivariate analyses using Chi-square significant at p=0.05). The data revealed that small percentage of female, the aged group (60+), never married, Indian, urban dwellers, no formal education and never work were did not own a house. Effort to achieve housing for all policy should give special focus to these groups of people towards successful ageing.

Keywords: older persons, home ownership,Malaysia, successful ageing

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Valuing Ecotourism and Conservation Benefits in Marine Parks: The Case of Redang Island, Malaysia

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ABSTRACT

The purpose of this paper is to estimate the visitors preferences of ecotourism attributes in Redang Island Marine Park. This study employs the choice experiments (CE), the conditional logit (CL) to investigate the visitors’ preferences of the ecotourism attributes. The personal interview has been made with a total of 298 representative respondents. The respondents’ has been asked to select the best among the alternatives of ecotourism attributes. The ecotourism attributes which have been investigated are ecological management, recreational activity congestion, provision of employment opportunity to local people and conservation charge. Results of the study found that the visitors are preferred the highest changed in ecological management attribute levels compared to recreational activity congestion and provision to local employment attributes levels. Results of this study are very important in assists policy maker in management and development plan for ecotourism in marine parks.

Keywords: ecotourism, economic valuation, choice experiments, conditional logit models, marine parks, sustainable development

Expenditure Patterns on Foodservice in Malaysia

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ABSTRACT

Rapid changes have occurred in the way food is prepared, in the way it is cooked, and in the places it is consumed. Foodservice has become increasingly important in the composition of the food account among Malaysians. The objective of this study is to analyze consumers' expenditure pattern on foodservice in Malaysia. Several functional forms and a Heckman two-step methodology to account for censored-response bias are employed in the analysis of Household Expenditure Survey 2004/2005 data. Regardless of functional forms, the empirical estimates of income elasticity of demand for foodservice are significantly bigger than income elasticity of demand for food at home. This study shows positive prospect for foodservice industry in Malaysia, where an increase in income has the propensity to lead to an increase in expenditure (demand) on foodservice.

Keywords: processed meat, demand, consumption pattern, expenditure elasticity, working-leser model

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Understanding Poverty Among Elderly Using Typology of Financial Status

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ABSTRACT

The objective of the study was to understand poverty among Malaysian elderly using typology of financial status. Data were obtained from Intensified Research Priority Areas (IRPA) grant title economic and financial aspects of aging in Malaysia, collected among 2327 elderly age 55 to 75 in 2004/2005. Typology of financial status was measured using netflow (income – expenditure) and networth (assets – liabilities). Four group were obtained 1=negative netflow and networth (hardcore poor), 2= negative netflow and positive networth (poor), 3=positive netflow and negative networth (poor) and 4 = positive netflow and networth (non-poor). The data showed that 5% of the respondents falls into the hardcore poor, 33% is poor and 62% is not poor. Majority of those in the hardcore poor groups were never married, had no formal education, never work and have retired between 11 to 15 years ago. Those non-poor were comprised of elderly male, Malays, age 70+, married, living in rural area, and with tertiary education. Poverty among elderly must take into account their networth to account for the accumulation of resources at an earlier age. Those 23% with negative networth fail to financially prepare for old age. The use of this typology is a better way to measure poverty as it enable us to get a clear picture of poverty situation of the elderly.

Keywords: older persons, typology, financial, Malaysia

Decision Making in Breast Cancer Treatment: A Qualitative Inquiry

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ABSTRACT

For breast cancer patients, making decisions are integral to cancer diagnosis, treatment and prevention of recurrence. In order to make these decisions, cancer patients require appropriate and relevant information or guide. These decisions can also be influenced by external and internal factors. To get an insight into decision making related to breast cancer treatment from the perspective of breast cancer patients and survivors, a series of focus group discussions (FGD) were conducted with 36 informants of the Chinese and Malay ethnicities. The informants were recruited from breast cancer support groups in the northern, central, southern and eastern regions of Peninsular Malaysia. The following research questions guided the FGD. These were (1) Who make (s) decision on cancer treatments?, (2) What guide (s) the decision making?, and (3) What influence (s) the decision? For most informants, the primary decision maker in their cancer treatment was themselves. However, these decisions were made upon advice and support from the physicians, family members and friends. The informants stated that information from physicians, family members, friends, internet, books and magazines also served as guidance to decision making on cancer treatment and management. Following the physicians’ advice, having the knowledge on breast cancer, taking care of family members and wanting to live longer to fulfil personal goals were also mentioned by these informants as factors which had influenced their treatment decision making. Further research using a quantitative approach is therefore recommended to confirm the findings of this study.

Keywords: decision-making, breast cancer treatment, breast cancer management, cancer information

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Benchmarking Malaysian Youth Practitioner Ethic

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ABSTRACT

Ethics are a core component of professionalism in youth work, and yet little research has been done in this area. Given the growing demand for greater standards of youth work, there is an urgent need for research in work ethics among contemporary youth development workers. The current self-administered survey was designed to investigate self perception in the area of work ethics among 813 government and non-government youth workers from Malaysia. The results showed that the samples fared well in terms of ethics as defined by respect for others, responsibility, and honesty, with respect for others more pronounced than the other two. Comparative analysis by selected personal attributes revealed significant differences in visibility of these three areas of ethical behaviour. Recommendations for work ethics training and development are discussed.

Keywords: ethics, youth work

Employment Accessibility for Elderly in Poverty in the Malaysia Region

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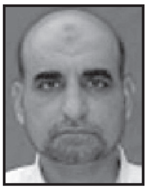
ABSTRACT

Understanding the geographic distribution of elderly poverty can aid in identifying important factors contributing to healthy and active aging. Determining the spatial distribution of accessibility can be an important component of this understanding. This study extends the spatial mismatch literature by examining access to employment for elderly welfare recipients in Malaysia. Based on the survey on EAR research entitled poverty among poor older Malaysians: towards productive ageing, the analysis uses geographical information systems (GIS) to map residence and employment locations and calculate measures of employment and transport access. Throughout the county region, majority of the respondents live within close proximity to a reasonable number of low-wage jobs. The ratio of the number of jobs accessible within a 30-minute commute by automobile versus public transit varies only slightly across neighborhoods with high poverty rates. The close proximity of the rural area to the central town and the network of grid and radial streets connecting the two places make job access reasonable. Thus, despite higher numbers of low-wage jobs in the rural areas, job access in the town areas is superior to job access due to higher densities of employment opportunities and the existence of developed transport networks. While poverty is highly centralized in the Malaysia main town, the analysis suggests that, based on the spatial distribution of low-wage employment and concentrations of poverty, central-town locations have significant advantages in terms of proximity to jobs. However, if elderly in poverty have poorer access to automobiles, they may only to search for jobs only within a smaller area. This study recommends enhancements to public transit in places with large concentrations of low-wage jobs and increased access to reliable automobiles in places with small concentrations of low-wage jobs. Above all, unemployment rates in low-income neighborhoods suggest a need to improve job readiness, placement and support in term of services.

Keywords: elderly, Malaysia, employment, accessibility

Are Cash Flows Relevant for Stock Pricing in Bursa Malaysia?



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ABSTRACT

The documented evidence on the impact of announced changes in cash flows on stock prices of listed firms, beyond the impact of earnings disclosures is inconclusive. Changes in cash flows of firms listed on Bursa Malaysia document significant impact on share prices beyond that of earnings only over a short window of about 3 days. There is no significant impact of cash flow announcement on share prices over a long window (i.e.51 days windows). This finding was reconfirmed using the portfolio approach. This implies that even though information of changes in cash flows is value relevant, investors are more comfortable with earnings announcements for share price valuation. This finding is consistent with documented evidence on similar issue from developed markets.

Keywords: cash flows, earnings, returns window, incremental information, portfolio approach

Characteristics and Coping Patterns of Young Adult Prostitute Mothers in Kuala Lumpur

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ABSTRACT

The study describes the characteristics, contributing factors and coping patterns of young adult prostitute mothers in Kuala Lumpur . The study is guided by four research questions: 1) What are the characteristics of young adult prostitute mothers? 2) Why did the young adult prostitute mothers get involved in prostitution? 3) Why did the young adult prostitute mothers continue in prostitution? 4) How did the young adult prostitute mothers cope in prostitution? A qualitative methodology was the research design used in this study. Data was collected mainly through interviews using a semi – structured question interview guide. Five young adult prostitute mothers participated in this study. The main findings emerged from this study have been classified into four categories which are characteristics of young adult prostitute mothers, pushing factors for young adult prostitute mothers involvement in prostitution, continuing factors for young adult prostitute mothers continued involvement in prostitution and coping patterns of young adult prostitute mothers. The study seems to suggest for policy makers to give attention to an Act for the benefit of this marginalized group. Basic survival needs to young adult prostitute mothers and their children must be looked into by the relevant authorities for their social well being. This study helps the readers and others to understand better young adult prostitute mothers.

Keywords: prostitute, coping pattern, and qualitative

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Activity-based Costing for Competition Against Generic Products: The Case of an Herbicide Product Company

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ABSTRACT

As complexities in manufacturing processes and market competition increase, the relevance of traditional costing system for efficient cost management and effective strategy formulation is increasingly being questioned. Activity-based costing (ABC) could enable managers to use activity cost information to improve cost efficiency and formulate more effective strategy against competition. Based on the case of an herbicide product company, this paper examines how DCPM, a subsidiary of a multinational company, used activity cost information to revise its pricing strategy to compete with the generic herbicide products, as the patent protection for its main herbicide product is coming to an end. The management of DCPM faced serious challenges of not only having to sustain its market share but also to achieve the profit target expected by its parent company. Using the activity cost information, DCPM was able to set competitive prices for different combinations of product and services to cater for customers with differing product/service price-sensitiveness. To sustain its long term competitiveness, the company would have to further improve the company’s overall cost efficiency in product manufacturing and logistics services, as well as to collaborate with the Pesticide Board of Malaysia, to educate users more extensively on the importance of quality and safety standards for herbicide products to sustain its market share.

Keywords: activity-based costing, competitive strategy, generic product, market competition, value-added services

The Use of Information and Communication Technology (ICT) among Agriculture Based Entrepreneurs: Towards Creating Knowledge Farmer (K-Farmer)

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ABSTRACT

The main objective of this study is to discover the ICT usage among Malaysian agro-based entrepreneurs. This study has four sub-objectives which are to determine the purpose of ICT usage among agro-based entrepreneurs, to know the contribution of ICT towards agro-based productivity, to identify obstacles and problems faced by agro-based entrepreneurs in using ICT and to discover networks and support services created by agro-based entrepreneurs through ICT usage. A total of 450 agro-based entrepreneurs were selected representing six fields of agro-based industry namely food processing, farming, fisheries, plantation, animal rearing and non-food processing. ICT tools that frequently used were mobile phone, telephone, television and radio. Mobile phone and telephone were frequently used by agro-based entrepreneurs for information sharing among entrepreneurs. Television and radio were used for seeking weather information. Department of Agriculture (DOA) website is the most surfed website among agro-based entrepreneurs where 32.2% of them have surfed this website. A total of 37.6% of agro-based entrepreneurs agreed that ICT highly contributes to their agro-business productivity. The main problem and obstacle faced by them in using ICT was they didn't know about the benefits offered by ICT. This study found that mobile phone and phone were the main tools used by agro-based entrepreneurs in creating network with customer and supplier while support services from development agency and private company were needed for repairing their ICT tools. Results gained reveal that factors such as zone where they live, gender and level of education have significant difference with ICT usage while there were four factors (age, period of involvement, starting investment and income gained) found to have significant correlation with ICT usage. Age was found to be the most contributing factor for ICT usage.

Keywords: information and communication technology, entreprenerus, knowledge farmer

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Giving and Taking – The Complexity of Volunteerism Motives

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ABSTRACT

Volunteerisms acquire active community participation and promote various benefits to both cancer patients and volunteers. However, the lack of understanding of Malaysian society towards the function and importance of cancer volunteerism created low responsive reaction. In line with such scenario and Malaysia's aspiration to become a 'caring society', this article discussed the findings of a study which has aimed to discover the profile of cancer care volunteers in Malaysia as well as the complex interconnectedness of the giving-getting motives of the volunteers.

Keywords: decision-making, breast cancer treatment, breast cancer management, cancer information

Audit Expectation Gap and Loan Decision Performance of Bank Officers in Iran

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ABSTRACT

Despite substantial evidence of the audit expectation gap in the developed and developing countries, few studies have empirically investigated the effect of the gap on decision performance. This study examines the effects of accounting knowledge and experiences of Iranian bank officers on audit expectation gap, and investigates whether the expectation gap mediates (or explains) the relationship between individual factors and decision performance of bank loan officers in Iran. Based on the human information processing theory and Libby’s decision making framework (Libby, 1979), the following research framework is formulated. Copies of a structured questionnaire were distributed to 113 loan officers of five large commercial banks in Iran. With the support of the heads of the training departments of the five banks, 111 completed questionnaires (nearly 100% response rate) were returned for analysis. The results show the existence of a fairly large audit expectation gap among Iranian bank loan officers and that the individual knowledge factor, *accounting qualification,* is a highly significant predictor (mitigating factor) of the audit expectation gap. Accounting and working experiences do not significantly improve bank officers’ understanding of audited financial statements, due to the lack of or ineffective training programmes. More importantly, this study provides the empirical evidence of a highly significant negative relationship between audit expectation gap and loan decision performance of the Iranian loan officers. Further analyses indicate that the audit expectation gap fully mediates the individual knowledge-performance relationship. The findings of this study have important policy implications for recruitment and training of bank loan officers.

Keywords: audit expectation gap, accounting knowledge, accounting experience, loan decision, performance evaluation, Iranian bank officers

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Prospect of Meat Processing Industry in Malaysia

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ABSTRACT

The objectives of this study were to analyze the processed meat consumption pattern in Malaysia by estimating expenditure elasticities and find out the determinants of consumption for processed meat products via Working-Leser model by using Household Expenditure Survey 2004/2005. The empirical results show positive income elasticities for all processed meat products. Age of household head, urbanisation, employment and income variables provide evidence to support the positive relationship to consumption of processed meat products, especially canned meat products.

Keywords: processed meat, demand, consumption pattern, expenditure elasticity, working-leser model

Strategic Decision: Procure Readymade or Buy Them Raw

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ABSTRACT

The paper presents a study which seeks to add to the body of knowledge that relates the effect of specific combination between Porter's generic strategies, and sourcing strategies to organisational performance in the context of Malaysia manufacturing industry. The research is based on the Industrial Organisation (IO) Theory, the Transaction Cost Theory, and the Resource Based View (RBV). Questionnaires were sent via mail survey to 1300 firms (total population of four major sectors, electrical and electronics, chemicals including petroleum, food and beverages and fabricated metal) and 314 of them responded. The findings indicated the cost leadership strategy which was mediated by make strategy generated better organisational performance than other types of association. The findings also indicated the differentiation strategy that mediated by the buy strategy produced better organisational performance than other type of association. In conclusion this study may change or strengthen decision makers' confidence in determining the most suitable combination between competitive strategies and sourcing strategies for their business.

Keywords: ponter's generic strategies, sourcing strategies, Malaysia manufacturing industry

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How Capital Structure Adjust Dynamically During Financial Crises

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ABSTRACT

The availability of a unique data set of financially distressed firms enabled this study to apply the dynamic capital structure adjustment model to a study of capital structure. In addition, the factors driving capital structure adjustment of financially distressed and of healthy firms were estimated. The results identified 13 significant variables, which included many macroeconomic variables previously not studied, thus evidence is produced of the impact of macroeconomic factors on capital structure for the first time. We also estimated the adjustment parameters using a new dynamic adjustment model applied to an unbalanced panel data set of distressed and healthy firms. It is found that the adjustment parameters are different in the short term and long term. These new findings add to the capital structure literature.

Keywords: capital structure, dynamic model, GMM, distressed firms, speed of adjustment and financial crisis

Predictors of Perceived Inter-Ethnic Tolerant Behaviors Among Youth in An Ethnically Diverse Society

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ABSTRACT

Youth are important assets for the continuous development of a nation. Therefore, many youth development programmes have been conducted to help youth to develop. Positive Youth Development, an approach that emphasizes the positive aspects of youth development is based on developing their health and physical competence, personal and social competence, cognitive and creative competence, vocational competence and citizenship competence. Having these competencies are very essential especially among youth living in a multi-ethnic society, Malaysia. In addition, the Theory of Planned Behavior also explains that the occurrence of a specific behavior of a person can be predicted with the presence of attitudes, subjective norms, perceived behavioral control and behavioral intentions. Incorporating both the Theory of Positive Youth Development and Theory of Planned Behavior, this study aimed to determine the potential predictors for perceived inter ethnic tolerant behavior among the youth. In order to determine the predictor variables for inter ethnic tolerant behavior, a four predictors multiple linear regression model was used. Using an 80 item questionnaire, data were collected from 1086 youth. The results indicated that among all the four youth development competencies, cognitive competence was the strongest estimator of inter-ethnic tolerant behavior. As the operational definition of cognitive competency in this study was defined as the 'willingness to understand the social, politic and cultural norms in navigating their behavior tolerantly towards the different ethnic groups,' this suggests the importance of education in playing its role to increase knowledge and understanding of the different ethnic groups among the youth. Thus, education has an important role to play in predicting and developing inter-ethnic tolerant behavior among the youth in an ethnically diverse society.

Keywords: youth, inter-ethnic tolerant, positive youth development, education

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Earnings Announcements: The Impact of Firm Size on Share Prices

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ABSTRACT

This paper investigates the impact of firm size on stock prices during earnings announcements. The impact is measured by the earnings response coefficient (ERC). The results show that the correlation between firm sizes and standardized unexpected earnings are significant and negative. The results show no incremental information content beyond earnings except that the direction of the effect is negative. The evidence suggest that the share prices of large firms had at least 8 to 10 percent less valuation compared to smaller firms, though the differences are not statistically significant

Keywords: earnings response coefficient, firm size, returns windows, portfolio

Contribution of Individual Attributes towards Tolerant Behavior: A Path Analysis

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ABSTRACT

Research shows that knowledge, attitude, religion (Adnan @ Nan bin Kamis, 1992, Hazri Jamil, Molly N.N. Lee, Sathiram, R., Hairul Nizam Ismail, Nordin Abd. Razak, Subadrah Nair, Najeemah Md. Yusuf & Lee Lay Wah, 2004, Amir Hasan Dawi, 2004, Zaharah Hassan, Bahaman Abu Samah & Abu Daud Silong, 2006, & Mohamad Zaini Abu Bakar, 2006), and personality traits play important roles in the ethnic relation issues. The main intent of this study was to develop a model to predict the correlates of inter-ethnic tolerant behavior. A total of 563 youth from seven districts in Selangor voluntarily participated in the study and they completed the Malay version of NEO PI-R, Universal Religious Personality Inventory (URPI) and the Inter-ethnic Tolerant Behavior Questionnaire (IETBQ). In this study, path analysis was carried out to determine the interdependencies amongst all the related correlates and the influences of several factors on perceived inter-ethnic tolerant behavior. These factors consisted of knowledge, personality traits (neuroticism, extraversion, openness, agreeableness, and conscientiousness), religious personality (pro-social behavior, ritual behavior, and anti-social behavior), and attitude. In conclusion, the proposed model is a good model fit and appropriate for Malaysia in explaining the relationship between the contributing factors towards inter-ethnic tolerance behavior.

Keywords: youth, inter-ethnic tolerance, personality traits, religious personality

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Guccira Tiles Sdn. Bhd. Italiano Tiles Anyone?

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ABSTRACT

In general, this case is interested in the issues related to deciding the strategic move particularly to develop brand name as top of the mind recall and the first brand to be considered. This would enhance its position in order to sustain the firm’s strategic position and competitiveness in the ceramic market. More specifically, the case presents how to create a strategic decision either to focus on export market or stay in the domestic market. The firm experienced the down trend in the performance due to high overhead, and relative to turn over and declining selling price due to market force that resulted in erosions of the margins. The firm also facing the challenges to reposition itself to be more competitive amid the problems of high labor cost, technological constraints as well as shift in mosaic demand market. Finally, the case explores the possible ways of the firm to position it products above competitors by continually upgrading and improving the product designs and development to meet the changing expectations of the industry.

Keywords: strategic business, ceramic market, competitiveness

Prior Employment and Auditor Independence

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ABSTRACT

The practice of companies hiring accounting and finance personnel from their external audit firms become the attention of various parties due to the potential impact of such practice on audit and financial reporting quality. This study investigates the prevalence of the ‘revolving door’ practice in the Malaysian corporate scene through interviews with senior loan officers and managers of public listed companies. The information gathered seems to suggest a minimal impact of this practice on auditor independence.

Keywords: client employment, auditor independence, external auditors, audit decision

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Fiscal Policy, Institutions and Economic Growth in Asian Economies

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ABSTRACT

This study investigates the relationship between fiscal policy, institutions and economic growth and also the role of institution in Asian economies between 1982 and 2001 through the application of Pedroni’s cointegration approach. It examines two different channels through which fiscal policy and institutions can affect long run economic growth in Asia economies. The first channel is when aggregate of government expenditure, aggregate of other fiscal variables and institution affects the real per capita Gross Domestic Production (GDP) and the second channel is to determine the role of institutions on the real per capita GDP. The Pedroni Cointegration result establishes a long run relationship between fiscal policy, institution and economic growth. We find positive and statistically significant impact of aggregate of government expenditure and aggregate of other fiscal variables and institution on real per capita GDP. We also find that there is a role of institutions on the real per capita GDP.

Keywords: economic growth, Institutions, aggregate of government expenditure, aggregate of fiscal policy, panel cointegration, FMOLS

Accountability in the Post Malaysian Code on Corporate Governance: The Role of Audit Committee/Independent Directors

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ABSTRACT

Audit committee has been in existence for many decades. The establishment of audit committee aimed to mitigate corporate fraudulent or creative accounting practices through internal control initiated by independent and effectively functioning non-executive members of audit committee. An effectively functioning audit committee helps to improve corporate governance practice of firms. This study identifies the attributes of an effective audit committee from audit committee chairman’s perspective. The study utilized questionnaire survey approach, where a total of 200 questionnaires were distributed to chairman of audit committee of companies that listed on the Main and Second Board of the Kuala Lumpur Stock Exchange. Seventy-two useable questionnaires were returned (or 36% response rate). Using factor analysis, the respondents rated highly the effectiveness attributes, which explained 72% of the variance in all of the variables. Three factors were extracted: overall features (54% variance), model to others (10% variance) and review and analysis of standards (8% variance). In general, the respondents believed that an effective audit committee should have the following attributes: sophisticated accounting knowledge, review of financial statements, traditional role in accounting and auditing to ensure auditor independence and good management, and internal control.

Keywords: audit committee, corporate governance, effectiveness, attributes and internal control

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Monetary Conditions Index

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ABSTRACT

This study applies the bound testing approach for cointegration, to verify the stability of Singaporean real Gross Domestic Product (GDP), to construct the Monetary Conditions Index (MCI) over the quarterly period 1981:1-2004:4. The bounds test confirms a long-run equilibrium relationship between the output and its determinants, namely short-term and long-term interest rate, exchange rate, claims on private sector, and share prices. Results reveal evidence of cointegration between these variables in both short and long run. As such, this has further verified the stability of the Singaporean output demand function to construct the Monetary Conditions Index (MCI), and how the Monetary Authority of Singapore (MAS) responds to exchange rate changes and whether the policy responses differ. The study has evidently showed that the actual monetary stance reacts corresponding to the MCIs.

Keywords: MCIs, bound test, cointegration, MAS, Singapore

Governance Structure And External Audit Price: Evidence from an Emerging Economy

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ABSTRACT

This study provides new evidence on the relationship between external audit price and corporate governance of largest (based on market capitalisation) 100 listed firms on both the main and second board of the Bursa Malaysia (BMB) (previously known as the Kuala Lumpur Stock Exchange). The findings show that for main board companies, external audit price is positively and significantly d with corporate size, complexity and internal governance variable (i.e. director’s remuneration). For the second board firms, complexity, corporate size and internal governance variables (i.e. proportion of non-executive directors to total directors) were important determinants of external audit pricing. External audit price had a significant negative relationship with individual shareholders ownership for both main and second board companies, and companies’ age for companies listed on the second board.

Keywords: external audit fee, corporate governance, Bursa Malaysia, retail shareholdings, corporate age, firm size

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Foragent Export Agent- A Case Study

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ABSTRACT

The case is about the process a forwarding agent had to undergo to document three major processes: importing, exporting, and billing. These major processes were recorded and tabulated to facilitate (1) easy understanding of the processes and (2) reengineering of processes. The case is appropriate for small and medium enterprises to follow in documenting processes and reengineering them by merging, collapsing and removing, and rearranging. The case also suggests ways to insert technologies and innovations at appropriate steps of the processes.

Keywords: process improvement, business process reengineering

The Case of Sinaran Construction Bhd (SCB)

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ABSTRACT

The case illustrates a scenario at Sinaran Construction Bhd (SCB) during the construction of Kuala Lumpur Convention Centre. It begins amidst a weekly progress meeting of all the project managers, about the project being three months behind schedule. The case then focuses on among others, the cause of the delay which was mainly human resource. The company reported an increase in employee turnover rate which rooted from poor working conditions, no job satisfaction, better offers elsewhere and no clear directions from superiors. Characters in the case were briefly described exposing more internal issues that needs to be resolved.

Keywords: human resource, employee turnover, job satisfaction

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Cost, Revenue and Profit Efficiency of Islamic vs. Conventional Banks: International Evidence Using Data Envelopment Analysis

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ABSTRACT

This paper measures and compares the cost, revenue and profit efficiency of 43 Islamic and 37 conventional banks over the period 1990-2005 in 21 countries using Data Envelopment Analysis. It assesses the average and overtime efficiency of those banks based on their size, age, and region using static and dynamic panels. The findings suggest that there are no significant differences between the overall efficiency results of conventional versus Islamic banks. Overall, the results in this paper are favorable with the 'new' banking system.

Keywords: islamic banks, conventional banks, efficiency, old and new banks, DEA method

Production And Research of Syahadah 4 Documentary Programme on Radio Televison Malaysia Channels

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ABSTRACT

Documentary programme Syahadah season 4 was produced by Radio Television Malaysian on channel RTM1 and RTM2 in conjuction with the month of Ramadhan. With the tag line ”Satu Lafaz Berbeza Resam” (translated to English , One Proclamation, Different Customs) the objective of Syahadah programme was to study the achievement of the muslim nations from various ethnics and races around the globe. The production of Syahadah programme was started in 2005 under the control of the Development and Agricultural Unit Radio Television Malaysia. In April 2008 RTM invited Dr Megat Al Imran Yasin from the Communication Department Faculty of Modern Languages & Communication to participate as a reasercher and a scriptwriter for the production of Syahadah programme in several European countries namely Italy, Greece, Albania and Kosovo. The cooperation between RTM and the Faculty of Moderrn Languages & Communication was undertaken based on the Memorandum of Understanding signed by both parties that enables experts in the field of communication and media studies in the university to help RTM in the development of television and radio programmes in the station. Dr Megat Al Imran Yasin is an expert in the field of broadcasting and media studies especially in the production of documentary programmes. The shooting and field work research of Syahadah programme took about 48 days started from 5 May 2008 until 21 Jun 2008. Eleven episodes of the programme with the duration of 30 minutes each were produced in Malay language in channel 1 (RTM1) and in English language in Channel 2 (RTM2) in the month of Ramadhan 1429Hijrah (Ocktober 2008). In Italy the shooting was done in Rome, Sicily and Milan. In Albania the shooting was done in Tirana, Shkodra, Durres and Vlora. In Kosovo the shooting was done in Pristina, Drenica, Pezrene and Mitrovica. And lastly in Greece the shooting was done in Athens dan the northern territory of Greece border with Turkey namely Komotini and Xanthi.

Keyword: documentary, television, syahadah

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Audit Committee Support and Auditor Independence

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ABSTRACT

This study investigates whether audit committee do contribute towards external auditor independence. Audit committees are mandatory internal control mechanism required in all listed firms to ensure effective enforcement of good corporate governance. The results indicate that auditor independence is positively d with audit committee meetings, audit committee report in the annual report, roles to approve and review audit fees, and composition of audit board. These results are consistent with the spirit of corporate governance code that was designed, among others, to improve the quality of financial reporting and hence increase confidence in the information presented in the reports.

Keywords: audit committee, auditor independence, bursa Malaysia, perceptions, compliance

Monetary Transmission: Evidence from Sectoral Activity in Malaysia

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ABSTRACT

This study analyzes the issue of money-output relationships in the aggregate sector and construction sector in Malaysia. It examines the response of construction activity and aggregate real economic activity to monetary variables, namely, money, interest rate, bank credit and exchange rate, exploiting data from 1970:1 to 2002:4. Using cointegration analysis and parsimonious vector error correction model (PVECM) the findings provide some notable results. It is the real construction activity that responds greater to bank credit. The significant response of the aggregate output to the highly liquid money explains a greater assess to highly liquid money in the market.

Keywords: monetary-output, credit-output, Malaysian construction sector, parsimonious vector error correction model (PVECM)

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Predicting Corporate Failure of Problematic Firms in Thailand Using Multiple Discriminant Analysis (MDA) Models

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ABSTRACT

Financial ratios have long been used as predictors of important events in financial markets. The ability to predict impending failures using common identifiable attributes can help formulate and implement pre-emptive measures to avoid or at least mitigate the adverse effects of such failures. This could ease financial distress to all stakeholders, reduce the costs of failures and contribute to business and financial environment stability. This study examines corporate failures before the 1997 Asian Financial Crisis in Thailand, and develops, tests and analyses a model for classifying and predicting financial distress. The failure prediction model developed successfully discriminates between failed and non-failed listed firms at the rate of 71%. The variables in the final model imply that profit, working capital and net worth are important predictors of failures of firm.

Keywords: corporate failure, financial ratios, prediction model, Thailand, analysis

Contemporary Malaysian English: Word Innovation through Morphological Processes

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ABSTRACT

The phenomenon of word-formation is subject to change. Some of the roots in word formation are inherited and some borrowed. According to Carstairs-McCarthy (2002: 97), there is far more that could be said about the ways in which studies of very large corpora can shed light on word-formation in contemporary English. In relation to language change, the same can be said of Malaysian English. This variety of English has emerged among non-native English speakers in Malaysia where English is the second most important language in the country, after Malay which is the national and official language. English in Malaysia has been referred to in a number of ways, such as Standard Malaysian English and Colloquial Malaysian English (Platt and Weber, 1980). This paper focuses on the processes of word formation as an ingredient that contribute to the variety of spoken contemporary Malaysian English. These processes impose form and meaning which differ from those of the Standard variety. Data for the study is collected from settings where topics are not formally selected in order to allow for a free flow of spontaneous discourse that forms a small corpus. Where new word formation involving lexical borrowings from the local vernacular languages and other processes are detected, they are annotated and analyzed for their form and meaning. The analyzed corpus reveals the violation of grammatical constraints as an operating parameter in relation to the target language under consideration (English) as well the L1.

Keywords: malaysian english, morphological processes, word innovation

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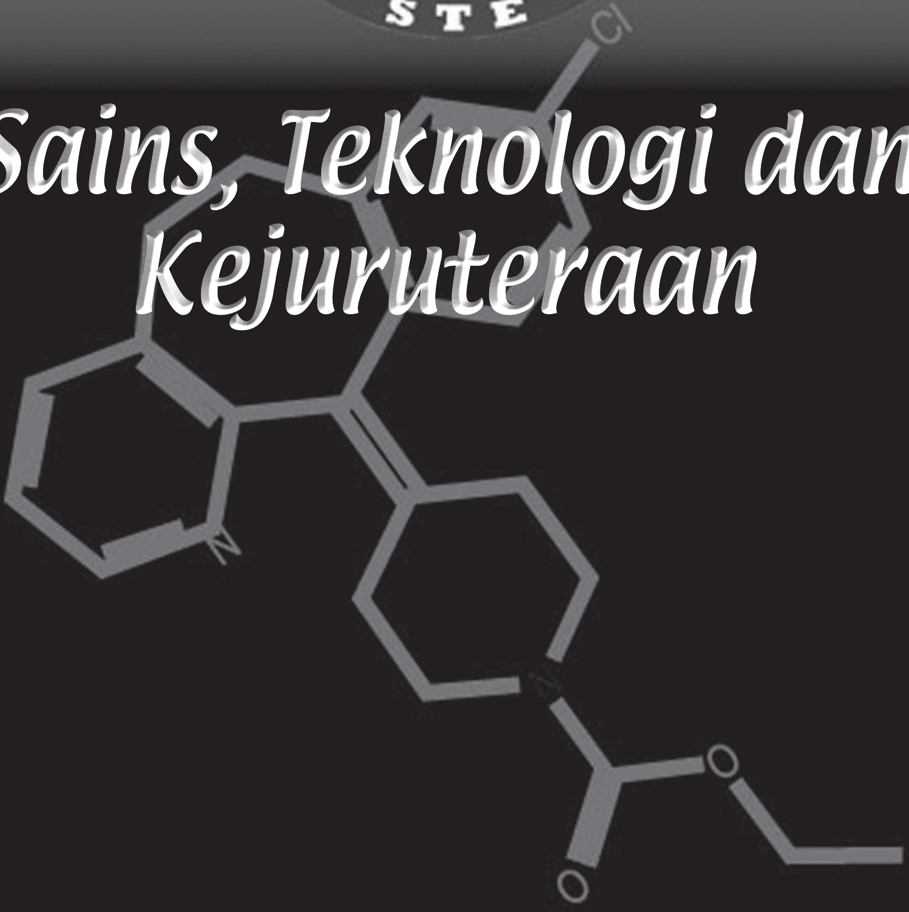
Sains, Teknologi dan Kejuruteraan



Sensitivity Analysis of an Optimal Access Road Location in Hilly Forest Area: A GIS Approach

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ABSTRACT

There are various models for establishing the efficient forest road allocation and evaluating optimum density of forest roads network for the transport of timber commodity. Most of them are based on the calculation of common timber transport costs and costs for forest roads. Today, forest road design from traditional method continues to be transformed by remote sensing technology and advancement of GIS. It is now possible for a forester to analyze many different road location alternatives over a large geographic area in a minimal amount of time. A computer programming using GIS, digital terrain data and sensitivity analysis for locating optimal forest road access in a hill area is presented. The optimal access road location specifies destination (starting point) and target (ending point) of the desired path. These paths were allocated by calculated each individual criteria by given weights placed on each cell. Therefore, the objective of this work is to describe an attempt to compute the optimal allocation of forest road corridor in hilly area of Peninsular Malaysia using GIS approach and sensitivity analysis to satisfy the result. Finally, the model minimizes total cost of construction and forest environmental impacts resulting from a specific access road. Sensitivity analysis should be explored further to understand the effects of uncertainty in derivation of model parameter on model outputs. It is concluded that the location of optimal access path were established in the area can reduce the cost and environmental impact to the forest ecosystem

Keywords: hill forest area, access road location, sensitivity analysis, GIS

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Osteoinductive Biological Composite Scaffold for Bone Repair

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ABSTRACT

Nowadays, increasing number of orthopaedic cases demand the use of bone graft substitutes in aid of bone repair. The limitations in the options available require the development of new reconstructive alternatives that include the utilisation of biomaterials. In this research, characterisation on the mineral composition and physicochemical properties of the cockle (*Anadara granosa*) shells performed shows that cockle shells could be the alternative biomaterial for the development of bone graft substitute. Based on these findings, the 3D biological composite scaffolds which incorporated cockle shells powder (<420 μ) and demineralized bone matrix (DBM) (w/w) has been developed and the efficacies of the composite were studied by evaluating the responses post intramuscular implantation in animal model. The results shows that the cockle shells-DBM composite is biodegradable and biocompatible in nature, and possessed an osteoinductive characteristic based on the responses post intramuscular implantation. In addition, bone forming potential by the composite is proportional with the amount of DBM being incorporated in one unit composite.

Keywords: cockle (*anadara granosa*) shells, demineralize bone matrix (DBM), composite, osteoindcutive, bone repair

Airborne Hyperspectral Sensor for Search-and-Rescue (SAR) of Crashed and Missing Helicopters

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ABSTRACT

Studies have been focused on the uses of an AISA airborne hyperspectral imagery for the identification and detection of the missing helicopters such as the Bell 406 Long Ranger and RMAF S61-A4 *NURI* that were both proven successful of using such imagery for these purposes, although the current AISA airborne hyperspectral system has limited capabilities when there is a thick moving cloud cover over the virgin jungles and high mountain forests and limited spectral signature library of the Bell and RMAF helicopters. However, with further development in sensor technologies and further development of new image processing techniques, it will be possible to assist in SAR for future land targets. This research describes success stories from an airborne hyperspectral remote sensing system for searching of missing and lost Sarawak's Hornbill Bell and RMAF Nuri helicopters, especially the Bell Long Ranger and NURI that crashed in Bario-Ba'Kelalan and Genting-Sempah, Malaysia on 12th July 2004 at 1235H and Friday 13th. July 2007 at 1325H, respectively. These AISA airborne hyperspectral imaging flights demonstrated that quality near real-time hyperspectral images could be pre-processed on-board the aircraft and become accessible to the SAR committee members for quick ground SAR within two hours after the flight. The combined geospatial information technologies were a major breakthrough in the Malaysian SAR near real-time imaging technique. Anomalies in the tree canopy/crown area such as scattered irregular canopies/crown cover and forest canopy gaps and helicopter spectral libraries developed during digital image processing of the AISA airborne data were used to detect the probable crashed locations of the missing helicopters. In addition, the narrow-range perfect match of the unique image spectral and spatial capability of the airborne AISA sensor was capable of detecting suspected spots of the wreckage with the aid of field spectral libraries. It is expected that future precise locations of the suspected targets can be transmitted via very high frequency radio communications and become accessible to the SAR ground members such as the commandos VAT69. Real-time airborne hyperspectral imaging will benefit strategic SAR and help reduce the loss of lives in future helicopter crashes.

Keywords: search-and-rescue, airborne hyperspectral sensing, near real-time, helicopter, mountain forests

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Concurrent Decision Making at the Conceptual Design Stage using Analytical Hierarchy Process

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ABSTRACT

There is an increased study for considering the right decisions on the design concept and material concurrently at the early stage of development of product. The level of success of product design achieved depends significantly on the right decisions on the design concept and material during development process. Inappropriate the decisions may cause the product to be redesigned or remanufactured. To overcome this circumstance, concurrent engineering is an approach which allows designers to consider early design problems need to be implemented. To illustrate the use of concurrent engineering approach at the early stage of design process, a concept selection model called concurrent design concept selection and materials selection (CDCSMS) was proposed. 8 design concepts and 6 different types of composite materials of automotive bumper beam were considered in order to demonstrate the proposed CDCSMS model. Both of these decisions were then verified by performing various scenarios of sensitivity analysis in order to check how sensitive the decisions are when the main criteria influencing the selection process are changed.

Keywords: concurrent engineering, analytical hierarchy process, automotive bumper beam

Porous Bioceramic Composition for Bone Repair

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ABSTRACT

The present invention relates to a porous bioceramic composition for bone repair and method of fabrication of the same. 3D-scaffolds were fabricated with a novel micro- and macro-architecture. Porous scaffolds based on dextrin, dextran, gelatin and biomineral ($CaCO_3$) powder were fabricated by heating and freeze-drying methods. Fabrication of different compositions of porous scaffolds (20, 30 wt% of gelatin, 20, 40 wt% dextrin, 30, 40, 50, 60 wt% dextran bounder with the constant quantity of $CaCO_3$ 50g). The scaffolds properties were characterised by x-ray diffraction (XRD), differential scanning calorimetry (DSC), scanning electron microscopy (SEM) and compression tests.

Keywords: porous bioceramic, scaffold, bone, repair

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434 MHz Surface Acoustic Wave Resonators for High Temperature Applications

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ABSTRACT

For over 30 years surface acoustic waves (SAWs) have been used as the main principle of operation for devices used for the processing of electrical signals. They have found use in the telecommunication industry, because of their high performance, small size, and high reproducibility. Also, due to their high accuracy and excellent crystal stability, one of the promising applications is for high temperature environments, where in this proposal, a temperature range of 400 ^oC to 600 ^oC is proposed typical for the power generation, chemical and petrochemical processes, nuclear, automotive engine and aerospace sector due to theirs safety and environmental monitoring. With the introduction of passive SAW sensors in wireless systems, SAW devices offer new and exciting potential for remote monitoring and control of moving parts, particularly in harsh environments such as those with high levels of radiation, high temperatures or electromagnetic interference, where no other monitoring system can operate. Through the used of wireless systems can be overcome the large number of components those are indispensable for the achievement of the required functionality for monitoring system, the electric wiring of spatially distributed system become complex and causes difficulties in system handling and installation. Wireless passive systems, which can continuously monitor a strain or temperature at high operating temperatures, would bring very significant reductions to the cost of operation and maintenance. The overall performance of these devices at higher frequencies and temperatures depends not only on the piezoelectric material but also on the fabrication method and the metallisation used. In this paper, a single crystal $GaPO_4$ with 5^o cut has been chosen as a piezoelectric material for fabrication and long-term stability tests of high temperature SAW devices operating at 434 MHz and up to 600 ^oC.

Keywords: surface acoustic wave , high temperature, gallium phosphate

Design and Fabrication of Chair From Hybrid Banana Pseudo-Stem/Glass Fibre Reinforced Polyester Composite.

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ABSTRACT

A study chair has been designed and fabricated using combination of conventional material and natural fibre composite. The seat and the backrest of the chair were made from a hybrid of banana pseudo-stem and glass fibre reinforced polyester composite while the chassis was made from stainless steel. Five concepts have been developed and the selected concept was further enhanced to achieve both ergonomic and aesthetic design. Hand lay-up method was used to fabricate the composite parts of the chair while the chassis was fabricated using commercial manufacturing process. The aesthetic value and mechanical properties make the hybrid of banana pseudo-stem and glass fibre reinforced polyester composites suitable for furniture making materials.

Keywords: natural fibre composite, banana pseudo-stem, glass fibre, reinforced polyester composite, stainless steel, ergonomic, aesthetic

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Laboratory Set-up for Rheological Characterisation of Gluten Extensibility

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ABSTRACT

Gluten is a cross-link of protein network developed during mixing of flour-water dough. By washing the dough under running water, the starch is removed and the remaining viscoelastic mass obtained is gluten. Nowadays, the uses of gluten in industry have been intensely applied in various food and non-food applications due to the unique cohesive properties. It has become a commercial material in food industry including bakery, breakfast cereals, noodles, sausages and also meat substitute. Its application has also expanded to other sectors such as pet food, aquaculture feed, natural adhesives and also as biodegradable films. A simple tensile test was built and set-up to determine gluten extensibility. Rested gluten strips were clamped at two ends using plastic clips arranged at 40 mm distance nailed to a wooden platform on an Instron machine. A V-shape metal rod which serves as a hook pulls the gluten strip upwards at its centre until it fractures. A fundamental equation was derived to describe the extensibility of gluten. The extensibility parameters such as the original length of gluten (l_o), final length of gluten at fracture (l_t) and the actual force (F_a) were captured to determine rheological parameters such as strain (ε_H) and stress (σ). This set-up was tested on gluten extensibility of doughs from various mixing times using the strong and weak flour. Gluten obtained from strong flour has greater extensibility compared to weak flour. The extensibility of gluten from both strong and weak flour dough increased as dough mixing time increased before decreasing at a peak of 8 minutes. The results demonstrated the capability of this tensile test set-up in describing the development of gluten during dough mixing and serve as a reliable method for gluten characterisation. Rheological characteristic of gluten indicated that gluten exhibited strain hardening effect during extension.

Keywords: extensibility, gluten, strain hardening, tensile test

Jatropha Curcas L. Fruit Shelling Machine

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ABSTRACT

Jatropha Curcas L. Shelling Machine is designed to remove Jatropha fruit shell and to obtain the broken seed for further oil extraction process. The machine is developed to overcome the problem faced in traditional fruit shelling method which is done manually. The machine comprises of two main parts which are cracking of Jatropha fruits and separation of the fruit shells from the seeds. The dimension of the machine is 1.5m (height) x 0.7m (width) x 1.4m (height). The desired output obtained from the machine is broken seeds and unwanted fruit shells is removed. The capacity of the machine is approximately 40 kg/hr. Dried Jatropha fruit is loaded to the hopper manually is cracked in the cruncher. The cracked Jatropha fruit is a mixture of fruit shells and broken seeds which will fall down to the screening table for separation process. The broken seeds will pass through the holes of the sifter and collected in a collection unit while the fruit shells will be conveyed to the end of the screening table and removed. The machine yields 99% efficiency in cracking process and 91% in separation process. Based on the high performance of the machine, it would definitely simplify the Jatropha fruit shelling and separation step in oil extraction process for biodiesel production and stimulate the growth of biodiesel industry in our country

Keywords: *jatropa curcas l.,* cracking, separation, machine

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A Gel-based Imaging Method for Quantitative Measurement of Green Fluorescent Protein

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ABSTRACT

There is an increased usage of green fluorescent protein (GFP) as a visual marker in biological fields. Therefore, availability of simple and affordable quantitation method for GFP is important. In this study, a gel-based imaging method using a native polyacrylamide gel was developed for quantitative measurement of GFP. Image of fluorescent band from a electrophoresed native gel was captured and analysed using a gel documentation system for the determination of GFP quantity. Various validation assays were performed to demonstrate the reliability and suitability of the developed method for practical application. The validation tests including the precision, limit of quantitation, linearity, reproducibility, accuracy and sensitivity test. The results show that this method generated a linear regression curves with coefficient correlation greater than 0.99 and with acceptable coefficient of variance (< 10) and signal to noise ratio (> 3) for every measurement. The accuracy of the gel-based imaging method was confirmed by comparing an unknown GFP concentration fluorescent intensity with a spectrofluorometer and the deviation of the results was only 9.4%. Moreover, the gel-based imaging method was successfully applied to the analysis of GFP in the presence of cells by separating the cell component using gel electrophoresis prior to measurement of fluorescent image. This finding indicates that the gel-based imaging method was superior in term of sensitivity to the spectrofluorometric method because the result analysis of GFP using the spectrofluorometric method was affected in the presence of cells.

Keywords: green fluorescent protein, quantitation method, gel-based imaging method, spectrofluorometer, gel electrophoresis

Development of Computer Casing using Oil Palm Fibre Reinforced Epoxy Composite

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ABSTRACT

The main objective of this project is to develop a computer casing from natural fibre reinforced composite using Total Design Method. The design process involved market investigation, product design specification, conceptual design, detail design, and prototyping process. A prototype of the designed product was fabricated using oil palm empty fruit brunch fibre reinforced epoxy. The prototyping process involved fabrication of the composite material, assembly, and surface finishing. Some advantages of natural fibre reinforced computer casing over conventional casings are environmental friendly, renewable, low energy consumption, and significant weight reduction.

Keywords: total design method, natural fibre, computer casing

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Modelling of Rheological Behaviour of Pummelo Juice Concentrates using Master-curve

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ABSTRACT

Various mathematical models have been used to represent the flow behaviour of fluids and typically in the food processing where flow properties and behaviour of fruit juices are important in determining the power requirements for pumping and sizing of pipes in its processing, and that as a measurement of processing stability and for predicting texture. The rheological characterisation of fluid food usually complicates when factors such as concentration and temperature come into picture. As such, this research looks into characterisation of the rheological properties using a master-curve technique by employing a stress-temperature superposition, a method analogous to the time–temperature superposition principle or the frequency-composition-temperature superposition. Freeze-dried-concentrated pummelo juice was chosen as the material of study where its rheological behaviours were modelled to investigate the effects of temperature and concentration on its fluid type and viscosity using a rotational viscometer at shear rates ranging from 1 to 400 s^{-1}. The effect of concentration measured by its total soluble solids content resulted in the juice concentrates behaving towards pseudoplastic behaviour with flow behaviour index values, $n < 1$. Temperature increase from 6 to 75 °C produced a reversing effect of the pseudoplastic behaviour from the increase of n values at all three investigated concentrations, 20, 30 and 50 °Brix. The consistency coefficient decreases with temperature but increases with total soluble solid contents. Modelling the rheological behaviour of pummelo juice concentrates using this master-curve yielded results over a range of temperature to overlap on a single line, which allows generalisation of flow behaviour and characteristics. The master-curve plots also confirmed that the juice viscosity and pseudoplasticity increase with concentration with high regression coefficients, $R^2 > 0.98$.

Keywords: rheological model, master-curve, modelling, pummelo juice concentrate, power law

Recovery of Histidine-tagged Nucleocapsid Protein of *Nipah* Virus using Immobilised Metal Affinity Chromatography

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ABSTRACT

The nucleocapsid (N) protein of Nipah virus (NiV) expressed in *Escherichia coli* is antigenic and immunogenic. Thus, it can be developed as a diagnostic tool in the surveillance of an outbreak of NiV. Currently the N protein is purified at a small scale using the labour exhaustive and high cost conventional method. This conventional method is a multi step purification process that involves four unit operations: centrifugation, concentration, dialysis and ultracentrifugation. The N protein of NiV is sensitive to the endogenus proteolytic activity of the host cells that co-released during the cell disruption. Hence, the recovery yield of N protein is low in the conventional method due to its long processing time. In this study, we have established a simplified purification technique to recover the N protein using Akta FPLC, a fast and efficient chromatographic system. The developed purification methodology for the recovery of the N protein is reported in Chong *et al*., 2009. A 68.3% yield of the N protein with a purification factor of 7.94 was obtained from this simplified purification method.

Keywords: nucleocapsid protein, *Nipah* virus, immobilized metal affinity chromatography, *Escherichia coli*

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Improvement of Celulase Immobilisation using Produced Carbon Nanotube in a Fluidised Bed Chemical Vapor Deposition

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ABSTRACT

Carbon nanotubes (CNT) represent a new opportunity in immobilisation of enzymes as they offer large surface areas, pore sizes tailored to protein molecule dimensions, multiple sites for interaction or attachment, and *etc*. The immobilisation of the enzyme cellulose (which is useful for any known treatment of cellulosic fabrics or textiles) has a wide range of industrial applications. In this study, the immobilisation of cellulase using CNTs could improve its desired characteristics and make its recovery and reuse possible due to the demand for highly stable enzymes, enzymes that are able to perform at extreme pH values and temperatures. Among different types of immobilisation techniques available, entrapment of the enzyme in a polymer matrix preserves the enzyme conformation since it only physically restricts the enzyme movement within the polymer matrix. It is worth mentioning that the structure of the support materials has a great impact on the performance of the immobilized enzyme. The enzyme cellulase was entrapped in chitosan-based support with and without CNTs to study the roles and effects of this nano-material. Carbon nanotube was synthesized in the lab by chemical vapor deposition in a fluidized bed reactor. MWCNTs (~1 mg/ml) were treated with water-based (pH 7.0) chitosan solution (1%) and then sonicated. Cellulase (8 mg/ml) was then entrapped in beads prepared from drop wise addition of 1 mg/ml CNTs suspended in 1% chitosan into $CaCl_2$ in KCl. Similar procedures were conducted for the chitosan-based without CNT solution. As a result, the immobilized cellulase beads showed significant improvement in terms of activity, better pH and thermal stability than free enzyme used in a previous method without using CNT.

Keywords: carbon nanotube, cellulase, immobilisation, chemical vapour deposition, fluidised bed, entrapement

Water Resources Management (WARM) Model to Mitigate the Effects of Land Use Changes in a Watershed

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ABSTRACT

The Bernam river basin where Proton city is located is rapidly developing, changing from agriculture based to an industrial area. Land development can be d with increased impervious areas causing increase in surface runoff and decrease in ground water recharge. Although rain water in high rainfall regions is sufficient to meet the water demand of crops, its spatial and temporal distribution makes rainfed farming a risky proposition. Being agriculture based area. The Malaysian government has set a 90% self-sufficient rice production through double cropping. The study area is the main source of irrigation water supply of paddy field in the downstream of the watershed and the required water for paddy irrigation should be made available continuously via maintaining high base-flows so that enough water is available for irrigation during the dry season. This decision support system model (DSS) is to mitigate the effects of future land use changes on watershed water resources and suggest optimal structural best management practices (BMPs) best location and size for stream flow control and management in order to maintain stream water quantity within the desirable limits especially during dry season. WARM model improves Soil and Water Assessment tool Model (SWAT) stream flow output. SWAT model did not account the seepage from the structure best management practices as a component of groundwater to total water yield from the watershed. WARM Model is a quantitative stream water assessment tool designed as a stand alone model using visual C++. Its inputs are based on calibrated Soil and Water Assessment Tool model (SWAT) output data, remote sensing data and GIS techniques. WARM model has three main components, best sub-basin search model, optimum BMPs (pond or wetland) size algorithm, groundwater model and water routing model using variable storage routing method. It serves as a decision support system (DSS) to help planners and decision makers to take the BMPs into account when formulating future plans for land development. It is designed to be applicable to any other watersheds.

Keywords: landuse change, BMPs, water resources management, watershed hydrology modelling

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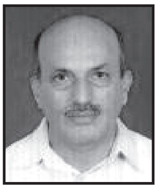
Design and Development of AC/AC PWM Auto Controller



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ABSTRACT

There are many types of loads used In home and industrial applications, some of these loads cause no harm to the quality of the electric network (linear devices), while other loads (Non-linear devices) mainly AC/AC or AC/DC controllers generate harmonics which distort the sinusoidal waveform of the main electricity supply. This project introduces a simple design of AC/AC PWM (pulse width modulation) controller to control an AC motor. In the design a PIC controller is used to trigger two IGBT's at a modulation frequency of 1 kHz. The main reason for using two IGBT's is to use one IGBT to deliver power to the load and the other IGBT is used for freewheeling (discharge the energy stored in the inductive load). A temperature sensor is used to measure the ambient the temperature and feedback to the PIC which in turn change the duty cycle (60%-95%) and hence changes the output RMS voltage. The main advantage of this PWM controller is that the shape of the sinusoidal waveform is maintained, unlike traditional phase angle controllers which cause distortion to the sinusoidal waveform and in turn generate more harmonics.

Keywords: PWM AC/AC controller, duty cycle, linear loads, IGBT

A Tableting Device for Malaysian Herbal Powders

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ABSTRACT

The present invention is to form selected Malaysian herbal powders into tablets, by introducing a tableting device which was fabricated based on a typical tableting device for pharmaceutical materials. In a pharmaceutical industry, tableting is one of the most important key of unit operations in order to develop solid oral dosage forms. It is the simplest way of combining the ingredients which can be blended and placed in a tablet press to make a tablet without any of ingredients having to be changed. Over recent years, the study and application of tableting has continued to develop and many researches have been conducted on tableting of pharmaceutical powders. Recently, the use of traditional and complementary medicine has increased enormously. Today, Malaysian herbs such as *Eurycoma longifolia Jack, Morinda citrifolia,* and *Ficus deltoidea* have been exploited in order to investigate the bioactive compounds present in those plants. However, most of the research was carried out in term of its chemical and medicinal properties. The process technology knowledge also needs to be addressed - the information of the powder characteristics during tableting is useful to investigate the deformability characteristic of the powder. This is important for downstream processing of Malaysian herbal powders. From this study, it was found that upon tableting, *Morinda citrifolia* powder was the most easily compressed compared to *Eurycoma longifolia Jack* and *Ficus deltoidea* powders. *Morinda citrifolia* was the weakest tableted herbs compared to *Eurycoma longifolia Jack* and *Ficus deltoidea*. These findings promote the practical use of granular form of Malaysian herbal powders. In particular, tableting can enhance understanding of material characteristic of the herbal powders. Consequently, tableting can improve the flowability, tensile strength and density of powdery herbs thereby improving the product transportation and handling, as well as to enhance the product quality and shelf-life.

Keywords: tableting device, Malaysian herbs

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Impact Performance of Carbon Nanotube Coated Glass Fibre Reinforced Composites

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ABSTRACT

Carbon fiber and glass fiber reinforced composites are gradually replacing the conventional metallic materials in diverse applications, due to their excellent properties with weight reduction, cost reduction and equal or better performance. Before reinforcements, carbon and glass fibers need to undergo surface treatments to improve the adhesion between the fibers and the matrix. Previous works of producing carbon nanotube coatings on carbon fibers as a mean of surface treatment using chemical vapour deposition technique have proved successful. The resulting carbon fiber reinforced composites have shown remarkable enhancement in tensile strength. However, in certain applications requiring high impact strength, glass fibers are probably even better than carbon fibers in terms of performance and cost. Glass fibers possess greater impact strength than carbon fibers, owing to their high strain-to failure properties. This work focuses on producing carbon nanotube coated glass fiber coated glass fiber reinforced composites and comparing the impact strength of the resulting composite to its glass fiber counterparts. The results show that impact strength of carbon nanotube coated glass fiber reinforced composite is significantly superior.

Keywords: carbon nanotube, glass fibre, impact strength, reinforced composite

Dye-ligand Adsorbent for the Selective Adsorption of Immunoglobulin G

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ABSTRACT

Dye-ligands attached on an expanded bed chromatography quartz base matrix (Streamline^{TM}) were applied for the affinity bioseparation of rabbit immunoglobulin G (IgG) in batch mode. With readily similar dye–ligand density of all dye–ligands provided, Reactive Green 5 (RG–5) was selected for capturing of rabbit–IgG due to its highest adsorption efficiency. The optimisation of adsorption parameters such as pH, temperature, ionic strength and initial rabbit–IgG concentration for rabbit–IgG adsorbed on the RG–5–immobilized adsorbent were performed. It should be noted that adsorption pH influenced significantly adsorption behavior of the RG–5–immobilized adsorbent. The optimal pH for rabbit–IgG was given at 7.0 that showed rabbit–IgG adsorbed highly and selectively on the RG–5–immobilized adsorbent about 64%. Rabbit–IgG adsorption on RG–5 immobilized adsorbent was declined as the increase of ionic strength. There is no significant influence of temperature against adsorption efficiency of RG–5–immobilized adsorbent for rabbit-IgG. The adsorption efficiency of RG–5–immobilized adsorbent obtained experimentally as the function of initial rabbit–IgG concentration was suitably explained by the Langmuir–Freundlich isotherm model that showed good expression of values obtained theoretically such as q_{max} (close to experimental data), low K_D (0.9 mg ml^{-1}) and good R^2. Though bovine serum albumin (BSA) was adsorbed in binary adsorption system, indeed, about 50% of bound BSA on RG–5–immobilized adsorbent was successfully removed with washing buffer containing 1 M NaCl. The optimisation of rabbit–IgG adsorption on the RG–5–immobilized adsorbent and an appropriate elution method could be utilized for purification of immunoglobulin G using expanded bed adsorption chromatography (EBAC).

Keywords: adsorption, affinity, bioseparation, dye-ligand, expanded bed chromatography, immunoglobulin G purification

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Precast Shell Footing for Industrialized Building System

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ABSTRACT

Shell footings are footings made into shape of conical, pyramidal or hyperbolic, as opposed to the conventional shallow footing, which is flat in plane area. By virtue of their shapes, shell footings have much better load carrying capacity compared with the conventional footing. Shell footings are economical alternative to plain shallow foundations in situations where heavy super structural loads are to be transmitted to weaker soils. The use of shells in foundations, as in roofs, leads to considerable saving in materials. An added advantage is the scope they offer for precasting, reduction in weight, which makes even large-size shell footings amenable to precasting. The present invention is a pre-cast inverted triangular shell footing comprising of a horizontal plane and two spaced apart angularly positioned vertical planes. The vertical planes are preferably angled at between 25º to 45º in relation to the horizontal plane. It further includes two parallel and spaced apart vertical walls, which are positioned on the horizontal plane. The vertical walls are made such that it could easily hold external structures such as masonry blocks and the like. The thickness of the present invention is preferably 15 cm and the load bearing capacity is between 38kN and 45 kN.

Keywords: shell footing, precast, industrialized building system

RaDeR: Radar-derived Rainfall Estimation System

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ABSTRACT

The measurement of rain falling in a watershed is based solely on rain gauges network density. These rain gauges are located in convenient locations, which may not be representative of the whole watershed. Hence under or over estimation of runoff from a watershed may occur. Therefore, good estimates of mean areal rainfall are needed as inputs to rainfall-runoff hydrological models. RaDer system is used to improve the rainfall-runoff modeling using virtual rainfall stations network with weather radar-derived rainfall data was developed. The radar rainfall calibration models based on rain gauges records were successfully developed for each radar station available in Peninsular Malaysia. The radar-derived rainfall data for these stations were estimated from raw radar data using a newly developed computer program called RaDeR ver1.0. The program is used for quick access to weather radar data from MMD, and to generate rainfall intensity report with short intervals (10 minutes). The radar rainfall calibration models give better correlation when adjusted radar-derived rainfall values were used instead of the original radar-derived rainfall values. With high density of virtual rainfall stations network, more representative rainfall variability distribution can be produced. RaDeR system can better estimate river runoff using calibrated radar-derived rainfall, which is important for flood control and irrigation water management, especially in the rice granaries.

Keywords: virtual rainfall station, rainfall-runoff mode, radar rainfall calibration, GIS

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Neutral-Point-Clamped Multilevel Inverter Using Space Vector Modulation

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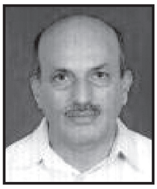

ABSTRACT

Multilevel inverters have attracted much interest from the researchers especially in applications involving high voltage and high power such as the utility and large motor drive applications. This increased recognition of multilevel inverter is due to the limitations of the conventional 2-level output inverters in handling high power conversions. The multilevel inverters can be developed by either using multiple 3-phase bridges or by increasing the number of switching devices per phase, in order to increase the number of levels. The concept of multilevel inverter involves in utilizing an array of series switching devices to perform the power conversion in a small increase of voltage steps by synthesizing the staircase voltage from several levels of DC capacitor voltages. The advantages of multilevel inverter are the dv/dt stresses on the switching devices are reduced due to the small increment in voltage steps, reduced electromagnetic compatibility (EMC) when operated at high voltage, smaller rating of semiconductor devices and better feature of output voltage in term of less distortion, lower harmonics contents and lower switching losses. Furthermore, the complex phase shifting transformers that are needed in the multipulse inverters at higher level are not necessarily required, thus helps in reducing the cost. Space Vector Modulation techniques is a technique where the reference voltage is represented as the reference vector to be generated by the power converter. This technique gives the advantages of enabling the inverter to be operated at system frequency instead of high frequency that might interfere with the AC system’s components that is always d with Pulse-Width-Modulation (PWM).

Keywords: neutral-point-clamped, space vector modulator, multilevel inverter

A New Solution for V2V & V2X Communication using Wireless Vehicular Adhoc Network (VANET) Technology

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ABSTRACT

This product relates to a new vehicle to vehicle (V2V) and vehicle to infrastructure (V2X) system which ensures driving safety, traffic efficiency by providing information of the vehicle(s) and surroundings to the driver. Today there is a lack of comprehensive system to help drivers to avoid typical causes of rear-end collisions, sudden braking ahead of a following vehicle or unavoidable crashes in any unknown dangerous locations of the road way. This invention is able to solve these common problems of vehicular communication network. The aforesaid problems of this research area are general information sharing, driving safety, traffic efficiency, emergency vehicles.

The brief overviews of some solved problems are as follow:

- *General information sharing:* Other vehicle's general information access, Remote diagnostics.
- *Driving safety:* collision warning, hazardous location notification among vehicles.
- *Traffic efficiency*: Enhance route guidance, Green light speed advisory.
- *Emergency vehicles:* Source and location of siren, crossing emergency vehicle at green lights, destination of emergency vehicle, Police remote checking and monitoring.

The product comprises of software and hardware. For software, the new vehicular Ad-hoc network (VANET) communication protocol and sensors interfaces are developed using J2ME and .NET. Hardware part of this product includes Micro-Controller, Sensors and GSM based smart hand phone. The sensors are attached with required car parts (for example, engine, exhaust, brake paddle, oil meter, temp meter etc.) and able to communicate wirelessly with each other and the central micro controller to control and inform the car driver and other necessary bodies. Notifications can be done through hand phone.

The so-formed Vehicular Ad-hoc Network (VANET) works like a new 'sensor' to increase the drivers' range of awareness to spots and diagnose the problems both the driver and onboard sensor systems which cannot be seen normally.

Keywords: vehicle to vehicle communication, vehicular ad-hoc network (VANET), driving safety, traffic efficiency, emergency vehicle

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Locally Fabricated Supercritical Fluid Extraction System for Production of Nanoparticles

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ABSTRACT

Supercritical fluid extraction (SCE) particles formation technique has gained a significant attention mainly in the pharmaceutical, cosmetic and paints industries. However, the scarcity of information on the design of this type of laboratory scale equipment is a significant drawback to the technological progress. Most of the SFE equipment available in Malaysia is imported and thus is very expensive. This study focuses on the design of a laboratory supercritical fluid extraction (SCE) system for production of nanoparticles. The estimated cost of the system is RM125,000 as compared to RM400,000 for the imported SFE. The SFE system consists of feed delivery, feed spraying, precipitation chamber and particle collection units. The system has been tested for supercritical anti solvent (SAS) technique for production of precipitates/co-precipitates of acetaminophen in polymer. The system can be extended for mass production of particles in pharmaceutical industry.

Keywords: design, supercritical fluid, SCF, supercritical anti solvent, SAS, particles formation

Electrokinetik Improvement of Soft Clay & Organic Soils and Modeling of their Mechanical Properties

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ABSTRACT

There is an increased demand for electromigration technique as an innovative and cost effective ground improvement method for soft soils worldwide. Electromigration technique is defined as a physicochemical transport of charge, action of charged particles, and effects of applied electric potentials on formation and fluid transport in porous media. The technique widely accepted for soft soil stabilisation and contaminant removal. To the best of our knowledge, a standard apparatus has not been reported yet. A comprehensive design was developed to fabricate an electromigration apparatus at the University Putra Malaysia. The electromigration apparatus consisted of an acrylic tube, where the soil was molded, connected at both ends to acrylic cylindrical chambers of the same diameter. Sampling ports were placed along the soil chamber. Titanium electrodes were held inside the electrolyte chambers. Each electrode chamber was connected to a Mariotte bottle and an electrolyte conditioning system. Each electrode chamber was further connected to a fluid circulation system where the fluids within the chamber were pump heads connected to the same peristaltic pump driver. Two other pumps with pH controllers were connected to the two conditioning reservoirs. These pH controllers allowed setting the pH levels as a prefixed value and the pump intermittently injected the conditioning liquid from a separate container into the conditioning reservoir to maintain the target pH value of the solution. The electromigration apparatus developed is the latest electromigration apparatus technology by reason of: (i) The essential requirements were fulfilled by using electrolyte conditioning system in order to utilize depolarisation and electroinjection methods for soft soil stabilisation. (ii)The dimensions of the soil chamber has designed specific for undisturbed non-homogeneous soft soils in that it could provide conditions to get a good quality of representative samples for doing most of the chemico-geomechanical tests across the sample. (iii) The design has been found satisfactory in that it provided the essential requirements for taking a sample for triaxial compression tests across the soil which is an advantage over the traditional cells. (iv) In order to control the mechanisms of contaminant removals, the sampling ports and probes placed along the soil chamber have specially designed for extraction of pore fluid and measurements of electrical potentials across the specimen, respectively. (v)The apparatus could accommodate to measure the coefficient of electro-osmotic conductivity and permeability of the soils. (vi)The electrical board has designed to change the AC to DC.

Keywords: electromigration, soft soil, stabilisation, contaminant removal

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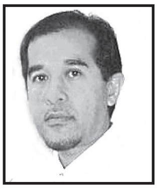
Spatiotemporal Data Visualisation using Morphing Approach for Limestone Activities in Kinta Valley



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ABSTRACT

The research area of spatiotemporal visualisation has received much attention over the past decade due to its challenging aspects and high benefits. In this paper we present the visualisation of spatiotemporal data in the form of earth terrain movements in the limestone area. An additional temporal dimension it is added to the terrain spatial dimensions of x, y and z thus creating a spatiotemporal visualisation system. Many existing visualisation system uses animation to visualize spatiotemporal data. This paper however takes a closer look into a different approach of terrain movement visualisation which is morphing. By using morphing technique, the structures of terrain that changes over time can be viewed in detail. A simple visualisation tool was built to demonstrate this idea and we believe that with gradual improvements, it holds a very promising prospect to be commercialized.

Keywords: spatiotemporal, 3D geospatial visualisation

Development of 3D Web Based Terrain Visualizer

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ABSTRACT

GIS applications are moving toward 3D as it is a better representation of the real world. In Malaysia, most the GIS applications available for public access are mostly in 2D visualisation, such as the services provided by Malaysian Centre for Geospatial Data Infrastructure (MaCGDI). These facilities are provided to the user using Web base facility. The main objective of this project is to present the development of the 3D Web based Terrain Visualizer for Universiti Putra Malaysia (UPM). The development scope is limited only to terrain visualisation of UPM and the user can access this system from anywhere and at anytime without paying any fee. The user only needs to install viewers (softwares) which are freely available from internet. This system involves the digital data (contour with elevation) that is provided by Department of Survey and Mapping Malaysia (JUPEM) and high resolution satellite image (QUICKBIRD). The R2V software is used to process and editing the contour data and PCI Geomatica software is used to process the satellite data. The data is then segregated into separate areas such as golf field, cemetery, and parks by using Arc GIS software. Then all these data overlaid with satellite image and export to the Virtual Reality Markup Language (VRML) file. All of these data is then compressed by using Chisel free software. By using the Macromedia Dreamweaver software, all data is arranged accordingly to form a website for the prototype. Finally, this website is launched into the web server. The user can access this website for 3D terrain visualisation with or without satellite image by using any browser. They can interact with the terrain by flying through, walk, jump, pan, and slide. This could help the potential visitors, students, staff, and the decision maker to explore the details of the UPM terrain.

Keywords: web based, satellite image, 3D terrain visualisation, VRML

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Construction of Biofilm using Textile Wire

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ABSTRACT

The construction of artificial microbial aggregates with defined internal architectures could potentially find applications in a variety of areas including biosensors, wastewater treatment, biotransformations, food production, as well as for fundamental studies of the interaction of cells and their micro-environment. Many different methods could be employed for the construction of tissue-like materials with microbial cells and one of the promising techniques is dielectrophoresis which is based on movement of cells under alternating current. To date, however, the surface area of the biofilms formed with dielectrophoresis has been limited to a few cm^2 because of the limitations of the photolithographic methods used to make the microelectrodes. To overcome these problems, novel microelectrode systems have been developed using weaving techniques adopted from the textiles industry. Arrays of microelectrodes for AC electrokinetic experiments were fabricated by weaving together stainless steel wires (weft) and flexible polyester yarn (waft) in a plain weave pattern. The cloth produced can be used to collect cells in low conductivity media by dielectrophoresis. The construction of model biofilms consisting of a yeast layer on top of a layer of *M. luteus* is demonstrated, using PEI (polyethylenimine) as the flocculating agent. This technique offers an alternative to the formation of biofilms at microelectrodes made by photolithography, and would allow the construction of biofims with defined internal architectures by dielectrophoresis at much larger scales than was possible previously. Futhermore, the flexibility of the cloth also would allow it to be distorted or folded in various shapes.

Keywords: dielectrophoresis, wire cloth, biofilm, textile

A Telegeoinformatic Based Road Accident Geocoding System

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ABSTRACT

This research focuses on road accidents data collection issues using geospatial technologies such as mobile GIS, Location-based Services (LBS) and geospatial central database. It is a duty of the police force to collect data on road accident event. It has to be accurate and as details as possible to assist other benefactors in doing the analysis up to decision-making party. The current method for data collection on road accidents is done by filling paper form and then entering data in a computer for storage in central database. However, this method is prone to under reporting process of geocoding and data collection in police office. In the same time, sending data to police headquarter consume time and effort, while traffic police is required in his location rather than in the office to assist the safety of the community and road users. With current development of information and communication technology, it is required to upgrade the method of data collection and maintain the level accuracy and quality of the data The development approaches from conceptual system modeling to integrating mobile-GIS and LBS middleware with the deployment of geo-coding and map service in real time. The developed system is partially based on open source software to reduce total cost of ownership for developing countries’ governments and to follow Malaysia government policy for year 2010 in adapting and developing open source solutions. It is found that the LBS and mobile-GIS geocoding method have achieved improvement compared conventional method of geocoding and data collection, where each of positional errors and effort of data transferring have been reduced using these new technologies.

Keywords: mobile GIS, geospatial database, location based services (LBS), open source, WebGIS, geocoding, road accidents

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Ultrasound assisted Extraction of Jatropha Seeds

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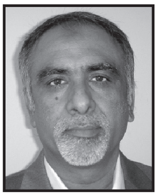
ABSTRACT

Jatropha curcas has a variety of uses which are of great economic significance. Jatropha oil can be used as fuel alternative and for making biodiesel that is supposed to overcome the source limitation problem. In this paper, conventional, ultrasound assisted and microwave pretreatment solid liquid extraction of Jatropha seed were studied in terms of amount and quality of the extracted oil. The free fatty acid content which is an important oil quality index was also investigated for the obtained oil. Both ultrasonication and microwave pretreatment of the seeds had a positive effect on amount of yield. With the application of ultrasound, more oil could be extracted compared with that obtained by conventional and microwave pretreatment extraction methods. The maximum amount of oil which could be extracted by conventional, ultrasound assisted and microwave pretreatment methods were 47, 51, and 49 % respectively. Regarding the quality, oil extracted by conventional, ultrasound assisted and microwave pretreatment extraction methods did not show any significant difference in terms of free fatty acids (FFA) content.

Keywords: ultrasound, microwave, extraction, jatropha, oil

Development of Earthquake Energy Dissipation System for Reinforced Concrete Frames Buildings



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ABSTRACT

The traditional approach to design earthquake resistance building is providing adequate strength and stiffness against lateral forces. Alternatively, latest concepts of earthquake energy dissipation system and damper device have been devoted via advance technology and techniques to reduce earthquake effect and preclude seismic damage of buildings.

Recently many investigations have been conducted to evaluate and analyze the seismic response of structures equipped different types of earthquake energy dissipation system and passive control device. Hence, the present system is development of a numerical finite element algorithm used for analysis of reinforced concrete structure equipped with shakes energy absorbing device subjected to dynamic load such as earthquake. Viscous dampers are known as effective energy dissipation devices improving structural response to earthquakes, therefore for developed system a new nonlinear viscose damper is proposed and a finite element program code for analysis of reinforced concrete frame buildings is developed. The validation of the proposed elements and the computer program has been made by analyzing of an example of frame building and comparison the result with commercial software. The effect of proposed system is evaluated by implementation in some simple model of reinforced concrete frame building. By comparing seismic responses of modeled structures without energy dissipation system, and structures with proposed system shows that using developed earthquake dissipation devices effectively reduced structural response subjected to earthquakes. Also the optimum design of passive control system is eligible by evaluation of damper device parameters effect on the structures response, and chooses suitable damper properties for desire design of structure base on the request performance demand level of building and maxi-mum effect of damper devices to diminish the seismic load

Keywords: viscous damper, finite element, earthquake, energy dissipation system, passive control

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Plant Starch/Oil Extracting Machine

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ABSTRACT

This invention relates to an equipment for extracting and squeezing desired substance from fruits and tuber plants (such as tapioca, sweet potato and jatropha) in the form of liquid (such as starch and oil), as well as crunching and rupturing the pith of palm trunks such as sago palm for the purpose of starch extraction. It is suitable for use in small and medium-scaled industrial operations. This portable machine is secured with a steel housing as a safety feature, easy to operate and user-friendly. It consists of a feeder through which the feed is inserted and consumed by the crushing rollers beneath it. The crushing rollers consume and spin the feed, while the square blades cut, compress and crush the feed into fine bits. The crushed feed falls through to the bottom container and is conveyed into the pressing section where a screw press squeezes it to extract starch or oil. A steel barrel with linear gaps running the length of its body houses the press and acts as a screen to allow only desired liquid to pass through. A slanted funnel resides below the pressing section to facilitate the flow of the extracted liquid from the barrel into a container. The pressed feed is moved along the screw press by steel coils and is discharged as residual waste through an opening at the end of the press. This invention crushes and presses feeds effectively, giving maximum yield and very minimal loss. The process is also reasonably hygienic, consumes minimal time and requires minimal supervision. Therefore, this invention leads to a more efficient operation with reduced operating costs.

Keywords: cut, compress, crush, extract, starch

Characterisation and Preparation of Biocomposite from Kenaf Cellulose and Low Density Polyethylene for Food Packaging Application

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ABSTRACT

The application of plastics in packaging materials is so exceptional that they have replaced traditional materials in the world. Due to their non-degradability, the disposal of waste plastic packaging now poses challenges to both the developed and developing countries. One possible solution to this problem is to make packaging materials, which behave like the natural materials that degrade when no longer required and discarded. Therefore, the possibility of using cellulose as natural fiber for the production of bicomposites was investigated in this project that included two stages. The first stage involved the extraction of cellulose from the cell walls of kenaf bast (*Hibiscus cannabinus L.*). Then, mixture of different weights of low density polyethylene (LDPE), as a matrix, with the obtained cellulose was blended in order to produce a bicomposite material suitable for food packaging. For the second stage, the characterisation of LDPE- cellulose biocomposites was performed in order to develop the optimal blends with optimized thermo-mechanical properties and propensity to environmental degradation. In addition, a scanning electron microscope (SEM) was used to observe the surface morphology of the tensile fracture surface of the samples before and after biodegradation test. The findings from biodegradation test illustrated that the degradability increased as cellulose content was raised in the composite’s formulation from 0 to 50 wt %. Simultaneously, the results showed that the mechanical properties of all treatments retained in an acceptable level of strength. These findings were confirmed by the SEM study. Also, the addition of kenaf cellulose into the body of LDPE was capable to increase their thermal degradation properties. Generally, it seems that the results of this research may lead to a development of a new type of biocomposites using kenaf cellulose as a natural fiber that can be used to replace plastics for food packaging in the near future.

Keywords: kenaf cellulose, low density polyethylene, biocomposite characteristics, food packaging

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Absolute Polar Duty Cycle Division Multiplexing

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ABSTRACT

Absolute Polar-Duty Cycle Division Multiplexing is a novel multiplexing technique which uses RZ duty cycle and polar signaling. In this technique, subsequence users at the multiplexer input have opposite polarity which results in a unique multilevel pattern at the output of the multiplexer. By using bipolar signaling the increment of the multiplexed signal amplitude with reference to the number of channels is reduced, consequently improve the receiver sensitivity. It is demonstrated that 40 Gb/s (4 x 10 Gb/s) AP-DCDM system shows a clear advantage over conventional 40 Gb/s RZ-OOK with 50% duty cycle in terms of dispersion tolerance and spectral efficiency. At 40 Gb/s its tolerance to chromatic dispersion (CD) is 196 ps/nm. This value is higher than that of 40 Gb/s RZ-OOK, which is around 100 ps/nm. Comparison against other modulation formats namely Duobinary, Non-Return-to-Zero (NRZ)-OOK and RZ-Differential Quadrature Phase-Shift Keying (RZ-DQPSK) at 40 Gb/s are made. It is shown that AP-DCDM has the best receiver sensitivity (-32 dBm) and better CD tolerance (±200 ps/nm) as compared to NRZ-OOK and RZ-DQPSK.

Keywords: optical communication, multiplexing, chromatic dispersion, duty cycle

Development of Active Variable Stiffness Control System to Restrain Lateral Movement of Buildings Subjected to Strong Earthquake

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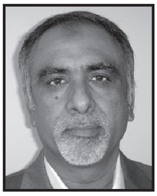

ABSTRACT

Active control of seismically excited buildings has attracted considerable attention in recent years. In addition to the long-held desire for designing structures capable of withstanding the effects of strong earthquakes, attention in active control systems is also fuelled by significant advances in both active and passive devices capable of altering the dynamic characteristics of a structure such as stiffness or damping in real time. In this research an attempt has been made to develop an active variable stiffness control system of multistory buildings in order to control the displacement response of structure, subjected to earthquake excitation.

The primary objective on design of this control system was focused on optimizing the structural response of the building equipped with active variable stiffness device during the earthquake shaking in order to design optimum active control system. To achieve this objective an attempt has been made to develop a powerful system to minimize the effects of the strong earthquake and mitigate safety of the building in seismic prone area by using latest computational techniques such as ”optimization”, ”active variable stiffness”, ”genetic algorithm” and ”neural networks”. The developed computation strategy has been applied to two simple structures. A comparison between the response of structures with using of developed optimum control system and with out that, show the efficiency and effectiveness of this system in reducing the structural responses during sever earthquakes.

Also the obtained results of stiffness optimization by means of genetic algorithm show the excellent performance and great efficiency and effectiveness of this technique in desirable optimization of the system. Also using of the neural networks in the optimization process can decrease the time of calculations significantly with strong accuracy.

Keywords: active control, variable stiffness, optimization, genetic algorithm, neural network

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Hybrid Spectral-Spatial Oil Palm Tree Counting and Analysis (HSSOPTCA)

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ABSTRACT

Oil palm plantation inventory and management require a range of fine-scale remote sensing data. In Malaysia, the coverage of oil palm plantation area is large, thus it really needs a systematic and modern technology especially for a constant monitoring and management. High spatial and spectral resolution remote sensing images acquired from airborne hyperspectral sensors can give such information efficiently. The main objective of this study is to develop an integrated system for oil palm tree counting and detecting disease infection. This system can calculate the number of oil palm trees automatically and also can give information on the condition status in a plantation area (e.g. healthy or disease infected). The system used a combination of high spatial and spectral resolution information that can be provided by airborne hyperspectral imagery. By using the system, the accuracy of oil palm tree detection and counting is averaged at 97%. Meanwhile, disease occurrence in oil palm plantation can be detected with an average accuracy of 86% using newly developed stress detection index and is superior in comparison with existing vegetation indices. The system will be useful to assist plantation managers in monitoring the oil palm plantation and could be crucial as a precision agriculture tool. The system could also be applied in related areas such as forest and natural resources management.

Keywords: airborne hyperspectral imagery, hybrid system, oil palm, tree counting, disease detection

Auto Adjust Centre of Gravity (COG) Generator

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ABSTRACT

Displacement of the center of gravity (COG) of tubular structures with various polygonal cross-sections is numerically investigated under an axial crush using the program code of ANSYS/LS-DYNA. A subroutine is developed using this code to calculate the COG of the deformed shape,during and after the crush. The effect of wall thickness on displacement of the COG is also investigated. Displacement of the COG decreases as the number of edges increases, it is a reasonable symmetric-deformed shape for the number of edges beyond eight. An even number of edges leads to a more symmetric displacement of the COG. The effect of the number of polygonal edges on symmetric deformation of the COG becomes more prominent as the initial wall thickness decreases. The higher number of edges stabilizes the deformed shape and the value of the mass moment of inertia of the deformed shape about the *y* axis (*Iyy*). The value of the mass moment of inertia about the *x*–*z* axes (*Ixz*) in comparison with *Iyy* can be neglected in the case of dealing with an axial crush along the *y* direction.

Keywords: center of gravity (COG), finite element method (FEM) , tubular structure, ANSYS/LS-DYNA

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Effect of Divalent Ions (A = Ca, Ba and Sr) Substitution in La-A-Mn-O Manganite on Structural, Magnetic and Electrical Transport Properties

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ABSTRACT

Microstructure of the grain will influence the properties of polycrystalline manganites when different dopant is introduced. In this work, an effort had been made to investigate the influence of Ca, Ba and Sr substitution in La site. Polycrystalline manganites compound of $La_{0.67}A_{0.33}MnO_3$ where A = Ba, Sr and Ca had been prepared via conventional solid-state reaction method. The structure, microstructure, magnetic and electrical properties had been investigated using XRD, SEM, VSM and four-point probe techniques. XRD spectrums showed that LBMO and LCMO were in single-phase orthorhombic structure whereas LSMO was rhombohedral structure. Scanning electron micrographs showed that LSMO had smaller average grain size as compared to LBMO. However, for LCMO, there was no clear grain boundary that can be observed and all the grains were well connected. The difference in the microstructure image might be due to the variance A-site cation that differs in grain growth. The Curie temperature, Tc of LBMO and LSMO was 343.0 and 363.5 K, respectively. But the Tc for LCMO was lower then 300 K. The Tp for LCMO was 215 K while it was near or above 300K for LBMO and LSMO. All samples showed extrinsic Magnetoresistance (MR) effect. Higher MR was observed well below Tc or Tp where MR value increased monotonically with the decrease of temperature. This was d with the different grain and grain boundary formation when different cation was substituted. LCMO displayed the highest low-field MR value (-15.82% at 0.2 T, 90 K) and high-field MR (-25.60% at 1 T, 300 K). Hence, electrical and magnetic transition temperature (Tp and Tc) were affected by the average A-site cation radius.

Keywords: ceramic, magnetoresistance, low field magnetoresistance

UPM GPR Road Pavement System

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ABSTRACT

UPM Ground Penetrating Radar (GPR) Road Pavement System consists of multipurpose programs designed to measure density of road pavement of types Hot Mix Asphalt (HMA) and Asphalt Concrete Wearing (ACW14). The system is essentially a PC-controlled GPR measurement system consisting of specially designed microwave sensors and components for use in the frequency range between 1.7 GHz and 2.6 GHz. In implementing the system, a Ground Penetrating Radar system by using microwave reflection technique and free space method is developed for measuring the density of road pavement. The method is found simple, fast, non-destructive and accurate to determine the density of road pavement where it can replace the traditional methods. This system involves 3 options which are Aggregate calculation with predicted density program, Attenuation with predicted density program and Received signal power with predicted density program. The programs had been saved in .VXE format which means that it would just allow a user to run it but not let them edit it. The program can be used to monitor density available to the real road pavement continuously, quickly and easy. This system eliminates guesswork so that road construction can be effectively scheduled according to the road standard requirements. Continuous and appropriate use of this system can effectively aid in obtaining optimum road pavement density. The system developed for use with the GPR measurement setup provides density measurement accuracy within 4.7 % error.

Keywords: ground penetrating radar, road pavement, microwave and electromagnetic

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Hydrogen Rich Gas Production from Agricultural Waste by Appling Air Gasification in Fluidized Bed Reactor

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Abstract

Today hydrogen could be the renewal energy for next world because of its best supersede of fossil fuel with the high heating value for transportation; home usage and heating. In line of Tokyo protocol the burn of hydrogen don't emission any CO; CO_2; NO_X; CH_4 and hydrocarbons. In this work the production of hydrogen-rich gas by applying air gasification of rice husk was investigate. The study carried out in a laboratory fluidized bed reactor under atmospheric pressure over range of temperature 700°C - 1000°C. A series of experiments have been preformed to investigate the effects of different temperatures; ER (Equivalence Ratio); FR (Feeding Rate) and biomass particle size on gas composition; hydrogen yield and HHV (high heating value) the results showed that higher temperature is appropriated of more hydrogen production. Over the range of operating condition examined maximum H_2 reaches to 65.86%; CO reaches 5.66% And CH_4 reaches to 11.79%. For Palm Kernel.
Maximum H_2 reaches to 48.00%; CO reaches 7.40% And CH_4 reaches to 12.80%. for Baggas.
Maximum H_2 reaches to 51.80%; CO reaches 7.80% And CH_4 reaches to 13.80%. for Coconut Shell.
Maximum H_2 reaches to 44.87%; CO reaches 6.40% And CH_4 reaches to 12.78%. for Rice Husk.

Keywords: hydrogen, air gasification, fluidized bed reactor, agricultural waste

Use of Dune Sand as Partial Cement Replacement

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ABSTRACT

Pozolanic materials such as silica fume and fly ash are considered as basic materials for the production of high performance concrete. As cost of these pozolanic materials increases and their availability may pose problem to the sustainable production al concrete products, there is a need to find cheaper and more sustainable supply of materials. The present invention relates to the use of dune sand as partial cement replacement for concrete products. Dune sand is red colored fine aggregates and can be found in many parts of the world. In its natural form (nominal sizes of 200 microns), it has been used as fine aggregates (inert materials) in normal and ultra high performance concretes. However, the dune sand, after undergoing milling and crushed to powdered form of 45 microns, and subjected to special curing method is found to be able to partially replace ordinary Portland cement or enhance the strength of concrete. This study showed that the powdered sand dune may replace up to 30% of ordinary Portland cement and still display similar strength characteristics. Up to this day, the use of sand dune as partial cement replacement has neither been suggested nor implemented.

Keywords: seismic assessment, retrofitting, finite element, pushover

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Comparison between Conventional and Microwave-assisted Hydrodistillation Methods towards Extraction of Essential Oils from *Murraya koenigii* (Curry leaves)

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ABSTRACT

Study on the extraction of essential oils from leaves of *Murraya koenigii* had been carried out to distinguish the different method of extraction by using two types of extraction process, Conventional Hydrodistillation (CH) and Microwave-assisted Hydrodistillation (MAHD). The aim was to compare the parameters of time and percentage yield obtained from both of the methods and major constituents presence in the essential oils. The temperature for both of the methods has been standardized at 100^{o}C and with the irradiation power of 450W for MAHD method. The extraction time for MAHD was 1 and half hour while for CH method was 5 hours. The constituents obtained from the essential oils of *Murraya koenigii* were analyzed by using GCMS and Kovats Indices. The CH method gave 78.91% identified constituents in contrast to MAHD method which gave 72.66% of identified constituents. The major constituents from the essential oils obtained from MAHD method were β-copaene(41.5%), α-selinene (10.0%) and α-humulene (8.4%). Meanwhile, major constituents from CH method were trans-caryophyllene (19.53%), terpine-4-ol (17.01%) and linalool (9.77%). MAHD was more preferable as an alternative method for extracting oils from plant materials. It provides rapid operation, easily conducted procedure with environmental friendly extraction process and produced cleaner features of essential oils compare with conventional hydrodistillation.

Keywords: *murraya koenigii,* microwave, conventional hydrodistillation, essential oils

Dynamic Emulsion System for Cream Formulation and Drug Delivery

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ABSTRACT

High internal phase emulsion have volume fraction of the disperse phase more than the maximum packing volume fraction, where the droplets just touch each other. The droplets no longer take the shape of polyhedral as they are squeezed to take the shape of polyhedral. This unique system renders interesting properties, in which it can be employed as a nutrient-rich cream and a reaction medium. The nutrient-rich cream consists of vegetable oil volume fraction of more than 75 wt%. Studies involving the cutaneous application of vegetable oils have shown improvement in somatic growth and on skin barrier function. The emulsion proved to be satisfactory from the personal care point of view as confirmed by the excellent hydrating effect, which we recommend for cases of dry skin. This revelation might interest the dermatologists since the hydration of the skin is considered to be a maker of its state of health, in the same way that skin dryness is a sign of malfunction. As a reaction medium, the droplets deformation creates the planar film of continuous aqueous phase where reaction occurs. The continuous phase gave rise to highly porous flower-like calcium phosphate crystals, in which when loaded with drug, successfully demonstrated the effectiveness in facilitating modulation of drug release rate.

Keywords: high internal phase emulsion, oil-in-water cream, skin hydration, reaction medium, drug delivery

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IANRA: An Intelligent Route Discovery Framework for Load-Balancing in Wireless Networks

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ABSTRACT

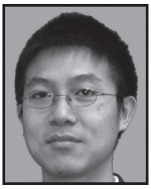
The ‘Intelligent Wireless Network Routing Framework (IANRA)’ innovation relates to load balancing in wireless networks based on Swarm Intelligence (SI) to improve Quality of Service (QoS) requirements. Swarm intelligence is a type of artificial intelligence based on the collective behaviour of decentralized, self-organized systems. In order to facilitate communication within wireless networks and to provide fair share load balancing, usually routing protocols are used to discover routes and manage the network flow congestion among nodes in a network. Two existing problems in SI based algorithms are: (a) routing table freezes due to selection of only one path as optimum route, and (b) choosing a non-optimized route as optimum. To eliminate these problems IANRA has been developed by considering intelligent ant like agent and their successive generations to obtain optimum as well as sub-optimum paths for routing with fair share load balancing in a network. Three main working phases of IANRA are Path discovery, Route maintenance and Handling for link failure. It is evaluated for Mobile Ad-hoc Network (MANET) and Wireless Mesh Network (WMN) taking into accounts the self-organizing behaviour of ants and related framework of Ant Colony Optimisation (ACO). The main key achievements of IANRA are as follows:

- Novel IANRA routing framework: this framework is able to obtain stable optimum and sub-optimum routes. It also able to configure any IP based gateway with minor modification of kernel.
- Stabilized packet routing behaviour under several imposed data load on the networks.
- Enhanced Routing performance in terms of average end-to-end packet delay, packet deliver ratio and packet overhead.

The obtained results for MANET and WMN indicate that IANRA’s is able to outperform AntHocNet and AODV (Default Routing Algorithm for Cisco Wireless Routers) routing algorithms.

Keywords: swarm intelligence, load balancing, routing framework, wireless communication networks, QoS

Enhanced Critical Current Densities in MgB_2 by Mixing Relatively Impure Boron Powders



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ABSTRACT

In this study, boron powders with varying purity and form were mixed in different proportion to serve as precursors for reaction with Mg forming polycrystalline MgB_2 bulks. The inductively measured superconducting transition temperature, T_c and the critical current density, J_c were compared to that of samples prepared from the respective single boron. Overall, T_c remains largely unchanged for all samples. It was found that J_c at 6K and 20K did not degrade significantly up to 4.6T as a result of adding impure boron as much as 10 wt.% indicating comparable J_c can be obtained without dependence of use of expensive high purity boron powder alone. The systematic decrease of J_c with increasing impure boron additions shows that a compromise between desired J_c and cost reduction can be made by varying the boron powder proportion. Finally, samples prepared from the mixture of both impure crystalline and amorphous borons even show *enhanced* J_c up to 3T at 20K. The increase in J_c correlates with the retention of strain level in these samples probably resulted from the more similar reaction rate of the respective borons

Keywords: MgB_2, boron powders, critical current density

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Young Leachate Ammonical Nitrogen and Organic Removal from Transfer Station by Combined Attached Growth Bioreactor in Different Condition

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ABSTRACT

The study was conducted to evaluate the biological nitrogen and organic removal of young leachate (BOD/COD >0.3) from transfer station. The process has been performed in combined Anaerobic/Anoxic/Aerobic bioreactor. Biological nitrification and denitrification in combination have been shown appropriate to remove nitrogen in the single column bioreactor where Cosmo-ball media were launched in to the aerobic zone to improve bacteria growth in aerobic zone. The up flow continuous Anaerobic/Anoxic/Aerobic vertical reactor has been run at one seeding phase and two main phases consist of three stages with different operation condition. The first phase involved three different Organic Loading Rates (OLR) and constant Hydraulic retention time (HRT) to investigate the effects of C/N ratio on the process. In the second phase different HRT; and constant OLR. This experimental run performed in the Environmental and Chemical UPM laboratory and samples was collected from the Taman Beringin Municipal Solid Waste Transfer Station, Klang, Selangor. Obtained results have been showed the highest removal of ammonical nitrogen in aerobic stage due to presence of sufficient amount of oxygen. The results of the project indicated that by increasing C/N ratios, ammonia removal decrease due to the competition between autotroph and heterotroph microorganisms which was 85%. The results indicated as HRT increased, NH_4-N concentration of effluent decreased and the removal efficiency increased accordingly and the best removal efficiency of the system has been achieved in 36 hour as much as 89%. The best organic removal has been obtain in the lowest COD loading rate and the longest HRT in phase one and two which was equal to 92% and 94% respectively.

Keywords: young leachate, Nitrification, Cosmo ball

Phytochemicals and Cytotoxic Activity of *Kaempferia angustifolia* Rosc.

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ABSTRACT

Zingiberaceae (ginger family) is one of the most important herbaceous families found in tropical forests. *Kaempferia angustifolia* (*Kunci pepet*), a species which is less well known in Malaysia as compared to *K. galanga* and *K. rotunda*, is usually used as a medicine to treat cold, stomachache, dysentery, coughs and as a masticatory. Phytochemical study on rhizomes of *K. angustifolia* has resulted in the isolation of cyclohexane derivatives, terpenes and chalcones. Crotepoxide, boesenboxide, 2'-hydroxy-4,4',6'-trimethoxychalcone, angustifolienol, 6-methylzeylenol, abieta-8-en-penta-6,7,9,11,13-ol, β-sitosterol and its glycoside and one triterpene were obtained from extracts of *K.angustifolia* using chromatographic methods and elucidated spectroscopically. Angustifolienol was modified using chemical reactions to give few derivatives. Crude extracts and isolated/structural-modified constituents were subjected to cytotoxic testing against four cancerous cell lines (HL-60, HT-29, MCF-7 and HeLa). Abieta-8-en-penta-6,7,9,11,13-ol, an abietane-type diterpene and angustifolienol, an oxygenated cyclohexane derivative, were never been reported previously either as natural products or synthetic compounds. Crude extracts were not active in cytotoxic assay whereas pure compounds exhibited different inhibition against cell lines tested.

Keywords: zingiberaceae, *Kaempferia angustifolia,* cytotoxic

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Green Energy from Photoelectrochemical Cell using Chalcogenide Thin Film Materials (Cu_4SnS_4)

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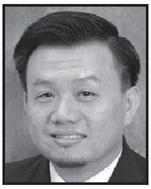
ABSTRACT

The solar cell made of polycrystalline thin film is one of the most promising low cost candidates for producing green energy such as solar cells. These are many methods for preparing thin films such as chemical bath deposition, electrodeposition, spray pyrolysis, vacuum evaporation, sputtering and the other. Amongst these deposition methods, electrodeposition and chemical bath deposition are more attractive, since they offer the advantages of simplicity, inexpensive set-up, suitable for large area deposition and less monitoring required. The Cu4SnS4 thin films were prepared by electrodeposition method on indium tin oxide coated glass substrate. The films deposited using lower concentration (0.01 M) of copper sulfate, tin chloride and sodium thiosulfate at room temperature for 45 min was found to show better photoactivity. At pH 1.1, only four peaks attribute to Cu4SnS4 peak were obtained. However, as the pH was increased to 1.5, the number of peaks increased to five indicating more favorable condition for the formation of films. The band gap energy of film was found to be 1.55 eV. On the other hand, the Cu4SnS4 thin films were also prepared by using chemical bath deposition technique. The thin films produced were polycrystalline in nature. The XRD pattern showed that orientation along (221) plane was the most prominent plane. The sharp peak obtained indicates that the material produced is of high crystallinity. Better films were deposited when deposition p[period was increased to 80 min at 50 °C. These films showed better photoresponse and better surface coverage. The films prepared at pH 1.5 showed higher absorption characteristics when compared to the films prepared at other pH values. The films exhibit direct transition with band gap energy of 1.60 eV.

Keywords: photoelectrochemical cells, electrodeposition, chemical bath deposition, thin film, green energy

Synthesis of Self-Assembled Nanorod Vanadium Oxide Bundles by Sonochemical Treatment



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ABSTRACT

Self-assembled nanorod of vanadium oxide bundles were synthesised by treating bulk V_2O_5 using high intensity sonochemical treatment technique. The synthesized materials were characterized by x-ray diffraction (XRD), scanning electron microscope (SEM), transmission electron microscope (TEM) and temperature-programmed reduction (TPR) in H_2. Catalytic behaviour of the materials over anaerobic *n*-butane oxidation was studied through temperature-programmed reaction (TPRn). Catalytic evaluation of the sonochemical treated V_2O_5 produced is also being studied through microreactor. XRD patterns of all the vanadium samples were perfectly indexed to V_2O_5. The morphologies as shown in SEM and TEM of the nanorod vanadium oxide are dependent on the duration of the ultrasound irradiation. Higher ultrasound irradiation duration produces materials with uniform, well defined shapes and surface structures and smaller diameter of nanorod vanadium oxide bundles. H_2-TPR profiles showed that higher amount of oxygen species are removed from the nanorod V_2O_5 compared to the bulk. Furthermore, the nanorod vanadium oxide bundles which produced after 90, 120 and 180 min of sonochemical treatment showed an additional reduction peak occurred at lower temperature (~850 K) suggested the presence of some highly active oxygen species. Temperature programmed reaction (TPRn) in *n*-butane/He over these materials showed that the nanorod V_2O_5 with the presence of highly active oxygen species gave markedly higher activity than the bulk material which is further proven by catalytic oxidation of *n*-butane.

Keywords: nanorod vanadium oxide, sonochemical treatment, butane oxidation

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Alkaloids from *Piper sarmentosum* and *Piper nigrum*

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ABSTRACT

Detailed chemical studies on the roots of *Piper sarmentosum* and *Piper nigrum* have resulted in several alkaloids. The roots of *Piper sarmentosum* gave a new aromatic compound 1-nitrosoimino-2,4,5-trimethoxybenzene. *Piper nigrum* roots gave pellitorine, (E)-1-[3’,4’-(Methylenedioxy)cinnamoyl]piperidine, 2,4-tetradecadienoic acid isobutyl amide, piperine, sylvamide, cepharadione A, piperolactam D and paprazine. Structural elucidation of these compounds were achieved through NMR and MS techniques. Cytotoxic activity screening of the plant extracts indicated very good activity with IC_{50} values less than 30 µg/ml. The petroleum ether and chloroform extracts of *Piper nigrum* gave high inhibitory activities against HL60 cancer cell line with IC_{50} values of 11.2 and 9.8 µg/ml respectively. Meanwhile, the hexane extract of *Pipe*r *sarmentosum* gave an IC_{50} value of 11.6 µg/ml against Hela cell line and an IC_{50} value of 14.4 *µg*/ml against MCF-7 cell line. The ethyl acetate extract gave an even lower IC_{50} value of 9.8 µg/ml. Pellitorine on the other hand was found to be extremely cytotoxic towards MCF-7 cell line with an IC_{50} value of 1.8µg/ml. However, it was slightly less toxic towards the HeLa cell line with an IC_{50} value of 13 µg/ml.

Keywords: *piper nigrum, piper sarmentosum,* alkaloids, cytotoxic

Polymers as Size Controlling Agents for the Synthesis of Zinc Layered Hydroxide and Its Calcined Product

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ABSTRACT

Zinc hydroxide nitrate, a brucite-like layered material was synthesized using pH control method. Poly(vinyl alcohol) and poly(ethylene glycol) were used as size controlling agents, and these polymers were added separately at various percentages into the mother liquor for the synthesis of zinc hydroxide nitrate. SEM and PXRD studies show the decrease of size and thickness of the resulting zinc hydroxide nitrate when the polymers were added during the synthesis. Thermal and surface area analysis confirmed the decrease of the particle size. When zinc hydroxide nitrates were heat-treated at 500 °C, the physicochemical properties of nano zinc oxides formed were found to be depending on the starting material, zinc hydroxide nitrate.

Keywords: zinc layered hydroxide, polethylene glycol, polyvinyl alcohol

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Portable Heavy Metal Detector

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ABSTRACT

Recently, the used of metals especially mercury in the industry and agriculture is increased. For an example, mercury is used as a flowing cathode in the electrolysis of brine to produce chlorine and caustic soda in chloralkali industry. In control instruments, mercury metal is used for barometers, gauges, thermometers and pump seals. In electrical apparatus it is used in fluorescent and mercury discharge lamps and in industrial power rectifiers. There are a few methods that have been practiced in the market in detecting the heavy metals. One of them is colorimetric method which used additional reagents that will react with the toxic metal by producing color changes. This method is more practical since it does not require big space and bulky equipment. However, the detection of the color changes has to use eye to eye inspection on the prepared sample for identification of the toxic metals in the sample. Such method is quite simple but inappropriate since human error may occur during the collection of the data. Furthermore, this colorimetric method is not suitable for person who is color blind. Thus, the new invention is about development of a new rapid, portable, inexpensive detection heavy metal detector based on the color detection system. The detection scheme is based on the color changes of the chromogenic reagent that react with toxic metals. The color changes will be detected by a photodiode or phototransistor sensor. The photodiode or phototransistor sensor will produce electrical signal which will be processed by a microcontroller. The microcontroller will display the level of quantity of toxic metal that reflect the safety of that liquid samples.

Keywords: protable heavy metal detector, lead detector, toxic metal detector

Dielectric Variations of Barium Titanate Additions on Mullite-Kaolinite Sample

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ABSTRACT

This research was designed to form better dielectric composite material using one steady state dielectric with a good dielectric material. Distinct dielectric composites were successfully produced using locally sourced kaolinite clay. The samples were made using kaolinite as the base matrix and Barium Titanate (BT) added at varying ratios. Barium Titanate was synthesized via solid-state reaction using Barium carbonate and rutile titanium oxide sintered at 1300°C. Local white kaolinite powder was washed and used as the matrix in varying weight ratios. The powders were dry mixed and made into pellets for calcinations at 1000°C.
The dielectric measurements were carried out using the HP4291B Impedance Analyzer dielectric setup. Three samples were prepared and measured, namely 50% BT, 60% BT and 70% BT sample. The dielectric measurements were carried out in an LT furnace at temperatures 30°C – 400°C with frequencies ranging from 10Hz to 1 MHz. The measurements exhibited varying ionic relaxation masked by interfacial responses. The three samples displayed different dielectric relaxation mechanisms whereas complex impedance plots did not exhibit grain boundary and bulk volume response.

Keywords: : barium titanate, mullite, dielectric relaxations, ceramics

* * *

Novel Organic Conductor with High Electrical Conductivity for EMI Shielding

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ABSTRACT

The conducting polymer composite films of polypyrrole-chitosan (PPy-CHI) were synthesized by electrochemical polymerisation method. The applicability of PPy-CHI conducting polymer composite films to the electromagnetic wave shielding in the microwave frequency range from 8 to 12 GHz was investigated. The PPy-CHI composite films offered the higher electromagnetic shielding effectiveness over the PPy film in any frequency which is due to increase in the conductivity towards a metallic conductivity. The composite film provided shielding efficiencies of 33.9 dB. Reflection (Re) and absorption (Ab) measurements showed the increase in EMI SE (electromagnetic interference shielding effectiveness) with the increase in electrical conductivity results from shielding by reflection rather than absorption. The SE of the composite films was also obtained by Simon formalism. Comparison of the experimental and theoretical values revealed a good correspondence of the shielding of the composite films at high conductivity and frequency. It was shown by electrical conductivity measurement and dynamic mechanical analysis (DMA) that the enhanced conductivity and mechanical properties of the prepared conducting polymer composite films were due to the presence of CHI in the composite films. The thermogravimetry analysis (TGA) showed that the CHI could improve the thermal stability of PPy-CHI composite.

Keywords: polypyrrole, chitosan, electromagnetic interference shielding effectiveness, simon formalism

Crystallisation of Amorphous Silica Glass Doped with Bismuth

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ABSTRACT

Amorphous silica sample was prepared through sol-gel technique by using TEOS and bismuth acetate as precursor hydrolyzing in aqueous solution acetate acid. The glass sample of SiO_{2x} $Bi_2O_{3\ (1-x)}$ where x=0.1 to 0.4 were sintered from 500°C until 1000°C for two hour in order to study the effect of sintering process and dopant to the phase of sample. The amorphous nature of each sample was confirmed by x-ray diffraction spectroscopy. The crystallisation of amorphous silica glass doped with bismuth has been studied by differential scanning calorimetry (DSC), x-ray diffraction (XRD), scanning and transmission electron microscopes (SEM, TEM) and enhanced with energy dispersive X-ray spectroscopy (EDS). Experimental data shows the crystallisation of silica glass occurred as Bi_2O_3 dopant is being added until 0.4% and sintered at more than 700°C.

Keyword: amorphous, silica glass, crystallisation

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Synthesis of Plasmid–Mg/Al-Layered Double Hydroxide Nanobiohybrid as a Vector for Gene Expression

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ABSTRACT

The delivery of a full plasmid, encoding the green fluorescent protein gene into African monkey kidney (Vero3) cells, was successfully achieved using nanobiohybrid based on layered double hydroxides. This demonstrated the potential of using the system as an alternative DNA delivery vector. Intercalation of the circular plasmid DNA, pEGFP-N2, into Mg/Al-NO_3^- layered double hydroxides (LDH) was accomplished through anion exchange routes to form the nanobiohybrid material. The host was previously synthesized at the Mg^{2+} to Al^{3+} molar ratio R_i = 2 and subsequently intercalated with plasmid DNA. Size expansion of the interlamellae host from 8.8 Å in LDH to 42 Å was observed in the resulting nanobiohybrid, indicating stable hybridisation of the plasmid DNA. The powder x-ray diffraction (PXRD) results, supplemented with Fourier-transform infrared (FTIR) spectroscopy, compositional and electrophoresis studies confirmed the encapsulation episode of the biomaterial. In order to elucidate the use of this resulting nanobiohybrid as a delivery vector, an MTT assay was performed to determine any cytotoxic effects of the host towards cells. The intercalated pEGFP-N2 anion was later successfully recovered through acidification with HNO_3 after treatment with DNA-degrading enzymes, thus also showing the ability of the LDH host to protect the intercalated biomaterial from degradation. Cell transfection studies on Vero3 cells were then performed, where cells transfected with the nanobiohybrid exhibited fluorescence as early as 12 h post-treatment compared to naked delivery of the plasmid itself.

Keywords: nanobiotechnology, nanobiohybrid, dna delivery vector, layered double hydroxide, nucleic acids

Synthesis of Azole-based Cyclic Peptides and a New Approach Towards Didmolamides

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ABSTRACT

Within the last few years, a number of unusual cyclic peptide alkaloids incorporating 5-membered heterocyclic ring have been isolated from marine sources. A rich variety of cyclic peptide natural products have shown biological activity properties. Some cyclic peptides are in advanced clinical trials, and others have proven useful in studies directed toward elucidating biochemical pathways. The synthetic approaches lead to didmolamide A and didmolamide B of the naturally occurring cyclic peptides found in the marine ascidians, *Didemnum molle*. Thiazole and 5-methyloxazoline amino acids were successfully synthesised using the modified Hantzsch reaction and deoxo-fluor respectively in high yield and enantiomeric purity. Coupling reaction using carbodiimide-mediated condition afforded the products in good yield. A macrolactamisation approach is developed to the synthesis of didmolamides using DPPA and FDPP. The development of a concise self-assembly reaction/cyclooligomerisation toward didmolamide A and didmolamide B using the mono-thiazole and *bis*-thiazole are also described. A mixed cyclooligomerisation of the thiazole and oxazoline was leading to three products, didmolamide A, the thiazole-based cyclic trimer and the cyclic tetramer. Treatment of a 1:1 mixture of the chiral oxazoline amino acid and the *bis*-thiazole amino acid gave the cyclic hexapeptide didmolamide A and cyclic tetramer of thiazole. Didmolamide B and the cyclic tetramer of thiazole were obtained when the dipeptide precursor was used.

Keywords: cyclic peptides, thiazole, oxazoline, self-assembly, cyclooligomerisation, didmolamides

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Thermal Effusivity Measurement of Virgin Coconut Oil-Methanol Mixtures using Photoacoustic Technique

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ABSTRACT

Thermal effusivity of virgin coconut oil-methanol mixtures were measured using open photoacoustic cell technique. The samples were prepared by simply mixing virgin coconut oil and methanol using similar procedure applied for preparation of biodiesel. Thermal effusivity of the sample was obtained by fitting the experimental data of photoacoustic amplitude signal to the expression of photoacoustic signal as a function of chopping frequency. Thermal effusivity of mixtures decrease between 0.0851 W $s^{1/2}$ K^{-1} cm^{-2} (pure virgin coconut oil) and 0.0644 W $s^{1/2}$ K^{-1} cm^{-2} (pure methanol) with the increasing of methanol in the mixture.

Keywords: photoacoustic cell, virgin coconut oil, methanol, biodiesel, methanol mixture

Novel Material for Capacitors Application Based on $La_{0.67}Sr_{0.33}Mn_{0.80}Ti_{0.20}O_3$ Perovskite

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ABSTRACT

Hole-doped rare earth manganites perovskite with the general formula $R_{1-x}A_xMnO_3$ (R is a trivalent rare earth metal ion such as La, Nd, Pr and A is the divalent alkaline earth ion such as Ca, Sr, Ba) have been studied extensively for several years due to the interesting colossal magnetoresistance (CMR), electronic transport and magnetic properties of the material. This type of material offers tremendous opportunities for the development of new technologies, including disc read and write head in data-storage devices and also in the so called Magnetoresistance Random Access Memory (MRAM). Currently it was discovered that by doping Ti at the Mn site produced an interesting dielectric properties of the material which may be used in fabricating high performance capacitors. In this study of $La_{0.67}Sr_{0.33}Mn_{0.80}Ti_{0.20}O_3$ we observed a very high dielectric permittivity, ε' at 1 kHz which is ~ 4.3×10^4 at 250 K and increases to 4.1 X 10^5 at 200 K compared to $BaTiO_3$ with ε' ~1200 at room temperature. The sample has the highest ε' ~6.7×10^5 at 200 K and 100 Hz. According to Maxwell-Wagner's model the dielectric structure of this material composed of large well conducting grains that are separated by the thin poorly conducting/insulating intermediate grain boundaries, which contributes to the high dielectric constant of the materials. A nearly frequency independent dielectric constant between 2×10^5 and 4×10^5 occurred at frequencies ranging from 150 to 1.5×10^4 Hz. In manganite the relaxation process of ε' can be explained from the hopping rate of the electron double exchange mechanism between Mn^{3+} and Mn^{4+} ions which cannot follow the alternating frequency of the applied field beyond a certain critical frequency. This behaviour can also be due to the grain boundaries that are effective at low temperature and electronic polarisation from polaron hopping mechanism.

Keywords: manganites ,dielectric permittivity

Design and Fabrication of A Student Competition Based Racing Car

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ABSTRACT

Design, fabrication and testing of a car is presented in this project. The design is based on the specifications set by Universiti Teknikal Malaysia (UTeM) Formula Varsity Car 2008. Design of the car was carried out using CATIA solid modeling CAD system and was validated using the Finite Element Analysis. Finally the car was fabricated and tested for the performance. The fabricated car was qualified for the race and was secured forth place during the race.

Keywords: conceptual design, racing car, static test, finite element analysis

Phase Formation and Electrical Properties Study of Bismuth Pyrochlores and Related Materials

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ABSTRACT

The phase formation of two pyrochlore analogues, namely bismuth nickel tantalate (BNT) and bismuth copper niobate(BCN) was investigated. Compositions with a general formula $Bi_3M_{2-x}N_3O_{14-x}$ (M = Cu and Ni; N = Ta and Nb) were prepared by conventional solid state method in the temperature range of 900 – 1050 ^{o}C. These materials crystallised in cubic structure, space group fd3m, no. 227 with a required average mixed valency $A^{3+}B^{4+}O_7$ type pyrochlore, in which A and B illustrating an eight-fold and a six-fold crystallographic sites, respectively. On the other hand, a series of intermediate precursor copper tantalates, $CuTa_{2-x}O_6$ (x = 0, 0.2, 0.4, 0.6, 0.8, 1.0) was synthesised and the phase pure samples were obtained at x = 0.2 and 0.4, respectively. The properties of the phase pure pyrochlores and related materials were characterised by a combination of techniques including X-ray diffraction, microscopy, spectroscopy, thermal analysis and physical property.

Keywords: pyrochlore, solid solution, dielectric constant, AC impedance spectroscopy

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Colossal Dielectric Permittivity $La_{0.4}Ba_{0.4}Ca_{0.2}Ti_{0.6}Mn_{0.4}O_3$ for Internal Barrier Layer Capacitor

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ABSTRACT

To date, the importance of ceramic materials as components in electronic devices has become a major interest in material research communities. Currently, capacitor based ceramic materials $BaTiO_3$ with bulk dielectric permittivity, $\varepsilon' \sim 1000$ (1 kHz at room temperature) is widely used since it was discovered in late 1940’s. In this project, high dielectric permittivity of $La_{0.4}Ba_{0.4}Ca_{0.2}Ti_{0.6}Mn_{0.4}O_3$ ceramic sample was observed at grain boundary region. The dielectric permittivity at 25^{o}C is ~ 16,000 (1 kHz) and increased to ~ 110,000 (1 kHz) at 200^{o}C. The dielectric permittivity expands to higher frequencies as the temperature increases to 200^{o}C which is suitable for wide frequency range application. Small activation energy value 0.54 eV (50^{o}C to 200^{o}C) in grain boundary conduction region (10 Hz) was obtained, indication of fast activation by the electrons. This high dielectric property has opened a new dimension for fabrication of new barrier layer capacitors which is suitable for long range of application from low to high frequencies and temperatures.

Keywords: dielectric permittivity and capacitor

Optical and Photoelectrochemical Properties of Potentiostatically Deposited $CuInS_2$ Semiconductor Thin Films

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ABSTRACT

Copper indium disulfide ($CuInS_2$) has recently drawn considerable attention as a promising material to be used as absorber layer in photovoltaic cells and other devices because its direct band gap energy of ~1.5 eV, high conversion efficiency, high absorption coefficient and free from hazardous chalcogenides, selenium or tellurium. Many deposition methods have been developed for the preparation of $CuInS_2$ thin films, such as sulfurisation of eletrodeposited Cu-In precursor, chemical vapour deposition, spray pyrolysis, ion plating, ion layer gas reaction, co-evaporation, etc. Among the various techniques, potentiostatic deposition is the most suitable for the commercial and large scale application because of its simplicity and economical. It is a method where a constant potential is applied to electrochemical cell for a desired duration to undergo redox reactions leading to solid phase formation on the electrode. This method has been widely employed for the deposition of elemental, binary, ternary or even more complex compound and alloy thin films. It is an isothermal process mainly controlled by electrical parameters which are easily adjusted to control thickness, microstructure and composition. In this work, $CuInS_2$ thin films were one-step potentiostatically deposited onto fluorine tin oxide coated glass from aqueous solution containing $CuSO_4$, $In_2(SO_4)_3$ and $Na_2S_2O_3$. The effect of cathodic potential and deposition time on the structure, optical and photoelectrochemical properties of the deposited films were studied. X-ray diffraction patterns showed that the deposited $CuInS_2$ films were polycrystalline with tetragonal structure. The films showed strong photoresponse when evaluated using linear sweep photovoltammetry. The optimum condition for $CuInS_2$ deposition was at potential -1.00 V for 30 minute. The band gap energy was 1.58 eV with direct transition.

Keywords: $CuInS_2$ thin films, potentiostatic deposition, photoelectrochemical, band gap

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Preparation and Physical Characterisation of Borosilicate Glass from Local Silica Sand for Laboratory Glassware

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ABSTRACT

Borosilicate glass is widely manufactured throughout the world and the market demand is increasing due to its superior durability, high thermal shock resistance and high electrical resistivity. Since Malaysia has abundance of high quality deposits of silica sand, research has been carried out to produce this glass locally. Hence, local silica sand can be value-added and this will give higher profit to the country. As a start, a series of borosilicate glass with the general composition of SiO_2 73, B_2O_3 10, Al_2O_3 4, Na_2O (12-X), RO X (wt%) (R = Ca, Mg, Ba, Zn) were prepared from local silica sand. This study is to examine the effects of RO oxides on the properties of glass produced. The physical characterisations measured are density, refractive index, Vickers micro hardness, thermal expansion, chemical durability and thermal shock resistance. It was found that the density and refractive index exhibited higher values compared to the standard whilst hardness and coefficient of thermal expansion are lower. Further, the effects of boron oxide on borosilicate glass are also studied. Preliminary studies have demonstrated that our local silica sand can potentially be made into this kind of glass. This project will focus whether the glass produced meets the standard specification of BS ISO 3585 : Borosilicate Glass 3.3* - Properties.

Keywords: borosilicate glass, silica sand, glass characterisation

Development of Ultrasonic Testing Method for Fresh Concrete Evaluation

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ABSTRACT

Time is an important parameter for fresh concrete. Concrete must be cast as soon as possible after mixing process because the increasing of time before casting (pre-cast) will decrease the workability of the concrete and affect strength of the concrete. An ultrasonic based system that can be used to measure pre-cast time before it being placed and to test/identify the effect of pre-cast duration in relation with the concrete strength was developed. The grade of the concrete that was used in this study is grade 30 and the mix design is calculated using a special software application called Calcrete. Immediately after the concrete has been mixed, it was loaded into a special mould which is attached with UT probe. The velocity of the fresh concrete was monitored for 4 hours. The velocity of this concrete was measured using the ultrasonic device. The same method was repeated for cast-time at 2, 3 and 4 hours. The test showed that the ultrasonic system is capable to estimate the age of concrete before it has been placed into formwork. The system perhaps can be used to check the quality of fresh concrete and to determine whether or not the casting time is exceeding the allowable time limit.

Keywords: fresh concrete, ultrasonic

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The Roles of Magnetic Nanoparticles Addition In Bi-2223 Superconductor

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ABSTRACT

Magnetic nanoparticles, M = Sm_2O_3 and Nd_2O_3, were added to Bi-2223 superconductor prepared by solid state reaction technique with intermediate grinding. Samples of $(Bi_{1.6}Pb_{0.4}Sr_2Ca_2Cu_3O_{10+\delta})_{1-x}(M)_x$ where x=00-0.02 were studied by XRD, resistivity, scanning electron microscopy and energy dispersive spectroscopy in order to compare the effect of magnetic nanoparticles addition to the system. The volume fraction of Bi2223 decreased from 84% for pure sample to 56%, 67% at x=0.02 for Nd_2O_3 and Sm_2O_3 addition respectively. The calculation of lattice parameter of Bi2223 phase indicates an increase of a-axis while c-axis decreases gradually. The critical temperature $T_{c\ (R=0)}$ which is 102K for pure sample decreased to 85K and 93k at x=0.02 for samples with Nd_2O_3 and Sm_2O_3 nanoparticles addition. The superconducting transition increases more for Sm_2O_3 than that for Nd_2O_3 magnetic nanoparticles addition. The hole concentration per CuO_2 plane decrease with increase of magnetic nanoparticles content. The addition of both magnetic nanoparticles decreases the samples’ grain size and increase the random orientation of the grains. EDX analysis indicates that magnetic nanoparticles have a homogenous distribution in BSCCO matrix. The results were explained according to different solubility of magnetic nanoparticles, the superconductivity suppression due hole concentration decreasing and microstructure changing by magnetic nanoparticles addition. These results have strong implication to the role of these nanoparticles as effective pinning centers.

Keywords: magnetic naoparticles, Bi-2223 phase, Edx, Superconductivity suppression, grain size

Ceremics Superconductor of $REBa_2Cu_3O_{7-\delta}$ (RE= Y, Dy & Er) Synthesised via Coprecipitation Method

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ABSTRACT

The $REBa_2Cu_3O_{7-\delta}$ (RE= Y, Dy, Er) superconducting ceramics have been prepared via coprecipitation(COP) method from nearly saturated solutions of metal acetates and 2- propanol solution of oxalic acid. The metal oxalates powders were subjected to thermal treatment of 12 hours calcination at 900 °C. The pelletized powder was sintered for 15 hr at 920 °C. All samples showed a single step transition in the R-T curves. The $TC_{(R=0)}$ for samples Dy123, Y123and Er123 and were 93 K, 91 K and 90 K, respectively. XRD data showed single phase of an orthorhombic structure for all samples. SEM micrographs showed large grain sizes that are randomly distributed. These results showed that COP method using metal oxalates starting powders is very effective to synthesize high quality superconductors and shorten the sintering time required due to the formation of sub micron oxalate powders.

Keywords: coprecipitation method, R-123 superconductor

Designs and Developments of Palm-based Transdermal Nanoemulsions for NSAIDs

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ABSTRACT

Non-steroidal anti-inflammatory drugs (NSAIDs) are primary medications to treat inflammation, mild to moderate pain and fever. However, as potent as they are, one patient in hundred treated orally from three to six months suffers serious gastrointestinal ulceration. As FDA sees NSAIDs market as strong and continuing, pharmaceutics are endlessly designing a carrier to administer NSAIDs topically. In this work, palm-based nanoemulsions system were designed and developed to deliver the NSAIDs. Nanoemulsions are proposed as a vehicle to enhance the transdermal delivery due to their small size (< 200nm) and large surface area. Currently, there are collections of phase diagrams with large isotropic region using POEs or PKOEs as the oil phase, binary surfactants and water. However, there were lots of challenges when incorporating NSAIDs into designed nanoemulsions. Most of the structures of NSAIDs exhibit amphipilic properties which cause them to take part in the surfactant bilayer disrupting the nanoemulsions system. Compositions from the phase diagram must be first screened for good stability before incorporation of NSAIDs. Rheological modifiers such as hydrocolloids, synthetic polymers and thickeners were used to stabilize the systems. Besides that, some NSAIDs could exhibit strong molecular interactions with the surfactants used in the nanoemulsions and subsequently, cause crystallisations to occur. Finally, some NSAIDs which are water and oil insoluble could be formulated into oil-in-water nanoemulsions by adjusting the surfactant compositions, temperature and pH. This work is a success as the shelf life of modified NSAIDs nanoemulsions is predicted to be over three years with controlled Ostwald ripening phenomena, consistent particle size and zeta potential measurements even after 6 months (approximately 100 nm and -60 mV), plastic behaviour with yield stress around 100 Pa which is a suitable rheology for topical application and they show higher percentage release of NSAIDs than cream or gel from the market.

Keywords: nanoemulsions, palm-based esters, transdermal, NSAIDs

The Stability of Low-voltage ZnO Based Varistor on Direct Current and Temperature Stresses

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ABSTRACT

The stresses to humidity, DC and AC bias, multiple impulse voltages and high temperatures are known to affect the varistor performance and it is also interesting to know the effect of both DC bias and temperature stresses at the same time. Here, the simultaneous DC and temperature stresses degradation was investigated to see the changes of nonlinear coefficient (α) in Zn-Bi-Ti oxide low-voltage varistor ceramics sintered at various sintering temperatures (1140°C to 1260°C) and two sintering duration times of 45 and 90 minutes. The current-voltage characteristics of the varistor ceramics were evaluated. The α of ceramic was observed to be decreased with increasing sintering temperature. After loaded with DC and temperature stresses of 0.75V_{1mA}/ 80°C/ 12h, the α of ceramics for 90 minutes sintering time decreases with sintering temperature, however that sintered for 45 minutes sintering time increase with sintering time. The application of DC and temperature stresses in Zn-Bi-Ti oxide ceramics sintered at very long time cause the α to decrease as evidence from higher leakage current.

Keywords: ZnO, low-voltage varistor, degradation

◆

Scaled Memoryless Symmetric Rank One Method for Large-scale Unconstrained Optimisation

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ABSTRACT

One of the first problems to which Sir Isaac Newton applied calculus was the optimisation of a function. For this kind of problem Newton proposed an iterative solution: a local quadratic approximation – by Taylor expansion to the nonlinear function and find its extremum, and then generate a new local approximation and so on. The Newton method is simple and straightforward to describe, but the major drawback of the method devolves from the fact that computing an analytical Hessian of a function is very expensive. Since the Hessian is rarely available easily, the efforts were made to find a way to approximate the Hessian more cheaply. This leads to the current quasi-Newton methods which can be traced back to 1950s. Memoryless quasi-Newton method is exactly the quasi-Newton method for which the approximation to the inverse of Hessian, at each step, is updated from a positive multiple of identity matrix. Hence its search direction can be computed without the storage of matrices. In this research, a memoryless symmetric rank one (SR1) method for solving large-scale unconstrained optimisation problems is presented. The basic idea is to incorporate the SR1 update within the framework of the memoryless quasi-Newton method. However, it is well-known that the SR1 update may not preserve positive definiteness even when updated from a positive definite matrix. Therefore, we propose that the memoryless SR1 method is updated from a positive scaled of the identity, in which the scaling factor is derived in such a way to preserve the positive definiteness and improves the condition of the scaled memoryless SR1 update. Under mild conditions it is shown that the method is globally and R-linearly convergent. Numerical results show that the memoryless SR1 method is very encouraging.

Keywords: large-scale unconstrained optimisation, symmetric rank one method, memoryless method, optimal scaling

Larvicidal Anthraquinones from *Morinda citrifolia* Roots

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ABSTRACT

Our recent investigation of *Morinda citrifolia* roots afforded a new anthraquinone, 2-ethoxy-1-hydroxyanthraquinone along with five other known anthraquinones, 1-hydroxy-2-methylanthraquinone, damnacanthal, nordamnacanthal, 2-formyl-1-hydroxyanthraquinone and morindone-6-methyl-ether. This is also the first report on the isolation of morindone-6-methyl-ether (6) from this plant. The structures of these compounds were elucidated based on spectroscopic analysis such as NMR, MS and IR. Biological evaluation of two pure compounds and all the extracts against the larvae of *Aedes aegypti*, indicated 1-hydroxy- 2-methylanthraquinone and damnacanthal and the extracts to exhibit promising larvicidal activities. The chloroform extract gave a very low LC_{50} value of 6.0 μg/ml while the petroleum ether gave a slightly higher LC_{50} value of 14.6 μg/ml. 1-hydroxy-2-methylanthraquinone, and damnacanthal gave extremely low LC_{50} values of 1.8 and 7.4 μg/ml.

Keywords: *morinda citrifolia,* 2-ethoxy-1-hydroxyanthraquinone, anthraquinones, noni, *aedes aegypti*

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Ownership and Usage of Computers and the Internet among Older Persons in Malaysia

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ABSTRACT

Computers and the internet play important roles in our modern life today. Older persons should also benefit from these advances in new technologies. The purpose of this study is to identify the level of ownership and computer usage and the internet among older Malaysians in the urban areas. Purposive sampling was used in four selected states (Kelantan, Pahang, Selangor and Negeri Sembilan) involving 708 people aged 55 years and over. Respondents were interviewed using the face-to-face interview potocol by trained enumerators. Data were analyzed using the Statistical Program for Social Science (SPSS). Results showed that majority of the respondents were female (58.6%), Malay (77.1%), with primary education (45.5%) and married (69.8%). The mean monthly income of respondents was RM584 (SD=RM804.5). From the study, it was found that only 19.8% have at least one computer at home, owned by family members (18.6%). Findings also showed that about 9% of the respondents are active computer users while 47% of them are also internet users. Most of the computer usage is for work (80.6%) and seeking information/knowledge (45.2%). Majority of the respondents (69.4%) access computers from the work place, followed by home (59.7%). The use of internet was generally to get information (72.4%), e-mail /communication (58.6%) and news (51.7%). Analysis showed that income (t=-5.734, p=0.000) and level of education (X^2=94.87, df=3, p=0.000) were two important factors influencing the level of ownership among respondents. The computer and internet used were influenced by gender (X^2= 36.374, df=1, p=0.000), level of education (X^2= 199.950, df=3, p=0.000) and marital status (X^2= 13.604, df=1, p=0.000). All these determining factors are useful indicators for planning and developing ICT strategies maximizing computer and internet usage among older Malaysians

Keywords: computers, internet, older malaysians, demographic background

Nano-engkabang Formulation for Excellent Skin Hydration

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ABSTRACT

The worldwide cosmeceuticals market is expected to reach more than $2.86 billion worldwide by 2009. Market growth is accelerating as consumers demand over-the-counter solutions and prescription products with better efficacy and safety profiles. Engkabang fat was chosen as a starting material in the formulations because of the efficacy of the engkabang fat itself on the human skin such as moisturizes the skin and restores elasticity. It also can prevent dry skin, the development of wrinkles and reduce degeneration of skin cells. Formulations containing engkabang fat and engkabang fat esters were prepared using high shear homogenizer, followed by using high pressure homogenizer in order to get nano-emulsions as covering the droplet radius size range of 50-200nm. Nano-emulsions are attractive for application in personal care products and cosmetics as well as in health care products due to extremely small size. The large surface area of the emulsion system allows rapid penetration of active ingredients through the skin. The particle sizes of formulations of engkabang fat and esters were below than 200nm. The zeta potential value of the formulations were found more negative than -30mV and validly to predict long-term stability. The rheology of the formulations showed pseudoplastic material with shear thinning properties. Short-term moisturizing effect on 20 subjects analyzed by means of Analysis of Variance (ANOVA), gave P-values of 7.35×10^{-12} and 2.77×10^{-15} for formulation of the formulations. The hydration of the skins increased after application of the formulations with P-value below 0.05.

Keywords: emulsion, engkabang, fat, esters, hydration, high pressure

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Enhancement of Critical Temperature in Bi-2223 Superconductor Ceramics via Eu_2O_3 Addition

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ABSTRACT

The effect of addition of nanoparticulates in $(Bi_{1.6}Pb_{0.4})Sr_2Ca_2Cu_3O_{10}+xM$ with M= Gd_2O_3, Eu_2O_3, Ce_2O_3 and x=0.0-0.05 system prepared via conventional solid state reaction method have been investigated. The volume fraction of superconducting phases, lattice parameters and critical temperature were affected by the introduction of different nanoparticulate content in the Bi-2223 system. With the addition of different amount of Gd_2O_3 and Ce_2O_3, the volume fraction of the high-T_c (2223) phase decreases with the presence of the low- T_c (2212) phase, except for Eu_2O_3 in x=0.03. The *c*-axis parameter decreases from 37.17°A to 36.07° A for all samples. However for sample with x=0.03 of Eu_2O_3 particulate the *c*-axis increases. This result is in accordance with the critical temperature value $T_c \cong$ 112°K for sample with x=0.03 of Eu_2O_3 (T_c for pure Bi-2223 is $\cong$ 110°K). This T_c enhancement is influenced by the structure factor. The morphological appearance of all the sample shows randomly oriented platelet-like grains with some degree of porosity. The grains size decreases with the increase of the added particulates. However for sample with x=0.03 of Eu_2O_3, the morphology displays an increase of grain size and the porosity seems to decrease. Hence, the effect of the addition of Eu_2O_3 at x=0.03 is unique, in the sense that the high T_c phase and critical current are optimized and thus can be utilized as possible effective pinning centres to sustain the critical current density in the superconductor.

Keywords: critical current, morphology

Elastic Properties of Zinc Borotellurite Glasses

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ABSTRACT

A series of ternary tellurite based glasses [(TeO2)70 (B203)30]100-x [ZnO]x glasses with different compositions of zinc oxide (x = 5 to 30 mol% in steps of 5 mol%) are synthesized by melt quenching method. The objectives of this study are to synthesize the ternary tellurite based glass and to study the change in the structure with addition of third component to the glass network which is ZnO. The ultrasonic velocity and attenuation are measured using a transducer having resonating frequency of 5 MHz (both longitudinal and shear). The density, ultrasonic velocity and attenuation show an interesting observation, which are used to explore the structural changes in the network. Elastic moduli, Debye temperature, Poisson's ratio and microhardness of the glasses are determined using the experimental data, which indicate that elastic moduli (L, G, and E), Debye temperature and microhardness (H) decrease while bulk modulus and Poisson's ratio increase with composition of ZnO.

Keywords: tellurite glasses, elastic moduli, ultrasonic measurement, poisson's ratio, debye temperature, microhardness

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Antimicrobial, Antioxidant and Cytotoxic Activities of Four Melicope Species

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ABSTRACT

Melicope is a genus of aromatic shrubs or small trees of the family Rutaceae found normally in tropical Asia and ethnomedicinally used in the treatment of malaria fever, shingles, dermatitis, haemorrhoids, wound infection, analgesic and anti-inflammatory. The leaves and stem barks extracts of four species, *Melicope confusa, M. clemensiae, M. lunu-ankenda* and *M. latifolia* were screened for their antimicrobial, antioxidant and cytotoxic activities. Almost all extracts of *M. clemesiae* exhibited moderate growth inhibition when tested against the three pathogenic fungi. However, when tested against pathogenic bacteria, the three leaves extracts showed potent activity against methicillin resistant *S. aureus* and moderate for the other bacteria. In the antioxidant assay by using DPPH, the three leaves extracts of *M. lunu-ankenda* exhibited significant activity with IC_{50} values of 7.8, 15.6 and 7.8 μg/mL. In addition, the petroleum ether leaves extract of *M. clemensiae* and the chloroform leaves extract of *M. lunu-ankenda* showed strong cytotoxic activity when tested against human proyelocytic leukemia (HL60) cell line with IC_{50} value of 2.8 and 0.8 μg/mL, respectively.

Keywords: *melicope confusa, m. clemensiae, m. lunu-ankenda, m. latifolia*, antimicrobial, antioxidant, cytotoxic

Chemo-Enzymatic Green Route Palm-based Epoxides for Benign Surface Coating Nanoformulation

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ABSTRACT

Recently, there is a strong attention in developing oligomers and monomers from renewable resources to serve as benign ingredients in surface coatings, with minimum pollutants and enhanced features. Palm-based epoxy adipate is predicted to replace the conventional highly toxic epoxy acrylate in many commercial and domestic appliances due to their relatively low cost, non-toxic, biodegradable and good balance of properties. The palm-based epoxides are made by reacting palm oil or palm kernel oil with fatty acids via patented chemo-enzymatic route, and later interacted with adipic acid to produce *MBepox*, the novel epoxy adipate. This invention containing palm-based epoxy adipate oligomers is then applied together with patented *MBadipate* (adipate ester monomers) in the production of solvent-free coating nanoformulations for radiation curing. This platform technology continues to look for ways to provide coating compositions that provide better performance yet environmental friendly in the workplace.

Keywords: palm oil, epoxide, adipate, chemo-enzymatic, coating

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Effect of Methyl Acrylate Grafted Oil Palm Empty Fruit Bunch Fibre on Properties of Poly(Vinyl Chloride)/Epoxidised Natural Rubber Composites

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ABSTRACT

Poly(methyl acrylate) grafted oil palm empty fruit bunch (PMA-g- OPEFB) fiber which was prepared by graft copolymerisation of methyl acrylate (MA) onto oil palm empty fruit bunch (OPEFB) fiber was used as a filler for poly(vinyl chloride)/ epoxidised natural rubber (PVC /ENR) composites. The composites were prepared by mixing the fiber with PVC/ENR blends using a HAAKE Rheomixer at 150^{0}C with a rotor speed of 50 rpm for 20 minutes. The fiber loading was varied from 0 to 30%. The effects of the fiber content in the composites on some of their properties were studied. Addition of both OPEFB and PMA-g-OPEFB fibers increases the tensile strength, Young’s modulus, flexural modulus, hardness and impact strength tensile strength, Young’s modulus, flexural modulus, hardness and impact strength of the PVC/ENR composites. The increase of the tensile strength and elongation at break of the composite loaded the PMA-g-OPEFB fiber is bigger than that of the composite with the unmodified fiber. However a reverse trend was observed when the study of effect of the fiber contents on the flexural and Young’s moduli of the composites were carried out. This indicates that the PMA-g-OPEFB fiber imparts some flexibility properties to the composites. The tensile fractured sample surface of the composite examined under scanning electron microscopy shows that the adhesion of the fiber and matrix is improved as the fiber is grafted. In addition the thermal analysis done by dynamic mechanical analysis indicates that the glass transition of the composite shifts as the fiber is added into the blend. Effect s of the electron beam irradiation and addition of the a crosslinking agent the composites was also studied.

Keywords: poly(methyl acrylate) grafted oil palm empty fruit bunch, poly(vinyl chloride)/ epoxidised natural rubber (PVC /ENR) composites

Electrical Properties of Chitosan at Microwave Frequency

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ABSTRACT

The work focused on studying the conductivity and dielectric properties of chitosan system. The dielectric study was carried out over a microwave frequency range from 10 MHz to 20 GHz at room temperature. The dielectric properties such as dielectric constant (ε') and dielectric loss (ε'') were measured and discussed as a function of frequencies. The dielectric constant (ε') decreases with increasing of frequencies due to the dielectric dispersion. At high frequency, the conductivity increases with increasing of frequencies. Due to the increase of the polarizability (α) and by increasing the dipolar moment, orientation and reorientation motion, its lead to the decrease of (ε'') at lower frequency, the same behavior was observed in (ε').

Keywords: chitosan, microwave frequency, dielectric properties, conductivity, polarizability

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Sixth Order Diagonally Implict Diagonally Implicit Runge-Kutta-Nystrom Method with an Explicit First Stage for Solving Second Order Ordinary Differential Equations

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ABSTRACT

Generally special second order ordinary differential equations (ODEs) of the form

$$y'' = f(x, y), \quad y(x_0) = y_0, \quad y'(x_0) = y'_0$$

which is not explicitly dependent on the first derivative of the solution are frequently encountered in celestial mechanics. The solution to the equation can be obtained by reducing it first to an equivalent first order system of twice the dimension and solved using a standard Runge-Kutta method or multistep method. However it is often advantageous to solve them directly using Runge-Kutta Nystrom (RKN) method. Currently, many researchers are working on the construction of explicit RKN method, producing continual improvement to the existing algorithms. In this research we confine our consideration to diagonally implicit RKN method. These method is more attractive from the practical point of view. If all the diagonal elements are equal, then the scheme is very efficient since the decomposition of the coefficient matrix $(I - \gamma h^2 J)$ where *J* is the Jacobian of the system of equations of the Newton iterations for solving stiff ordinary differential equations (ODEs) can be used in all stages. In this research, sixth order diagonally implicit RKN method with the first diagonal element $a_{11} = 0$ and the rest of the diagonal elements are equal is constructed and used to solve a standard set of test equations which often appear in the field of engineering. Comparisons are made when the same set of test problems are reduced to first-order system and solved using existing embedded third order in fourth order singly diagonally implicit Runge-Kutta (SDIRK) method. Numerical results suggests that the new method is more efficient..

Keywords: special second order, runge-kutta nystrom

Stereoselective Oxidation Towards *Galacto*-configured Hydroxylated Lactam

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ABSTRACT

In studies towards the synthesis of nagstatin, a naturally occurring iminosugar and glycosidase inhibitor, a *galacto*-configured hydroxylated lactam was recognized as a suitable precursor. Following a variant of Knight’s route to D-mannolactam, application of stereoselective oxidation procedure revealed the tendency of hydroxylated *N*-tosyl lactams to rearrange to γ-lactones. Unexpectedly, attempted directed dihydroxylation in this series resulted in high *anti*-selectivity.

Keywords: nagstatin, stereoselective, directed oxidation

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Efficient Parallel Direct Block Method for Solving Higher Order Ordinary Differential Equations

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ABSTRACT

The aim of this research is to investigate the performance of the developed two point block method designed for two processors for solving directly non stiff large systems of higher order ordinary differential equations (ODEs). The method calculates the numerical solution at two points simultaneously and produces two new equally spaced solution values within a block and it is possible to assign the computational tasks at each time step to a single processor. A system of higher order can also be reduced to a system of first order equations and then solved using any numerical method. This approach is very well established but it obviously will enlarge the system of first order ODEs. However, the developed method will solve the system of higher order ODEs directly. The method proposed was presented as in the simple form of Adams Moulton method using variable step size. The method is in a simple form but we intend for efficiency and economically. The algorithm of the method was developed in C language and the parallel computation was done on a parallel shared memory environment. Numerical results are given to compare the efficiency of the developed method to the sequential timing. For large problems, the parallel implementation produced 1.95 speed up and 98% efficiency for the two processors.

Keywords: parallel method, block method, higher order ODEs

Dielectric Properties of Strontium Titanate in the 1 MHz to 1.5 GHz Frequency Regions

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ABSTRACT

Strontium Titanate, $SrTiO_3$ samples were prepared using the conventional solid state reaction method. $SrTiO_3$ samples were sintered at 1100˚C, 1200˚C, and 1300˚C. XRD was used to determine the crystalline structure of the samples. The AFM showed the grain size was significantly increased with an increase in sintering temperatures. The dielectric properties of the sample were measured using Agilent 4291B Impedance/material Analyzer in the sub-microwave region in the frequency range 1 MHz to 1.5 GHz at room temperature. The dielectric constant and the average grain size were found to be the highest for the $SrTiO_3$ sample sintered at 1200˚C. Hence, greatest dielectric polarisation occurred in the sample with the largest grain size.

Keywords: strontium titanate, dielectric properties, grain size

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TiO_2-Chitosan/Glass Photocatalyst for the Removal of Monoazo Dye via Photodegradation-Adsorption

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ABSTRACT

Application of TiO_2 in wastewater treatment has been extensively explored in past three decades due to its undeniable long photostability, non-toxicity and strong oxidising ability. However, high rate of electron and hole recombination decreases the mineralisation efficiency of TiO_2. Therefore, further improvements of its photocatalytic activity can be achieved by combination of both photodegradation and adsorption process where the adsorbed target pollutants are diffused to the photocatalyst surface which eventually degraded to CO_2, H_2O and mineral acids. Chitosan, consisting of amino ($-NH_2$) and hydroxyl (-OH) functional groups, have been employed successfully as an adsorbent for various pollutant including organic, inorganic and heavy metals. Some unique properties of this biopolymer that draw interest of researchers to utilise it as adsorbent include non-toxicity, hydrophilicity, biocompatibility, biodegradability and anti-bacterial property. Hence, in this research, the combined effect of TiO_2 photocatalyst and chitosan as an adsorbent which was immobilised on glass (TiO_2-Chitosan/Glass) towards removal of a monoazo dye, Methyl Orange (MO) was ventured. In this study, approximately 87% removal of MO was achieved at optimised TiO_2-Chitosan loading. The simultaneous process of photodegradation and adsorption which is related to the surface properties of TiO_2-Chitosan/Glass was supported by Scanning Electron Microscope fitted with Energy Dispersive X-ray Spectrometer, X-ray Diffractometer and Fourier Transform Infrared Spectrometer characterisations. This proposed new method is economical to be applied in industrial wastewater treatment due to its easy preparation method and elimination of filtration step; hence suggesting an inexpensive alternative material in the abatement of organic pollutants.

Keywords: photodegradation, adsorption, titanium dioxide, chitosan, visible light

Biodegradation of Carboxymethyl Cellulose from Sago Waste by *Trichoderma reesei* Cellulase

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ABSTRACT

The growing problem of non-biodegradable plastic waste and resulting general shortage of landfill availability. The need for the environmentally sensitive use of resources together with the CO_2 neutrality aspects are two main reasons for the interest in biodegradable plastics and polymers. Biodegradable products should not only fulfill their task excellently but after use and disposal should degrade easily in the soil by the action of naturally occurring microorganisms. Sago pulp (cellulose) is an abundant naturally occurring macromolecular material in sago waste (57% w/w) and was isolated and converted to carboxymethylcellulose (CMC) by etherification in the system consisting of sago pulp, sodium hydroxide, isopropyl alcohol and sodium monochloroacetate (SMCA). This study is on the biodegradability of CMCs from Sago waste with degree of substitution (DS) 0.4, 0.6 and 0.8. Biodegradability of the CMCs was evaluated by measuring the glucose produced during the *Trichoderma reesei* cellulase hydrolysis of CMC. The results showed that the concentration D-glucose released was in increasing order of CMC of DS 0.4<0.6<0.8. Thus, the ease of biodegradation of CMCs is in the increasing order of CMC of DS 0.4<0.6<0.8.

Keywords: sago waste, sago pulp, carboxymethyl cellulose, biodegradation, cellulase

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Three Point Block Method for Solving Ordinary Differential Equations

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ABSTRACT

Three block implicit method is developed for solving first order ordinary differential equations (ODEs) using variable step size. This method will estimate the solutions of Initial Value Problems (IVPs) at three distinct points on the x-axis in the block simultaneously. The method is in a simple form as the Adams Moulton method with the specific aim of gaining efficiency. The performances of the block method are superior compared to the non block method when solving small systems of ODEs. The method calculates the numerical solution at three points simultaneously and produces three new equally spaced solution values within a block and it is possible to assign the computational tasks at each time step to a single processor. Therefore, the block method is suitable for parallelisation across the method when solving large systems of ODEs. The parallel implementation produced a good speed up with respect to the sequential timing and hence better efficiency on a parallel shared memory computer.

Keywords: three point, block method, parallel block

Organic Conductor: Influence of Preparation Temperature

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ABSTRACT

The conducting polypyrrole polyethylene glycol (PPy PEG) composite films were produced at various polymerisation temperature ranging from 5°C to 60°C using 1×10−3 M PEG, 0.20M pyrrole and 0.10M *p*-toluene sulfonate at 1.20V (vs. SCE). The polymerisation temperature of 5°C appeared as the optimum preparation temperature showing the highest electrical conductivity of 70 S/cm and the thermal diffusivity of 8.76×10−7m2 s−1. The electrical conductivity and thermal diffusivity exhibited a decreasing trend with the increase in polymerisation temperature in the pyrrole solution used to prepare the composite films. The XRD results reveal that low temperature (5 °C) typically results in more crystalline films, which are denser, stronger and have higher conductivity. The optical microscopy of PPy–PEG shows the globular surface morphology. The surface of the of the solution side of PPy–PEG film prepared at low temperatures showed a globular morphology.

Keywords: polypyrrole, polyethylene glycol,thermal diffusivity,electrical conductivity, dopant

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Sampling Distribution of R^2_{MAD} from Standard Logistic Distribution

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ABSTRACT

Alternative to the least square coefficient of determination (R^2_{OLS}), the coefficient of determination based on median absolute deviation (R^2_{MAD}) is an attractive consideration in the construction of goodness-of-fit test based on regression and correlation, due to its robustness. However, the properties of the sampling distribution of R^2_{MAD} itself has not been well researched. Hence, a simulation study was conducted to obtain graphical and numerical description on the sampling distribution of R^2_{MAD}, focusing on samples from the standard logistic distribution. The sampling distribution of R^2_{MAD} above , which will be referred to as $R^2_{MAD(CL)}$, can be used to construct tables of the critical values and to conduct a power study on the goodness-of-fit tests. This research project explores and discusses the resulting plots and descriptive measures obtained from contaminated standard logistic distribution. Contamination was introduced to investigate perseverance of robustness property of $R^2_{MAD(CL)}$ for samples from the standard logistic distribution. The sampling distribution of $R^2_{MAD(CL)}$ was simulated for various sample sizes (n = 20, 40, 100), percentage of contamination (5%, 15%, 25%) and distribution of the contaminants (logistic (2, 0.2), logistic (0, 0.2), logistic (2, 1) and normal (3, 0.2) contaminants). It is observed that symmetricity of the sampling distribution of $R^2_{MAD(CL)}$ improves obviously with the increase in sample size and percentage of normal contaminants. With the same situation of sample sizes and percentages of logistic contaminants, the sampling distribution of $R^2_{MAD(CL)}$ becomes more skewed with decrease in location, but increase in scales.

Keywords: sampling distribution, median absolute deviation, contaminated standard logistic distribution

Voltammetric Studies of Nano Zirconium Dioxide / Carbon Nanotubes / Chitosan-Modified Glassy Carbon Electrodes

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ABSTRACT

Voltammetric studies of a sensitive electrochemical DNA sensor based on ZrO_2 nanoparticles and multi-walled carbon nanotube (MWNTs) for DNA immobilisation is described. Layer deposition technique was used to prepare nano ZrO_2/MWNTs/chitosan-modified glassy carbon electrode (GCE) and oligonucleotides were immobilized to the GCE. The immobilisation of DNA on the electrode was monitored by cyclic voltammetry (CV) analysis by measuring the change of peak currents using electroactive methylene blue (MB) as an indicator. Compared with previous DNA sensor with oligonucleotides directly incorporated on carbon electrodes, this carbon nanotubes-based assay with its large surface area and good charge-transport characteristics increased DNA attachment quantity. Parameters used on this study including electrochemical characterisation, scan rate study, pH optimisation, and scanning electron microscope (SEM) as well as chronoamperometry (CA) and chronocoulometry (CC). The electrochemical reduction and oxidation of the redox couples of methylene blue (as a DNA indicator) can be recognized easily by the solid-phase voltammetry of microparticles. The cyclic voltammograms for three differently modified electrodes, nano ZrO_2/chitosan, MWNTs/chitosan and nano ZrO_2/MWNTs/chitosan, showed 2 major peaks responding to redox couple of methylene blue.

Keywords: nanoparticles, zirconium dioxide, multi-walled carbon nanotubes, cyclic votammetry

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Development of Practical Biosensor for Heavy Metal Ions by Exploiting Amino Acids as Recognition Elements

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ABSTRACTWW

The release of different pollutants into environment has increased noticeably as a result of industrialisation, and thereby, lowered the quality of the environment to alarming levels. Of such pollutants, heavy metals are the most important because of their non-biodegradability, with lead ion being among the most toxic and hazardous. Therefore, a practical biosensor has been developed for detection and quantification of lead (II) ions by using modified carbon screen-printed electrode (CSPE). The surface of CSPE was modified by addition of CNT and amino acids as bio-recognition elements. CNT has promotion effects on the direct electron transfer of these bio-recognition elements, which was immobilized with MWCNT. The cyclic voltammetric measurements were utilized to optimize the condition parameters. Selectivity study showed that among the 20 basic types of amino acids existed; the aspartic acid is the most selective towards lead (II) ions. The optimum pH is 2. The best ratio of composition is 1:4 (CNT:aspartic acid). The reproducibility is 1.290mA±1.93%, linear dynamic range 1 to 50μM for lead (II) ion. The developed transducer is applied on real samples from electroplating and printing industry.

Keywords: lead ion, amino acids, biosensor, carbon nanotubes

Synthesis and Characterisation of N, N′-Carbonyl Difatty Amides from Palm Oil

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ABSTRACT

Fatty amides have attracted much attention due to their activities against bacteria, yeast and mold, and industrial applications such as surfactants, lubricants, cosmetics, shampoos, detergent sand antifoams. Palm oil is an attractive starting material for fatty amides synthesis as it is renewable, non toxic, readily available and biodegradable. N, N- Carbonyl difatty amides (CDFAs) was synthesized from palm oil and urea using sodium ethoxide as a catalyst. The synthesis was carried out by refluxing the mixture of palm oil and urea in the presence of the catalyst. The optimum reaction conditions with the CDFAs recovery of 79% were when the reaction mixture at the molar ratio of urea to palm oil of 6: 1 and the reaction period of 8 hours. Ethyl fatty esters (EFEs) and glycerol were produced as a by-products

Keywords: palm oil, urea, difatty amides, ethyl fatty esters. sodium ethoxide

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Optical Properties of Borotellurite Glass Sysytem

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ABSTRACT

A series of of binary tellurite glass $[(TeO_2)_x(B_2O_3)_{1-x}$ with x = 60, 63, 70, 73, 75, 78 and 80 mol% was synthesized by rapid quenching method and some of physical and optical properties were investigated. The optical absorption was recorded at room temperature in the wavelength range of 200 to 800 nm. From the absorption edge studies, the value of the optical band gap E_{opt} and Urbach energy ΔE have been evaluated. The value of E_{opt} lies between 2.71eV to 2.16eV for the indirect transition and for direct transition the values vary from 2.90eV to 3.15eV and Urbach energy from 0.495eV to 0.758eV. From the experimental results, values of the optical energy band gap and Urbach energy are found to be dependent on the glass composition.

Keywords: tellurite glass, borate glass, optical band gap, urbach energy

Classification Theorem of Low-Dimensional Diassociative Algebras

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ABSTRACT

This project deals with the isomorphism problems of a subclass of finite dimensional algebras. One considers a class of algebras having two algebraic operations with five identities. They have been called diassociative by French algebraist J.-L.Loday. This class of algebras naturally arisen from some problems of algebraic *K*-theory. However, later on it turned out they have had some geometrical and physical applications as well. In this project, we give complete classification of diassociative algebras in dimension two and three.

Keywords: associative algebras, diassociative algebras

Numerical Solution of Cauchy Type Singular Integral Equations of the First Kind

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ABSTRACT

In this work, we present a method for the numerical solution of the Cauchy type singular integral equations of the first kind, over a finite segment. Bounded and unbounded solutions are considered. The Chebyshev polynomials of the first and second kinds with the corresponding weight functions are used to approximate the unknown density function. It is shown that the numerical solution of characteristic singular integral equation is identical with the exact solution, when the force function is a cubic. Moreover, it shown that this numerical method gives exact solution for other singular integral equations with some degenerate kernels.

Keywords: singular integral equations, cauchy kernel, interpolation, chebyshev polynomials

Thermal Diffusivity Measurement of Soda Lime Silica (SLS)-Coal Fly Ash (CFA) Ceramics

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ABSTRACT

The thermal diffusivity (α) values of a ceramic made from a mixture of soda lime silica (SLS) and coal fly ash (CFA) was investigated. Samples were obtained by mixing 90, 80, 70 and 60 wt% of SLS and 10, 20, 30 and 40 wt% of CFA respectively. The mixture was pressed in a disc-shaped form at 3300 psi. The samples were then sintered at 600, 800 and 1000 ºC for 2 hours with heating and cooling rates of 2 ºCmin^{-1}. The resulting samples were then characterized using Laser Flash Apparatus (LFA) for determining α value. The measurements of α were carried out at room temperature up to 300 °C with the intervals of 50 °C. Experimental results showed that α value is in the range of 0.102 mm^2/s to 0.858 mm^2/s. The other physical measurements were measured using the Scanning Electron Microscopy (SEM) and X-ray Diffraction (XRD) and density.

Keywords: thermal diffusivity, soda lime silica glass, coal fly ash, ceramic

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Approximate Solution of Singular Integral Equations of the First Kind

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ABSTRACT

In this work a study of efficient approximate methods for solving the Cauchy type singular integral equations (CSIEs) of the first kind, over a finite interval, is presented. In the solution, Chebyshev polynomials of the first kind, Tn(x), second kind, Un(x), third kind, Vn(x), and fourth kind, Wn(x), corresponding to respective weight functions W1(x), W2(x), W3(x) and W4(x) have been used to obtain systems of linear algebraic equations. These systems are solved numerically. It is shown that for a linear force function the method of approximate solution gives an exact solution. Numerical results for other force functions are given to illustrate the efficiency and accuracy of the method.

Keywords: singular integral equations, cauchy kernel, chebyshev polynomials, collocation, approximation

Structural, Morphology and Electrical Properties of Layered Copper Selenide Thin Film

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ABSTRACT

Thin films of copper selenide (CuSe) were physically deposited layer-by-layer up to 5 layers using thermal evaporation technique onto a glass substrate. Various film properties, including the thickness, structure, morphology, surface roughness, average grain size and electrical conductivity are studied and discussed. These properties are characterized by X-ray diffraction (XRD), atomic force microscopy (AFM), ellipsometer and 4 point probe at room temperature. The dependence of electrical conductivity, surface roughness, and average grain size on number of layers deposited is discussed.

Keywords: CuSe thin films, electrical conductivity, surface roughness, film thickness, grain size

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Electrocatalytic Characteristic of Nanoparticles/Amino Acid Nanohybrid Modified Electrode in Development of Biosensor for Determination of As(III)

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ABSTRACT

The development of practical sensor for the detection and quantification of metal ions in environmental samples is the subject of considerable research. The majority of this research involves the synthesis and testing of amino acid and peptide ligands with selectivity of target metal ion . Using nanotransducer ion biosensor, a novel method to concentrate a modification of electrode and improve the sensitivity for electrochemical heavy metal detection was developed. A modified MWNT- electrode was proposed to determine heavy metal at trace levels and cyclic voltammetry was conducted using the system and the technique.

Keywords: biosensor, amino acid, heavy metal

Effectiveness of Sterilisation of Oil Palm Bunch Using Microwave Technique

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ABSTRACT

The extraction of crude palm oil from oil palm bunches requires the bunch to be sterilized and the fruitlet detached before it can be further processed for oil recovery. Research was carried out to find ways to reduce oil loss in condensate and make sterilisation a continuous process. This paper discusses a laboratory scale study on microwave sterilisation, together with the microwave dielectric properties and moisture content surrounding the abscission layer of oil palm fruitlets. An interesting result was found where the moisture content was higher in the abscission region as compared to the other regions of the fruitlet. With stripping efficiency above 80%, we conclude that microwave radiation is suitable for quick detachment of the fruitlet from the bunch since the abscission layer is heated-up and fruit loosening performed without damaging other regions of the fruit.

Keywords: oil palm fruit, sterilisation, dielectrik properties, moisture content, microwave

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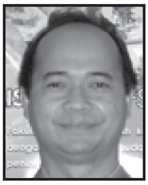
Bugpower - Green Electricity from Microbes Using Single Chamber Membraneless Microbial Fuel Cell



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ABSTRACT

In recent years, clean and efficient energy production from renewable sources is highly desired due to the forthcoming depletion of fossil fuel resources and also the environmental contamination issue. Of particular interest is microbial fuel cell technology. It uses microorganism as biocatalyst to consume oxidizable organism material in the environment such as domestic wastewater and benthic sediment to produce electricity. However, the biggest obstacle in up-scaling the technology for industrial application is the extremely high construction cost of the fuel cell. The present invention described a single chamber membrane-less air cathode microbial fuel cell with electrodes made up of wood charcoal and cement plaster. The structure of the invention consists of an internal anode of wood charcoal granules, cylindrical air-cathode made of fine powder wood charcoal with plaster cement as binder and stainless-steel as connector for both electrodes. The main aim of the study was to reduce the constructing cost of a microbial fuel cell by using widely available raw materials and therefore wood charcoal serves as a perfect choice. Wood charcoal is widely available in Malaysia at very low cost and therefore the cost of the invention is greatly reduced. This makes up-scaling of the invention for industrial application possible. The performance of the invention is comparative with microbial fuel cell with graphite electrodes. The maximum voltage and power generated with mangrove forest brackish water as inoculums was 1.11 V and 0.8 mW, respectively.

Keywords: microbial fuel cell, green energy

Carbon Dioxide Superfluid Extraction of Flavonoid from Selected Herb (Eg Strobhilanthes Crispus (*Pecah Kaca*) Etc)

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ABSTRACT

Optimisation of Supercritical Carbon Dioxide (SC-CO_2) Extraction Conditions of Bioactive flavonoid compounds from Pecah Kaca **(***Strobilanthes crispus)* and Spearmint **(***Mentha spicata L.*) Leaves

Flavonoids are polyphenolic compounds that are ubiquitous in nature and most commonly known for their antioxidant activity. However, it is now known that the health benefits they provide against cancer and heart disease are the results of other mechanisms. The main focus on this work is to identify the major flavonoid compounds from different types of herbs at optimum condition by using HPLC analysis. Supercritical carbon dioxide extraction (SC-CO_2) was performed at various pressures, temperatures and dynamic extraction times through an orthogonal experiment (3^3). The optimum condition for Pecah Kaca (*Strobilanthes crispus)* and spearmint (*Mentha spicata L.*) leaves were obtained at 200 bar, 50˚C, 60 min and 200 bar, 60˚C, 60 min respectively. Under the optimum condition, the obtained extraction yield for Pecah Kaca (*S. crispus)* and Spearmint (*M.spicata L.*) are 51.685 mg/g and 60.566 mg/g, respectively. Eight flavonoid compounds were identified in the Pecah Kaca (*S. crispus)* extract while, seven flavonoid compounds were detected in the Spearmint (*M. spicata L.*) extract under optimum condition.

Keywords: *pecah kaca* (*Strobilanthes crispus*), spearmint (*Mentha spicata L.*), bioactive flavonoid, supercritical carbon dioxide extraction (SC-CO_2), HPLC

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A Quantum Algorithm for Network Routing

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ABSTRACT

Classical algorithms have been used to search over some space for finding the shortest paths problem between two points in a network and a minimal weight spanning tree for routing. Any classical algorithm deterministic or probabilistic will clearly used O(N) steps since on the average it will measure a large fraction of N records. Quantum algorithm is the fastest possible algorithm that can do several operations simultaneously due to their wave like properties. This wave gives an O(sqrt(N)) steps quantum algorithm for identifying that record, where was used classical Dijkstra’s algorithm for finding shortest path problem in the graph of network and implement quantum search. Also we proposed the structure for non-classical algorithms and design the various phases of the probabilistic quantum-classical algorithm for classical and quantum parts. Finally, we represent the result of implementing and simulating Dijkstra’s algorithm as the probabilistic quantum-classical algorithm.

Keywords: graph theory, algorithm design, quantum algorithm, network routing

Multi-class Bandwidth Reservation Scheme Based on Mobility Prediction for Handoff in Multimedia Wireless/Mobile Cellular Networks

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ABSTRACT

Next generation of wireless cellular networks aim at supporting a diverse range of multimedia services to Mobile Terminal (MT) with guaranteed Quality of Service (QoS). The challenge is to maintain the playing continuity of multimedia streams during handoff. In this paper, a bandwidth reservation scheme based on mobility prediction is proposed, to enable high accurate prediction of next crossing cell (target cell) which a MT is going to, in order to avoid too early or over reservation resulting in a waste of resources. The amount of bandwidth to be reserved is dynamically adjusted according to (a) the current position (location) and the extrapolated direction of MT and; (b) the sector and zones of the cell. A Call Admission Control scheme (CAC) is also considered to further guarantee theQoS of real time traffic. The performance of the system is evaluated through discrete event simulation of the wireless cellular environment. Simulation results show that the proposed scheme as compared to several existing schemes is able to reduce the Handoff CallDropping Probability (HCDP) of real time traffic and the number of terminated ongoing calls of non-real time traffic. In addition, it is efficient to reduce the number of cancelled reservation and subsequently increase the system bandwidth utilisation.

Keywords: multimedia wireless cellular networks, mobility prediction, handoff and quality of service

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A Web-based Recommendation System to Predict User Future Movements

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ABSTRACT

Web usage mining has become the subject of exhaustive research, as its potential for web based personalized services, prediction user near future intentions, adaptive Web sites and customer profiling is recognized. A variety of the recommendation systems for online personalisation through web usage mining have been proposed. However, the quality of the recommendations in the current systems to predict users' future requests systems can not still satisfy users in the particular huge web sites. To provide online prediction efficiently, we have developed a recommendation system, named as WebPUM (Web-based Recommendation System to Predict User Future Movements) for online prediction through web usage mining system and propose a novel approach for classifying user navigation patterns to predict users' future intentions. The approach is based on the new graph partitioning algorithm to model user navigation patterns for the navigation patterns mining phase. Furthermore, longest common subsequence algorithm is used for classifying current user activities to predict user next movement. We have tested our proposed approach on the two datasets. The results indicate that the approach can improve the accuracy of the system for both clustering and classifying phases.

Keywords: web usage mining, personalisation systems, recommendation system, navigation pattern mining

The TCP-based New AIMD Congestion Control Algorithm

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ABSTRACT

Congestion control is one of the fundamental issues in computer networks. Without proper congestion control mechanisms there is the possibility of inefficient utilisation of resources, ultimately leading to network collapse. Hence congestion control is an effort to adapt the performance of a network to changes in the traffic load without adversely affecting users perceived utilities. AIMD (Additive Increase Multiplicative Decrease) is the best algorithm among the set of liner algorithms because it reflects good efficiency as well as good fairness. Our control model is based on the assumption of the original AIMD algorithm; we show that both efficiency and fairness of AIMD can be improved. We call our approach New AIMD. We present experimental results with TCP that match the expectation of our theoretical analysis.

Keywords: TCP, AIMD, congestion control

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Performance Enhancement of Utility Accrual Scheduling Algorithms in Adaptive Real Time System

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ABSTRACT

This research presents the new utility accrual real time scheduling algorithms called Preemptive Utility Accrual Scheduling (PUAS) and Non-preemptive Utility Accrual Scheduling (NUAS). These algorithms solve the unnecessary abortion problem that was identified in the existing algorithm known as General Utility Scheduling (GUS). We consider independent tasks that are subject to deadline constraints specified using step time/utility functions (TUFs). A TUF specifies the utility of completing a task as an application specific or situation specific function of when that task completes. The scheduling optimality criteria are based on maximizing accrued utility from those tasks. These criteria are named as Utility Accrual (UA). These algorithms are design for adaptive real time system environment where deadline misses do not have great consequences to the system. Simulation studies reveal that PUAS and NUAS algorithms perform better than the existing algorithm in an error free environment. This research also considers the problem of recovery from task failures in UA scheduling algorithms domain. Fault recovery in a real time system implies that the system is able to deliver correct results in a timely manner even in the present of faults. Two recovery solutions are presented. A proposed fault recovery algorithm named as Backward Recovery works by adapting time redundancy model i.e., by re-executing the affected task after its transient error period is over. A less complicated recovery algorithm known as Abortion Recovery that simply aborts all faulty tasks is also presented. Both of these algorithms are performed in conjunction with PUAS, NUAS and GUS algorithms to provide correctness of the executed task on best-effort basis and achieve the error free task as much as possible. Simulation results show that the proposed model is suitable and efficient to be used in adaptive real time system by accruing higher utility compared to the existing abortion recovery model.

Keywords: real time scheduling, time/utility functions, utility accrual, time redundancy model, simulation

A Scalable Numerical Method for Interactive Frequent Pattern Mining

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ABSTRACT

Knowledge discovery or extracting knowledge from large amount of data is a desirable task in various applications like competitive businesses, World Wide Web, weather prediction, biological science, spatiotemporal systems and etc. Data mining is an essential step in the process of knowledge discovery to extract data patterns. Frequent patterns mining plays an important role in all data mining tasks such as clustering, classification, prediction, and association analysis. In some real time applications finding new correlations between items by changing minimum support threshold called interactive mining is very useful. Many algorithms have recently been introduced based on two basic approaches Apriori and FP-tree to mine frequent patterns. However, providing shorter response time and more scalability still is needed. Obviously, using integers and simple mathematics operations like divide and product instead of string and string operation can enhance the performance of data mining process. In this research, we propose a numerical approach for data mining process. Particularly, we introduce a new method based on prime number characteristics and only two simple mathematics operations divide and product to generate completed frequent patterns and maintain them. The method introduces a data transformation technique, a novel tree structure called PC_Tree and an efficient PC_Miner algorithm. The experimental results verify the compactness and accuracy of the method. Our method outperforms the state-of-the art algorithm in terms of both execution time and scalability.

Keywords: data mining, frequent pattern mining, interactive frequent pattern mining, prime number

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New Partial Evaluation Function in Constructive Hyper-heuristic Framework for Examination Timetabling Problem

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ABSTRACT

In this research we introduce a new partial evaluation function formula to evaluate partial solutions in a constructive hyperheuristic framework for solving Examination Timetabling Problem (ETTP). Since scheduling of each exam may restrict resources for remained unscheduled examinations, the function in order to evaluate partial solutions in each step, not only pays attention to situation of scheduled exams in current partial solution but also considers state of unscheduled exams after each scheduling. The function focuses on effect of previous scheduling of exams on time feasibility resource of remained unscheduled ones through a Bubble sort mechanism. The main formula is integrated by proportional coefficient. The framework applied on a graph based constructive hyperheuristic framework]. The efficiency of formula is analyzed and the prediction embedded in the new partial evaluation function is discussed.

Keywords: partial evaluation function, constructive hyperheuristic, examination timetabling

A Host Mobility Support with Adaptive Network Selection Method in Hybrid Wireless Environment

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ABSTRACT

The B3G or 4G of cellular/wireless communications network is expected to be purely IP-based and consist of heterogeneous access networks from 3G cellular, WiFi, WiMAX and a converged core network. To sup-port the mobile host in the hybrid overlay wireless, a cross-layer vertical handoff control method has been proposed. Implemented architecture is composed of four part; Connection Profile Manager (CPM), Net-work Access Assistance (NAA), Neuro-Fuzzy Decision Engine (NFDE), and Peer-bind Connection Manager (PCM). The most effective connection is selected based on the attributes from the multi-layer platform that provided handoff decision component which is responsible for handoff decision. The proposed network selection algorithm is based on hybrid neuro-fuzzy concept with low packet loss and latency. We have analyzed our implemented model on different scenarios. Results of the experiment indicate the advantages of the proposed scheme.

Keywords: celluar/wireless co mmunications network, host mobility support, hybrid neuro-fuzzy concept

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Agent-based Tool To Support Collaborative KMS In Software Maintenance Process Environment

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ABSTRACT

In recent years, many organisations consider knowledge management (KM) to be strategically important to bring synergies among different teams, units or departments, to accelerate innovation, improve quality and reduce costs and exposure to business risks. In Software Engineering area, KM have been studied mostly on Software Development environment, but Software Maintenance (SM) environment are often neglected. SM environment is complex, knowledge-driven and highly collaborative and therefore, KM is critical to SM to provides an environment for creating and sharing knowledge. One of the major challenges faced by software maintainers is inadequate knowledge to perform daily activities. Maintainers spent considerable efforts checking codes and collaborating with other parties to obtain information. To overcome the problems, we propose a Multi-Agent System (MAS) tool to enable both users and software maintainers to automate the process of capturing and sharing of knowledge and link them to the SM process information. Prometheus methodology was used to design the MAS and as a result, six agent types are proposed: User Agent, Helpdesk Agent, Maintenance Request Agent, Maintainer Agent, SM Process Agent and Domain Knowledge Agent. Critical to the MAS is the ontology for domain and SM process knowledge, to allow software agents to communicate among each others. Henceforth, we outline a combined ontology which links and extends the business domain to SM process ontology and model an ontology-based algorithm to allow agents to automatically filter the required information and select experts. With this tool, users and maintainers shall benefits from systematic organisation of knowledge, and also promote automation and integration of systems to support maintenance processes.

Keywords: software maintenance, knowledge management, software agent

An Automated Tool as Efficiency Factor in Software Project Effort Estimation

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ABSTRACT

Accuracy of software project effort estimation is a crucial task in most of the software organisations. Being able to measure the functionality delivered by a system is essential for a project development, costing, and task scheduling. Efforts and initiatives were largely invested to improve the outcome of effort estimation process. However, estimate the project's effort is remain time consuming, costly and inaccurate due to lacking of training and automated tools in the industry which will significantly solve the problems mentioned above. In this study, we present an automated effort estimation tool which is based on a window-based exponential effort estimation model to predict the effort required in terms of man days in order to increase the efficiency of estimation process. In addition, we also investigate how much do training factor might further increase the performance of the estimator in this field. A very comprehensive statistical analysis and test was carried out on two empirical experiments under university setting and the findings verify that combination between usage of automated tool and training are significantly reduce the time taken (-21.53%) as well as increase the accuracy of the results (+8.03%) in the project effort estimation process.

Keywords: automated tool, training factor, software effort estimation, function points analysis, window-based effort estimation model

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Plan Based Object-oriented Program Understanding System

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ABSTRACT

Program understanding is a very important activity in software maintenance process and debugging a programming code. In order to aid the program understanding process, specific software is most needed, especially for the novice programmer. The purpose of this research is to develop software which can understand an object-oriented program code using the programming code abstraction approach. In this approach, a program code is analyzed based on the knowledge called plan which is kept in the plan base. Plan recognition algorithm is needed to match the program code with the plan. Plan formalism is a language for representing the plan. The most frequently used plan formalism is by Kozaczynski. In representing an object-oriented programming code, the Kozaczynski plan formalism needs to be modified. The modification process has been done by analyzing an object-oriented program code written by students from the higher level institution in Malaysia. From the analysis, common errors and structure of program codes writing have been identified. This research continues in building the model for program understanding software by using the Unified Approach. The software model is documented using Unified Modeling Language (UML) then used as guideline for developing the program understanding software called CONCEIVER++. This software then has been tested with two case studies. This research has successfully put in several contributions to the program understanding area. First, this research has identified common errors and structures of program code used by students in writing an object-oriented program. Second, this research produced a form of object-oriented control flow graph (OO-CFG) representation showing the execution flow for the object-oriented programming code. Third, this research also has produced plan formalism for an object-oriented programming code. Fourth, the UML model that has been documented and produced for the object-oriented program understanding software. Fifth, this research also produced object-oriented program understanding software, CONCEIVER++.

Keywords: program understanding, program analysis, and software maintenance

An Adaptable Business Process Execution Engine

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ABSTRACT

Business Processes in Service Oriented Architecture (SOA) are run using an orchestrate engine. The point here is that running a huge number of business processes under a centralized orchestrate engine result in degrading of run-time environment abilities. Apart from this, running clustered orchestrate engines as an alternative way to obviate centralized orchestrate engine problems is not a final solution. On the other hand, there exist many researches focusing on decomposing or segmentation of business processes in run-time some of which attempts to decompose a business process to its building activities, while others break business process parts to sub flows or segments. Decomposing of a business process to its building activities will lead to a large number of activity agents in run time and it subsequently leads to more resource consumption and run-time system degradation. Segmentation, though, is useful however there are no criteria for business process segmentation commensurate with run-time environment requirements. In this paper, we introduce an intelligent process distribution method to firstly) increase business process adaptability with run-time environment, secondly) choose the best granularity for segments as well as encapsulating them in agents and thirdly) decrease resource consumption due to reduced number of agents and messages. We also prove the correctness of our method mathematically.

Keywords: adaptive systems, business process mining, BPEL, service oriented architecture, mobile agents, workflow, distributed orchestrate engine

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Facial Feature Extraction

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ABSTRACT

Extract of facial feature points has become an important issue in many applications, such as face recognition, expression recognition, and face detection. Segmenting facial features points in an image is the first important step for human face recognition, identification and verification. A method of facial feature extraction-based and corner detection is presented in this project to unravel the problems of this domain. This project uses techniques for extracting the facial features from a color image captured by the real-time webcam with under normal lighting condition. In order to more precisely extract the facial features such as eyes, mouth and nostrils this project used some preprocessing steps as soon as the image is captured, and also during the corner detection, this can save the time during the feature extracting with the goal of detecting the features in different expression and orientations. Experiments have been done with a number of images of frontal, near frontal, up and down view of the head by the different expression such as happy, sad surprise and neutral. Also a number of face images captured by a color camera, are tried by this method and the correct detection rate is over 89%.

Keywords: facial feature extraction, face recognition, corner detection, image processing

Liver Lever Set (LLS) Algorithm for Automatic Segmentation of Disconnected Liver Regions in CT Scan Abdominal Dataset

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ABSTRACT

Liver cancer or *hepatocellular carcinoma* is a cancer arising from the liver. It is the fifth most common cancer in the world and it is estimated by World Health Organisation (WHO) 2008 statistic, the incidence of liver cancer will enter the top 20 causes of death in the world by 2030. This has sparks our interest to produce a 3D liver visualisation application to help medical practitioners in diagnosis and treatment of liver cancer. The first and foremost step in producing 3D liver visualisation is liver region segmentation. It aims in extracting liver volume from CT scan data. Liver is considered as the most difficult organ to segment in abdominal area because of the liver's physical state itself. The liver is made from soft tissues, there is a large variation of liver geometry between patients. Furthermore, the liver has similar tissues density with neighboring organs causing a limited contrast in CT gray level between them. Another frequently overlook feature of liver's physical is that the liver has a multi-lobe structure, thus different lobes can exhibit as disconnected regions in a transverse slice image. Previous works on liver segmentation either ignore this problem or used manual initialisation when facing this disconnected regions. For that reason, we proposed a liver level set (LLS) algorithm which able to segment disconnected region automatically. The LLS algorithm is based on level set framework together with hybrid energy minimisation as the stopping function. By using the LLS algorithm in a looping manner, we allowed the current liver boundary to inherent the topological changes from previous sliced images in a 2.5D environment. We obtained an average factor for dynamic localisation radius based on liver anatomy to improve the segmentation accuracy. Our experiment gave a respective segmentation result with dice similarity coefficient (DSC) percentage of 87.5%.

Keywords: liver segmentation, level set algorithm, energy minimisation algorithm

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Applying Hybrid Method for Uncertain Data for Decision Making in Dynamic Environment

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ABSTRACT

Meteorological forecasting is applicable for versatile applications. Accurate weather prediction saves lives, money and time in both local and global area. Forecasting accuracy is still not accurate because of the uncertain (fuzzy) data of nature, due to several reasons including: incomplete data, hand writing error, device error, precision of measurements and discreet description of connective phenomena Inherent part reflecting our understanding of things. On the other hand in global area with large amount of data to process whole the data is time consuming, thus, to improve the quality of data and execution time, we need to manage the uncertainty of data and extract desired data. Therefore the uncertainty management and process the data demand intelligent methods with knowledge based approaches. This paper reviews challenges in this field and compares advantages and drawbacks of the existing methods that essentially are only applicable for local area. Finally we proposed a hybrid technique for new research based on fuzzy c-mean clustering technique and type-2 fuzzy logic that is useable in both local and global area. Finally we show our experiments and prove that hybrid technique performs better than existing weather prediction methods in low error rate.

Keywords: type-2 fuzzy logic system, fuzzy C-Mean clustering, outlier

Fuzzy Integral Approach in Quality Determination for Web-Based Applications

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ABSTRACT

The problem of extracting a global score for the site can be qualified as a multi-criteria decision making problem, where values to be aggregated are gathered in a score table and represent evaluations of alternatives according to various criteria. The different kinds of values have to be aggregated in a complex way to produce a single absolute value. Previously, researchers have developed software quality models that were intended to be comprehensive and applicable to all software development. However, most of the works that focus on the quality model do not reference the aggregation methods used to calculate the values of the different element of the model. Most of the works are mostly dealt with the simplest form of aggregation, which is the weighted sum approach. Since these aggregation operators are not appropriate when interacting criteria are considered, people usually tend to construct independent criteria that had cause some bias effect in evaluation. The purpose of this research is to develop a rigorous evaluation model of WBA and to improve the existing aggregation method by incorporating the interaction phenomena that exist between the dependent quality characteristics in aggregation of the quality measures. We propose the application of the fuzzy integral for criteria aggregation. The relationships conditions are defined based on relationships between criteria to represent the interaction behaviour. The investigation of quality characteristics is conducted by an online survey and statistical approach. The fuzzy measures are defined based on the relationships condition, relative importance and preference. The use of the fuzzy measures in multi-criteria decision-making enables us to model some interaction phenomena existing among the criteria and behaviour of dependent multi-criteria. The approach chosen can represent the real assessment that is able to characterize human subjective decision-making.

Keywords: quality attribute relationships, multi-criteria decision making, fuzzy integral

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Parallel Computation for LUC Cryptosystem on Distributed Memory Multiprocessor Machine

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ABSTRACT

Cryptosystem based on Lucas Function is known as LUC Cryptosystems. Lucas Function is a special form of second order linear recurrence relation using a large public integer as a modulus. We are sure that, an existing computation technique will suffer a huge computations time and spaces when calculating a very large size of public-key and private-key. Recently, a method for fast LUC Cryptosystems computation on single processor has been proposed. In this paper, we extend the method in parallel on distributed memory multiprocessor machine using message-passing interface. We are generating a special sequence from a given value of public-key and private-key. This special sequence will be used to direct the computation of LUC. We examine the parallelism efficiency of the algorithm by analyze the simulation time and speedup.

Keywords: parallel computation, LUC cryptosystem, distributed memory multiprocessor machine

VASD on the Move

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ABSTRACT

VASD is a video content analysis that extracts video contents for efficient access, understanding, browsing, and retrieval of videos. VASD focus on detecting and recognizing human actions. This work discusses the application of an Artificial Intelligence technique called data extraction and a process-based ontology in constructing experimental qualitative models for video retrieval and detection. A framework architecture will be presented in that it uses multimodality features (audio, visual and motion) as the knowledge representation scheme to model the behaviors of a number of human actions in the video scenes. The main focus of this project placed on the design of two main components (model classifier and inference engine) for a tool abbreviated as VASD (Video Action Scene Detector) for retrieving and detecting human actions from video scenes. The discussion starts by presenting the workflow of the retrieving and detection process and the automated model classifier construction logic followed by demonstrating how the constructed classifiers can be used with multimodality features for detecting human actions. Finally, behavioral explanation manifestation is discussed. The simulator is implemented in bilingual; MatLab and C++ are at the backend supplying data and theories while Java handles all front-end GUI and action pattern updating. To simplified, VASD is unique as compared to other research prototypes due to the multimodality features integrated into it. Testing on sample videos shows that VASD able to achieve 90% of precision. VASD has the potential to be used in detecting violent scenes in videos of any censoring boards or authorities. Its advantages include: potential in detecting action scenes in videos, provides efficient assistance for censoring boards and authorities, and proven to provide more than 90% of accuracy.

Keywords: video action detection, multimodal, HMM

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Static Filter Range Selection Algorithm for Peer-to-Peer Network

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ABSTRACT

Selection algorithm has been existed for some time in which it is applied in various computer science areas. In the networking area, it is used to find the shortest path and the closest server in the various network topology and environment, like star, hypercube, peer-to-peer network and parallel computing environment. In this project, a new selection algorithm, which is known as “Static filter range multiple selection algorithm” is proposed. This algorithm is based on the statistical knowledge about the uniform distribution nature of the data and arrange in certain order in the file. A global file with *n* keys is distributed evenly among *p* peers in the peer-to-peer network. The keys in each local file in the peer are sorted in certain order. Without exposing all the local keys of one peer to another, the selection algorithm is able to find the target keys with predefined global rank in the network. The selection algorithm can perform multiple selections concurrently to find multiple target keys with different predefined target ranks. The algorithm used a fixed filter approach in which the algorithm is able to make sure the target key is within certain filter range in each local file. The range is made smaller and smaller as the selection process iterates. After a few rounds, all target keys will be found. The algorithm is able to reduce the number of messages and the number of rounds needed and increase the success rate of all multiple selections in the selection process compared to the previous multiple selection algorithms exist in the literature, which has been claimed to be the best in the peer-to-peer environment.

Keywords: selection algorithms, multiple selection, fixed filter range, peer-to-peer network

3d Facial Recognition for Pose and Expression Variation

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ABSTRACT

Over a decade ago, a new research paradigm for face recognition focused on three-dimensional images. This is because of 3D models hold more information of the face, like surface information, and it is still a challenging and very promising research area. The problem in facial recognition is to find an efficient algorithm that uses less features data but produce better recognition rates. The 3D face recognition algorithms can be divided into 3D appearance based, ‘free form’ based, and ensemble based which is a combination of multiple ‘free form’ techniques. Thus, this research aim to design and develop a novel face detection approach that is less computationally demanding using a ‘free form’ based named 3D local geometric features and improve the accuracy of matching faces with minimum of significant features using a combination of Principal Component Analysis (PCA) and Euclidean classifier. As a result, this research set a benchmark for face detection using a set of key anchor points in the context of face verification. The research focused on recognition of variance of expressions and positions of facial images. Here, an adapted encoding algorithm for the anchor point detection of twelve anchor points have been developed which introduces a simple encoding technique that used less space. Nose tip is detected first, followed by segmenting to obtain upper face and mouth regions. Based on that, seven points have been detected and one of the points is upper nose which will be referred to get the eye region. From this segmented eye region, outer and inner eyes have been detected. After all the twelve points have been obtained, the calculation of the distance error between the ground truth and the automatically determined has been done to measure accuracy of the detection algorithm. Next, fifty-three local geometrical features are extracted to model the face for face recognition based on the distance and angle measurements. The discriminating power using Fisher coefficient has been calculated to get the most significant features. Twenty-four have the most significant and is used for matching. For detection, all the anchor points are based on the measurement on an absolute scale (mm) and the average of median error for eight points is around 5.5 mm. The accuracy of each anchor point is approximately 99% for below 20 mm error. Meanwhile, for matching, the performance is 83% accuracy for a rank-one rate.

Keywords: face recognition, localisation

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Knowledge Management System Framework of Open Source Software Development with Collaborative Environment

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ABSTRACT

The global economy crisis gives the advantages of Open Source Software (OSS). Software developers benefit not only from reduced cost of acquisition, but also access to source code and components. In this aspect, knowledge sharing among developers are immensely important in all facets of System Development Life Cycle (SDLC). Feller and Fitzgerald (2000) raised the critical questions on what life-cycle underpins the OSS model and what is the best methodology to support the OSS as well as what toolkit support OSS methodology. This paper discuss the formulation of Knowledge Management System (KMS) framework for sharing knowledge in OSS using SDLC from the planning phase until the maintenance phase. As initial fact finding, a survey was conducted among selected OSS developers in Malaysia to analyze the current usage and acceptance of OSS. The results, analyzed are quite unexpected, with many OSS developers are still not fully using OSS tools in SDLC stages. As such, initial proposed KMS model designed to enable Community-of-Practice to share the OSS knowledge in SDLC.

Keywords: open source software, knowledge, knowledge management, community of practice, KMS framework

A Voice Control Assisted Surgery System

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ABSTRACT

This system will be used in medical field where, it is a combination of voice and keyboard or mouse control system. It contains the details of doctor, details of nurse, and details of patient. The whole system consists of three parts which are database, image processing and voice control. During surgery, Surgeons sometimes need to navigate through the computer system for more patients' details to get the surgery done successfully in higher possibilities. Constraints happened on the navigation through the computer system due to surgeons unable to manage both computer system and operation at the same time. Hence, this system is developed due to these constraints which are enabling the surgeons to control the system through voice commands. This system is designed to store patients' details in the database, where surgeon can obtain and visualize the medical images of patient in a short period through voice commands. Enlargement, zooming and edge detection can be performed easily through a series of trained voice commands.

Keywords: voice activation, edge detection

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A QoS-Support Mobility Management Approach in Wireless Network

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ABSTRACT

Design of mobility management protocols stands out as an important challenge in integrating wireless networks into the IP-based Internet, especially when such networks are deployed for Real-Time applications. We present a new hierarchical model for intra-domain mobility management with QoS support for the wireless access network. The scheme includes an anchor selection algorithm with QoS support, and efficient techniques for intra-anchor handover, inter-anchor handover, and paging management. In addition to QoS support, the proposed scheme has the advantages of robustness, scalability, load balancing and fast handover. Simulation results of our model indicate that it provides good handover performance in the presence of multiple QoS classes of applications.

Keywords: wireless network, real-time applications, IP-based internet

Anti-inflammatory Action of New Synthetic Compound, 2,6-Bis(2,5-dimethoxybenzyliden) Cyclohexanone, Upon Pro-inflammatory Mediators Expression in RAW264.7 Cells

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ABSTRACT

At present, non-steroidal anti-inflammatory drugs (NSAIDs), steroidal agents and immunosuppressants are used in the treatment of inflammatory disorders. However, these drugs were known to produce various side effects including gastrointestinal disorders, immunodifficiency and humurol disturbances. In our previous results, curcumin a phytochemical isolated from the rhizomes of *Curcuma longa* exhibited promising anti-inflammatory activity. Thus, in this study a series of curcumin-like diarylpentanoid analogues with two identical aromatic ring region separated by five carbon spacers were synthesized and evaluated for their anti-inflammatory action in activated macrophages cell line (RAW264.7). Among these compounds, 2,6-Bis(2,5-dimethoxybenzylidene cyclohexanone (33) exhibited potent nitric oxide (NO) inhibitory effects on IFN-γ/LPS activated RAW264.7 cells. In addition, compound 33 has significantly down regulated the inducible nitric oxide synthase (iNOS) enzyme expression at dose dependant manner. Furthermore, analysis of cyclooxygenase (COX) enzyme in activated RAW 264.7 showed that compound 33 selectively down regulated COX-2 instead of COX-1 expression. These promising results further support that compound 33 can served as alternative anti-inflammatory agents by becoming the main ingredient or lead compound in formulating new pharmaceutical products mainly in treating inflammatory disorder.

Keywords: 2,6-Bis(2,5-dimethoxybenzyliden)cyclohexanone, iNOS, COX, anti-inflammatory

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Expression of a Novel Cold-adapted Protease from Antarctic Psychrophilic Yeast

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ABSTRACT

Psychrophilic basidiomycete yeast was isolated from marine water near Casey Station, Antarctica. It was identified as *Leucosporidium antarcticum* strain PI12 based on the morphological characteristics, metabolic profile and ribosomal RNA identification of 18S rRNA, 26S rRNA and ITS1/ITS2 region. It was shown to be a protease-producer wherein casein hydrolysis on skim milk agar plate was observed. Extracellular protease activity with 1.0 U/mL was secreted at 4°C. Full-length cDNA of the cold-adapted protease (designated as PI12 protease) was successfully amplified by rapid amplification of cDNA ends (RACE) strategy. An open-reading frame of 2892 bp which coded for 963 amino acids was deduced. The gene encoding mature PI12 protease was cloned into *Pichia pastoris* expression vector, pPIC9, which was placed under the control of methanol inducible alcohol oxidase (AOX) promoter. Recombinant PI12 protease was expressed and secreted into the culture medium driven by a *Saccharomyces cerevisiae* α-factor signal sequence with 20.3 U/mL azocaseinase activity after 3 days of induction at 15°C. The expressed protein was detected by SDS-PAGE and activity staining with molecular weight of 99.3 kDa.

Keywords: psychrophilic yeast, RACE, *pichia pastoris*, cold-adapted protease

PCR-based DGGE and FISH Analysis of Methanogens in an Anaerobic Closed Digester Tank for Treating Palm Oil Mill Effluent

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ABSTRACT

16S rRNA-targeted fluorescent in situ hybridisation combined with PCR-cloning, light microscopy using Gram stains, scanning electron microscopy and denatured gradient gel electrophoresis were used to reveal the distribution of methanogens within an anaerobic closed digester tank fed with palm oil mill effluent. For specific detection of methanogens, 16S ribosomal RNA (rRNA)-cloning analysis was conducted followed by RFLP (restriction fragment length polymorphism) for presumptive identification of methanogens. To cover the drawbacks of the PCR-cloning study, the organisation of the microorganisms was visualized in the activated sludge sample by using fluorescent oligonucleotide probes specific to several different methanogens, and a probe for bacteria. In situ hybridisation with methanogen- and bacterial probes and denatured gradient gel electrophoresis within activated sludge clearly confirmed the presence of *Methanosaeta* sp. and *Methanosarcina* sp. cells. *Methanosaeta concilii* was found to be the dominant species in the bioreactor. These results revealed the presence of possibly new strain of *Methanosaeta* in the bioreactor for treating palm oil mill effluent called *Methanosaeta concilii* SamaliEB (Gene bank accession Number: EU580025). In addition, fluorescent hybridisation pictured the close association between the methanogens and bacteria and that the number of methanogens was greater than the number of bacteria.

Keywords: wastewater sludge, DNA extraction, environmental samples, polymerase chain reaction (PCR), denaturing gradient gel electrophoresis (DGGE), fluorescent in situ hybridisation (FISH)

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A Simple Method to Screen for Azo-dye-degrading Bacteria

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ABSTRACT

A stab-culture method was adapted to screen for azo dyes-decolorizing from soil and water samples. Decolorized azo dye in the lower portion of the solid media indicates the presence of anaerobic azo dyes –decolorizing bacteria, while aerobic decolorizing bacteria decolorizes the surface portion of solid media. Of twenty soil samples tested, one soil sample shows positive results for the decolorisation of two azo dyes; Biebrich scarlet (BS) and Direct blue 71 (DB) under anaerobic conditions. A gram negative and oxidase negative bacterial isolate was found to be principal azo dyes degrader. The isolate was identified by using the Biolog™ identification system as *Serratia marcescens*.

Keywords: murraya koenigii, microwave, conventional hydrodistillation, essential oils

A Method for Direct Isolated of High Yield, PCR-Compatible DNA from Environment Samples

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ABSTRACT

Application of molecular techniques has led to the development of new methods to study the unculturable microorganisms in environmental samples. The purpose of this study was to extract DNA from wastewater sludge using nine different methods which are normally used for environmental samples including a procedure used in this study (Tabatabaei, M., Zakaria, M. R., Abdul Rahim, R., Wright, A. D. G., Shirai, Y., Abdullah, N., Shamsara, M., Sakai K., and Hassan M. A., Malaysian Patent PI20082842, 2008) and to compare the results obtained. The quality of the differentially extracted DNAs was subsequently assessed by PCR amplification of methanogenic and eubacterial 16S rDNA and the patented protocol was further evaluated by extracting DNA from various samples, PCR-cloning, DGGE and *FISH* analysis. Our results showed that great differences existed among the nine procedures and only a few gave satisfactory results when applied to wastewater sludge. Thermal shock alone was shown insufficient to disrupt methanogenic cell wall to release the DNA. If DNA purity is of paramount concern, the method presented in this study (Procedure 9) is recommended because of the low concentration of contaminants. If DNA is to be used directly e.g. in DNA-DNA hybridisations, Procedure 2 is recommended since it gives maximal yields. However, if DNA fragmentation is of concern, the methods that produced low fragmentation are recommended. These observations suggested that the extraction method needed to be carefully selected based on the downstream objectives to produce desired results in the detection of specific group of microorganisms from environmental samples.

Keywords: wastewater sludge, DNA extraction, environmental samples, polymerase chain reaction (PCR), denaturing gradient gel electrophoresis (DGGE), fluorescent in situ hybridisation (FISH)

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A Novel Bifunctional Cold Active Lipase with Protease Activity Isolated from Antarctic Microorganism PI12

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ABSTRACT

A unique recombinant bifunctional cold active lipase (LipPI12) with protease activity was successfully purified and characterized. Temperature profile of the bifunctional LipPI12 showed that the lipase functions optimally at 20°C whereas the protease was more active at 40°C. pH profile showed that both LipPI12 lipase and protease were active at near neutral condition. Medium chain length fatty acid (C12) seemed to be the best substrate for LipPI12. Activity of LipPI12 lipase and protease were also activated in the presence of $CaCl_2$ but its protease counterpart seemed to be more active in the presence of other metal ions such as $ZnCl_2$ and $MgCl_2$. Effect of surfactants showed LipPI12 lipase was activated by Tween 80 and SLS and in contrast, LipPI12 protease was almost deactivated in all surfactants tested. Nonetheless LipPI12 protease managed to retain 82% of activity in the presence of Tween 20. The presence of organic solvents did not affect both the lipase and protease activities. The lipase was more stable at solvents with higher log P value whereas the protease was slightly activated at low log P value particularly with dimethylsulfonyl. Inhibitor studies revealed that LipPI12 lipase was partially inhibited with EDTA and PMSF whereby the LipPI12 protease was inhibited by pepstatin and was also partially inhibited by EDTA and PMSF. The findings of unique LipPI12 has led to better understanding of the enzyme as shown from its bifunctional properties. The contrasting figure of LipPI12 lipase and protease reveals greater elucidation on protein structure and function. Thus it is concluded that LipPI12 lipase and protease is a remarkable enzyme which has highlighted potential application in the future.

Keywords: cold active lipase, protease, bifunctional enzyme, biochemical characterisation

Effects of Ultrasonic Irradiation on Raw Rubber Mill Effluent under Different Operating Conditions

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ABSTRACT

Rubber industries are known to generate large quantities of wastewater containing high concentration of organic matter, suspended solids, chemical oxygen demand, biochemical oxygen demand, and nitrogen which is difficult to deal with. The application of ultrasonic waves for wastewater treatment is an area of interesting and promising technology. The aim of this study is to investigate the effects of ultrasonic irradiation in raw rubber mill effluent at different operating conditions namely power density, varying pH, the presence of saturating gas and catalysts under the frequency of 20 kHz. The reactions were carried out at 30^{o}C for 30, 60, 90 and 120 min. The results shows that the presence of saturating gas with ultrasonic irradiation has the highest COD percentage reduction, 61.83 % compared to others operating conditions that have the reduction range from 30.87% to 51.30%. Ultrasonic irradiation is known to be effective method for the rapid destruction of COD in water because of localized high concentrations of oxidizing species such as hydroxyl radical and hydrogen peroxide in solution and high localized temperatures and pressures.

Keywords: rubber wastewater, ultrasonic irradiation, organic pollutant, hydroxyl radical

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Appropriate Technology for Accelerated Composting of Oil Palm Biomass

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ABSTRACT

Malaysia is the largest palm oil producer and exporter in the world. Despite high economic return to the country, the industry also generates large amount of wastes such as oil palm empty fruit bunch (EFB), mesocarp fiber, oil palm frond (OPF), palm oil mill effluent (POME) and POME sludge. Currently the solid wastes are being utilized inefficiently for soil mulching, boiler fuel and incineration and POME is being treated in large open ponding system before discharged. These wastes could be transformed into high value-added product such as biocompost using an advanced biotechnological technique. The composting process utilizes POME anaerobic sludge as nitrogen source and microbial seeding and oil palm biomass as carbon source. The active microbial seeding strategies accelerated the composting process from 100 days to only 40 days, reducing the overall operation cost and avoid the dependency on effective microbes (EM) supplementation. Furthermore, this integrated composting system produced high and consistent quality biocompost in term of nutrients value and beneficial microbes. Based on EFB biocompost, the final matured product has a satisfactory N:P:K content of 2:1:3, considerable amount of nutrients (calcium, magnesium, sulfur, iron, manganese, zinc and copper) and final C/N ratio of 12. In addition, low level of heavy metals was detected in the compost and meeting the USEPA standards. The biocompost could also be fortified with other suitable wastes to increase the nutrient value. For commercilisation, this environmental-friendly technology and know-how to produce biocompost from oil palm biomass could be transferred to the small medium industries in the rural areas for wealth creations and sustainable development.

Keywords: biocompost, biomass, POME sludge

Producing a Software Program for Rapid Evaluation of Buildings and Earthquake Management

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ABSTRACT

Geo Information Technology (GIT) has become increasingly used in different parts of the earth sciences and engineering. In additional, Geographical Information Systems (GIS) plays an important role for data analyzing, quality management and easy accessibility to the data. One of the greatest challenges in this area is evaluation of buildings for the earthquake management. This problem is related to GiT, Civil and industrial engineering domains. Unfortunately, either there has been few works or not an integrated system for management and analyzing data. This research introduces a new integrate system for rapid evaluation of buildings and city planning by combination of GiT, Civil and industrial engineering.

Keywords: geoinformation technology, geographic information system, management

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Recycling and Utilisation of Millscale to Produce Commercial Magnetite and Ferrite

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ABSTRACT

The focus of our research project is to produce pure **magnetite (Fe_3O_4)** and **hematite (Fe_2O_3)** using waste material from the Malaysian steel plants. The pure magnetite is targeted to be a ready commercial product. The pure hematite is to be utilized in making **ferrite** products for the electronics industry. Thus this research project describes briefly the technical and economic/financial aspects of extracting magnetite, a black iron oxide, from steel-mill waste products called **millscale**. It also briefly describes a millscale-to-hematite conversion and the resulting utilisation of hematite in making magnetic ferrite products. Impure magnetite for conversion to iron metal in the steel industry is usually obtained by mining the ore. Pure magnetite has always been produced by synthesis and not for steel industry uses. Its main uses are as black pigments in paints and other media including toners and magnetic inks. Magnetite is also used as the basic catalyst material in the production of ammonia and insulating glass and plastic materials in the construction industry. Recently we have successfully extracted pure magnetite from millscale obtained from some Malaysian steel mills, using a proprietary magnetic separation technique. We have also successfully extracted **wustite** (iron oxide **FeO**) from millscale and converted it into hematite (iron oxide Fe_2O_3). The hematite quality attained is good enough to produce ferrite products for the electronics industry. The methodology consists of 2 branches which start after the extraction process. The millscale is procured from Malaysian steel mills, washed, dried and crushed to micron size powder particles. This powder consists mainly (about 98%) of magnetite, wustite and hematite. It is subject to a proprietary magnetic separation process, yielding pure magnetite, pure wustite and pure hematite. The pure magnetite, having been analysed and characterized by x-ray diffraction and other morphological techniques, by then, has become a saleable product. The remaining mixture of wustite and hematite is converted to hematite alone by heating in air at temperatures between 400°C and 500°C for a few hours. Then the pure hematite is utilized in ferrite making.

Keywords: millscale, magnetite, hematite, ferrite, conversion

A Novel High Rate In-Vessel Composter for Oil Palm Biomass, Organic and Municipal Wastes

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ABSTRACT

This invention is a pioneer design for high-rate closed composter machine for oil palm biomass and also applicable for other organic and municipal wastes. The present invention enhance and expedite the composting process from 3-4 months to only 30-40 days. The system comprises a vertical position cylindrical with conical shape bottom vessel design and equipped with an axial mixing system, feeding and discharge systems, leachate collection system, aeration system and CO_2 removal system. The integration of all features promote conducive environment for the composting process. The vessel design provides for less installation area, effective working volume, eliminates dead zone mixing problems, proper leachate collection and easier product discharge. The top loading feeding system takes full advantages of the gravitational force in distributing the raw materials inside the vessel. The compost product is discharged through the outlet located at the bottom of the vessel by gravity force without any additional removal mechanism. The composter is equipped with a vertical helical screw impeller in order to generate a good axial mixing pattern by conveying the composting materials from bottom to the top and free drop to the side by the gravitational force to complete the mixing process. The impeller design also creates less friction by reducing the mixing load to the impeller that will ensure lower maintenance cost and provides longer lasting of material. The efficient aeration method is achieved by introducing the air by the air blower, material mixing by the impeller and CO_2 removal from the vessel. The accumulated leachate will be either recycled to the vessel or sent to the storage tank. The unique design of the composter allowed it to receive variable volume of input. This will provide flexibility for the system to easily meet the current variable market demand.

Keywords: closed composter, high-rate, vessel design, mixing, feeding and discharge, aeration, helical screw impelle

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A Fast Electromagnetic Solver Using Half-sweep and Quarter-sweep Approaches in Source Free Region

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ABSTRACT

Since its appearance in 1966, the Finite-Difference Time-Domain (FDTD) method has become a very important tool in computational electromagnetic. Recently, there is other formulation, namely the scalar wave-equation finite-difference time-domain (WE-FDTD) , can potentially be used as an electromagnetic solver. Unlike the conventional FDTD, the scalar WE-FDTD allows computing any single field component without the necessity of computing other field components. Therefore, significant savings in the computational time and memory storage can be achieved. In this project, we introduce the techniques known as a half-sweep and a quarter-sweep methods based on the scalar WE-FDTD for solving electromagnetic problems in source free region. The methods are shown to be very much faster and improved the stability requirement of the methods compared to the conventional finite-difference time-domain (FDTD) method.

Keywords: finite difference time domain (FDTD), scalar wave-equation, half-sweep, quarter-sweep

Technique on Simulation for Oil Palm Fruits Maturity Prediction

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ABSTRACT

This paper is to introduce the new method of procedure in study the relationship of the oil extraction rate (OER) for mesocarp with the colour skin of oil palm fruit. The procedure will start after collecting the fruitlets sample from fresh fruit bunches (FFB) at during unripe until overripe stage. The images on three age categories of FFB were captured at monitoring area with setting image parameter. NIKON coolpix4500 digital camera with tele converter zooming device was used to capture the image. With same day after capturing session finish, the fruitlets was pulled from FFB and sent to analyse it oil mesocarp content. The Soxhlet Extractor machine is used to determine the oil content of the fruit based on the experiment of standard bunch analysis procedure. The image will be analysed for optical properties of colour using developed analysis Graphical User Interface (GUI). Using regression analysis of polynomial 2nd order method show the optical property of oil palm fruit was significant in determining the oil mesocarp fruit which respect to it degree of maturity with correlation of equation; Y= -0.0093X2 + 4.3736X - 440.06 and R2= 0.9239 where;Y = Mesocarp oil content , X = Hue value and R2 = Regression Squared respectively. To estimate the days harvesting of FFB, the triangulation method will apply into the data collection from an experiment. The accuracy of developed equation will confirm later by determine the digital value of Hue that generate from KEYENCE camera vision and commercial MPOB colour meter. A commercial color meter will be developed to measure fruit ripeness by using non-destructive technique. The handheld instrumentation will be attach with tele-converter lens and installed with FFB maturity computer program. The user can carry the instrument to the site, capture the image and determine immediately the date for harvest.

Keywords: day estimation for harvesting, digital image processing, hue digital value, maturity prediction, mesocarp oil content, oil palm optical properties, outdoor vision

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DGRSS: Dynamic Geometric Risk Space Software

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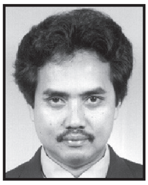
ABSTRACT

In this research, a new dynamic geometric methodology for financial risk measurement was developed for finance, focusing on theoretical bases rather than isolated facts of financial risk management. Subsequently, this study provided the first graphical financial risk ranking software, which provides visualisation of risk factors. This software known as DGRSS:Dynamic Geometric Risk Space Software is ideal for public and private investors, banks, market analysts, companies and stock markets and compatible with any discrete/continuous and country/sector dataset with higher accuracy results.

Keywords: risk factors, graphical financial risk ranking, DGRSS software, geometric approach

The Application of Data Envelopment Analysis (DEA) to Commercial Banks in Malaysia



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ABSTRACT

Performance and the relative efficiency of the banking industry are the important things in our environments. Data Envelopment Analysis is one of the best ways for evaluating the relative efficiency of the decision making units. Along the efficiency the response of the different policies and the future programming are important too, which is related to target setting and resource allocation? In this research we applied a centralized resource allocation model with interval data to the five Commercial Banks in Malaysia. We supposed all the banks units are under supervision of centralized decision maker whose aim is to reduce total inputs and increase total outputs simultaneously which results to solve only one mathematical programming for each phase. In our numerical results we consider each bank as a decision making units to be evaluated with its own inputs and outputs. We also illustrate which bank is more efficient and how the decision maker can allocate the resource for the future programming due to the bank' efficiency.

Keywords: data envelopment analysis, centralised planning, imprecise data, banks

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A Partial Differential Equations with Constant Coefficients and Double Convolutions

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ABSTRACT

The partial differential equations appear in everywhere in all applied sciences where the modeling involved. The PDEs are two categories based on the coefficients, the theory of constant coefficients are well established, however in many applications of partial differential equations the coefficients are not constant, in fact they are a function of two or more independent variables and possible dependent variables. Therefore the analysis described may not be hold globally for variable coefficients equations that we have for the equations having constant variables. How ever in this study we only focus on the PDEs with constant coefficients by applying the integral transform method where we use a new integral transform known as Sumudu transform. First of all, we establish a relationship between double Sumudu transform and double Laplace transform. Then we apply double integral transforms to solve three fundamental equations with constant coefficients, in particular, we also solve three examples by using the same techniques.

Keywords: partial differential equations, convolutions, integral transform

Novel Moment-closure Approximations to Stochastic Epidemic Model and Application to Inference

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ABSTRACT

Moment closure schemes are used to provide analytic approximations to non-linear stochastic models. They often provide insights into model behaviour and help validate simulation results. However, existing closure approximations often fail to predict extinction behaviour of a stochastic process or in situations where the population distribution is highly skewed. Hence, in this study we address these problems by developing the mixture approximation which is applied to the stochastic *SIS* epidemic model. A closure approximation based on mixture distribution is developed in order to capture the behaviour of the stochastic *SIS* model around the threshold between persistence and extinction. This mixture distribution comprises a probability distribution designed to capture the quasi equilibrium probabilities of the system and a probability at 0 which represents the probability of extinction. Two third-order versions of this mixture approximation are considered in which the log-normal and the beta-binomial are used to model the quasi-equilibrium distribution. Comparison with simulation results show that mixture approximations are able to predict transient and extinction behaviour as shown by the stochastic *SIS* model, in marked contrast with existing approaches. In this study we also apply moment closure to inference by constructing a likelihood function based on the mixture approximation which is used to carry out point and interval parameter estimation.

Keywords: moment closure, mixture approximation, stochastic, epidemic, sis, log-normal, beta-binomial

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Front Floor of Natural Gas Vehicle Platform

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ABSTRACT

Petrol and diesel have been the traditional fuel for automotive vehicle. However, strict emission requirement, depleting resources and increasing prices require alternative fuel to be used. Natural gas is a suitable choice. For automotive use, natural gas is stored in tanks and in compressed state. Almost all tanks for compressed natural gas are cylindrical. Therefore vehicle platform designed specifically to accommodate the tanks is needed. The present work is the design and development of front platform for use in the compressed natural gas vehicle (CNGV). It is designed to accommodate at least two compressed natural gas (CNG) tank. The tank is situated underneath and outside the vehicle such that one tank is situated below the front seats. The front platform is designed to withstand crashworthiness requirements similar to the Proton Waja front platform.

Keywords: front platform, natural gas vehicle, crashworthiness, bulged platform

A New Integral Transforms and Differential Equations

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ABSTRACT

Since a differential equation by itself is inherently under-constrained in the absence of initial values as well as boundary conditions. It is also well known that a differential equation along with the initial values or boundary conditions can be represented by an integral equation then by using this integral representation, it becomes possible to solve the problem. However one of the most important achievements and applications of integral transform methods is solving the partial differential equations (PDEs) as well as the ordinary differential equations (ODEs). In the literature there are several works on the theory and applications of integral transforms such as Laplace, Fourier, Mellin, Hankel, to name a few, but very little on the power series transformation such as Sumudu transform, probably because it is little known, and not widely used yet. The Sumudu transform was proposed originally by Watugala. In this project this new integral transform, namely Sumudu transform was used to solve linear ordinary differential equations with and without constant coefficients having with convolution terms.

Keywords: integral transform, convolutions, non-constant coefficients and differential equations

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Curved Cracks Problem in Plane Elasticity

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ABSTRACT

The complex variable function method is used to formulate the multiple curved cracks problem into hypersingular integral equations. The multiple curved cracks are mapped onto straight cracks, yield the hypersingular integral equations for straight cracks, which are equivalent to curved cracks. Here the so-called curved length coordinate method is used. These equations are then solved numerically for the unknown function, which are later used to find the stress intensity factor for the problem considered. Numerical examples for double circular arc cracks are presented. The advantage of the technique used is that less collocation points are needed to archive good accuracy.

Keywords: hypersingular integral equations, multiple curvesd cracks, stress intensity factor

Cohomological Approach to the Classification Problem of Low Dimensional Nilpotent Leibniz Algebras

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ABSTRACT

It is known that there is one to one correspondence between all central extensions of fixed Lie algebra (with k-dimensional centers) by k-dimensional trivial modul and certain orbits in the set of all k-dimensional subspaces in the second cohomology group of this algebra isomorphism classes of all Lie algebras with kdimensional center and without nonzero abelian direct factors and some orbits in the k-Grassmanian of the second cohomology group with trivial coefficients under the action of automorphism group of the Lie algebra. It has been shown that this bijection is a homeomorphism of the corresponding orbit spaces. This approach has permitted to classify nilpotent and solvable Lie algebras of dimensions at most seven. The present paper deals with the Leibniz algebras introduced by J.-L.Loday (1993) . They are non-antisymmetric generalisation of the Lie algebras. We adapt the above mentioned correspondence to nilpotent Leibniz algebras category. As a result we obtain complete classification of nilpotent Leibniz algebras of dimensions at most three.

Keywords: leibniz algebra, nilpotent, central extension

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Two-step Robust Diagnostic Method for Identification of Multiple High Leverage Points

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ABSTRACT

High leverage points, the data far from the other data in the data set, can be defined as outliers in X-direction. In regression analysis, the detection of these leverage points becomes important due to their arbitrary large effects on the estimations as well as multicollinearity problems. As a diagnostic tool for identification of outliers in multivariate analysis, Mahalanobis Distance (MD) has been used to find the distance between normal and abnormal groups of the data. Since computation of MD relies on non-robust classical estimations, the classical MD can hardly detect outliers accurately. As an alternative, Robust MD (RMD) methods such as Minimum Covariance Determinant (MCD) and Minimum Volume Ellipsoid (MVE) estimators have been used to identify the existence of high leverage points in the data set. However, these methods tend to swamp some low leverage points even though they can identify high leverage points correctly. In this study, we proposed a relatively new two-step method for detection of high leverage points by utilizing the RMD (MVE) and RMD (MCD) to identify the suspected outlier points in the first step In the second step the MD is used based on the mean and covariance of the clean data set. This Two-Step Robust Diagnostic Mahalanobis Distance ($RDMD^{TS}$) can identify high leverage points correctly and also swamps less low leverage points. The existing diagnostic tools do not have this nice property.

Keywords: multicollinearity, high leverage points, robust mahalanobis distance

Gradient-type Methods without Line Search for Large-scale Unconstrained Optimisation

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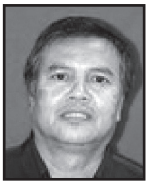

ABSTRACT

One of the first and well known method for unconstrained optimisation is the steepest descent method, designed by Cauchy early in 1847, in which the negative gradient direction is used to find local minimizers of a differentiable function. The method proved to be effective for very well conditioned functions, but for poorly conditioned functions the method is excessively slow, thus hardly mentioned in a modern practice on optimisation, even though the storage requirements are minimal ($3n$ locations for n-dimensional problems). In 1988, a paper by Barzilai and Borwein proposed a steepest descent method (the BB method) that uses a different strategy for choosing the steplength. The main advantage of the BB method is that for $n = 2$, the method converges R-superlinearly and is considerably superior to the classical steepest descent method for one instance of a quadratic function. However, Barzilai and Borwein gave neither numerical nor theoretical results beyond quadratic case and the method attracted little attention. In this research, we present a new gradient-type method for solving large-scale unconstrained nonconvex optimisation problems. The proposed method is a kind of fixed step gradient-type method like that of Barzilai-Borwein method. In contrast with the Barzilai and Borwein approach's in which the stepsize is computed by means of a simple approximation of the Hessian in the form of scalar multiple of identity, the proposed method considers approximation of the Hessian in diagonal matrix form based on the modified weak secant equation. A remarkable feature of the proposed method is that it possesses a global convergence property for nonconvex minimisation even without any line searches to ensure descent in the objective function. Numerical experiments also show that the proposed method seems to converge more stably and is superior to Barzilai-Borwein.

Keywords: large-scale unconstrained optimisation, gradient method, barzilai-borwein method, line search

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The New Variable-Length Key Symmetric Cryptosystem

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ABSTRACT

In this study, we proposed a new 64-bit block cipher that accepted a variable-length key up to 512 bits, which is suitable for implementation in a variety of environments. The cipher algorithm is a 16-round Feistel network with a bijective function f and is made up of two key-dependent 16×16 S-boxes, bitwise rotations, and a carefully designed key schedule. The block cipher, what we called NBC08, was designed to perform under the powerful operations supported in today's computers, resulting in an improved security/performance tradeoff over existing block ciphers. The study concluded the differential, linear and algebraic cryptanalysis on the NBC08 and showed that the cipher cannot be analyzed by any cryptanalytic attack. The statistical test results for NBC08 did not indicate a deviation from random behavior.

Keywords: block ciphers, feistel structure, key dependent s-boxes, attacks

A Robust Rescaled Moment Test for Normality in Regression

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ABSTRACT

Most of the statistical procedures heavily depend on normality assumption of observations. In regression, we assume that the random disturbances are normally distributed. Since the disturbances are unobserved, normalitytests are done on regression residuals. But it is now evident that normality tests on residuals suffer from superimposed normality and often possess very poor power. This study showed that normality tests suffer huge set back in thepresence of outliers. We proposed a new robust omnibus test based on rescaled moments and coefficients of skewness and kurtosis of residuals that we call robust rescaled moment test. Numerical examples and Monte Carlo simulations showed that this proposed test performs better than the existing tests for normality in the presence of outliers. We recommend using our proposed omnibus test instead of the existing tests for checking the normality of the regression residuals.

Keywords: regression residuals, outlier, rescaled moments, skewness, kurtosis, jarque-bera test, robust rescaled moment test

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An Accelerated Over-relaxation Quarter-sweep Point Iterative Method: A Fast Poisson Solver

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ABSTRACT

Iterative methods, particularly over-relaxation methods, are efficiently and frequently used to solve large systems of linear equations, because in the solutions of partial differential equations, these methods are applied to systems which are resulted from different iterative schemes to discrete equations. In this paper we formulate an accelerated over-relaxation (AOR) method with the quarter-sweep iterative scheme applied to the Poisson equation. One feature of the method is the AOR technique of the method, which involves two relaxation parameters, which allow flexible management of convergence. Another feature is the quarter-sweep approach, which reduces the computational effort up to 25% and increases the convergence rate, while producing satisfiable results. To benchmark the new method we conducted experiments by comparing it with the previous AOR methods based on full- and half-sweep iterative schemes. The results of the experiments and the estimation of the computational complexity of the methods proved the superiority of the new method. Thus, it has been proven as a fast Poisson-solver. The Poisson solver can be used as a fast and efficient tool for solving stationary problems, which arise in scientific and engineering applications.

Keywords: accelerated over-relaxation, point-iterative method, quarter-sweep approach, Poisson equation

Linear Regression Model Selection based on Robust Bootstrapping Technique

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ABSTRACT

Bootstrap approach has introduced new advancement in modeling and model evaluation. It is a computer intensive method that can replace theoretical formulation with extensive use of computer. The Ordinary Least Squares (OLS) method is often use to estimate the parameters of the regression models in the bootstrap procedure. Unfortunately, many statistics practitioners are not aware of the fact that the OLS method can be adversely affected by the existence of outliers. As an alternative, a robust method is put forward to overcome this problem. The existence of outliers in the original sample may create problem to the classical bootstrapping estimates. There is a possibility that the bootstrap samples may contain more outliers than the original dataset, since the bootstrap re-sampling is with replacement. Consequently, the outliers will have an unduly effect on the classical bootstrap mean and standard deviation. We propose to use a robust bootstrapping method which is less sensitive to outliers. In the robust bootstrapping procedure, we propose to replace the classical bootstrap mean and standard deviation with robust location and robust scale estimates. A number of numerical examples are carried out to assess the performance of the proposed method. The results suggest that the robust bootstrap method is more efficient than the classical bootstrap.

Keywords: bootstrap, outliers, robust location, robust standard deviation

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On Low-dimensional Lie–like Filiform Liebniz Algebras and their Invariants

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ABSTRACT

This paper deals with low-dimensional Lie-like truncated filiform Leibniz algebras and their classification in dimensions 5-9. There are two sources to get classification of filiform Leibniz algebras. The first of them is naturally graded non-Lie filiform Leibniz algebras and another one is the naturally graded filiform Lie algebras. Here we consider a subclass of Leibniz algebras appearing from the naturally graded filiform Lie algebras. The case of filiform Leibniz algebras arising from non-Lie filiform Leibniz algebras was studied in [1],[2],[4] ,[5]and [6]. The theoretical base and the motivation to study of filiform Leibniz algebras appearing from the naturally graded filiform Lie algebras has been given in [3]. We give Isomorphism criteria and the list of algebras in this case. In parametric family cases give the corresponding invariants to distinguish the orbits.

Keywords: lie algebra, filiform leibniz algebra, isomorphism, invariant

Suitability of *Kenaf* as Raw Material for Particleboard

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ABSTRACT

Kenaf (*Hibiscus cannabinus*) has recently been introduced to the Malaysian bio-composite industry. Based on their basic properties, both the bast fibres and core material of kenaf are distinctly different. While bast fibres are stiffer and low in wettability, the core material of kenaf is weaker and has excellent absorbing properties. This study evaluated the properties of kenaf board made from a combination of bast fibres and core material. The bast fibres were separated first from the core, followed by pre-treatment with NaOH, then combing until the fibres became loose. The properties of kenaf board were tested using MS standards 1787: 2005. An analysis of variance was carried out to study the effects of resin types and bast to core proportion on the boards. The buffering capacity study revealed that kenaf bast, kenaf core and rubberwood behaved similarly in alkali but differently in an acidic condition. Both the kenaf bast and core were relatively less stable in acid compared with rubberwood. Due to its morphological characteristics, the kenaf core inner surface exhibited higher wettability than the outer surface.The mechanical properties [modulus of elasticity (MOE), modulus of rupture (MOR), internal bond (IB)] of the boards were significantly influenced by the amount of bast fibre in the board—the higher the amount, the poorer the strengths. This effect, however, was reversed for thickness swelling (TS). Only UF-bonded kenaf-based boards had comparable water absorption (WA) property to that of the control (100% rubberwood). The best performance was given by boards made from 100% kenaf core irrespective of the type of resin used. All kenaf boards in this study had higher MOR than that of 100% rubberwood.

Keywords: *Kenaf*, bast, core, particleboard, bonding

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Numerical Solution of Infinite Boundary Integral Equation by Using Galerkin Method with Laguerre Polynomials

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ABSTRACT

In this paper the exact solution of infinite boundary integral equation (IBIE) of the second kind with degenerate kernel is presented. Moreover Galerkin with Lagger polynomial is applied to get the approximate solution of IBIE. Numerical examples are given to show the validity of the method presented.

Keywords: approximation, galerkin method , integral equations, laguerre polynomial

A 5(4) Pair Explicit Runge-Kutta-Nyström Method for Solving Oscillatory Problems

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ABSTRACT

A new 5(4) pair embedded explicit Runge-Kutta-Nyström method is developed to integrate second-order differential equations of the form $y'' = f(x, y)$ where the solution is oscillatory. The embedded formula has dispersive order eight and dissipative order three for the fifth-order 5(4) pair. The 5(4) pair cost four function evaluations at each step of integration. Numerical comparisons with current methods such as DOPRI5, RKN5(4)D and RKN5(4)B show the efficiency of the new method developed.

Keywords: runge-kutta-nyström methods, Phase-lag, oscillatory solutions

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MALDI – TOF Mass Spectrometry of *Acacia mangium* Polyflavonoid Tannins

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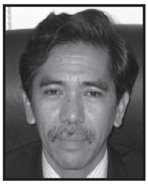
ABSTRACT

Matrix–assisted laser desorption/ionisation time of flight mass spectrometry (MALDI- TOF) and ^{13}C nuclear magnetic resonance (NMR) spectroscopic technique were used to characterize polyflavonoid tannin from bark extracts of *Acacia mangium*. The bark samples were collected from processing mills in three different malaysian sites. The tannin was extracted from the bark at reflux in water (1:6w/v) at 75°C for 3hr. The MALDI-TOF mass spectra showed a series of peaks corresponding to oligomers of condensed tannin of up to twelve flavonoid units (3500 Da). *Acacia mangium* condensed tannins were found to consist predominantly of pronobinetinidin combined with profisetinidin and prodelphinidin. Both the ^{13}C Nuclear Magnetic Resonance (NMR) and the MALDI mass spectra indicated that the *Acacia mangium* tannins obtained from two of the locations, namely Lembah Beringin and Tawau, included "angular" polymer structures in oligomers of up to 7 flavonoid units. On the other hand, *Acacia mangium* tannin that was obtained from the third location (Kudat) had an almost completely linear structure. The spectra also indicated that *Acacia mangium* tannins are more heavily branched and have higher degree of polymerisation (DP = 7.2) compared to commercial mimosa tannin (4.9) from *Acacia mearnsii*. Angular tannin oligomers of such a high degree of polymersation have not been observed in other previous studies of condensed tannins.

Keywords: MALDI, polyflavonoid, tannin, structure, nmr, polymer

Isolation of New Class of Materials to Produce *Kenaf* Nanocellulose and Nanocomposite



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ABSTRACT

Kenaf *(Hibiscus cannabinus)* nanofibers were isolated from unbleached and bleached pulp by a combination of chemical and mechanical treatments. The chemical methods were based on NaOH-AQ (anthraquinone) and three-stage bleaching (DEpD) processes, whereas the mechanical techniques involved refining, cryo-crushing and high-pressure homogenisation. The size and morphology of the obtained fibers were characterized by environmental scanning electron microscopy (ESEM) and transmission electron microscopy (TEM), and the studies showed that the isolated nanofibers from unbleached and bleached pulp had diameters between 10-90 nm, while their length was in the micrometer range. Fourier transform infrared (FTIR) spectroscopy demonstrated that the content of lignin and hemicellulose decreased in the pulping process and that lignin was almost completely removed during bleaching. Moreover, thermogravimetric analysis (TGA) indicated that both pulp types as well as the nanofibers displayed a superior thermal stability as compared to the raw kenaf. Finally, X-ray analyses showed that the chemo-mechanical treatments altered the crystallinity of the pulp and the nanofibers: the bleached pulp had a higher crystallinity than its unbleached counterpart, and the bleached nanofibers presented the highest crystallinity of all the investigated materials.

Keywords: *Kenaf* bast, nanofiber, bleached pulp, unbleached pulp, thermal properties, crystallinity, microstructure

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Development of Parallel-functioned Multiple Crystalliser in Uses of Habit and Morphology Study on the Palm-based 9,10-Dihydroxystearic Acid (DHSA) Crystals

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ABSTRACT

A parallel functioned multiple crystallisation unit was designed with a process tank that had the capacity to hold in place twelve 600ml, three-inch outer diameter beakers which would act as the vessels where twelve crystallisation processes would take place simultaneously. The unit is used to to study the crystals of Dihydroxystearic acid (DHSA) produced under different crystallisation conditions. DHSA and its derivatives are hydroxyl fatty acids suitable to be used as multipurpose intermediates in the synthesis of personal care products and decorative cosmetics. In Malaysia, DHSA has been successfully produced frompalm-based oleic acid, via epoxidation with per-formic acid followed with hydrolysis of the epoxide. The crystal habit and morphologywere observed in terms of scanning electron microscopy (SEM) and X-ray diffraction (XRD). Results show that solvent type, solvent concentration and cooling mode affect the crystal habit but not the morphology. The DHSA crystals agglomerated into either sphere-like or plate-like habit structure while always maintaining the triclinic crystal system.

Keywords: parallel functioned multiple crystalliser, DHSA, crystal structure, crystallisation, scanning electron microscopy

Impact of Personal Qualities and Management Skills of Entrepreneurs on Venture Performance in Malaysia: Opportunity Recognition Skills as a Mediating Factor

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ABSTRACT

This research studied the role of personal qualities, management skills, and opportunity recognition skills of entrepreneurs in influencing the venture performance. In this research, personal qualities and management skills were combined into a single construct, qualities-skills. Specifically, this research explored and argued the role of opportunity recognition skills as a mediator between qualities-skills and three measures of venture performance. Additionally, the research addressed the specific components of opportunity recognition skills that had the mediating effect. The study was carried out in Malaysia, a fast developing country in South-East Asia. A questionnaire was designed and sent to 1275 small and medium enterprises (SMEs). The results indicated the following: (1) opportunity recognition skills acted as a ‘‘pure’’ mediator, (2) opportunity recognition skills influenced the venture performance, (3) alertness mediated the relationship between personal qualities and venture performance, and (4) alertness and prior knowledge mediated the relationship between management skills and venture performance. Sales volume, sales growth, and stability in profit were used as measures of venture performance.

Keywords: opportunity recognition skills, personality skills, management skills, Malaysia, mediating

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Green Composites: Effect of Electron Beam Irradiation and Poly (Vinyl Pyrrolidone)

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ABSTRACT

New biodegradable composites or green composites have been developed by melt blending technique using polycaprolactone, PCL and oil palm empty fruit bunch fiber (OPEFB) to overcome the growing problem of plastic waste. However the hydrophilic nature of oil palm empty fruit bunch fiber (natural fiber) affects negatively its adhesion to hydrophobic polymer matrix, thus, poly(vinyl pyrrolidone), PVP was used as a binder to improve the interaction between PCL and OPEFB. The mechanical properties of the composites were improved by irradiating using electron beam. The ratio of 40:60 OPEFB/PCL with the addition of 1% by weight of PVP and irradiated at 10 kGy of electron beam produced green composites with optimum tensile, flexural and impacts strengths. The shifting of C=O peaks from 1730 to 1732 cm^{-1} proves the interaction of C=O in the PCL with the O-H from the OPEFB. The SEM micrographs of the fracture surface of tensile test also indicate good adhesion between OPEFB and PCL.

Keywords: polymer composites, biodegradable polymers, mechanical properties

Polyolefin Films Modified with Crude Palm Oil (CPO) for Improved Mechanical Properties

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ABSTRACT

The influence of small amount of crude palm oil (CPO) content on the physical properties of high density polyethylene (HDPE) and linear low-density polyethylene (LLDPE) was investigated. The HDPE and LLDPE containing 2%, 3%, and 5% CPO were prepared in a twin-screw extruder. Then films of 0.2mm thickness were produced by using blown film technique. The improvement in tensile strength and elongation at break with a concurrent decline in density implied the enhancement in toughness of the polymers by the addition of CPO. A gradual increase in impact strength of HDPE with the CPO content further supported the previous notation. The enhancement in the physical properties in the presence of CPO is believed to be attributed to the increased chain mobility of the polymer along with improved orientation strengthening in HDPE and LLDPE. Evidence from scanning electron micrographs was also used to support this contention. The decline in impact strength of LLDPE with the addition of CPO is d with the formation of defects in the amorphous phase of LLDPE.

Keywords: polyolefin film, CPO, mechanical properties, elongation

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Performance Measures and Metrics for E-Supply Chains

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ABSTRACT

Purpose – e-Supply chains are fast becoming a reality. In order to manage such supply chains efficiently and effectively, traditional measures of supply chain performance are not adequate. The literature search revealed lack of measures and metrics for e-supply chains. The purpose of this paper is to develop new measures and metrics for monitoring the performance of e-supply chains.
Design/methodology/approach – A framework based on the benefits of e-supply chains has been used to develop the metrics and measures. The study makes use of focus group discussion by assembling eight experts and practitioners in the field of e-supply chain to come up with the measures and metrics. A questionnaire is designed with these measures and metrics and is sent to about 300 electronic component manufacturing companies in Malaysia to obtain feedback from the industry practitioners. Appropriate reliability and validity tests are conducted to measure the reliability of the instrument and validity of the constructs.
Findings – Through the focus group discussion, this study identifies six metrics and 21 measures. Further validation through the industry practitioners, reveals that these measures are important and some are in use by the industries. The six metrics are: web-enabled service, data reliability, time and cost, e-response, invoice presentation and payment and e-document management metrics. Originality/value – The study uses a simple framework and a sound methodology to develop new measures and metrics that are relevant for e-supply chains.

Keywords: supply chain management, performance measures, e-business, focus group, Malaysia