Synthesis

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Towards World-class University —

What does it take to be a prestigious research Institute?

"Adequate expertise, funding and infrastructure are the three mandatory prerequisites that any research centre should have in order to reach the unprecedented heights of research excellence",— Professor Dr. Fatimah Md. Yusoff, Director, Institute of Bioscience, UPM

Since the formation of the Institute of Bioscience (IBS) about 10 years ago, the Institute has been propelled by the power of dreams to be a world class research centre. 'Towards World Class University' has been a common slogan for many of us for the past few years. Now it is quite clear to us that we have quite a long way to go to get there. The fact that Institutions of Higher Learning in the country are working at 25% of the world's class standard, translates that we have to jump by leaps and bounds to be at par with other world class institutions. Getting there is not impossible. However, unwavering persistence, stanch determination and sincere sacrifices are needed from all quarters to score this goal. The rules of the game are very clear before us. We know the answers to the great overarching question of 'what does it take to be a prestigious research institute?'

Adequate expertise, funding and infrastructure are the three mandatory prerequisites that any research centre should have in order to reach the unprecedented heights of research excellence. However, we should not expect all those items to be delivered to us on a silver platter. Each one of us has to be motivated and driven by a sense of mission to contribute to the successful implementation of our strategic research plans. If each of us takes the challenge to be the best scientist and the best team player, I believe we will grow from strength to strength. In spite of the fact that University tries hard to support the Institute to pursue research activities, there seems to be several unending shortcomings. However, there are successful individuals who can perform in spite of all the odds. In IBS, we have many scientists who illustrate these wonderful traits. These individuals have the passion, commitment and burning desire to achieve their goals. After all, as Mr. Soichiro Honda once said 'success is 99% failure'.

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New Materials for our Industries:

PANGIUM EDULE REINW. (Kepayang) – Any Takers for Development of Products?

I. Faridah-Hanum, Nik Idris, N.Y. and Jack Liam

Pangium edule Reinw. or locally known as *'kepayang, pangi* or *keluak'*, is monotypic and belongs to the family Flacourtiaceae (Figure 1). They can reach heights of up to 40m, and is found in the wild or is more commonly cultivated especially in villages in Sabah and Sarawak. The boles are straight and often reach a diameter of 1 m, *kepayang* offers good timber source to the locals. The seeds contain high quality oil which has been used for cooking for decades even in areas where coconut is plentiful. The investigation into *P. edule* was initiated following the observation of the wide use of its seeds as a preservative for meat and fish throughout the *Dusun* community in Sabah, and the widely used oil from the seeds for cooking in Sarawak. Many fieldworks were carried

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Editorial

Indicators of Research University Performance

Publishing quality research findings is, of course, one of the significant sources of the institution's strength as a competitive academic enterprise

Universiti Putra Malaysia (UPM) is one of the designated research universities and is renowned for its broad spectrum of research. During the 8th Malaysian Plan (2001-2005), UPM received more than RM256 million in research funding from various government agencies, private sector partners and international bodies. Productivity in research is bound to be measured by the extent to which the individual researchers have succeeded in publishing their work in journals. Publication is the principal means to communicate and disseminate new ideas and findings among researchers, which ultimately leads to the advancement of knowledge. It is also widely acknowledged as the yardstick for gauging the reputation of an individual researcher. Publishing is considered by many as the first step towards establishing ourselves as experts in our fields. When scientists conduct an experiment and analyze the results, the next step is to write a report that describes the experiment and the results, and submit it for publication in a scientific journal that is "peer-reviewed." Peer-review means that the paper is examined and scrutinized by fellow scientists, who evaluate the methods used and identify any potential flaws in logic or methodology that may shed doubt on the findings. Publishing results of research projects in peer-reviewed journals enables the scientific community to evaluate the findings themselves. It also provides instructions so that other researchers can repeat the experiment or build on it to verify and confirm the results. Researchers' publication records therefore carry a great deal of weight when they apply for academic posts or research grants, and build their reputation in the scientific community.

In 2002, Malaysia's share of published papers totalled up to 10,583 or 0.08% of the world's output. This placed our country in the 55th position, among 178 nations, together with Kenya, Iran and Slovenia (MOSTI, 2004). Based on the Evaluation of R&D Projects funded under the IRPA during the 7th Malaysian Plan programme, proceedings were the favoured type of publications produced in each sector with an overall average of 5.59 publications/project. The average number of publications per project in citation index, both internationally and nationally refereed journals was 1.38, 1.23 and 1.67, respectively. According to the Research University data for 2005, UPM published 238 articles in citation index journals, 463 in non-citation index journals, 104 technical papers, 87 chapters in books, and 102 other publications (including conferences proceedings). In the evaluation of the 7th Malaysian Plan IRPA (MOSTI, 2006), the lower number of publications in journals as compared to conference proceedings was attributed to several factors. First, the process of publishing in proceedings is relatively less stringent as the articles are usually not peer- reviewed. Second, new research findings can be disseminated to interested parties within a shorter period through proceedings. Another issue is the cost of publication is high in cited international journals. The page charges for publishing in some high-impact factor journals can be as high as RM4,000 – 5,000. However, this issue has been addressed in UPM, whereby the University has allocated RM200,000 to assist the researchers in covering their cost of publications therefore encouraging them to publish their research findings in international journals. There is also a fear of rejection from the editorial board of "flagship" journals for being unable to meet the required standards.

Many doctoral and master theses are valuable and interesting source of knowledge, but these are rarely read. Hence, the Research Management Centre will be given the task to co-ordinate writing retreats or workshops to facilitate researchers in preparing articles from the theses of their graduated students for submission to quality journals. It is envisaged that more high quality journal publications can be produced from such programmes in line with University's vision of being a top-ranking research university in the country, and beyond.

UPM as a successful research university must have a constant, continuing commitment to competition supported by measurable indicators of comparative performance. As such, additional research publications will look at the process of change over the past decade that has produced an eminent structure of research at UPM thus far.

Executive Editors
zulkifli@agri.upm.edu.my

Spotlight

Web Presence & Development

Your web content and design must communicate the branding or unique market position immediately. Upon visiting your site, the visitors should know immediately whether this site has the information, products or web functions they are looking for. Otherwise they may not stay long or return to your site.

The content of your site depends on your positioning, audience and objectives. Regardless of the market position of your institution or service, the site must include content that accomplishes the following objectives:

- Communicate the market positioning or branding;
- Prove or support the market positioning;
- Give visitors useful information related to your business;
- Provide content that is interesting to the audience;
- Enable and encourage visitors to ask questions, make comments and contact you.

Back-Linking Strategies

It's no secret that getting other websites to link to yours (reciprocal linking) is an important part of your website development and Search Engine Optimization. Steady, strategic link building can help you, not only maintaining your website traffic, but also increase it significantly as well.

However, when adding back links to your website be aware of a few things. It's about quality, not just quantity. Having thousands of random websites pointing a link to you might not always be a good thing. If your link comes from a page with hundreds of links on it, the search engines may deem it a link farm and it will not help you at all, and may even harm you in some cases.

Search engines prefer a link to your website from a website where the page content is relevant to yours. For instance, if you have a website that mainly promotes research, you do not want to have a link from a website about entertainment news in the Antarctica! Your link will not likely be seen as relevant to the visitor of an educational and research institution, and search engines will also view this linking as non-relevant. Non-relevant links may not hurt you in any way, but they will also not be an effective use of 'real estate', in that they will not be considered as important as relevant links.

On the dark side, if you are linked to sites that send spam, are scams, or use black hat techniques, the search engines may 'paint you with the same brush', and/or realize you must not know who exactly you are linked with. It is best therefore; to check who your link partners are by visiting the sites to be sure they are what they say they are. Of course it would be difficult to know everything about them, but just try to see the obvious. If you are not doing indiscriminate (massive) linking, it may be a benefit to actually look them up by "*Googling*" them and just see if there are any negative comments.

You can get back links to your website using a number of different methods: Writing product reviews that allow you to post your URL; Writing articles and submitting them with your website link in your resource box; Submitting your website to directories; Submitting your website to classified ad sites; Posting in forums with your website URL in your signature; Responding to blog postings in niche forums; Ask for a link exchange with other relevant websites personally (ideal).

Building steady and strategic back links to your website can benefit you in a number of ways, in particular: Get your website indexed and crawled by search engines; Increase your overall search engine position for keywords or phrases due to higher PR; Increase your visitors from strategic placement of your website link; Possibly also increase brand awareness for your name or business entity.

If done properly, building back links can greatly increase your website traffic. Just do a little at a time and you may be surprised with the results over a short period of time. There are even companies and software programs out there that will help you build your back links if you have the luxury of an operating budget. Start getting back links to your website today!

Managing Editor
ndeeps@admin.upm.edu.my

NMFerit™: Formulation-Tailoring of the Ni-Mg-Ca-Co-Cu-Zn-Fe Ferrite System to Attain Extremely Low Magnetic-Energy Loss for High-Frequency Application

Award*Winner*

Noorhana Yahya, Mansor Hashim, Beh Hoe Guan, Mohd Hashim Mohd Saad, Mohd Shamsul Ezzad Shafie and Raba'ah Syahidah Azis

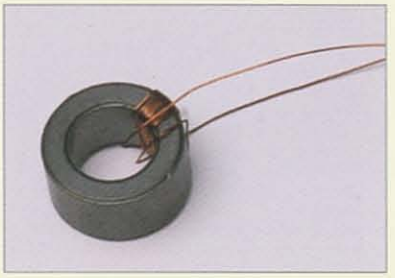
This work is our response to the demand for miniaturization of electronic circuits and the shift to higher operating frequencies. Development of high-density and low-magnetic-energy loss in the $Ni_{0.76-x}Mg_{0.04+x}Ca_{0.005}Co_{0.1}Cu_{0.075}Zn_{0.04}Fe_{1.96}O_{3.96}$ system, where x=0.01, 0.02, 0.03 and 0.04, was done. Conventional ceramic processing technique based on solid-state chemical reactions was employed. Low-grade production oxide powders (~99.4%) were used. The microstructure was tailored using CuO as sintering aid. The formulation employed the Co^{2+} to broaden the operating frequency in the MHz region, Mg^{2+} to increase the electrical resistivity and the Ca^{2+} to neutralize the presence of SiO_2, thus blocking the intergranular eddy currents hopping.

The air sintered (1140°C) material showed fine-grain microstructure (~2.3μm). It was found that increasing MgO concentration led to increased relative loss factor (RLF) but resistivity was decreased.

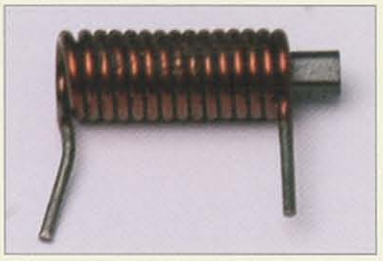
This new material, named N1M1 was compared to the existing antennae in the current market, K8, manufactured by TDK. N1M1 is currently pending for approval for trade mark under "NMFerit" name with application number 05-002215.

NMFerit EMI Rods (Sample %201)

NMFerit EMI Sleeves (Sample %202)



NMFerit Toroidal Inductor (Sample %203)



NMFerit RF Choke (Sample %204)

GOLD – *IPTA R&D Expo 2006.*

Reader Enquiry

Department of Physics
Faculty of Science
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: 603-8946 6675
E-mail: noorhana@science.upm.edu.my

■ *From Page One*

Ranking of the world universities by The Times Higher Education Supplement (THES) is a blessing to us. To improve the positions of our universities in the world ranking, the Government has to take drastic measures to accelerate research activities in IPTAs. Thus, the recognition of UPM as a Research University by the Ministry of Higher Education Malaysia (KPTM) marks another major milestone in our mission to be a world class university. In IBS, research strength that has been developed for the last one decade provides a stable research platform that is ready to move forward with the Research University agenda. Advances in high impact publications, production of high quality products, net-working and linkages with world class institutions, establishments of internationally competitive research facilities, and increase of research funding have enhanced our research profile, and these efforts will be intensified until we can achieve 100% of the world's research university standards.

In IBS, the five laboratories; Laboratory of Natural Products, Laboratory of Molecular Biomedicine, Laboratory of Cancer Research UPM-MAKNA, Laboratory of Industrial Biotechnology, and Laboratory of Marine Science and Aquaculture are poised to take our focused research programmes to their pinnacles. All the heads, coordinators, research associates and research/science officers are working in harmony, making great strides to give new meanings to our research activities. Our scientific endeavours closely address our societal needs which are unique to our country. In our quest to be in the frontiers of knowledge and wealth creation, it is not only to satisfy the scientific curiosity, but also to plan and chart the course of our societal responsibilities for the progress of our people and protecting the interest of our future generations. Our laboratory outputs are not only to be published in flagship journals and won many accolades and medals, but also to make a difference to our local industries. Hopefully we will continue to make valuable contributions with long lasting effects.

The Adoption of Econet: The Internet-Based Malaysian Ecotourism Network and Site Rating Expert System

Husaini Omar

Award Winner

The environment is the backbone of tourism products. Profitability in tourism depends on maintaining the attractiveness of tourist destinations with pleasant environment.

Malaysia is a tropical country that is rich in a variety of ecological resources with a high tourism potential. Hence, the condition of the environment plays a critical role if the industry is to be sustained for future generations. The concept of ecotourism emphasises the sites that have potential for ecological interest. Although the ecotourism industry in Malaysia has vast potential for further development, it has not received adequate attention. All ecotourism sites must be planned, guided and developed in a monitored and controlled manner for effective and efficient management.

A systematic expert rating system is developed to maintain a certain level of standard based on different levels of categorisation to ensure the sustainability of ecotourism sites in Peninsular Malaysia.

SILVER –*British Invention Show (BIS2005).*

Reader Enquiry

Department of Civil Engineering
Faculty of Engineering
Universiti Putra Malaysia Serdang, Selangor
43400 UPM,
Malaysia

Tel: 603-8946 7581
E-mail: husaini@eng.upm.edu.my

New Materials for our Industries: *PANGIUM EDULE REINW....*

■ *From Page One*

out throughout Malaysia to collect samples for detail morphological studies and preliminary determination of chemical components from the seeds of this species. This research was supported by the International Foundation of Science, Sweden (Grant No. 63401 - Multidisciplinary Studies on *Pangium edule*).

Figure 1: Specimens of Pangium edule leaf, fruit and seed

During the numerous fieldworks, two distinct variants of *Pangium edule* with respect to fruits and seeds morphology were observed. The typical *P. edule* (*kepayang lenga, kepayang* and *payang*) is distributed widely in Sabah, Sarawak and Peninsular Malaysia but its variants *kepayang papan* and *kepayang bubur* have been found in Sarawak. While the fruits of *kepayang papan* are nearly globular, the seeds are similar to those of *kepayang lenga* in both their shape and size. However, the fruits of *kepayang bubur* are smaller and ellipsoidal and the seeds are relatively smaller as well (Figure 2).

Three components from the seeds namely, Hexadecanoic acid (=Palmitic acid), Heptadecene-(8)-Carbonic acid and 9,12-Octadecedienoic acid (=Linoleic acid) were identified. Samples subjected to Brine Shrimp Lethality Bioassay showed that the samples were not toxic.

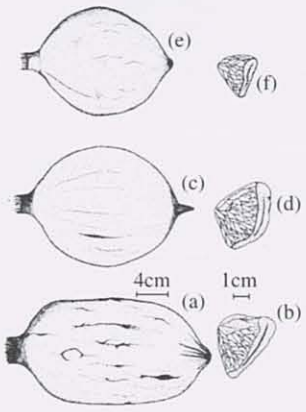


Figure 2: Morphology of fruits and seeds of Pangium edule. (a-b, kepayang lenga; c-d, kepayang papan; e-f, kepayang bubur)

Hexadecanoic acid

Hexadecanoic acid or palmitic acid has been reported to be present in almost every vegetable and animal fat. Industrially, palmitic acid is used principally in the form of commercial stearic acid which is a mixture of stearic and palmitic acids, containing 55% of the latter. In commercial pure form, it has a variety of applications, including the preparation of esters, metallic salts, palmityl, alcohol, amides, nitriles, amines, and quarternary of ammonium salts. The acid or its derivatives find the use in the manufacture of synthetic detergents, soaps, cosmetics, greases, plastics, and various types of protective and decorative coatings. It is suggested here that the *kepayang seeds* could be one of the future local sources of palmitic acid.

9,12-Octadecadienoic acid

Also known as linoleic acid, it is widely distributed in the plant kingdom. By frequency and proportionality, it is the most important polyalkenoic acid found in vegetable fats. It is characteristic and often forms the major component important in many commercialized fats such as cottonseed, soybean, peanut and sunflower seeds. Linoleic acid is almost invariably accompanied by oleic acid in vegetable oils and it is generally considered characteristic of semi-drying and drying oils.

Heptadecene-(8)-Carbonic acid

Unlike palmitic and linoleic acids, the characteristics, uses and potentials of Heptadecene-(8)-Carbonic acid have yet to be established. Since the seeds are known to preserve meat and fish widely without refrigeration in Sabah and Sarawak among the natives, it is suggested here that further research should be conducted to understand the preservation action of Heptadecene-(8)-Carbonic acid on various food, wood and perhaps some chemical products.

P. edule could be considered as one of the species for planting on a large scale. Besides providing good timber due to its straight and large diameter bole, other local uses of *kepayang* include the use of seeds in sterilizing wounds and treating boils.

Reader Enquiry

Faculty of Forestry
Universiti Putra Malaysia
43400 UPM Serdang
Selangor, Malaysia

Tel: +603-8946 7178
E-mail: i.faridahhanum@gmail.com

RF Coaxial Cavity for Ignition

Norman Mariun, Liyth Nassirat, Nasrullah Khan, Ishak Aris

Award Winner

The function of the ignition systems is to inject the required energy into the combustion chamber in order to ignite the air-fuel mixture. The amount of the injected energy depends on many factors such as the kind of combustion gas used, air-fuel ratio, and the combustion pressure. To meet the future fuel economy demands the vehicle engine manufacturers try to design engines that run on lean or ultra lean air-fuel ratios. These lean mixtures require more efficient energy injection mechanism to be ignited.

The conventional ignition systems use spark plugs with a narrow spark gap to ignite the air-fuel mixture. The spark plug ionizes the mixture in the gap volume between the electrodes by means of DC high voltage source which is established from the energy stored in a magnetic coil. The drawback of such systems to meet the lean mixture demands is the need to increase the DC voltage between the gap electrodes in order to ignite the lean and ultra lean mixtures. The spark is localized around the spark plug volume and the size of the plasma channel is small. Moreover, going to higher DC voltage levels cause shorter life time for the spark plugs.

The use of high energy plasma to ignite the mixture has recently gained interest. Many researches have been carried out on studying the Quarter Wave Radio Frequency Coaxial Cavity (QWRFCC) as a microwave plasma generator. This plasma source has many advantages: the mixture has lower breakdown voltage when using microwave frequencies, the device is working as electric field amplifier, and there is no electrode degradation.

In this work a coaxial cavity is developed to be used as an ignition source. The cavity is intended to work at household microwave frequency range (2.45GHz). The dimensions of the cavity have been calculated along with lumped parameters to be used in the RLC electrical model to analyze the behavior of the cavity under the load variation. It is noted that the radio frequency cavity is able to initiate plasma kernel larger than the conventional spark plug with less input energy requirements. This cavity is planned to be used as an ignition source in a compressed natural gas engine (CNG engine) where the air-fuel ratio (φ) is around 25:1.

Figure 1, shows the block diagram of the system and the components connectivity. ***Figure 2***, shows the results of the MATLAB 2dD simulation and shows the propagation of the microwave signal inside the cavity. ***Figure 3***, shows the fabricated RF cavity for this experiment. ***Figures 4 to 6***, are Infra Red images to show the glow of the plasma around the tip of the designed cavity.

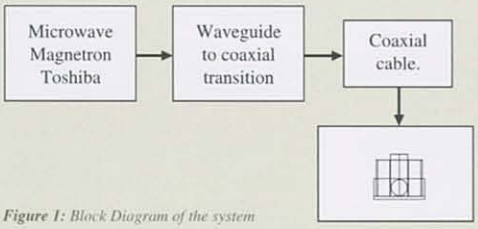


Figure 1: Block Diagram of the system

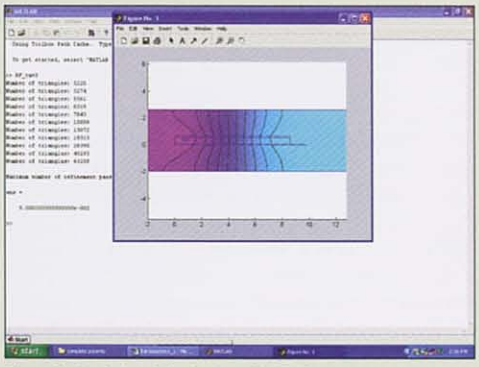


Figure 2: Simulation of the Cavity on MATLAB

Figure 3: The Cavity Structure

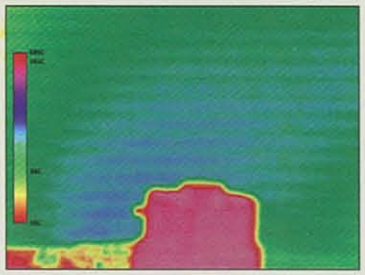


Figure 4: Test 1 results, IR image, Rectangular Antenna 1.5 cm by 0.2 cm

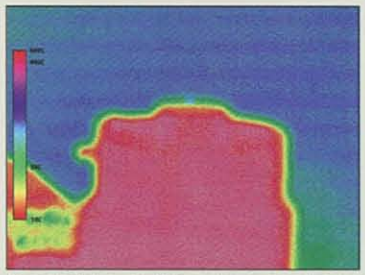


Figure 5: Test results, IR image, Rectangular Antenna 2 cm by 0.2 cm

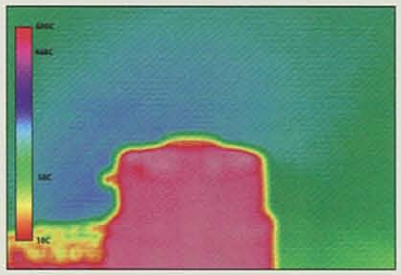


Figure 6: Test 3 results, IR image, Circular Antenna

GOLD – *British Invention Show (BIS2005).*
Silver – *International Invention, Innovation, Industrial Design & Technology Exhibition (I-TEX 2005).*

Reader Enquiry

Department of Electrical Engineering
Faculty of Engineering
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8946 6266
E-mail: norman@eng.upm.edu.my

Developing Ergonomics seat for Commercial Vehicle in Malaysia: A Concurrent Approach

Award Winner

Shamsul Bahri Hj Tamrin Mohd Tamrin, Rizal Rahman, Rosnan Hamzah, Nasaruddin Abdul Aziz, Hamiraj Fahry, Juliana Jalaludin, Nizam Jemoin, Rosnah Yusof, Wan Chik Zaharah, Azlan Ariffin, Siti Sahartini, and Salawati

Professional driving is associated with long hours in a single body posture, under exposure to vibration, vehicles exhaust and noise. There is evidence that those who spend more than half their working lives driving are three times more likely to suffer back trouble than the rest of the population (Troup, 1978; Ishibasi, 1988). Sitting is a source of postural, spinal stress, which can be disabling for those who have had serious back and sciatic pain (Nigel C et al, 1986). Prolonged sitting is generally accepted as a risk posture in developing low back pain. Low back pain occurs very frequently and is one of the most costly health problems affecting industry and society. It has been accepted that 70-75% of the population experiences low back pain at least once in their lifetime (Van Poppel *et al*, 2000).

Our recent finding of musculoskeletal problem had shown that 60% of Malaysian bus drivers reported an incidence of low back pain and other related musculoskeletal disorders such as upper back, neck and legs. It is important that action must be taken to improve the condition of drivers health especially with regard to musculoskeletal disorders. This action should not be narrowed to bus drivers alone but also to coach as well as private drivers since we do travel frequently to work, holiday and also experience traffic congestion just like any bus drivers do. Ergonomics field is quite new in Malaysia and the implementation on wider scope had been limited to application in Occupational safety and Health.

In this research, the use of two intervention program was proposed to effectively reduce musculoskeletal disorders namely; 1) health promotion program through introduction of exercise for prevention and treatment of low back pain and 2) engineering program through development of ergonomics seat specifically customized for Malaysian drivers.

Criteria's in development of ergonomics seat

The main objective of developing ergonomics seat is to develop a seat that fits; 1) Malaysian male anthropometry, 2) suitable range of lumbar support, 3) suitable adjustment of sitting height, seat pan and backrest. 4) absorbs whole body vibration, and 5) biomechanical massager for relaxation while driving. To kick start with this project, more integration were required between occupational health practitioner, industrial hygienist and ergonomist, Occupational practitioner developed tools such as reliable and valid questionnaire to determine the prevalence of MSD and risk factors while ergonomist developed tool such as Anthropometric chair to be use in collecting main parameters for developing future seat. Industrial hygienist involved in collecting data of current vibration level of seat and posture analysis of driving style. Later stage shows how industrial designers translated the information collected earlier into prototype design and finally fabricated by engineers into mechanical and electrical components.

Ergonomics Data

In this study, the anthropometrics data was the basic principle in applying the design for adjustable range for bus seat. Five body dimension parameters were measured for the basic data to accommodate the size required for headrest, backrest, seat pan, seat depth and lumbar support for 5th to 95th percentile of Malaysian male. A total of 669 Malaysian male bus drivers from four different locations - Center Region (Klang Valley); Eastern Region (Kelantan); Northern Region (Perak, Penang and Kedah) and Southern region (Johor Bahru) had participated in this study. Martyn Type Anthropolometer (USA) was used to measure body segments. Each participant was measured while sitting on our customized-made anthropometrics chair that included the lumbar support to measure the height of the lumbar support.

In order to determine whether a lumbar support will significantly reduce muscle fatigue. Preliminary studies were carried out using commercial adjustable lumbar support, Nimble-pedic adjustable backrest (USA), (Figure 2) and Visual Analog Discomfort Scale (VADS) were used as equipments in 30 bus drivers in Kota Bharu, Kelantan. Visual Analog Discomfort Scale (VADS) was a body assessment scale in 100mm length to measure a comfort level. It had been divided into 3 categories: 0-33mm – very comforable, 34-66mm – moderately comfort and 67-100mm – very discomfort. It was measured as a comment or response from each respondent that had been tested after using commercial adjustable lumbar support. This study on lumbar support showed that majority of bus drivers (53.3 %) agreed that the use of lumbar support was very comfortable while driving, while 33.3% of bus drivers stated that moderately comfortable. Only 13.3% of bus drivers disagreed with the use of lumbar support. In determining the effectiveness using muscle fatigue indicator, a number of UPM bus drivers showed that a trend that indicate less muscle small fiber is being recruited and higher median frequency threshold suggesting that lumbar support is an effective tool in reducing muscle fatigue especially in long duration driving. In determining the effectiveness of anti vibration material to be used later in the development of the seat, an experiment was conducted to determine the level of whole body vibration.

The study shows that the summation of vibration among Malaysian bus was slightly above the recommended 8 hours permissible limit (ISO 2631-1), however the level of vibration reduced significantly after the seat was blanketed with rubber material to attenuate the vibration level. Therefore by gathering all this ergonomics and occupational health information, we were able to formulate a requirement both for designers and engineers for them to translate into a workable ergonomics seat design.

Design Stage

Architectural design was the first stage to determine ideas and design concept for the ergonomic bus seat and biomechanical lumbar support. In this stage, the architectural design from the industrial designer presented 10 ideas and design concept from sketches, preliminary images data and drawing layout on how the biomechanical lumbar support could integrate and function with the new ergonomics bus seat. At this stage, all the material, design works, scaling, technical modeling, assembly process, testing and modifications were discussed and evaluated before the final prototype of biomechanical lumbar support could be developed. Finally a full-scale model was developed so that mechanical, electrical and electronic system engineers could develop, fabricate and integrate the biomechanical lumbar support for testing.

Mechanical and Electrical stage

The biomechanical lumbar support constitutes of 7 main components namely roller, reel housing, gearbox, chain unit, support plate, support frame and motor housing. The roller of lumbar support covered by the anti vibration material and plastic roller was used as a tool to massage the lower back. The integration of lumbar support with electronic motor system makes the lumbar support to massage the lower back and reduce muscle fatigue. The biomechanical lumbar support is situated just above the seat pan and the upper part of the backrest which covers the suitable range for Malaysian lumbar spine and covers the range of at least 29cm. The electronic motor system constituted 3 main hardware components namely stepper motor, printed circuit board (PCB) and the driver of the printed circuit board.

A Family of Parallel Explicit Group Iterative Algorithm on Shared Memory Multiprocessors (SMPs) Architecture

Award Winner

Mohamed Othman, J. Sulaiman, and A.R. Abdullah

Many scientists and engineers use the iterative algorithm for solving large-scale complex scientific and engineering problems which requires a huge computation, communication and is very time consuming. Computer simulation or network simulation application is one of the engineering problems that demand a fast computing mechanism as well as an efficient technique on top of the parallel computer architecture, see Fig 1. In order to speed up the process of solving these problems, a family of parallel explicit group iterative algorithm will be able to help the scientist and engineers in a short period of time. The family consists of three iterative algorithms; they are the Explicit Group (EG), Explicit Decoupled Group (EDG) and Modified Explicit Group (MEG) iterative algorithms. For instance, it can be used to model, solve and simulate the optical wave guided propagation, packet traffic flow network, computer graphics, computational fluid dynamics and radio wave propagation.

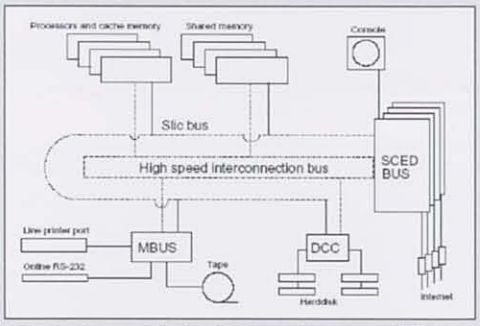


Fig 1: Architecture of the shared memory multiprocessors (SMPs)

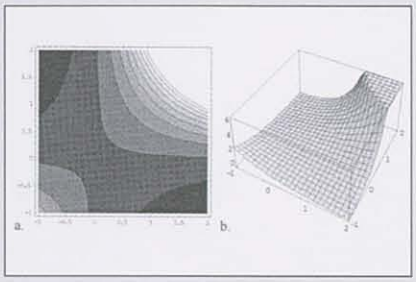


Fig 2 a and b solution domain in the form of 2D and 3D, respectively

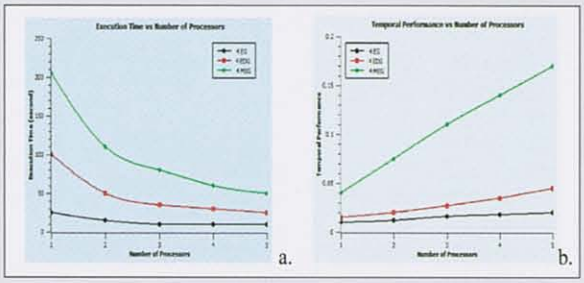


Fig 3 a and b execution time (sec) and temporal performance vs number of processors, respectively

As a case study, the algorithms described above were used to solve a model $u_{xx}+u_{yy}=(x^2+y^2)e^{xy}$. It is defined in a solution domain which subjected to the Dirichlet boundary conditions and satisfying the exact solution $u(x,y) = e^{xy}$. The model is presented in the form of two dimensional (2D) and three dimensional (3D) as shown in Fig 2a and b, respectively. By applying an optimal ordering strategy to the iterative algorithms, the experiments were carried out with different sizes of problems. The experimental results of the family iterative algorithm were shown in the form of execution time (seconds) and temporal performance vs. number of processors as shown in Fig 3a and b, respectively.

In conclusion, the parallel MEG iterative algorithm is the most superior and effective method among all algorithms in the family, in particular the SMPs parallel computer architecture.

In future, all the above iterative algorithms will be implemented on the network of SMPs parallel computer architecture and it will be used to model, solve and simulate the real world applications such as in modeling and simulating monopole antenna.

GOLD – *UPM Invention, Research & Innovation Exhibition (PRPI 2006).*
Silver – *IPTA R&D Expo 2006.*

Reader Enquiry

Dept. of Communication Technology & Networks
Faculty of Computer Science & Information Tech.
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8946 6535
E-mail: mothman@fsktm.upm.edu.my & mothmanupm@gmail.com

The software that had been programmed and fabricated on the printed circuit board controlled the stepper motor. The integration between hardware and software components of electronic motor system was deployed to run the program lumbar support massager. The controlling part has a user-friendly design with only four knobs for control namely; (1) scroll up button (2) scroll down button (3) yes button (4) no/cancel button. The user can control the massaging time based on the time they needed to massage. Finally, the massage controlling unit is located on the left instrument panel near the steering wheel for easy reaching and manipulation by the bus driver.

Testing and Evaluation

With the development of 1st prototype (CBSD ver 1.0) more testing are on the way. Currently we are focusing on two types of testing namely; 1) functional testing 2) effectiveness test. Both tests are compulsory before being marketed to maintain the effectiveness, functionality, comfort ability and safety factor.

The future of ergonomics seat

We foresee that there is a big market in marketing and developing better ergonomics seat. Not only we are able to market domestically, but there is an opportunity with customize anthropometry based on the need of every country even in the middle east, southeast Asia, Europe and even the American continent.

Its application can be clearly seen in the buses, train coaches, monorails, and executive seats for passengers even in first class seats in planes. Not to mention the number of private cars that we can implement to reduce muscle fatigue and reduce musculoskeletal disorders and more comfortable driving. Eventually, the possibility of more road accidents can be reduced effectively.

Comparing with the traditional approaches of over the wall, this concurrent engineering concept of Integrity which includes communications and team work enhancement has proven to deliver a better quality product in shorter time. This modern system of integrationed, product will meet with consumer expectations and satisfactions which indirectly will enhance the credibility of the manufacturing company as well as to generates a positive profit margin.

Bronze – *Malaysia Technology Expo (MTE 2007).*
GOLD – *UPM Invention, Research & Innovation Exhibition (PRPI 2006).*
Special Award – *Invention and New Product Exposition (INPEX 2006).*

Reader Enquiry

Department of Community Health
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor
Malaysia

Tel: +603 8947 2395
E-mail: shamsul@medic.upm.edu.my

Research

International Exhibition of "Ideas-Inventions-New Products" (IENA 2006) *(2 –5 Nov 2006)*

IENA 2006: The delegates from the Faculty of Engineering and Institute of Bioscience (IBS), UPM

I AM PROUD OF YOU: Prof. Abu Bakar Salleh showing his gratitude to gold medallist, Prof. Fatimah Md. Yusoff

WELL DONE: Dr. Ahmad Bustamam Badul feels proud as he receives his certificate from Prof. Abu Bakar Salleh

FOCUS: Prof. Dato' Dr. Shariff Mohamed Din speaks his mind!

I AM THE BEST: Gold medallist Ir. Azlan Abdul Aziz displaying his award

ENLIGHTENING: Prof. Dato' D journalist

British Invention Show (BIS 2006) *(18 –21 Oct 2006)*

HE'S THE MAN: A/P Dr. Wong Shaw Voon from the Faculty of Engineering bagged a gold medal award for *"COMBAT ARMOR, (Composite for Anti Ballistic Threat Armor)"*

BIS 2006: The Malaysian delegates at the Alexandra Palace in London

The 3rd Malay and Islamic Trade

HOT ITEM: Synthesis, a part and parcel of every display!

Down the Memory Lane *(Newsmakers around the campus)*

INSPIRED: A student receiving a Vice Chancellor Award from Prof. Dr. Nik Mustapha R. Abdullah

THANK YOU: Prof. Dr. Nik Mustapha R. Abdullah receiving a token of appreciation from Deputy Vice Chancellor of Student Affairs

FOREVER YOUNG!: A/P Dr. Tengku Aizan Hamid in her best at the official opening ceremony of National Conference on Ageing 2006 at Marriot Hotel, Putrajaya

THE GOOD OLD DAYS: Mr. Jam with his staff during the RMC Hari R

Happenings

MOMENT TO REMEMBER: Silver medallist Prof. Dr. Shattri sor, the inventor of *"A New Robust Data Compressor for GIS a"*

FOR THE RECORD: The winners of Innovative R&D with Prof. Abu Bakar Salleh and Prof. Zulkifli Idrus

COVERED BY TV3: A/P Dr. Ratnasamy Muniandy draws attention of a journalist from TV3

ariff shares his view with a

UPM BOLEH!: Prof. Abu Bakar Salleh poses proudly with gold and silver medallists

IT SHOULD BE THIS WAY: Prof. Dato' Dr. Shariff Mohamed exposes a secret to Prof. Abu Bakar Salleh!

hibition (MAITREX 2006) *(9 –11 Sept 2006)*

INNOVATIVE R&D: Products with commercial potential at the expo

RED CARPET: Y.B. Datuk Seri Utama Dr. Rais Yatim, the Minister of Arts, Heritage & Culture *(second from left)* and Y.A.B. Datuk Seri Haji Mohd. Ali Mohd. Rustam, the Chief Minister of Malacca *(second from right)*

NO ONE UNDERSTANDS BETTER: A representative from UPM offering an explanation to a visitor

Tamsir *(second from left)* celebration

DOWN TO EARTH: Malaysia Prime Minister, Datuk Seri Abdullah Ahmad Badawi and the Minister of Agriculture and Agro-based Industries, Tan Sri Muhyidin Yassin at MAHA 2006

SAY CHEESE: The UPM representatives pose for the camera!

JALAN-JALAN CARI MAKAN: Prof. Zulkifli Idrus showing his support towards UPM commercialised products

NewsBriefs

MAITREX 2006: from Local to Global *(9-12 September 2006)*

In conjunction with the 7th Malay World, Islamic World Convention (DMDI), the much talk about Malay and Islamic Trade Exhibition (MAITREX) was successfully held on 9th – 12th September 2006.

Hosted by Malacca International Trade Centre (MITC), the 3rd MAITREX was officiated by Y.B. Datuk Seri Utama Dr. Rais Yatim, the Minister of Arts, Heritage & Culture. Also present was Y.A.B. Datuk Seri Haji Mohd. Ali Mohd. Rustam, the Chief Minister of Malacca.

The main objectives of MAITREX were to give exposure and introduce the local products and services at national and international level.

MAITREX is also a great platform for the local product manufacturers to enhance the promotions and marketing activities as well as to build wider networks.

This year, Universiti Putra Malaysia (UPM) was invited by the Ministry of Higher Education to take part in the exhibition. The participants from UPM were mainly from the Faculty of Food Science and Technology and Interim Halal Product Research Institute.

The annual exhibition was participated by 93 organisations including government agencies, local and international corporations.

Listed below are the participants from UPM and their research projects.

	Participant	Research/ Project(s)
1	**Yaakob Che' Man (Prof. Dr.)** *Interim Halal Product Research Institute*	1. FAE Makanan Halal 2. Trans Free Plant Based 3. Development of Rapid Techniques for Halal Authentication 4. FTIR Spectroscopy: A Potential Tool for Halal Authentication 5. Halal Food- Perception and Awareness Among Food Manufacturers and Marketers in Klang Valley
2	**Suhaila Mohamad (Prof. Dr.)** *Faculty of Food Science and Technology*	1. Herbal Product for Diabetes 2. Anti Obesity, Antioxidative and Cholesterol Lowering Seaweed Products for Cardiovascular Health
3	Che Zaini Hassan (Mrs.) *Faculty of Food Science and Technology*	1. Healthy Fat Substitute of Bakery Products from Avocado

The British Invention Show 2006 *(18th -21st October 2006)*

Universiti Putra Malaysia (UPM) recently participated in the British Invention Show (BIS 2006) held at Alexandra Palace in London from 18th – 21st October 2006.

BIS is an annual event which gives opportunity to the inventors, innovators, academics and entrepreneurs around the world to showcase their latest inventions and to share their common belief- that invention is the vital spark that drives the world's technology and new orders of wealth creation.

This year's show managed to attract more than 200 exhibitors from 20 participating countries across the world, which also included support organisations that could assist with business development. A total of 175 innovative research products and inventions were displayed at BIS 2006.

The UPM representatives, lead by A/Professor Dr. Wong Shaw Voon from the Faculty of Engineering bagged a gold medal award for their inventive research, "COMBAT ARMOR, (Composite for Anti Ballistic Threat Armor)".

A seminar was also run alongside the event, covering topics such as new product development, intellectual property protection, and marketing.

UPM Bags Five Medals in Germany

Universiti Putra Malaysia (UPM) bagged 2 gold and 3 silver medals recently at the International Trade Fair "Ideas – Inventions – New Products" (IENA) 2006.

The trade fair that was held at Nuremberg, Germany from 2nd – 5th November 2006 was represented by delegates from the Faculty of Engineering and Institute of Bioscience (IBS) of UPM.

UPM showcased a total of five innovative R&D researches during the exhibition and all of them won the awards. The gold medallists were IBS's team lead by Professor Dr. Fatimah Md. Yusoff for their ground breaking research on "Natural Booster Kit for High Quality Microalgal Production", and Ir. Azlan Abdul Aziz from the Faculty of Engineering for his novel research on "A Long Term Triaxial Filtration Test System".

More than 645 inventions from 30 participating countries around the world were exhibited at IENA 2006. Germany, Iran, Turkey, Croatia, Russia and Taiwan presented the largest number of inventions during the exhibition. The recipients of silver medals are as below:

	Participant	Research/ Project(s)
1	**Megat Johari Megat Mohd. Noor** (A/Prof. Dr.) *Faculty of Engineering*	Eco- polymer Coagulant
2	**Shattri Mansor** (Prof. Dr.) *Faculty of Engineering*	A New Robust Data Compressor for GIS Data
3	**Ahmad Bustamam Badul** (Dr.) *Institute of Bioscience (IBS)*	A Natural Drug, Extracted and Purified from Malaysia Herbal Plant Interferes the Progression of Cervical Intraepithelial Carcinoma (CIN)

UPM Receives the Highest R&D Funding in Malaysia

Universiti Putra Malaysia (UPM) was in the limelight again after receiving the highest amount of grants under the Higher Education Ministry's Fundamental Research Grant Scheme.

According to the Higher Education Minister Datuk Mustapa Mohamed, the ministry had received about 2, 045 proposals from researchers of 18 public universities nationwide but only 746 were granted with the grants worth RM 67.9 million.

UPM Vice Chancellor Prof. Dr. Nik Mustapha R. Abdullah confirmed that UPM had received about RM 16.8 million. The amount allocated will be used for science and technologies, and social sciences areas.

Earlier, UPM was announced as one of the country's four research universities under the Ninth Malaysia Plan.

Research University (RU) Roadmap and Strategic Plans Workshop

Ever since Universiti Putra Malaysia (UPM) was announced to be one of the major research universities in Malaysia, the designation seems to give a total brand new dimension to the university and its academia.
In order to keep up with the reputation as a research university (RU), a workshop on Research University (RU) Roadmap and Strategic Plans was conducted at Legend Water Chalets, Port Dickson from 7th-8th December 2006.

The 2-day workshop was organised by the Research Management Centre (RMC) in collaboration with the Vice Chancellor Office, Deputy Vice Chancellor (Research & Innovation) Office and Registrar Office.

The workshop that was participated by more than 100 deans, deputy deans (research), lecturers and deputy registrars from each faculties/ institutes/ centre /academies aimed at discussing on UPM's goal to meet 100% RU Key Performance Indicator (KPI) by the end of 2009 since the RU audit would be performed in April 2010.

Other agendas included group discussions and presentations about the action plans and monitoring methods to meet the nine RU sections as well as the discussion on projection of 2007-2009 for each Pusat Tanggungjawab (PTJ).

Hadhari Community Convention (KNKH) 2006

"To retrace issues pertaining to Islam Hadhari (Civilisational Islam) from a comprehensive perspective including economy, education and social matters" became the main theme of Hadhari Community Convention (KNKH) 2006.

The 5-day convention was held at Federal Territory Mosque, Kuala Lumpur from 6th – 11th December 2006. KNKH 2006 aimed at instilling the practicality of the Islam Hadhari concept among society through various programs conducted during the convention. Round-table discussions, expos, business matching and exhibitions on Muslim entrepreneurs' products were among of the activities held in conjunction with the convention.

Interim Halal Product Research Institute of UPM displayed seven research posters during the event which contained information on the research outcomes conducted at the university.

Forthcoming R&D Exhibitions

The forthcoming International and National R&D exhibitions from March to June 2007

	Exhibition	Date	Venue
1.	**MTE 2007:** Malaysia Technology Expo	Mar 29-31, 2007	Putra World Trade Centre (PWTC), Kuala Lumpur
2.	**NATPRO 2007:** Asia Pacific Natural Products Expo	Mar 29-31, 2007	Putra World Trade Centre (PWTC), Kuala Lumpur
3.	**Research Award for Research Excellence (APC) 2007**	Apr 12, 2006	Marriot Hotel, Putrajaya Kuala Lumpur
4.	**National Intellectual Property Day Expo**	Apr 19-21, 2007	Convention Centre (KLCC)
5.	**Bio International Convention**	May 6-9, 2007	Boston, USA Kuala Lumpur
6.	**I-TEX 2007:** International, Invention, Innovation, Industrial Design	May 18-20, 2007	Convention Centre (KLCC)
7.	**INPEX 2007:** Invention & New Product Exposition	June 6-9, 2007	Pittsburgh, USA
8.	**Biotechnology Asia 2007**	June 12-14, 2007	Putra World Trade Centre (PWTC), Kuala Lumpur

Seminars on Fundamental Grant

Two separate seminars on Fundamental Grant were conducted early this year. The first seminar was held on 23rd January 2007 while the second seminar was on 23rd February 2007. Both were organised by Grant Unit of Research Management Centre (RMC).

The first seminar, which was carried out at Panggung Percubaan, Sultan Salahuddin Abdul Aziz Shah Cultural & Arts Centre, stressed on the new applications for Fundamental Research Grant Scheme (FRGS) for year 2007. The guest speakers for the seminar were Prof. Dr. Muhamad Awang and Prof. Dato' Dr. Sheikh Omar. Both of the speakers are the Evaluator Panel for Ministry of Higher Education Fundamental Grant Scheme.

Conversely, the second seminar that was held at Seminar Room 1 of Administration Building, UPM focused on Social Sciences and Humanities. The guest speaker was Prof. Dr. Samsudin Abdul Rahim, who is the Head of Executive Officer in Malaysian Youth Research Development Institute. He is also the Chairman of Social Sciences and Humanities Panel, Fundamental Research Grant, Ministry of Higher Education.

FactFile

For the record

The New Incoming Deputy Director

Prof. Dr. Kaida Khalid, Incoming Deputy Director, Research Grant Unit, RMC

A very warm welcome to Prof. Dr. Kaida Khalid for being the new Deputy Director of Research Grant Unit. He replaces Prof. Dr. Nor Aripin Shamaan who left RMC on 5th March 2007. Prof. Dr. Kaida obtained his BSc in Physics from Universiti Kebangsaan Malaysia in 1976, MSc in Solid State Physics from University of London in 1978 and PhD in Electronic and Electrical Engineering from University of Birmingham, England in 1986.

He started off as a lecturer in 1979 and was appointed as Associate Professor in 1991. Through out 30 years of his profession, he was also the Head of Physics Department (1992-94), Deputy Dean (Research and Development affairs) for Faculty of Science and Environmental Studies (1997-1999) and Deputy Dean (Development), Faculty of Science (2001-2006).

His research interests include microwave moisture sensors, microwave dielectric properties of materials and high power microwave applications. Most of his work is primarily engaged with the development of moisture sensor for hevea rubber latex and oil palm fruit.

With such impressive credentials, RMC believes that he will be able to be one of RMC's main backbones for the betterment of the Centre.

The Outgoing Deputy Director

Prof. Dr. Nor Aripin, the Outgoing Deputy Director, Research Grant Unit, RMC

RMC wishes to extend its gratitude to Prof. Dr. Nor Aripin Shamaan for his significant contributions to the Centre

Prof. Dr. Nor Aripin Shamaan joined RMC on 1st December 2003 as the Deputy Director of Research Grant Unit. He left the Centre on 5th March 2007 to concentrate on his research efforts and is currently the Deputy Dean (Academic and Student Affairs) of the Faculty of Biotechnology and Biomolecular Science.

Expanding Horizons

RMC also welcomes the following staff to its existing team

Diana Sophia Barieng
Assistant Publication Officer
Publication Unit

Mohd. Khairul Azra Mohd. Khairuddin
Assistant Admin Officer
Research & Innovation Unit

Iftiqar Bee Abd Gani
Admin Assistant
Research Grant Unit

Check it out

I am very pleased to announce that *Synthesis* is now into its fourth year of publication with its circulation surpass 4,000 nationwide.

Effective March 2008, the makeover issue of *Synthesis* will capture your imagination with its content and attention-grabbing size and layout. I also take this opportunity to sincerely acknowledge with thanks the numerous letters from our readers that have been piling up in the last few months, congratulating the editors. I am very pleased to note that you find the articles informative, useful and well written. I am also glad to note that many of our readers find our articles succinctly yet instructive.

Thank you to one and all that have made *Synthesis* a success. We sincerely hope to keep up the good work and look forward to see yet another climb in the readership of *Synthesis*. *Synthesis* is the official research bulletin of the University and is published by Research Management Centre quarterly. It is available free of charge to the academic community.

MANAGING EDITOR

Read this – a call for contributions!!

If you have any contributions comprising feature articles or research write-ups that you would like us to publish in the esteemed columns of Synthesis or any suggestions that you may wish to make for the forthcoming issues, please send them to: The Managing Editor, Synthesis, Publication Unit, Research Management Centre, 4th Floor, Administration Building, 43400 UPM, Serdang, Selangor, Malaysia or via the Internet to ndeeps@admin.upm.edu.my or rschinfo@admin.upm.edu.my

The editor reserves the right to edit articles for clarity and space before publication.

A Glance at Research Inventions & Innovations at UPM[1]

Continued from Issue 15, 1st Quarter (Dec. 2006)...

No.	Faculty/ Institute	Researcher	Innovation	Research Cluster	Project Number	Allocation
395.	Veterinary Medicine	Noordin bin Mohamed Mustapha	Nutritional and immunoregulatory approaches in abating bovine mastitis	AFF	01-02-04-0091 EA001	RM197,000
396.	Veterinary Medicine	Rasedee @ Mat Bin Abdullah	Pathophysiological changes leading to equine tendinitis	AFF	01-02-04-0401 EA001	RM185,000
397.	Veterinary Medicine	Sheikh Omar Abdul Rahman	Development of a new recombinant vaccine for foot rot infection	AFF	01-02-04-0112 EA001	RM140,000
398.	Veterinary Medicine	Siti Khairani Bejo	Development of protein-base diagnostic kit for brucellosis in ruminant	AFF	01-02-04-0507 EA001	RM191,000
399.	Veterinary Medicine	Siti Suri binti Arshad	Molecular characterization of infectious bronchitis virus	AFF	01-02-04-0117 EA001	RM196,000
TOTAL PROJECTS: 399		TOTAL ALLOCATION: RM65.9m				

[1] Data presented IRPA RM-8 (as at Cycle 1, 2004); Total 416 EAR Grants, sorted by PTJ & Name.

†The description of the some of the above Inventions and Innovative research products available for commercialisation at UPM are contained in the books—"**R&D at UPM**: *Creating New Frontiers of Innovative Research*", First Edition, and "**R&D at UPM**: *Research Snapshots*", First Edition, ISSN. 1675-1248, Editors: Nayan Deep S. Kanwal, Mohd. Shahwahid Hj. Othman and Sidek Hj. Abd. Aziz, Published by Research Management Centre (RMC), UPM, available from Publications Unit, Administration Building, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor Darul Ehsan, Malaysia, Tel: +603 8946 6028 / 8946 6192, Fax: +603 8942 6539, e-mail: rschinfo@admin.upm.edu.my

Pertanika

Our goal is to bring high quality research to the widest possible audience

Pertanika is an international peer-reviewed leading journal in Malaysia which began publication in 1978. The journal publishes in three different areas — Journal of Tropical Agricultural Science (JTAS); Journal of Science and Technology (JST); and Journal of Social Sciences and Humanities (JSSH).

JTAS is devoted to the publication of original papers that serves as a forum for practical approaches to improving quality in issues pertaining to tropical agricultural research or related fields of study. It is published twice a year in **February** and **August**.

JST caters for science and engineering research or related fields of study. It is published twice a year in **January** and **July**.

JSSH deals in research or theories in social sciences and humanities research with a focus on emerging issues pertaining to the social and behavioural sciences as well as the humanities, particularly in the Asia Pacific region. It is published twice a year in **March** and **September**.

Why should you publish in Pertanika Journals?

Benefits to Authors

PROFILE: our journals are circulated in large numbers all over Malaysia, and beyond, in Southeast Asia. Recently, we have widened our circulation to other overseas countries as well. We will ensure that your work reaches the widest possible audience in print and online, through our wide publicity campaigns held frequently, and through our constantly developing electronic initiatives through e-pertanika and Pertanika Online.

QUALITY: Our double-blind peer refereeing procedures are fair and open, and we aim to help authors develop and improve their work. Pertanika JTAS is now over 30 years old; this accumulated knowledge has resulted in Pertanika JTAS being indexed by Scopus (Elsevier).

AUTHOR SERVICES: we provide a rapid response service to all our authors, with dedicated support staff for each journal, and a point of contact throughout the refereeing and production processes. Our aim is to ensure that the production process is as smooth as possible, is borne out by the high number of authors who publish with us again and again.

LAG TIME & REJECTION RATE: the elapsed time from submission to publication for the articles in Pertanika averages 6-8 months. A decision of acceptance of a manuscript is reached in 1 to 3 months (average 7 weeks).

Our journals have a 30% rejection rate of its submitted manuscripts, many of the papers fail on account of their substandard presentation and language (frustrating the peer reviewers).

Call for Papers

Pertanika invites you to explore frontiers from all fields of science and technology to social sciences and humanities. You may contribute your scientific work for publishing in UPM's hallmark journals either as a ***regular article***, ***short communications***, or a ***review article*** in our forthcoming issues. Papers submitted to this journal must contain original results and must not be submitted elsewhere while being evaluated for the Pertanika Journals.

Submissions in English should be accompanied by an abstract not exceeding 300 words. Your manuscript should be no more than 6,000 words or 10-12 printed pages, including notes and abstract. Submissions should conform to the Pertanika style, which is available at www.rmc.upm.edu.my/pertanika or by mail or email upon request.

Papers should be double-spaced 12 point type (Times New Roman fonts preferred). The first page should include the title of the article but no author information. Page 2 should repeat the title of the article together with the names and contact information of the corresponding author as well as all the other authors. Page 3 should contain the abstract only. Page 4 and subsequent pages to have the text - Acknowledgments - References - Tables - Legends to figures – Figures, etc.

Questions regarding submissions should only be directed to the Executive Editor, Pertanika Journals.

Remember, ***Pertanika is the resource to support you in strengthening research and research management capacity***.

Mail your submissions to:

The Executive Editor
Pertanika Journals
Research Management Centre (RMC)
Publication Division
4th Floor, Administration Building
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor, Malaysia

Tel: +603-8946 6192
ndeeps@admin.upm.edu.my
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From the Innovation & Commercialisation Centre (ICC) desk...

Moving Towards "world" Patent System through PCT

What is PCT?

The Patent Cooperation Treaty (PCT) is an international agreement which provides a single system to enter into the patenting process in many different countries at one time. The PCT is ministered by the International Bureau of the World Intellectual Property Organization (WIPO), headquartered in Geneva, Switzerland. The member countries of the PCT are called PCT Contracting States. Currently there are over 130 countries that are members of the PCT and Malaysia has recently become the 131st member on the 16th of May 2006.

What are the Advantages?

The main advantage of filing a PCT application is the additional time gained before having to prosecute application in other countries after the initial filing in Malaysia. Without the PCT, the applicant generally has 12 months to file patent application in Paris Convention countries after filing the initial application. In contrast, by using the PCT, the applicant has at least 30 months from the date of filing to begin prosecuting his application in other countries.

This delay provides time to gain knowledge regarding the patentability and commercial prospect of an invention. It also postpones the major cost of internationalizing a patent application, such as, paying regional fees, translating the patent application and paying fees to patent agents in various countries.

In the Paris Convention system, application made to different countries will have to go through patentability search by different countries. Under the PCT system, the single report produced by WIPO can be used for submission of patent application in various countries.

Timeline For Filing A PCT Application

The timeline below shows the basic steps in filing a PCT Application

0-Months

- Typically, the start of PCT application timeline occurs when an applicant files a patent application in his home country and claims the date of filing of the local application as the "priority" date.

12-Months

- Under Paris Convention, an applicant has 12 months from the filing date of his first application to file a PCT international application for the same invention.

16-Months

- After a PCT application is filed, the International Searching Authority (ISA) will carry out an international search on novelty and non-obviousness and issues an international search report and a written opinion on patentability. This report can be used to file application in various countries.

18-Months

- After 18 months from the priority date, the international application is then published by WIPO, together with the international search report and any amended claims. The publication discloses to the world the content of the international application.

22-Months

- In the next step, the applicant has the option of requesting an international preliminary examination of application and paying the relevant fees. The preliminary examination is based upon novelty, inventive step and industrial applicability.

28-Months

- The international preliminary examination report should be provided by the 28th months after the priority date. This report procedure provides applicants with an opportunity to amend the application.

30-Months

- Applicants must enter the national phase of other countries before the expiration of the time limit set that is 30 months from the priority date. If an applicant fails to do so, the international application loses the effect of a national application and the procedure comes to an end.

For further inquiries on PCT, please contact
The Director, Innovation & Commercialisation Centre (ICC).
Tel: +603 8947 2055

UPM's Commercialised Products and Technologies

Vita-Grow™
The growth and yield enhancer
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Diversatech Sdn. Bhd ©©
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Fowl Pox Vaccine
Tissue culture adapted
⊃ ® Prof. Dr. Aini Idris
© Malaysian Vaccine and
⊃ Pharmaceutical Sdn. Bhd.
⊃ $ > RM 1,968,000

Newcastle Disease Vaccine, V4-UPM Heat resistant strain
Prof. Dr. Aini Idris ®©
Malaysian Vaccine and ©©
Pharmaceutical Sdn. Bhd.
> RM 574,000 $©

ZAPPA™
The rice seeds germination enhancer
® A.P. Dr. Ahmad Husni M. Hanif
© Diversatech Sdn. Bhd.
$ > RM 1,300,000

Fast Target™
White spot virus detection kit
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Probiotic-fed broiler chicken
Prof. Dr. Ho Yin Wan ®©
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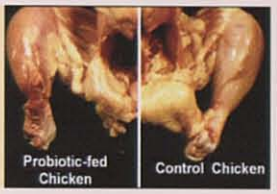

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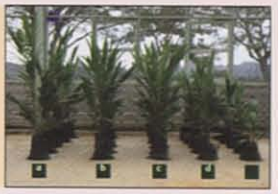

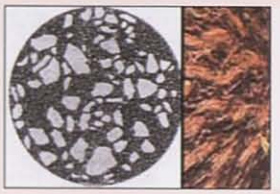

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Asphalt with cellulose oil palm fiber
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Antimicrobial compound
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Recombinant Pneumonic Mannheimia Vaccine
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KUSTEM Vax
Mannheimiosis Vaccine
Prof. Dr. Mohd Zamri Saad ®©
Profound Vaccine Sdn. Bhd. ©©
Royalty : 3 % $©

Commercialised R&D	- 15 products
Total Gross Sales Revenue	- RM 12.789 million
Mode of Commercialisation :	
Licensing	- 9 products
Outright Sales/Sales	- 6 products

® - Researcher © - Company/Industry $ - Gross Sales

Synthesis

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Letters to the Editor

If you have any comments about the content of the publication or any contributions that you may wish to make for the forthcoming issues, please send them to: The Managing Editor, *Synthesis*, Publication Unit, Research Management Centre, 4th Floor, Administration Building, 43400 UPM, Serdang, Selangor, Malaysia or via the Internet to ndeeps@admin.upm.edu.my. The editor reserves the right to edit articles for clarity and space before publication.

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RMC

Research Management Centre

UNIVERSITI PUTRA MALAYSIA
Chancellory
Administration Building
43400 UPM, Serdang,
Selangor Darul Ehsan
Malaysia

Tel
+603 8946 6028 / 6192 / 6185
Fax
+603 8942 6539

E-mail
ndeeps@admin.upm.edu.my
rschinfo@admin.upm.edu.my

Website
http://www.rmc.upm.edu.my/