KUANTAN RESEARCH DAY

23 OCT 2019 | GRAND HALL, OCD

" Research Towards Sustainable Development Goals"

PROGRAMME & ABSTRACT BOOK

الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يونيفرسيتي إسلام انترنابغسا ملسيا
(Company No. 101067-P)
Garden of Knowledge and Virtue

ORGANISED BY

RMC, KUANTAN
CPS, KUANTAN

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WELCOMING REMARKS

Assalāmu`alaykum Wa Rahmatullahi Wa Barakatuh

Alhamdulillah, this year Research Management Centre (RMC) with close collaboration with all the HOR's Kulliyyah at Kuantan Campus and Centre for Postgraduate Studies (CPS), we manage to organize our 3rd Kuantan Research Day. The theme for this time is "*Responsible Research towards Sustainable Development Goals*". It is in line to remind us as *khalifah* we need to care this earth for our future generation.

This year, we are focusing on poster presentation that allows all participants to present themselves with the research and share the idea personally among other researchers which would be difficult with the oral presentation method. We are very hopeful that this event will encourage more interdisciplinary research among different kulliyyah in Kuantan.

May Allah bless our effort and give us barakah.

Associate Professor Dr. Nazri bin Mohd. Yusof
Chairman
Kuantan Research Day 2019
International Islamic University Malaysia

Assalāmu`alaykum Wa Rahmatullahi Wa Barakatuh and greetings,

On behalf of the organising committee, it is our great honour and pleasure to welcome all of you to Kuantan Research Day 2019 (KRD 2019) with the theme 'Responsible Research Towards Sustainable Development Goals'.

KRD 2019 provides an excellent opportunity to al academicians, researchers and students to disseminate their valuable research and develop collaborative research through effective networking. I hope this event would be a platform for all participants to establish collaborations in exploring new and innovative research.

I would like to extend my sincere thanks and congratulations to all committee members for their dedication, time and hard work to ensure a successful event. Also to our sponsors, thank you very much for the financial support. Special thanks to the keynote speakers for their support. I am very certain that all participants will enormously benefit from this event.

Asst. Prof. Dr. Zarina Zainuddin
Vice Chairman
Kuantan Research Day 2019
International Islamic University Malaysia

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PROGRAMME

22nd October 2019 | Tuesday

03:00 p.m. – 05:00 p.m.	Registration and putting up poster

Note to participant: *Please put up your poster directly after registration and please take it down at the end of the program to guarantee most interactive discussion on your results. Please come to our registration table if you need assistance with putting up your poster.*

23rd October 2019 | Wednesday

08:00 a.m. – 09:00 a.m.	Registration and arrival of VIPs and all participants
09:00 a.m. – 09:15 a.m.	Welcoming remarks and introduction By Associate Professor Dr Nazri Mohd. Yusof Deputy Director, Research Management Centre (RMC), IIUM *Cum* Chairman, KRD 2019
09:15 a.m. – 09:35 a.m.	Opening ceremony and speech By Professor Dr Kamaruzzaman Yunus The Campus Director, IIUM Kuantan
09:35 a.m. – 09:45 a.m.	Video presentation
09:45 a.m. – 10:00 a.m.	VIPs photo session and visit to the poster exhibition area
10:00 a.m. – 10:30 a.m.	Break
10:30 a.m. – 11:15 a.m.	Keynote speech 01: ***Overview on Commercialization of Research Products*** By Associate Professor Dr Farahidah Binti Mohamed Kulliyyah of Pharmacy
11:15 a.m. – 12:00 p.m.	Keynote speech 02: ***Inculcating Art of Publication in Early Career of Academics and Postgraduates*** By Associate Professor Dr Muhammad Muzaffar Ali Khan Khattak Kulliyyah of Allied Health Sciences
12:00 p.m. – 02:00 p.m.	Luncheon/Break/Dhuhr Prayer
02:00 p.m. – 04:00 p.m.	Poster presentation (Rapid-fire/3MT style) and judging
04:00 p.m. – 04:30 p.m.	Performance by Students of Kulliyyah of Dentistry
04:30 p.m. – 05:00 p.m.	Award presentation and closing remarks By Assistant Professor Dr Zarina Zainuddin Deputy Dean, Centre for Postgraduate Study (CPS) *Cum* Vice-Chair, KRD 2019

KEYNOTE SPEAKER 1

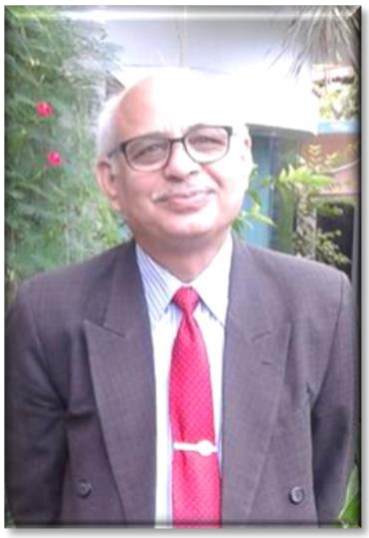
Associate Professor Dr. Farahidah Mohamed
Overview on Commercialization of Research Products

Associate Professor Dr. Farahidah Mohamed received BSc. in Pharmacy from Strathclyde University in 1999, used to work at the community pharmacies and government hospitals before deciding to pursue a PhD in 2004. She obtained her PhD in 2008 from Strathclyde Institute of Pharmacy and Biomedical Sciences, Scotland. She has been leading various research projects funded by various ministries. She had also received industrial grants to lead and coordinate GMP-associated trainings. She had participated in more than 30 international conferences, has more than 25 publications and had supervised more than 15 postgraduate master and PhD students. While contributing in teaching and research, she is also responsible in managing IKOP Sdn. Bhd., a shariah-compliant pharmaceutical manufacturer, the first and the only GMP-certified pharmaceutical plant located within university campus, i.e. the campus of International Islamic University Malaysia, Kuantan. Currently her research team focusing on designing various dosage forms by fusioning contemporary medicine with natural products with the aim to create synergistic effects, to reduce overall toxicity, to improve compliance and to reduce the overall treatment cost.

Two of her researched products have been commercialised and she had become one of the finalists for the Award of Malaysia Commercialisation Year (MCY), organised by MOSTI in 2017. Towards the end of 2017, IKOP has been awarded a government tender to supply one of her research products, namely iGESIC for 2 years with tender value ~ RM2.2 million.

KEYNOTE SPEAKER 2

Associate Professor Dr. Muhammad Muzaffar Ali Khan Khattak
Inculcating Art of Publication in Early Career of Academics and Postgraduates



Associate Professor Dr. Muhammad Muzaffar Ali Khan Khattak obtained his B.Sc. (Hons) in 1984, M.Sc.(Hons) in 1986 from NWFP, Agricultural University Peshawar Pakistan in Human Nutrition. He received PhD in 1995 from the University of Newcastle Upon Tyne, England, United Kingdom in human nutrition. For his outstanding position among the undergraduates and postgraduates he was awarded PhD scholarship from Government of Pakistan and USAID scholarships in 1989. Upon completion of his PhD he returned to Pakistan in March 1995 and joined his old position in the Ministry of Agriculture and after that he was appointed as an Assistant Professor at the Department of Human Nutrition, NWFP, Agricultural University Peshawar Pakistan. He joined Department of Nutrition Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia in November 2005.

Dr. Khattak 's specialty is Human Nutrition and has published articles in various journals in the areas of diabetes and worked intensively on adipokines, obesity, hyperlipidaemia and nutritional status assessment.

POSTER

POSTER

Category: Applied Science (Staff)

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Category: Applied Science (Student)

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ABSTRACT

ABSTRACT

ABSTRACT 02

ANTIBACTERIAL EVALUATION OF *Curcuma longa, Punica granatum* AND *Terminalia catappa* EXTRACTS

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ABSTRACT

The *in vitro* antibacterial activities of three Malaysian medicinal methanolic plant extracts were determined using broth dilution method; rhizome extract of *Curcuma longa*, leaf extracts of *Punica granatum* and *Terminalia catappa*. Four different strains of bacteria that are *Escherichia coli* 0157:H7, *Escherichia coli* (ATCC 0157), *Listeria monocytogenes* (ATCC 19115), and *Staphylococcus aureus* (ATCC 700699) were selected. Only the extract of *Terminalia catappa* was found to exhibit antibacterial activity against *Escherichia coli* 0157:H7 with minimum inhibitory concentration (MIC) value of 500 µg/ml. The best MIC value (15.63 µg/ml) was obtained with the extract of *Punica granatum* against *Staphylococcus aureus* (ATCC 700699). The extracts were further fractionated using paper chromatography. Rhizome extract of *Curcuma longa* cannot be separated when viewed using visible light, long-wave, and short-wave ultra-violet illumination, thus, only two extracts were selected for further antibacterial screening. Most fractions showed very low antibacterial activity (1000 µg/ml) and others were nil. From the experiment, it was found that the extract of *Punica granatum* has strong potency against *Staphylococcus aureus* (ATCC 700699). The results obtained from this study will provide some new scientific evidence and verification of the traditional uses of the plants in treating bacterial infections.

Keywords: Antibacterial activity, medicinal plants, *Curcuma longa, Punica granatum, Terminalia catappa*, methanol.

Acknowledgements: We gratefully acknowledge the support received from Prof. Shaida Fariza Sulaiman. We are also thankful to the laboratory expert for their kind assistant.

ABSTRACT 04

IDENTIFICATION OF *Blastocystis* sp. INFECTION FROM CATTLE, GOAT AND SHEEP ISOLATED FROM FARMS IN PAHANG, MALAYSIA

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ABSTRACT

Blastocystis sp. is a common anaerobic intestinal parasite infecting humans and a wide range of animals. This study was aimed to identify the rate of infection of *Blastocystis* sp. from three types of livestock, namely cattle, goat and sheep in farms in Pahang, Malaysia. Briefly, 110, 65 and 20 faecal samples were randomly collected from the farms in the district of Kuantan, Bera and Pekan respectively. These samples were cultured in Jones' medium and incubated at 37°c until day 14 before been observed under light microscopy for the presence of *Blastocystis* sp. The overall rate of infection of *Blastocystis* sp. was 5.4% in cattle (6/110), 21.5% in goat (14/65) and 10.0% in sheep (2/20). Based on the result of this study, *Blastocystis* sp. were commonly found in goats. However, further study could be done for identification of the subtypes of the *Blastocystis* sp. as well as the association of the occurrence to the type of farm management systems. Nevertheless, this study has provided additional insight into the prevalence of each livestock reared in farms in Pahang that serve as important information in understanding host-parasite relationship.

Keywords: *Blastocystis*, cattle, farm, goat, Pahang, sheep

Acknowledgement: This study is funded by FGRS grant no FRGS15- 188- 0429.

ABSTRACT 05

THERMODYNAMICS AND KINETICS OF ELECTRON TRANSFER BETWEEN K_3FeCN_6 ELECTROLYTE AND rGO:PSS MODIFIED ELECTRODE FOR SENSOR APPLICATION

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ABSTRACT

Next-generation devices that are sensitive to stimulus-responsive properties is a highly desired goal in monitoring and diagnostics technology field. Nanomaterial has been extensively used in transducer development for sensor applications. However, sensor devices possess a huge challenge in exhibiting sensitive responses with fast electron transfer. Little studies have been made to understand the thermodynamics and kinetics of electron transfer at the electrode-analyte interface. Therefore in our project, we have utilized the intrinsic property of reduced graphene oxide:polystyrenesulfonate (rGO:PSS) as a transducer of a sensor. Reduced graphene oxide (rGO), poly(3,4-ethylenedioxythiophene):polystyrenesulfo- nate (PEDOT:PSS), and rGO:PSS were casted onto the active sensing area of glassy carbon electrode (GCE). The developed electrode was electrochemically characterized by cyclic voltammetry (CV) measurement at varying scan rates (75, 100, 150, 200, 250) mV/s. The CV graphs elucidated the thermodynamics and kinetics of electron transfer between potassium ferricyanide (K_3FeCN_6) electrolyte and rGO:PSS modified electrode by analysing the shifts in peak potentials, E_p. The peak potentials of resultant electrodes revealed a shift of 120 mV for rGO modified electrode, which decreased to 90 mV when the electrode was modified with PEDOT:PSS, and further decreased to 30 mV when rGO:PSS was casted onto the GCE. The smaller shift in rGO:PSS electrode suggests that the kinetics or the rate of electron transfer at the electrode-analyte interface was very fast and rapid, indicating a strong electronic coupling between electrode and electrolyte; the electron transfer was reversible. The thermodynamics of the redox process happened easily, which deals with the transformation of energy between the rGO:PSS modified electrode and the ferricyanide electroactive species in the electrolyte. Additionally, the peak potential difference ($\Delta E = E_{pa} - E_{pc}$) was also analysed. The ΔEs were 0.42 V, 0.30 V, and 0.12 V for GCE/rGO, GCE/PEDOT:PSS, and GCE/rGO:PSS, respectively. The lower ΔE for GCE/rGO:PSS implied an improved electrocatalytic ability of the developed electrode. As for the accuracy of the CV analysis, the adsorption from the electrolyte to the electrode was investigated by plotting peak currents against the square root of scan rates. The linear fit for all CV measurements; R^2 = 0.999, 0.940, 0.930, and 0.999 for GCE, GCE/rGO, GCE/PEDOT:PSS, and GCE/rGO:PSS, respectively, revealed that no adsorption occurred during the redox process. Besides, the lowest scan rate was set as 75 mV/s in order to avoid convection of electroactive species into the diffusion layer. Therefore, the CV analysis was based solely on electron transfer, and not on adsorption and convection, which would otherwise interfere with the CV analysis. As a conclusion, rGO:PSS nanomaterial has a prevalent potential as a transducer and ultimately improve the sensor performance in the monitoring technology field.

Keywords: Thermodynamics, kinetics, cyclic voltammetry, peak potential, rGO:PSS, sensor

ABSTRACT 06

JOINT ENGAGEMENT OF MALAY-SPEAKING TYPICALLY-DEVELOPING CHILDREN

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ABSTRACT

Joint engagement (JE) is a state in which a child and a social partner attend to the same object or event. JE is a fundamental skill and important for the development of language and social skills in children. Parent-child interaction has been found as crucial for scaffolding children's language skills development, including JE abilities. In this observational study, JE in 14 young Malay-speaking typically-developing (TD) children (M age = 64 months) were investigated during 20 minutes free-play interaction with their mothers. JE of TD children was coded and rated from video recordings using Joint Engagement Rating Inventory (JERI; Adamson, Bakeman, Suma et al., 2018). The results found that TD children displayed different types of JE which includes engagement with person as well with the object. Although other studies have documented JE of TD children, this was first known to explore the different states of JE in young TD Malay-speaking children as observed during mother-child interaction.

Keywords: Joint engagement, typically-developing children, social interaction, Malay-speaking, mother-child interaction

Acknowledgement: The authors thank the parents and their children who participated in this study.

ABSTRACT 07

DISPERSAL PATTERN OF CORAL LARVAE FOR SUSTAINABLE ECOSYSTEM MANAGEMENT IN KUANTAN COASTAL REGION

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ABSTRACT

Understanding the source and sink pattern of coral larvae among the key elements in designing effective marine protected area for sustainable ecosystem management. This study examined the dispersal pattern of coral larvae among three known inshore reefs (Pulau Ular, Balok Reef and Raja Muda reef) in Kuantan coastal region by simulating virtual larvae trajectories during spawning event in 2018. Pulau Ular has high larvae retention (70%) in which most of the larvae originated from the natal reef. Balok reef was the dominant source of larvae for Raja Muda reef. Results also indicated that patches reefs near Raja Muda was ideal sink site for coral larvae and should be prioritized for future ecosystem management action.

Keywords: Coral larvae dispersal, Source-sink dynamic, Ecosystem management

Acknowledgement: We would like to thank the Department of Marine Science, Kulliyyah of Science IIUM and INOCEM Research Station for providing technical support during this study. This project was funded by E-science Fund under the Ministry of Energy, Technology, Science, Climate Change and Environment Malaysia (SF16-002-0071).

ABSTRACT 08

SODIUM ALGINATE BEADS CONTAINING PEPPERMINT OIL: DEVELOPMENT AND CHARACTERIZATION *IN VITRO*, *IN VIVO* AND *EX-VIVO* TECHNIQUE.

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ABSTRACT

Peppermint oil (PO) is the most prominent oil using in the pharmaceutical formulations. In this sense, this oil is attracting deep attention by the scientific community due to its traditional therapeutic claim; biological and pharmacological potential in recent research. The current study deals with the development, optimisation, in vitro characterisation, in vivo gastrointestinal tract drug distribution and ex-vivo mucoadhesive properties of PO loaded-entrapped sodium alginate beads. The factorial design was conducted to optimise the formulation using Minitab version 17. The average % of yield was 89.46% (n=3/batch). The optimised beads showed high drug encapsulation efficiency 91.31±3.20% and suitable drug release pattern in gastrointestinal media (cumulative drug release after two-hour of 98.57±1.78%). The mean size and sphericity factor of these formulated beads containing peppermint oil ranged from 0.75±0.01 to 2.64±0.01 mm and 0.05±0.005 to 0.01±0.00 mm. On the other hand, a very low release has found in acidic media (pH 1.2) at two-hour of from 2.39±0.27 to 7.71±0.86%. It found to be dominant by first-order kinetic (R_2 = 0.926-0.975) and Hixson-Crowell model (R_2 = 0.831-0.983) with a correlation coefficient close to unity over two-hour. It has shown excellent floating behaviour over two-hour, mucoadhesive, swelling and GIT distribution properties in ex-vivo over 2 & 6 h. The high voltage assisted electrospray technique is the novel encapsulation process which made this formulation unique. The technique for the preparation of sodium alginate beads containing peppermint oil was found to be simple, reproducible, easily controllable, economical and consistent. Besides, the raw materials used for the formulation in this study such as sodium alginate, lecithin, calcium chloride and peppermint oil were cheap and easily available. This new approach to sustainable development goal is going to take a step forward, through a wider contribution to the pharmaceutical sector.

Keywords: Peppermint oil, emulsion, electrospray technique, microencapsulation

Acknowledgement: Authors are thankful to iKOP and Advanced Drug Delivery Laboratory, Pharmaceutical Technology Department for instrumental support.

ABSTRACT 09

EVALUATION OF WOUND HEALING PROPERTIES OF PLECTRANTHUS AMBOINICUS USING HPdLF FIBROBLAST CELL LINES AS STUDY MODEL

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ABSTRACT

Plectranthus amboinicus is a semi-succulent with pungent oregano odour that belongs to family Lamiaceae. It has been extensively used in traditional medicine for its wound-healing effect. However, there is a lack of scientific evidence to support the claimed. Thus, this study aimed to evaluate wound healing properties of *P. amboinicus* extracts through *in vitro* study. Six extracts were used in this study, including three parts of the *P. amboinicus,* namely, leaves, stem and roots with two types of solvent, aqueous and methanol respectively. Cell proliferation assay was conducted to identify a significant dose that has the potential of wound healing properties. Determined concentration then proceeded with a scratch wound assay for evaluation. Based on the result, it shows that methanol root extract of *P. amboinicus* with concentration 0.3906 µg/ml has a high potential of wound healing properties in comparison with control. These findings would support the potential use of *P. amboinicus* as a wound-healing plant.

Keywords: Cell proliferation; In vitro; *Plectranthus amboinicus*; Wound healing

Acknowledgement:

ABSTRACT 10

EVALUATION OF BASELINE DIAGNOSTIC LETHAL CONCENTRATION FOR ADULT *AEDES ALBOPICTUS* IN KUANTAN, PAHANG

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ABSTRACT

Infectious diseases carried by mosquitoes remain a major threat to global public health. Adult bioassays using WHO standard concentration are the essential studies for early detection in insecticide resistance. Prior to the overreliance of insecticide-based vector control, this study was conducted to establish new diagnostic concentration for deltamethrin against *Aedes albopictus* using a known susceptible reference strain in Kuantan mosquito population. A lab strain species of *Ae. Albopictus* at F2 generation, which was originated from the locality in Kuantan was used according to the requirement for a susceptible strain. Following the WHO protocol, a series of 5 concentration tests were conducted toward adult female mosquito. The mortalities of mosquitoes were recorded for each bioassay after 24-h exposure of insecticide. Results were analysed using Probit analysis and doubling the LC_{99} value obtained was used as a diagnostic concentration for the respective population. Diagnostic concentration for deltamethrin was established at 0.10%, which differs from the WHO guideline. The findings of the current study may assist local authorities by providing an updated susceptibility baseline and data to be used for choosing the insecticide rate for different localities.

Keywords: Aedes albopictus, deltamethrin, diagnostic concentration, insecticide resistance, susceptible strain.

ABSTRACT 11

A PRELIMINARY RESEARCH ON AWARENESS OF PUBLIC HEALTH AND SAFETY IN SLAUGHTERING LIVESTOCK AND POULTRY AMONG ABATTOIR OPERATORS

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ABSTRACT

The necessary food-animal issues with zoonoses in general and food-borne diseases (FBD) in special are to be discovered. It is to be more valuable not only for both health and safety but also for the prevention of animal cruelty. Discovering the awareness of abattoir operators for the best methods with ethics of slaughtering livestock and poultry (SLP) will help to obtain most qualified meat and chicken. The preliminary findings will be value-added to guide for the prevention of diseases and injuries among abattoir operators. Insufficient knowledge and training for health and safety in SLP can result in the hazards of FBD and injuries among abattoir workers. Animal cruelty in SLP is also to be avoided for the welfare of animals before and during slaughter. This study aims to collect the available sources for providing a proper guideline to operators in SLP after discovering the awareness level among abattoir operators towards a code of practice in SLP. The research is a type of combination of qualitative and quantitative literature review. Issues related to health and safety of slaughterhouse workers were explored by focusing on the potential risk of FBD, and occupational injuries. Providing the necessary information and highlighting standard operation procedures among abattoir operators can be prevented systematically from the causes of injuries and the danger of diseases. Musculoskeletal disorders, upper limb and back pain, and FBD as well as risks from exposure to noise and cleaning chemicals or other substances hazardous to health, are to be concerned for health and safety precaution in SLP. Abattoir workers are at risks for contracting certain zoonoses such as leptospirosis, and they are required for developing control measures. It is hoped that the information obtained from this study would be beneficial as well as serve to eliminate some misconceptions of Islam from members of other religions.

Key Words: Abattoir operators, livestock and poultry, Public health and safety

ABSTRACT 12

ISOLATION AND STRUCTURAL CHARACTERIZATION OF SECONDARY METABOLITES FROM *Actinophytocola* sp. K4-08 RARE ACTINOMYCETE WITH POTENTIAL BIOSYNTHETIC CAPABILITY

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ABSTRACT

Thousands of antibiotics have been found from different actinomycetes, but there was less study recorded on isolation, characterisation and antimicrobial properties of rare actinomycete, especially *Actinophytocola* sp. K4-08, making it a prominent source of novel bioactive compounds. Therefore, the present study was carried out to isolate, characterise and identify the antimicrobial activity of rare actinomycete, *Actinophytocola* sp. K4-08. *Actinophytocola* sp. K4-08 was successfully isolated from Kuantan mangrove sediment and growth on starch-yeast extract agar (SYE) medium. Abundant cream coloured substrate mycelium was formed on SYE, and no obvious diffusible pigment was produced within 21 days of incubation. Partial 16S rRNA gene sequence revealed that *Actinophytocola* sp. K4-08 possessed 99% similarity to *Actinophytocola sediminis* YIM 75636. Moreover, both PKS-I and NRPS genes, both of which usually related to secondary metabolite potential were detected in this isolate through PCR amplification. Preliminary screening using cross streak test showed that *Actinophytocola* sp. K4-08 displayed antibacterial activity against *B. subtilis* and *S. aureus*. Its crude ethyl acetate extracts also displayed inhibitory activity against *B. subtilis*, further confirming the antimicrobial properties of this isolate. *Actinophytocola* sp. K4-08 was cultured in SYE broth followed by centrifugation to separate the cells and the supernatant. Crude ethyl acetate (EA) extract from the supernatant was also prepared, and cells of *Actinophytocola* sp. was extracted with methanol (ME) extract. All extracts (supernatant and cells) produced dark orange solid and yellow coloured crude. Disc diffusion assay against B. *subtilis* with a concentration of 20, 40, 60, 80 and 100 µg/disc was conducted to check on the antibacterial capabilities of the extracts. All extracts displayed weak inhibition activity against B. *subtilis*. Although the extracts produced weak antibacterial activity, nevertheless, the potential of *Actinophytocola* sp. indicated potential as a bioactive compound producer that is worth exploring. Purification of crudes using TLC shows a few purified compounds can be separated from EA and ME crude each using highly polar mobile phase. FTIR spectrum of EA and ME crude shows the presence of alcohol, alkyl, esters and aromatic functional groups. Further investigation is needed in an attempt to purify further and elucidate potential bioactive compounds produced by *Actinophytocola* sp. K4-08 using HPLC, LCMS and NMR.

Keywords*:* *Actinophytocola*, antibacterial activity, disc diffusion, TLC and FTIR

Acknowledgement: The authors would like to acknowledge the Ministry Of Higher Education, Malaysia, for the financial support under grant FRGS17-025-0591.

ABSTRACT 13

ACTIVITIES EVALUATION OF SILVER NANOPARTICLE SYNTHESIZED USING ETHANOL EXTRACT OF PAPAYA LEAVES AS COSMETICS INGREDIENT

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ABSTRACT

Silver nanoparticles (AgNPs) synthesised using ethanol extracts of Carica *papaya L.* leaf to develop and exploit the ethanol extract of 70% and 96% of *Carica papaya L.* as bioreduction in the synthesis of AgNPs resulting the antioxidant and antibacterial activity. The antioxidant activity was determined using the DPPH method measured by UV-Vis spectrophotometer and the IC_{50} value was determined. While the antibacterial activity of AgNPs was determined by the inhibitory zone diameter of *Staphylococcus aureus*. The result of this research showed that AgNps biosynthesised from 70% and 96% ethanol extract of *Carica papaya L.* leaf able to inhibit the free radicals of DPPH with IC_{50} values of 1415.12 µg/mL and 1351.22 µg/mL respectively. While, both 70% and 96% ethanol extract also inhibit the *Staphylococcus aureus* bacterial growth within 5.40 mm and 6.27 mm, respectively. To sum up, although the AgNPs produced have low antioxidant activity, both extracts have the bacterial activity of *Staphylococcus aureus*.

Keywords: Biosynthesis of Silver Nanoparticles, Ethanol Extract of *Carica papaya L.*, Antioxidants, Antibacterials.

Acknowledgement: Authors were proud and thankful to LPPM UAD, which have given the Fundamental Grant in 2019.

ABSTRACT 14

ELECTROSPUN PVA-GRAPHENEOXIDE-PEDOT:PSS NANOFIBERS FOR WOUND HEALING

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ABSTRACT

Nanotechnology has been broadly acknowledged in scaffold development for wound healing applications. Nanofibers-based scaffolds are highly valued for its mechanical and biological properties. Nonetheless, nanofibers composed of different nanofillers posed an enormous challenge in emulating the architecture of the extracellular matrix. In our study, we have capitalised the unique property of graphene oxide (GO) and poly(3,4-ethylenedioxythiophene)-poly(styrenesulfonate) (PEDOT:PSS) as nanofillers. Polyvinyl alcohol (PVA), PVA-GO and PVA-GO-PEDOT:PSS composites were electrospun into nanofibers of varying morphological, structural, and mechanical properties. The resulting nanofiber films were analysed using FESEM imaging, FTIR spectroscopy, and Raman spectroscopy. The morphology of resultant nanofibers revealed no evidence of beading and the nanofiber diameters were normally distributed with reasonably low variance (n = 50). The average diameter of PVA nanofibers was 248 ± 51 nm, which increased to 270 ± 94 nm when GO was added, and to 275 ± 140 nm when PEDOT:PSS was incorporated into the electrospun solution. Upon soaking in PBS, PVA nanofibers showed pores formation, while no pores were visible in PVA-GO and PVA-GO-PEDOT:PSS nanofibers. As for FTIR spectra, we observed broadening of -OH bond and shift to higher wavelength in both solution and nanofibers. Additionally, Raman spectroscopy analysis showed splitting and shifting of D band (1362 and 1409 cm^{-1}) and G band (1504 and 1586 cm^{-1}) in PVA-GO-PEDOT:PSS nanofibers. As for PVA-GO nanofibers, we observed shifting of D band (1311 cm^{-1}) and G band (1593 cm^{-1}), with no evidence of band splitting. Our study indicates that PVA-GO-PEDOT:PSS nanofiber has similar tensile strength measurement to native skin, while exhibiting a combination of a unique property of PVA, GO and PEDOT:PSS. Hence, we deduce that PVA-GO-PEDOT:PSS nanofiber can serve as an initial template for further modifications and subsequently used to promote wound closure.

Keywords: Electrospinning, PVA-graphene oxide, PEDOT:PSS, nanofibers, wound healing

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ABSTRACT 15

DETERMINATION OF LD_{50} OF ORAL GENTAMICIN-*NIGELLA SATIVA* EMULSION (GNE) IN RABBIT.

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ABSTRACT

Antibiotic resistance has been recognized by the World Health Organization (WHO) as among the three major threats to global health. A combinational approach can provide an opportunity for a synergistic interaction between plant extract and conventional antibiotics to combat antibacterial resistant. A stable emulsion which contains *Nigella sativa* oil (NSO) and gentamicin has been formulated as an alternative antimicrobial therapy to treat *Staphylococcus aureus* osteomyelitis. Previously, gentamicin and *N. sativa* emulsion (GNE) was reported to be effective against *Staphylococcus aureus* and capable to impede the ability of bacteria to form biofilm based on Disc Diffusion assay and Biofilm Inhibition Formation. The present study was to assess the toxicological profile of GNE by acute oral toxicity in rabbits by the method of OECD guidelines 425. GNE was administered to rabbits by force-feeding procedure with the start dose of 267 mg $_{gentamicin}$ /kg b. wt. and progressed to dose 854 mg $_{gentamicin}$ /kg b. wt. for the next rabbit. The test was stopped after five reversals occurred in six consecutive rabbits tested. Blood samples were collected 2 hours after dosing for blood profile analysis and gentamicin detection. The surviving rabbits were observed for 14 days for any signs of toxicity and delayed death. An oral dose of GNE, caused immediate agitation and behavioural perturbation with temporary writhing, followed by quiet attitude period and sedation. At a higher dose, the serum gentamicin concentration was detected at 10 µg/mL, and all of the rabbits died within the 12-hour overnight period. At the lower dose, all of the rabbits survived, and the serum gentamicin concentration was detected at 1.79 µg/mL. However, minor alteration to body weight and reduced water and food intake were observed in the surviving rabbits. The surviving rabbits quickly recovered their normal activity and growth after a period ranging from 1 to 2 weeks afterwards. The LD_{50} in rabbits for oral GNE was determined to be 477.5 mg $_{gentamicin}$ /kg b. wt. The trace of gentamicin in the blood serum has shown some evidence of the absorption of gentamicin through the gastrointestinal tract. Oral GNE administration did cause acute toxicity effect and death in rabbits at 854 mg $_{gentamicin}$ /kg b. wt.

Keywords: osteomyelitis, GNE; *Staphylococcus aureus*, LD_{50}, antibiotics.

Acknowledgement: This work was supported by grant 02-01-08-SF0325 from Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) of Malaysia.

ABSTRACT 17

IN VITRO AND IN SILICO STUDIES: ANTI-BIOFILM ACTIVITY OF ACTIVATED VIRGIN COCONUT OIL (AVCO) AGAINST CARIOGENIC *Streptococcus mutans*

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ABSTRACT

The oil of *Cocus nucifera* (Arecaceae) has numerous medicinal values. The fatty acids contents of the oil have been studied and determined to exhibit antimicrobacterial activity. However, the activity of the oil combatting *Streptococcus mutans* (*S. mutans*) biofilm is still not known. Here in this study, we evaluated the antibiofilm activity of AVCO against *S. mutans* biofilm and we studied the binding affinity of the prominent fatty acids (Lauric Acid, Capric Acid, Caprylic Acid, and Myristic Acid) with Quorum Sensing (QS) DNA receptor gene (PDBID: 1NXO) and the *Staphylococcus aureus* LuxR family (PDBID: 3B2N). The minimum biofilm inhibition concentration (MBIC) and the minimum biofilm eradication concentration (MBEC) for antibiofilm activity were determined by serial dilution method, and biofilm thickness on *S. mutans* was quantified by confocal laser scanning microscopy (CLSM). The molecular docking study was performed using AutoDock Vina 1.1.2 program to determine the binding location and the interaction formed between the selected fatty acids and QS DNA receptor and LuxR genes. At the concentration of 15.63 mg/ml of AVCO, it successfully inhibits the development of *S. mutans* biofilm, and AVCO (62.52 mg/ml) eradicate biofilm that was formed by the bacteria. The z-stack images obtained from CLSM allows the construction of 3-D biofilm structure and a significant difference in the thickness of *S. mutans* biofilm pre and post-treatment with AVCO were observed. In silico analysis revealed that these fatty acids could interact efficiently with the bacterial communication quorum-sensing (QS) regulators *Streptococcus* OmpP and *Staphylococcus* Lux proteins. The oil of AVCO possessed dual-function where anti-biofilm agents in AVCO not only inhibit growth but also control the colonization and accumulation of caries-causing *S. mutans*.

Keywords: Antibiofilm, Antiquorum sensing, AVCO, CLSM, Docking Studies,

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ABSTRACT 18

DIFFERENTIAL SCANNING CALORIMETRY (DSC) ANALYSIS OF PLASTIC MATERIALS IN FRYING OILS

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ABSTRACT

Adding plastics materials in frying oils to make fried foods crunchier among hawkers has been controversial. Generally, low-density polyethylene (LDPE) plastic is safe for food contact. However, when the plastic is heated, it melts and degrades, releasing all its components into the frying oil. Some components in the plastic materials are toxic and may affect human health. Thus, this study aimed to analyse the thermal properties of adulterated frying oils by using Differential Scanning Calorimetry (DSC). Samples of frying oils from homemade fried bananas, homemade fried onions and homemade fried chickens that added with plastic materials were analysed. The exothermic and endothermic changes were then compared with the unadulterated frying oils. The data obtained were further analysed with Principal Component Analysis (PCA) for statistical data visualization. The results found that the DSC is able to differentiate adulterated frying oils and unadulterated frying oils. Future works on the evaluation of frying oils collected from the hawkers would be favourable.

Keywords: Plastics, Frying oils, Palm oil, Differential Scanning Calorimetry (DSC), Principal Components Analysis (PCA)

Acknowledgement: This work was supported by the IIUM Research Initiative Grant Scheme [RIGS16-068-0232] from the International Islamic University Malaysia (IIUM), Selangor, Malaysia.

ABSTRACT 19

FOURIER TRANSFORM INFRARED (FTIR) SPECTROSCOPIC METHOD IN DETECTION OF GELATIN IN COFFEE JELLIES

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ABSTRACT

Gelatin is one of the common ingredients that has been used in many coffees based confectionery products. It is widely used because of its ability to form foams, gels or solidifies into pieces and dissolve slowly or melt in the mouth. The largest scale of porcine and bovine gelatins production in a global market has raised scepticism among consumers toward products-containing gelatin, particularly on religious concerns. Thus, this study was aimed to detect gelatin in coffee jellies by using Fourier Transform Infrared (FTIR) Spectroscopy. A total of three types of gelatin (i.e. porcine, bovine and fish gelatins) with five different concentrations ranging from 1 – 30% were mixed with three different types of coffee and analysed with FTIR. The FTIR spectra were then analysed using chemometric, Principal Component Analysis (PCA). The results found that gelatin can be detected by the presence of a dominant band at Amide I. In the assessment of spiked samples, this method could detect at the minimum of 1% of gelatin in coffee jellies. This method would beneficial to ensure food integrity in the coffee jellies.

Keywords: Gelatin, Coffee, Fourier Transform Infrared (FTIR) Spectroscopy, Principal Component Analysis (PCA)

Acknowledgement: This work was supported by the IIUM Research Initiative Grant Scheme [RIGS16-068-0232] from the International Islamic University Malaysia (IIUM), Selangor, Malaysia.

ABSTRACT 20

CARTILAGINOUS MATRIX COMPONENTS PRODUCTION IN THE *IN VIVO* 'CELL-SCAFFOLD' CONSTRUCT

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ABSTRACT

Articular cartilage has the potential to be regenerated via tissue engineering strategy. This approach aims to improve the available cartilage degenerative related treatment modalities. With the utilisation of the tissue engineering principles, the engineered cartilage tissue was formed in the *in vitro* three-dimensional (3D) culture and evaluated in the *in vivo* ectopic implantation setting. The cultured chondrocytes at passage-1 were transfected with SRY (Sex Determining Region Y)-box9 (*SOX9*) and Telomerase Reverse Transcriptase (*TERT*) genes. The cells were grouped into 1) *SOX9*/*TERT*-transfected chondrocytes, and 2) non-transfected chondrocytes (NTC). The NTC serves as a control. A total of 1×10^5 cells were seeded into the porous poly(lactic-*co*-glycolic) acid (PLGA) with and without fibrin scaffolds. The formed *in vitro* "cell-scaffold" construct were cultured for three weeks. The constructs were subcutaneously implanted at the dorsum of the athymic mice for two and four weeks. The evaluation includes macroscopic observation as well as histological analyses to detect sulphated glycosaminoglycan (sGAG) and proteoglycan productions. The *in vivo* construct's morphology has the appearance that resembles cartilage. Regardless of cells and scaffold groups, the *in vivo* constructs at week-4 were firmer than the constructs at week-2 confirmed thru simple palpation using forceps. The construct's rigidity supported by the extracellular matrix distribution in the construct. The presence of sGAG can be visualised in all *in vivo* constructs. However, the proteoglycan can be seen only at the pericellular matrix region of the week-4 *SOX9*/*TERT*-PLGA/fibrin construct. The presence of these two extracellular matrix components indicates ongoing cartilaginous tissue development. The overall findings showed that the *SOX9*/*TERT*-PLGA/fibrin construct has the potential to be developed into functional cartilage tissue. The information retrieved from this study gives some insight into the translational endeavours to manoeuvring laboratory-grown engineered tissues to tangible impact in the future clinical application.

Keywords: Articular Cartilage, Chondrocytes, *In Vivo*, Tissue Engineering, Gene Transfer

Acknowledgement: The authors thanked the Kulliyyah of Allied Health Sciences, IIUM Kuantan Campus and the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) or formerly known as the Ministry of Science, Technology and Innovation (MOSTI) for providing ScienceFund (SF14-012-0062).

ABSTRACT 21

INVESTIGATION OF HORIZONTAL AND VERTICAL LIQUID FLOW INTERACTION AT VARIOUS VISCOSITY OF SUCROSE SOLUTION ON PAPER-BASED MICROFLUIDIC ANALYTICAL DEVICES

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ABSTRACT

Nowadays the use of paper-based microfluidic analytical devices (µPADs) which is fabricated by patterning paper into the hydrophilic and hydrophobic channel are developing in diagnostics field especially in resource-limited countries due to its low-cost, simplicity and user-friendly properties. However, these devices are less sensitive with slow reaction time. According to the World Health Organization (WHO), the diagnostics devices must be ASSURED which are affordable, sensitive, specific, user-friendly, rapid and robust, equipment-free and deliverable to end-users. In this research, the parameters that affect the flow of liquid in the channel are investigated and discussed. Wax channel is drawn on the paper by applying the handcrafted technique and heated on the hotplate within 3 minutes for the diffusion of wax into the paper. Different viscosities of sucrose solution ranging up to 70% of solutes are tested on two different platforms of the channel which are a horizontal and vertical platform on three types of paper that are filter paper type 1; chromatography paper type 1 and blue litmus paper. For the study of the horizontal flow of liquid in the channel, the sucrose solution is pipetted into the channel while for the vertical flow procedure, the tip of the wax channel is dipped into the solution. From the investigation, when the viscosity of sucrose solution increased, the time taken for the flow of liquid in the channel becomes longer. The ability of a liquid to flow in a horizontal platform is 48 percents faster than in vertical platform. Therefore, these results could emphasise upon the reaction time of µPAD.

Keywords: Paper-based microfluidic analytical devices (µPADs), horizontal flow, vertical flow, viscosity

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ABSTRACT 22

COMPOSTING OF FOOD WASTE AND ITS PRODUCT PERFORMANCE ON *Ipomoea aquatica*

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ABSTRACT

Food wastage is a serious problem reported currently, and their disposal at landfills caused environmental problems such as leachate and odour. Apart from being disposed, FW is biodegradable, and hence it can be treated through composting. Composting involves the activity of microbes to convert the FW into compost which can be used as organic fertiliser. While most of the previous studies focused on one type of composting method, the comparison between two methods to determine the efficient one in producing good quality compost is scarce. Hence, this study aimed to compare the physicochemical parameters of FW in conventional and spinning barrel composting method. Physicochemical parameters (temperature, pH, moisture content except for C/N ratio) were measured every three days interval throughout 30 composting days and analysed using SPSS. For the results, only moisture content differed significantly between both methods in which spinning barrel reach an optimum range of 54.61% in the end. The FW compost from both composting methods was then combined for application on *I. aquatica*. Four fertilisation treatments; control, NPK fertiliser, FW compost and combination of NPK fertiliser + FW compost were used to measure and compare the growth of *I. aquatica* in determining the best fertilisation treatment by looking at growth parameters (height, number of leaves and leaf width). The growth parameters were measured weekly for five weeks, and data were analysed using SASS. It was found that the best fertilisation treatment was the combination of NPK fertiliser + FW compost that recorded a better growth of *I. aquatica* (significant tallest height, the highest number of leaves and largest leaf width) most probably due to the synergetic effect of nutrients released from both fertilisers. To conclude, apart from reducing the FW disposed at landfills, composting also produce a valuable end product known as compost which can be used in combined with NPK fertiliser to promote the planting of *I. aquatica*.

Keywords: food waste composting, physicochemical parameters, compost, *I. aquatica*

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ABSTRACT 23

DEVELOPMENT OF SIMPLE NUCLEIC ACID DIAGNOSTIC TOOLS FOR RAPID AND RELIABLE DIAGNOSIS OF *CANDIDA* SPP. INFECTIONS.

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ABSTRACT

Invasive candidiasis is the most common fungal infection among hospitalised patients. Its high morbidity and mortality rates have been attributed to inadequate diagnosis and the delayed implementation of effective antifungal treatment. Traditional diagnostic methods are time-consuming, cumbersome and lack specificity. Therefore, the need for a novel diagnostic tool with high sensitivity, specificity and rapidity have arisen. Here, two different biomarker detection platforms were explored, namely, Multi-component Nucleic Acid Enzymes (MNAzymes) and Multiplex Probe Amplification (MPA), as simple nucleic acid biosensors for the diagnosis of invasive candidiasis. *Candida* DNA biomarkers were used to identify pathogenic *Candida* species (pan-*Candida*) and well-known drug-resistant species *Candida krusei*, *Candida glabrata*, *Candida auris*. The biomarkers were designed from the ribosomal DNA locus to be used in each DNA detection technique. The first technique, MNAzymes, is based on a modified DNA enzyme that consists of multiple, nucleic acid oligonucleotides which are catalytically active in the presence of the target DNA sequence. The catalytic activity of an isothermal MNAzyme assay was determined at 1.0×10^{8} min^{-1} M^{-1} for detection of amplified *Candida albicans* DNA. Secondly, MPA relies on five DNA probes designed with specific melting temperatures for *Candida* spp., the well-known drug-resistant *C. krusei*, *C. glabrata* and *C. auris*, and internal control. All five biomarkers are detected using only two real-time PCR channels (FAM and HEX). In the presence of the target, the corresponding probe is cleaved during amplification, and the signals can be compared with the positive control that can be seen in the post-amplification melting profiles. The assay exhibit high sensitivity, demonstrating a limit of detection ranging from 10-100 copies of genomic DNA. Developing effective diagnostic tests for fungal infections could save thousands of lives through accurate antifungal therapy and deliver substantial cost-cutting benefits to health care budgets worldwide.

Keywords: *Candida* spp., Nosocomial infections, Multiplex Probe Amplification, Multi-component Nucleic Acid Enzymes.

Acknowledgement: This work was supported by an Institutional Links Grant from the Newton Fund to JTT. MHJ is a recipient of a PhD scholarship from the International Islamic University Malaysia and Ministry of Education. The authors would like to thank Professor Julian Naglik (King's College London) for *Candida* strains and Professor Neil Gow, (University of Aberdeen) for access to unpublished *C. auris* whole-genome sequencing data.

ABSTRACT 24

PREPARING HEALTHCARE PROVIDERS TOWARDS SUSTAINABLE DEVELOPMENT GOAL 3.D.1: INTERNATIONAL HEALTH REGULATIONS AND HEALTH EMERGENCY PREPAREDNESS

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ABSTRACT

Preparing healthcare providers to sustain during the episode of emergency and disaster is critical. Indeed, it is concurrent to the global agenda of Sustainable Development Goal 3.D which has mentioned the target of "*Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks*". This study aimed to explore the experience of the diverse working background of nurses that have been involved in various disaster since 2004, including emergency physicians. Constructivist grounded theory by Kathy Charmaz was adopted to facilitate this study. About thirty nurses and five emergency physicians were involved in sharing their opinions, views and thoughts about their response during the cataclysmic situation. One-to-one, in-depth and semi-structured interviews were carried out to gain rich data, with an average of forty-five minutes for each session. This study revealed that most of the nurses were unprepared in facing disasters which then leads to the formation of 'Being A Disaster Nurse' model. Nurses pointed out three key notions that need to be given attention while preparing them in advance; 1) establishing competencies and responsibilities, 2) getting support and 3) managing emotions. It gives focus on ensuring individual sustainability when in a hostile environment. The discipline of the disaster still in its infancy in Malaysia, as compared to other countries that experience similar situations. Therefore, this study is adding to the current body of knowledge on the healthcare provider's experiences during disaster responses which could assist the healthcare administrators in giving further attention and preparing them to face and cope with disaster, apart from ensuring their sustainability while responding to any disaster events. This could help to react to the global agenda of strengthening the 'human' capacity in preparing the healthcare providers for emergencies and disasters.

Keyword: Disaster; Nurses; Sustainability; Sustainable Development Goal; Healthcare Providers

ABSTRACT 25

VOLKMANN'S ISCHAEMIC CONTRACTURE FOLLOWING DELAYED ANTIVENOM ADMINISTRATION: A CASE REPORT

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ABSTRACT

Snake envenomation is a serious health problem in Malaysia; however, it rarely causes compartment syndrome directly. Local envenomation will result in swelling, blistering and necrosis, while systemic envenomation will result in bleeding diathesis, hypotension and shock. Specific antivenom is required to reverse the symptoms of progressive oedema, coagulopathy and tissue necrosis, nevertheless delayed and inappropriate anti-venom may prove devastating. We reported a case of king cobra (*Ophiophagus hannah*) bite on a patient who developed compartment syndrome. Even though fasciotomy and debridement have been performed, the patient still developed a complication of Volkmann Ischaemic Contracture (VIC).

Keywords: Volkmann's ischemic contracture, compartment syndrome, fasciotomy

ABSTRACT 26

ASSESSING PREVALENCE OF CORAL HEALTH AND DISEASE IN TIOMAN ISLAND MARINE PARK, MALAYSIA

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ABSTRACT

Coral disease outbreaks continue to reduce coral populations worldwide. Its occurrence and prevalence are increasingly reported around the Indo-Pacific countries. However, there is a paucity of research on the coral disease in Malaysia. This study provides baseline information on the prevalence of coral health and disease in Tioman Island. Disease surveys were recorded a higher mean prevalence of healthy (66.9%) compared to diseased (6.9%) and compromised (26.0%) coral colonies. Developed isolated (9.1 ± 3.8%) and west coast (6.4 ± 1.2%) reef areas exhibited higher disease prevalence compared to less developed east coast (4.5 ± 0.5%) area of Tioman. Among five recorded diseases, yellow band disease/ YBD (3.0%) showed the highest mean prevalence, followed by ulcerative white spot/ UWS (1.5%) and white syndrome/ WS (1.1%). Meanwhile, sediment necrosis/ SN (6.7%), algal overgrowth/ AO (6.5%) and predation scar/ PS (6.5%) were the higher mean prevalence of compromised health states. *Fungia* sp. was found dominant being affected by YBD while *Porites* sp., being affected by UWS, AO and PS. Overall, this study suggests that the coral colonies in Tioman were in good condition. However, further study is required to examine the factors influenced by the occurrence of recorded coral diseases and other compromised health.

Keywords: Coral disease, Yellow band disease, Ulcerative white spot, White syndrome, Peninsular Malaysia

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ABSTRACT 27

DEVELOPING A NEW ARTIFICIAL REEF MATERIAL USING ARTIFICIAL LIVE ROCK (ALR) FOR MARINE HABITAT RESTORATION

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ABSTRACT

Artificial reefs are mostly adopted to enhance the biological and ecological benefits for the marine ecosystem. In Malaysia, the first artificial reef material was from tyres and introduced in 1975. Since then, various artificial reefs material has started to emerge such as wood, metal, concrete, ceramic and PVC. This study aimed to develop a new material, namely artificial live rock (ALR) that can be potential to be used as artificial reef material for marine habitat restoration. ALR was adopted from the natural live rock which is the foundation for the marine ecosystem. Designated ALRs were deployed at Tioman Island in March 2018 at three different locations, namely Teluk Salang, Teluk Bakau and Teluk Sanggit with a total of 250 pieces of ALR. In this work, terracotta tiles have been used as a control. The ALRs and tiles were retrieved with three months interval until June 2019. Identification in terms of coral spat species and macrobenthic organisms was done after retrieval. The coral spat was identified based on the morphology of their columella, septa and corallite wall by using Dinolight Digital Camera. Three species of coral juveniles (*Pocillopora damicornis, Stylophora pistillata* and *Seriatopora hystrix*) were found attached on ALR surfaces. Whereby, 11 phyla of epibenthic organisms were found attach on ALR. Percentage coverage of epibenthic calculated using Coral Point Count with Excel extension (CPCe) shown ALR was dominated by coralline algae (CCA) and has a significant difference ($p<0.05$) with tiles at all sites. The presence of CCA was a good indicator since CCA have positive effects on coral settlement and recruitment. Based on the results, ALR only takes 12 months to become a good substrate for epibentic organism and corals juveniles. Hence, ALR is an ideal material that can be applied and has a huge potential to be upgraded as an artificial reef in the future.

Keywords: Artificial reef, artificial live rock, live rock, coral juveniles.

ABSTRACT 29

CARP-1 FUNCTIONAL MIMETIC-4 IS A NOVEL SUPPRESSOR OF COLORECTAL CANCER CELL GROWTH AND METASTASIS

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ABSTRACT

Colorectal cancer (CRC) constitutes one of the most aggressive malignancies worldwide and in Malaysia. Due to high recurrence rate and toxic side effects of radiation and chemotherapies, new agents are urgently needed. CARP-1 is a peri-nuclear phospho-protein which plays a dynamic role in regulating cell growth and apoptosis. CARP-1 functional mimetics (CFMs) are a class of compounds that stimulate CARP-1. CFM-4, a lead compound, was shown to suppress growth and metastasis of various cancers. This study aimed to assess the extent to which CFM-4 inhibits CRC proliferation and metastasis and delineate the mechanism. CFM-4 anti-cancer effects of on CRC cells were investigated using MTT assay, Annexin V/Propidium iodide (PI) apoptosis assay, cell cycle analysis, quantitative real-time PCR (qRT-PCR) and Western blotting. Antimetastatic activities were assessed by migration, colony formation and invasion assays. CFM-4 inhibited CRC cell proliferation and was much more potent than the classical anti-CRC 5-fluorouracil. These effects were shown to be mediated at least in part by stimulating apoptosis, as indicated in our Annexin V/PI assay results. Cell cycle analysis showed that CFM-4 induced G2/M phase arrest. Molecularly, qRT-PCR results revealed that CFM-4 promoted intrinsic apoptosis by upregulating expression of *caspase-8* and *-9*, *p53, PUMA* and *Noxa,* and stimulated extrinsic apoptosis by enhancing the expression of death receptors. CFM-4 upregulated *NF-□B* signalling inhibitor A20-binding inhibitor protein-1 and the *PI3K* negative regulator *PTEN.* Western blot analysis results revealed that CFM-4 enhanced expression of CARP-1, caspase-8 and executioner caspase-3. Metastatic properties of the CRC cells were reduced by CFM-4 through blocking their capabilities to form colonies, migrate and invade through the matrix-coated membranes. The potent antitumor and anti-metastatic properties of CFM-4 against CRC are due to collective pro-apoptotic, anti-proliferative and anti-metastatic activities. Together our data warrants further investigations of CFM-4 as a potential anti-tumour agent for CRC malignancy and metastasis.

Keywords: Colorectal cancer; CARP-1; CFM-4; apoptosis; metastasis.

Acknowledgement: We are very grateful to all the faculty members, Medical Laboratory Technicians and staff in the Department of Basic Medical Sciences, Kulliyyah of Medicine, International Islamic University Malaysia, for their extraordinary assistance.

ABSTRACT 30

PHASE DIAGRAMS OF POTTS MODEL WITH COMPETING BINARY-TERNARY-QUATERNARY INTERACTIONS ON CAYLEY TREE OF ORDER THREE

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ABSTRACT

We investigate the phase diagram of the Potts model with competing binary interactions J_1, ternary interactions J_t, and quaternary interactions J_q on the Cayley tree of order 3. At vanishing temperature T, the phase diagram is fully determined for all values and signs of J_t/J_1, J_q/J_1 and T/J_1. The phase diagram shows the appearance of additional phases: Antiferromagnetic, Period 5, Period 7, Period 9, Period 11 and Period 12 which are in addition to the expected Ferromagnetic, Paramagnetic, Antiphase and Period 6 phases for the case of nonzero J_q for several ranges of the competing parameters. As a result, there was a significant effect of additional new phases in the phase diagrams when the order of the Cayley tree is extended up to the order 3.

Keywords: Potts model, Binary Interaction, Ternary Interaction, Quaternary Interaction, Phase diagram

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ABSTRACT 31

ANTIOXIDANT, ANTICANCER AND GCMS ANALYSIS OF PORCUPINE BEZOAR AQUEOUS EXTRACTS: A COMPARATIVE STUDY BASED ON MODERN AND CONVENTIONAL EXTRACTION TECHNIQUES

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ABSTRACT

Porcupine bezoar (PB) is a mass of undigested material formed by calcification process that generally found in the gastrointestinal tract. Traditionally, it is claimed as the prince of antidote because of the medicinal properties believed to treat many diseases such as cancer, poisoning, dengue, typhoid, etc. The price for PB is high due to the scarcity as it can only be found in wild porcupine. This study was conducted with the aim to know the best way of reducing time and cost of analysis of PB extracts. Aqueous extract of PB was initially prepared by sonication method and then compared with the aqueous extract of PB obtained through conventional method, viz. maceration method. PB aqueous extracts were firstly screened for antioxidant capacity by *in vitro* bioautography based antioxidant assays, namely, 2,2′-azino-bis-3-ethylbenzothiazoline- 6-sulphonic acid (ABTS), 2,2-diphenyl--picrylhydrazyl (DPPH), and β-carotene. PB aqueous extracts were further evaluated for their total flavonoid, total phenolic contents and radical scavenging capacity. In vitro anti-proliferative assay was also performed on breast cancer cell (MCF7) to confirm its anticancer effect. Finally, Gas Chromatography-Mass Spectroscopy (GCMS) assay was done to detect bioactive compounds present in PB aqueous extracts. All three *in vitro* bioautography based antioxidant assays revealed antioxidant capacity with almost similar results for both PB aqueous extracts obtained through maceration and sonication methods. Sonication based PB aqueous extract showed higher total phenolic content than the maceration based PB aqueous extract, 8.79 ± 3.28 (µg GAE/5 mg dry weight) and 6.96 ± 2.25 (µg GAE/5 mg dry weight), respectively. Both the extracts were devoid of total flavonoid content. Maceration based PB aqueous extract showed lower IC_{50} value compared to sonication based PB aqueous extract for radical scavenging activity. Both PB aqueous extracts showed similar anti-proliferation effect on MCF7 cells. GCMS analysis for both the PB aqueous extracts displayed similar putative compounds that might be responsible for the aforementioned properties elicited viz. octadenoic acid, gomisin C and Cholest-5-en-3-ol (3. beta.)-, carbonochloridate. Based on the results obtained, it can be concluded that the sonication method can give an almost similar result in a shorter time and at a lower cost.

Keywords: Porcupine bezoar, antioxidant assays, anticancer, MCF7 cells, GCMS.

Acknowledgement: FRGS grant (144740-169326), International Islamic University Malaysia Kuantan Campus, Kulliyyah of Allied Health Science, Kulliyyah of Pharmacy, Department of Wildlife and National Parks, Semenanjung Malaysia (PERHILITAN) – JPHL&TN(IP):100-34/1.24 Jld 8.

ABSTRACT 32

OPTIMAL PORTFOLIO SELECTION BY USING COOPERATIVE GAME THEORY APPROACH DURING MALAYSIA GENERAL ELECTION 14 AND ITS PERFORMANCE

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ABSTRACT

The cooperative game theory approach focusses on the final decision to the investors' portfolio based on the payoffs. In this paper, the model of players (sectors) is divided into three groups where each player will have three strategies (stocks) for the game. The prices of each stock from Bursa Malaysia have been used in order to get the payoff from each stock and its coalition sectors by averaging the returns. The game value of the multiple-player game will be applied to obtain Shapley value to find the optimal increment of the returns. The players will cooperate to defeat the market by using Shapley value percentages. The optimal portfolio performance has been calculated during Malaysia GE14 by using Sharpe criteria. The proposed portfolio performed outperformed the market in 6 months before and after GE14.

Keywords: Cooperative Game Theory, Shapley Value, Portfolio Selection

ABSTRACT 33

PERFORMANCE ANALYSIS OF DECISION TREE MODEL IN PREDICTING WOMEN'S BEHAVIOURAL ADOPTION OF MAMMOGRAPHY FOR EARLY BREAST CANCER DETECTION

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ABSTRACT

Breast cancer is leading cancer occurring to women globally. Early detection of breast cancer could result in reduced mortality and morbidity rate as well as cancer treatment cost. In this study, a data mining method called the decision tree is utilised to predict women's intention in adopting mammography for early breast cancer detection. The study is intended to investigate how using different validation, and optimisation techniques might have an impact on decision tree predictive performance. The application of data mining method is of the aim to produce predictive modelling that can make future predictions by learning from the previous data. The data from this study was collected amongst 500 women in Kuantan, Pahang using a validated self-developed questionnaire to elicit the health beliefs of women towards breast cancer and mammography as well as its' relation to their intention in practising mammography. By using RapidMiner software, data modelling was done using a decision tree to predict women's behavioural adoption towards mammography. The predictive performance of the tree was enhanced through several methods of validation and optimisation and further be analysed through its accuracy, sensitivity and specificity. The model was found to perform better when using a combination of method, namely the split validation, the threshold as well as weight and parameter optimisation. Based on the results, a finalised decision tree was created based on the model that give the best performance results. Despite many decision tree studies that relate to breast cancer, yet only a few studies have been carried out to determine the behavioural pattern of Malaysian women's towards breast screening. Knowing the women's behavioural adoption towards breast screening in relation to their beliefs and perception will be a promising approach in early-stage breast cancer detection.

Keywords: Breast Cancer, Mammography, Health Belief Model, Machine Learning, Decision Tree

Acknowledgement: Asst. Prof. Dr Moey Soo Foon and Assoc. Prof. Dr Mohd. Zulfaezal Bin Che Azemin.

ABSTRACT 34

BISINGLAH! BEB (BELIA ELAK BISING): THE DEVELOPMENT OF MALAY VERSION OF EDUCATIONAL HEARING CONSERVATION PROGRAMME (EdHCP) FOR YOUTH

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ABSTRACT

Exposure to leisure noise in youth has become a public health concern. Excessive noise exposure might lead to permanently damaged outer hair cells (OHCs) which caused noise-induced hearing loss (NIHL). It has been reported that attitudes and behaviours are important factors in determining how well someone is taking care of their ears. Therefore, it is essential to implement a hearing healthcare programme to address this problem. The main objective of the current study is to develop and validate a Malay version of educational hearing conservation programme (EdHCP) for students at high school, college or/and university. A cross-sectional study is conducted among students in Kolej Tingkatan 6, Desa Murni Butterworth. This programme involved 3 phases: 1) reviewing and adapting of EdHCP, 2) content-validity from 10 expert panels, and 3) a 50- minutes classroom session for 40 students. The contents of this module are basic information of the ear, dangerous noise and hearing preventive measures. 'Bisinglah! BEB (Belia Elak Bising)' has been modified based on the reviews and comments from the content validation index (CVI) and content validation ratio (CVR). The S-CVI/Ave value is high, at 0.935 and agreement among the students in pre-testing were excellent. The contents and layout of the newly developed Malay EdHCP known as 'Bisinglah! BEB (Belia Elak Bising)' are relevant, informative and produced a high value of content-validity finding. However, further study is needed to investigate the effectiveness of the programme among Malaysian youth.

Keywords: Educational hearing conservation programme (EdHCP), youth, content-validity, pre-testing, Bisinglah! BEB.

Acknowledgement: Thanks to the expert panels for their contribution in developing this programme and the students who participated in this study. This study was funded by the Research Initiative Grant Scheme (Grant no: RIGS 16-136-0300).

ABSTRACT 35

Hystrix brachyura BEZOAR: AN IN VIVO TOXICITY EVALUATION USING EMBRYO ZEBRAFISH (*DANIO RERIO*) MODEL

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ABSTRACT

Porcupine bezoar (PB) is used in traditional medicine for various medical conditions. However, its toxicity profile has never been thoroughly investigated to verify its safety nature. Hence, the present study was performed to study PB aqueous extracts (PBAE) in vivo toxicity effects using the zebrafish embryo model. The toxicity evaluated morphology and mortality of embryo at 96-hour post-fertilisation (hpf). The embryos were exposed with PB aqueous extract at 0.25, 0.5, 0.75, 1.0 and 1.25 mg/mL with egg water as negative control (NC) and 3, 4-dichloroaniline (4.0 mg/L) as positive control (PC). The PBAE found to affect tail detachment rate, hatching rate, severe craniofacial defects, brain morphology defects, spinal bent with somites and notochord deformities. Furthermore, it was also found to affect the soft tissues with absence/uninflated swim bladder, oedema in the yolk sac and pericardial area. Measured median lethal concentration, median effective concentration and teratogenicity index were 69.4 µg/mL, 28.5 µg/mL and 2.44 ratio respectively. The finding of this study concluded PBAE is a teratogen agent which induced severe malformation and high mortality on embryo zebrafish at high concentration.

Keywords: Porcupine bezoar; *Hystrix brachyura*; zebrafish; developmental toxicity

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ABSTRACT 37

COMPARING THE EFFECTS OF QUR'AN RECITATION AND NATURE SOUNDS ON PREOPERATIVE ANXIETY AND PHYSIOLOGICAL PARAMETERS AMONG PATIENTS UNDERGOING SURGERY AT A TEACHING HOSPITAL

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ABSTRACT

There is an increasing concern regarding the impact of sounds on the physiologic response of patients. Several studies observed the individual effects of Qur'an recitation and nature sounds on patients' emotions and their physiological parameters. There was evidence of improvement seen among the studies conducted on patients undergoing surgery. Thus, this study aim is to compare the effectiveness of listening to Qur'an and nature sounds on preoperative anxiety and physiological parameters. A randomised controlled trial study using systematic random sampling was conducted at the International Islamic University Malaysia Medical Center (IIUMMC) in Kuantan, Pahang, Malaysia. A total of 81 patients were allocated to three equal groups which were a group that listened to Qur'an recitation or nature sounds for 20 minutes and a control group. Preoperative state anxiety was measured by using the Spielberger State-Trait Anxiety Inventory (STAI), and physiological parameters were recorded before and after the intervention. Data were analysed using repeated-measures ANOVA. There was an insignificant difference in all physiological parameters data observed between the two groups. The mean anxiety level of nature sounds group is significantly lower than that of the control group ($p < 0.015$) but no significant reduction observed after listening to Quran compared to control group ($p = 0.165$). An insignificant difference has been found in preoperative anxiety data between those who listened to Qur'an recitation and nature sounds ($p=1.000$). Listening to Quran recitation and nature sounds were found to be effective in reducing preoperative anxiety. Both Qur'an and nature sounds had similar effects on state anxiety score, and both showed a similar level of reduced preoperative anxiety. They can be used as a non-pharmacological intervention to reduce preoperative anxiety among patients undergoing surgery.

Keywords: Preoperative anxiety, physiological parameters, Qur'an recitation, nature sounds

ABSTRACT 39

HYPOCHOLESTEROLEMIC AND ANTI-INFLAMMATORY EFFECTS OF TRIHONEY IN HYPERCHOLESTEROLEMIC RABBIT MODEL

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ABSTRACT

Inflammation is a well-established consequence of hypercholesterolemia. Acute inflammation is transient and beneficial body response whereas, chronic inflammation is persistent and may progress to various diseases. This study aims to investigate the hypocholesterolemic and the anti-inflammatory effects of a novel Trihoney (a mixture of Trigona, Mellifera and Tualang honey) in hypercholesterolemic rabbits and compare its effects with atorvastatin. Thirty-six male New Zealand white rabbits were randomly assigned into six groups (n=6). Two groups were fed commercial rabbit pellet and 0 and 0.6 g/kg/day of Trihoney while the other four groups were fed 1% cholesterol diet and 0, 0.3, 0.6 g/kg/day of Trihoney and 2 mg/kg/day of atorvastatin. After 12 weeks of consumption, each rabbit was anaesthetised, and blood was collected from the central ear artery for the analysis of lipid profile and proinflammatory cytokines. Administration of 1% cholesterol diet markedly increased serum total cholesterol (TC) ($p<0.001$) and low-density lipoprotein cholesterol (LDL-c) ($p<0.001$). Treatment with atorvastatin resulted in a significant reduction of serum TC ($p<0.05$) and LDL-c ($p<0.05$). Likewise, Trihoney, particularly at the dose of 0.6 g/kg/day, significantly reduced serum TC ($p<0.01$) and LDL-c ($p<0.01$). Feeding of rabbits on 1% cholesterol diet significantly increased serum interleukin-1β (IL-1β) ($p<0.001$) and tumour necrosis factor-alpha (TNF-α) ($p<0.05$) with a nonsignificant increase of interleukin-6 (IL-6) ($p>0.05$). Atorvastatin received group expressed a significant reduction of IL-1β ($p<0.01$) and TNF-α ($p<0.01$) with a nonsignificant reduction of IL-6 ($p>0.05$). On the other hand, Trihoney supplementation significantly reduced serum TNF-α ($p<0.001$), IL-1β ($p<0.01$) and IL-6 ($p<0.05$). Trihoney offers its potential health benefits as lipid-lowering and anti-inflammatory agent.

Keywords: Hypercholesterolemia, Inflammation, Trihoney, Atorvastatin.

ABSTRACT 40

TRIHONEY AMELIORATES OXIDATIVE STRESS IN ATHEROSCLEROTIC AORTA

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ABSTRACT

Oxidative stress is one of the mechanisms involved in the pathogenesis of atherosclerosis. Reactive oxygen species (ROS) are implicated in various pathogenic signalling pathways underlying vascular inflammation. Antioxidant enzymes such as superoxide dismutase (SOD) and glutathione peroxidase (GPx) play a significant role in protecting against harmful effects of ROS. Honey has been shown to function as antioxidant through suppression of oxidative stress and radical scavenging ability. This study aims to explore the antioxidant potential of Trihoney (Combination of three types of honey, namely: Trigona, Mellifera, and Dorsata) on oxidative stress in atherosclerotic plaques of hypercholesterolemic rabbits**.** Thirty male New Zealand white rabbits were assigned into 5 groups as follows: normal diet (C), normal diet with 0.6g/kg/day of Trihoney (C+H), 1% cholesterol diet (HC), 1% cholesterol diet with 0.6g/kg/day of Trihoney (HC+H), and 1% cholesterol diet with 2mg/kg/day of atorvastatin (HC+At). All animals were sacrificed after 12 weeks of treatment upon confirmation of hypercholesterolemia. The atherosclerotic aorta was harvested and homogenised. Activities of SOD and GPx were determined in aorta homogenate by enzyme assay kits. Aorta homogenate malondialdehyde (MDA) concentration was determined by enzyme-linked immunosorbent assay kit. Untreated hypercholesterolemic group HC showed it suppressed SOD and GPx activities, in addition to significant (p<0.001) elevation of MDA concentration**.** The atherogenic group treated with Trihoney demonstrated significant (p<0.01) enhanced activities of both SOD and GPx compared to HC group. Treatment with atorvastatin significantly (p<0.001) enhanced GPx activity as compared to all other treated and untreated groups. Trihoney supplemented group, and atorvastatin treated group demonstrated significant (p<0.001) reduction in MDA concentration compared to the HC group. **Conclusions:** Trihoney has the potentials to enhance antioxidant enzyme activity and ameliorates the oxidative stress in the atherosclerotic aorta.

Keywords: Atherosclerosis, Oxidative stress, Trihoney, Atorvastatin.

ABSTRACT 41

PHYTOREMEDIATION OF ARSENIC FROM MINE WASTE BY *Jatropha curcas*

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ABSTRACT

The increasing activities of mining industries had led to an increasing number of mine tailings. Mine tailings containing a high concentration of heavy metal such as arsenic generated from the refining process contributes to the pollution of the environment and brings harmful effects to human health. Phytoremediation is an emerging technology that adopts the ability of the plant to accumulate heavy metals for remediation of the environment. *Jatropha curcas* was chosen as a candidate in this work due to its potential in accumulating heavy metals in its tissues and consequently could remediate the polluted area. The concentration of arsenic in the root and leaf tissues were analysed after the plants were planted in the tailings for one month. The accumulation of arsenic was higher in the root tissues compared to leaf tissue. Furthermore, the translocation factor (TF) of *Jatropha curcas* was detected around 0.010 to 0.015. The arsenic reduction in the tailings is about 80% after the remediation. Overall, this work may provide a preliminary inference on the *Jatropha curcas* in phytoremediation of arsenic from mine tailings.

Keywords: *Jatropha curcas*; mine tailings; phytoremediation; arsenic

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ABSTRACT 42

EVALUATION OF MULTIDISCIPLINARY EDUCATION ON DIET MODIFICATION AND FLUID INTAKE RESTRICTION ADHERENCE AMONG THE CHRONIC KIDNEY DISEASE PATIENTS IN HEMODIALYSIS UNIT OF GENERAL HOSPITAL IN KUANTAN

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ABSTRACT

Patients with chronic kidney disease may have a deteriorated condition that may lead to end-stage renal disease. Growing incidence and prevalence of CKD in Malaysia required an evaluation of knowledge and adherence level throughout disease management. Thus, this study was conducted to determine the sociodemographic background, level of satisfaction on the education received, level of diet modification and fluid intake restriction adherence among the CKD patients. A survey was purposely conducted among 58 CKD patients attended the Hemodialysis Unit, Hospital Tengku Ampuan Afzan, Kuantan, Pahang. A validated questionnaire was used to collect the data. Results were analysed descriptively and Fisher's Exact Test for univariate. Level of significance was set at p-value less than 0.05. Half of the patients were aged 50 years or more, male (58.6%), Malays (82.8%), married (67.2%), having normal BMI (75.9%), completed secondary school (65.5%) and unemployed (43.1%). There was no association between sociodemographic background and diet modification adherence except for BMI (p=0.052). Similarly, no association between sociodemographic background and fluid intake restriction adherence except for marital status (p=0.034). Finally, there was no association between the level of satisfaction on education received about CKD in regards to diet modification and fluid intake restriction adherence. This study reported moderate adherence for diet modification and fluid intake restriction, respectively. Overall, they have equally rated moderate (50.0%) and high (50.0%) satisfaction in education received about CKD during treatment. Multidisciplinary approach in managing CKD disease through educational intervention had proven to improve patients' satisfaction.

Keywords: chronic kidney disease, multidisciplinary education, adherence, dialysis

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ABSTRACT 43

THE RELATION BETWEEN RETINOIDS AND NON-ALCOHOLIC FATTY LIVER: A REVIEW

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ABSTRACT

Non-alcoholic fatty liver (NAFLD) is the most common liver disease. It carries the risk of progressing to liver fibrosis, cirrhosis and hepatocellular carcinoma. The accumulation of triglyceride in hepatocytes is the hallmark of the disease. NAFLD is defined as liver fat exceeding 5–10% triglyceride of liver weight. Diacylglycerol acyltransferase (DGAT) is the main enzyme for hepatic triglyceride synthesis. A retinoid is a form of vitamin A. stored mainly (80%) in the liver of healthy individuals, while diseased liver with NAFLD lacks their retinoid content. The leading cause of death in the NAFLD is a cardiovascular disease due to triglyceride accumulation in the liver of NAFLD patients. Therefore, decreasing triglyceride biosynthesis effect of retinoid could have a beneficial effect in prolonging the life expectancy of NAFLD patients beside improving the hepatic steatosis and insulin resistance. The article summarises the current knowledge of (NAFLD) and its relation to retinoid, providing a better understanding to the readers by discussing the recent finding present in research papers. A keywords search of Medline and PubMed was performed for NAFLD, retinoids, and triglyceride. The search was limited to the English language published papers between 2004-2019. Sixty-nine journal articles were found, and after reviewing the content of each article, 13 had relevant trials for animal and human with NAFLD and included in this review. NAFLD patients and animal model of NAFLD had reported having a decreased serum retinol level, and decreased hepatic antioxidant enzymes, with an increased hepatic level of triglyceride. Additionally, a human study of NAFLD reported that serum retinoid inversely correlates with triglyceride level. Retinoid deficient animals, either transgenic or dietary, had developed steatosis, steatohepatitis and even hepatic tumours. Many researchers reported a decrease in hepatic triglyceride level in NAFLD animal model in response to RA treatment also reported a decrease in the body weight, hepatic steatosis, and increase antioxidant enzymes. Moreover, animals with DGAT2 antisense oligonucleotide significantly inhibited triglyceride accumulation. In conclusion, the retinol deficiency can be the leading cause for the development of NAFLD, it can be used in the future for the treatment of obesity and NAFLD, and the role of retinoids in decreasing hepatic steatosis and triglyceride is not entirely understood. One of the suggested mechanism is through inhibition of hepatic triglyceride synthesis.

Keywords: Non-alcoholic fatty liver, Retinoid, Triglyceride.

ABSTRACT 44

ANALYSIS OF PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY IN *Anacardium occidentale* LEAVES.

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ABSTRACT

Anacardium occidentale (*A. occidentale*) young leaves are consumed traditionally as part of a southeast Asian diet. The regular consumption is believed to have beneficial effects on health in general and potentially against type 2 Diabetes mellitus due to its high content of polyphenols. The aim of this study was to investigate the polyphenol content of the plant using two methanol extracts; Free Phenolic Extract (FPE) and Bound Phenolic Extract (BPE) as well as highlight the presence of six phenolic acids and flavonoids namely; gallic acid, sinapinic acid, caffeic acid, quercetin, ferulic acid and kaempferol using High performance liquid chromatography-photodiode array (HPLC-UV-Vis). The total polyphenols and flavonoids content were also measured which showed high amounts of total polyphenols in BPE with 8.5 mg GAE/g as well as high amounts of total flavonoids in both extracts FPE and BPE with 0.86-0.9 mg QE/g respectively. The presence of these polyphenols was further confirmed by measuring the antioxidant activity through the scavenging of the free radical DPPH, which showed the high antioxidant percentage for both extracts. These findings confirm the importance of *A. occidentale* as a rich source of polyphenols which can be further investigated to determine its effects on non-communicable diseases such as type 2 diabetes.

Keywords: Anacardium occidentale, Phenolics acids, Flavonoids, HPLC, antioxidants.

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ABSTRACT 45

THE DEVELOPMENT OF PRAYING ABILITY SCALE FOR MUSLIM WITH DIABETIC FOOT PROBLEM

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ABSTRACT

Solah or prayer is one of the pillars of *Islam* and a fundamental component of *Ibadah*. Muslim prayer involves physical motions and recitations. It requires cleansing of the body, ablution, and proper clothing before the prayer. In *Muslim* patient who has a diabetic foot problem, most of them having difficulty in doing prayer due to their variety disability. This newly developed scale is meant to gauge their ability to pray objectively. Five experts each from orthopaedic, psychiatry, Islamic studies and science were gathered and construct the new scale to measure a Muslim ability to pray objectively. Nineteen items have been established to be tested. Two hundred twelve participants enrolled in this study which took place at IIUM Medical Centre and Hospital Tengku Ampuan Afzan. 125 participant is from the control group, while 87 participants are from the diabetic group. They were selected through stratified random sampling. The Kaiser-Meyer-Olkin (KMO) value was 0.72. The Exploratory Factor Analysis showed the 19 items of praying ability scale composed of five domains with three items in each domain**.** Cronbach's alpha values on finalised 19 items were 0.788, which signify good scale reliability**.** All of the items showed good factor loadings of more than 0.5. The five identified domains are namely Preparation of praying (factor 1), Physical movement (factor 2), Spirituality (factor 3), Engross & Tayammum (factor 4) and Disturbance (factor 5). The individualised Cronbach's alpha of each domain ranged from 0.67 to 0.903. This study has proved that the new Praying Ability Scale (PAS) is valid and reliable to be used as tools to measure prayer ability in diabetic foot patient.

Keywords: Praying Ability Scale, Muslim, Diabetic Foot Problem

ABSTRACT 46

POTENTIAL REHABILITATION AND PHYTOREMEDIATION OF BARREN BAUXITE MINING SITES BY *JATROPHA CURCAS*

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ABSTRACT

Recent bauxite mining activities in Kuantan have raised public concerns including environmental and health issues, such as poor soil quality, soil erosion and dust pollution; which eventually leads to health problems such as asthma, allergy and cough. Barren bauxite mines were left without vegetations, making soil erosion problems becoming worse. The potential of *Jatropha curcas*, a non-edible biodiesel producing plant in rehabilitating and remediating barren bauxite mining sites need to be investigated and further studied. The objective of this research is to investigate the effects of planting *J. curcas* on bauxite-mined soil. Growth performance of *J. curcas* before and after planting on bauxite-mined soil was observed by periodic observations of the numbers of leaves, shoots length and root length; while heavy metal content of bauxite-mined soils was analysed each month using inductively coupled plasma mass spectrometry (ICP-MS). Based on the results obtained, *J. curcas* could thrive and grow on both topsoil and bauxite-mined soil. Soil pH levels also improved while heavy metal concentrations decreased after planting. Therefore, *J. curcas* is identified suitable for both revegetation and phytoremediation; thus, potentially can solve the environmental problems that arise on the bauxite-mined site.

Keywords: *Jatropha curcas*; bauxite-mined soils; rehabilitation; phytoremediation

Acknowledgement: We gratefully acknowledge the support received from all involved parties, including the financial support from the ministry (Grant ID: FRGS17-039-0605).

ABSTRACT 47

THE EXPERIENCE OF BREASTFEEDING SUPPORTERS WORKING WITH MOTHERS AT THE EARLY STAGE OF BREASTFEEDING PRACTICE

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ABSTRACT

There are uncountable advantages of breastfeeding and the complications of early breastfeeding cessation occurring both for the mother and the newborn. The use of the alternative technique in promoting breastfeeding practice such as traditional body massage was belief can increase breast milk production that encouraged the mother to breastfeed continuously. This study aims to know the experience of traditional massage practitioner who acts as a breastfeeding support group that works with breastfeeding mothers. A total of five participants from *Mamacare, LPPKN* Kuantan were involved and interviewed. Data were analysed using a thematic analysis. The findings revealed three themes emerged; enjoyed sharing knowledge and breastfeeding technique, vast massage experience and breastfeeding challenges during the services. Traditional massage practitioner as breastfeeding support group members appreciated their practices and enjoyed to provide help for postnatal mothers at their early breastfeeding practice to strengthen infant's immunisation.

Keywords: Breastfeeding, traditional massage practitioner, postnatal mother, breastfeeding peers, breastfeeding support group.

Acknowledgement: Thanks to IREC IIUM, Kuliiyah of Nursing, IIUM and Mamacare Group from LPPKN, Pahang.

ABSTRACT 48

SMOKING CESSATION AND ITS RELATIONSHIP WITH RELIGIOSITY: A REVIEW OF LITERATURE.

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ABSTRACT

This study aims to systematically review the literature regarding the relationship between religiosity/spirituality and smoking behaviour. Systematic searches were conducted to identify the literature published since 2013-2019 based on sets of inclusion and exclusion criteria. Four electronic databases were used to identify the literature, including Scopus, Science Direct, ProQuest and PubMed. The search was limited to full-text articles/ review papers and in English or Malay language only. Articles on smoking prevention and other nicotine delivering devices such as vape or electronic cigarette were excluded from the study. Initially, 26,938 articles were retrieved, but only 12 were finalised to be critically appraised. Out of the 12 studies, five studies revealed a significant relationship between religious/spiritual activities and cessation while the others showed an inverse association between religiosity and smoking. Religiosity/spirituality played an essential role in influencing smoking behaviour, making it an important vehicle to complement other existing tobacco control efforts. Limited studies were focusing on the Islamic religion despite the growing number of the Muslim population worldwide. Thus further research on the integration of Islamic religion in the smoking cessation program is highly recommended, especially in a Muslim country like Malaysia.

Keywords: Religiosity, Spirituality, Islamic, Smoking Cessation

ABSTRACT 49

METAL RELEASE OF STANDARD AND FAKE ORTHODONTIC BRACES: AN IN VITRO STUDY

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ABSTRACT

Fake braces are currently an epidemic in this country with many wearers reported of complications due to poor quality fake products and treatment by unqualified personnel. The purpose of this study was to investigate the release of metal ions from standard and fake orthodontic braces immersed in artificial saliva of different pH. Three standard and three fake orthodontic brackets were immersed in containers containing 5 mL of artificial saliva of pH 4.9 and pH 7.8. Inductively-Coupled Plasma Mass Spectrometry (ICPMS) was used to analyse the amount of metal ion released into the artificial saliva on day 1, day 14 and day 28. Statistical analysis was performed to determine the significant difference of metal ions release between two types of braces in different pH solutions. The results showed the release of 5 types of ions: aluminium, nickel, chromium, manganese and copper. Fake braces released the highest concentration of chromium, manganese and nickel ions in both artificial salivae as compared to standard braces. Brackets immersed in pH 4.9 released a higher number of ions compared to pH 7.8. This study showed that fake braces released a higher concentration of metal ions as compared to standard braces. The release of metal ions from orthodontic brackets is influenced by both time and pH.

Keywords: Fake braces; Real braces; ICP-MS; Bracket corrosion; Orthodontic bracket

Acknowledgement: We would like to acknowledge the assistance of Br. Abdul Halim bin Ihsan, Assistant Science Officer at Central Research and Animal Facility Management (CREAM), Kulliyyah of Sciences, IIUM and Sr. Fatimah Maryam Binti Ali, Medical Laboratory Technologist at Multidisciplinary Laboratory, Kulliyyah of Dentistry, IIUM.

ABSTRACT 50

PULMONARY ARTERY ANEURYSM: A VERY RARE ENTITY

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ABSTRACT

Pulmonary artery aneurysm (PAA) is defined as a focal dilatation of the pulmonary artery. It is noted to be very rare and infrequently diagnosed. From literature reviews, only 8 cases of pulmonary artery aneurysms were identified from a total of 109,571 cases within an extended period of 100 years. This gives an incidence of about 0.0073%. PAA is usually associated with some structural cardiac anomalies, structural vascular anomalies, pulmonary hypertension, vasculitis and infection. However, idiopathic pulmonary artery aneurysm has also been identified in some cases. PAA can be classified as proximal or peripheral PAA depending on its location. Most of the patients are asymptomatic. Symptoms are only seen when complications occurred such as bronchial or tracheal compression, dissection, rupture or thrombus formation causing pulmonary hypertension. It can be treated conservatively or surgically if symptomatic or if the size is more than 6 cm. We reported a case of a left pulmonary artery aneurysm, which is an incidental finding in a patient who underwent a CT pulmonary angiography (CTPA) for a suspected pulmonary artery embolism. A left pulmonary artery aneurysm was seen measuring about 4.2 cm (W) x 3.9 cm (CC), which extends into the proximal branch of the descending pulmonary artery. Unfortunately, no further treatment was able to be given to the patient since the patient succumbed from sepsis shortly after the diagnosis.

Keywords: pulmonary artery, aneurysm

ABSTRACT 52

B CELL LYMPHOMA OF THORACIC VERTEBRAE: A GREAT MIMICKER

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ABSTRACT

Non-Hodgkin lymphoma (NHL) is a malignant neoplasm affecting multiple systems in which extranodal NHL represents 10-20% of all NHL. This is a case of a 45-year-old female with no known medical illness who presented with progressive numbness of bilateral lower limbs since March 2016 which subsequently progress to loss of motor power since November 2016. She initially was diagnosed as tuberculous (TB) spondylitis which then turned out to be B cell lymphoma of the thoracic vertebra. The diagnosis was confirmed on histopathological examination (HPE) after the patient underwent laminectomy of T3-T7 vertebra bodies and excision biopsy with the removal of the caseous material. Due to a lack of specific findings, the diagnosis of vertebral NHL is often missed or delayed. It warrants the attention that NHL of a thoracic vertebra may be misdiagnosed as TB spondylitis due to their similarities, and sometimes the imaging features may simulate and overlap each other. The main treatment for vertebral NHL is chemotherapy, radiotherapy or both. Surgery may be necessary if the patient has a story of neurological deficits. However, the patient was treated conservatively as she refused chemotherapy.

Keywords: bone lymphoma, tuberculous spondylitis

ABSTRACT 53

ANTIDIABETIC BURDENS AMONG GERIATRIC DIABETIC PATIENTS AND ITS ASSOCIATION WITH QUALITY OF LIFE

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ABSTRACT

Geriatric diabetic patients contribute to the major demographic background of diabetic patients follow up in primary health clinics. Despite their increasing age and morbidities, they are still targeted towards good sugar control achieving ideal HbA1c level, without taking into consideration of their quality of life. This study aims to determine the prevalence of antidiabetic usage among geriatric diabetic patients and their association with the patients quality of life. A cross-sectional study was done among 269 geriatric diabetic patients in all government health clinics in Kuantan using Diabetes Quality of Life questionnaire. SPSS version 23 is used for statistical analysis. Most of the geriatrics are female (61%), Malay (84.8%), pensioner (54.3%), education up to primary school (52%) and stay with family members (93.7%). In terms of antidiabetic agents, mostly depend on two antidiabetic agents (48%) followed by single antidiabetic agent (32%). 0.4% still taking glibenclamide despite its risk of hypoglycaemia. Usage of insulin is still common in the elderly in which 21% of them are on intermediate-acting insulin, 15.6% on premixed insulin and 7.8% on short-acting insulin. Interestingly, those taking a higher number of antidiabetic agents are associated with higher DQOL score ($p = 0.03$) compared to those taking one or two antidiabetic medications. Those taking long-acting insulin also significantly have higher DQOL score (0.037). Despite the risk of polypharmacy, geriatric patients do benefit the better quality of life with the further intensification of their antidiabetic medications according to guidelines. Usage of long-acting insulin has a lower risk of hypoglycaemia in which contribute to the quality score.

Keywords: Elderly, Diabetic, Antidiabetic agents, Quality of Life

Acknowledgement: We would like to express our gratitude to all elderly diabetic patients in Kuantan District for their cooperation in this study.

ABSTRACT 54

FUNCTIONALISED PROPANE THROUGH SELECTIVE OXIDATION OVER $MoVTeNbO_x$ CATALYST: EFFECT OF WATER VAPOR TOWARDS CATALYTIC ACTIVITY

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ABSTRACT

Selective oxidation of short-chain alkane to oxygenates, although promising, was not well studied until the 90's. Although highly challenging, selective oxidation reaction found to be advantageous and could revolutionise the process and commercialisation of bulk chemicals supply in the industry. One example is acrylic acid, currently synthesised by a two-step process is an essential intermediate for the chemical, petrochemical and consumable industry. It can also be produced through selective oxidation of propane over $MoVTeNbO_x$ catalyst. Although challenging, this direct one-step process has attracted researchers and industrialists community due to the energy and environmental conservation concern. This has made research to fine-tune the process and catalyst for this reaction intensified in the recent moment. In this work, four $MoVTeNbO_x$ catalysts were synthesised in different pH ranging from 1 to 3.5. The resulting catalysts have been characterised by X-ray powder diffraction (XRD), Brunauer-Emmett-Teller (BET) Surface Area Analysis, Temperature Program Reduction (TPR-H_2) and Scanning Electron Microscopy (SEM) for surface morphology. The XRD results showed that the catalysts contained highly pure M1 phase with the surface area is in the range of 21.56 – 40.11 m_2/g. The SEM results show the only single morphology of rod shape in accordance with an M1 phase which is found present in high purity. After being characterised, the catalysts were subsequently used in the partial oxidation of propane to acrylic acid. The catalytic studied was carried out by using a fixed-bed Pyrex tubular reactor at atmospheric pressure. Effect of reaction temperature and percentage of water were investigated. From the catalytic test, it was revealed that the $MoVTeNbO_x$ catalysts are useful for partial oxidation of propane to acrylic acid. The catalytic results show the conversion of propane in the range of 34.4 to 39.6 % and the selectivity of the acrylic acid 19.0 – 25.0 %.

Keywords: M1 phase, $MoVTeNbO_x$, Propane, Selective Oxidation, Acrylic Acid

ABSTRACT 55

DEVELOPMENT AND VALIDATION OF MATERNAL DIET GUIDELINE MODULE TOWARDS REDUCTION OF ALLERGIC REACTION AMONG EXCLUSIVELY BREASTFED INFANTS

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ABSTRACT

The allergy prevalent among infants is in increasing trend in Malaysia. Surprisingly, the exclusively breastfed infants also experienced an allergic reaction due to many associated factors that include maternal dietary intake. However, there was no specific guideline on the maternal diet and allergy prevention among exclusively breastfed infants. Thus, the need for a guideline for maternal diet is crucial in order to prevent and reduce the allergic reaction among exclusively breastfed infants. This study aims to develop and validate the module of maternal diet guideline for prevention of allergy through modulation of maternal diet among breastfed infants. The module was developed based on the current literature review. The content of the module was validated using the content validity index (CVI), which are the Item-level Content Validity Index (I-CVI) and scale-content validity index (S-CVI). The item-level (I-CVIs) was considered in this study due to its consistency which further calculated into modified kappa statistics. The items with an I-CVIs of 0.78 or higher was considered evidence of good content validity. The percentage of agreement is 88.72% that indicates the highest level of achievement. The validity of the module had achieved I-CVI of 0.89, which was considered as having excellent content validity with the majority of the kappa value for each item is excellent. This study shows that the module that is developed has excellent content validity that can be used for the targeted population in order to reduce the allergy prevalence among breastfed infant for better health outcome.

Keywords: Module, Maternal Diet, Content Validity Index (CVI), Infant Allergy, Breastfeeding

Acknowledgement: Knowledge Transferring Grant (KTP) LL(R3)-MHC/9(UIAM-18)

ABSTRACT 56

THE EFFECT OF IMPRISONMENT HISTORY AND ACTIVE ILLICIT DRUG USE ON THE RETENTION RATE OF HIV-POSITIVE METHADONE MAINTENANCE THERAPY CLIENTS IN PRIMARY HEALTH CARE CENTERS, KUANTAN, PAHANG.

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ABSTRACT

Methadone maintenance therapy (MMT) program introduced in Malaysia since 2005 for people who inject drug (PWID) population was a success story. Studies showed that combination of antiretroviral therapy (ART) and MMT also plays an important role for harm reduction program and reduce the spread of new HIV infection by reducing the risky behaviour and suppressing the viral load in HIV infected PWID. However, only 34.6% of people who inject drugs (PWID) received ART, and 45.3% of physicians will defer ART in this population due to a history of imprisonment and active use of illicit drugs. This study was conducted to investigate if imprisonment and active drug use affected the retention rate of MMT clients. All HIV-positive MMT clients' files (the year 2006 to 2019) from six MMT Clinic in Kuantan were evaluated. The data collected regarding the history of imprisonment and drug use was based on patients' record and regular urine tests in the MMT clinic. A total of 67 HIV-positive MMT clients were included in the study. A total of 37 (55.2%) clients were started on ART, and 30 clients were on MMT only. This study showed that the number of MMT clients who retained in the MMT program were higher in MMT+ART subgroup (59.5%) compared to MMT only subgroup (20.0%). There were no statistical differences on imprisonment history and positive urine drug tests between the two groups, $p = 0.609$ and 0.268, respectively. The pre-ART counselling session was higher in MMT+ART compared to MMT only subgroup, $p < 0.001$. In conclusion, despite the history of imprisonment and active illicit drug use, MMT clients should be started on ART to ensure the successfulness of the harm reduction program. Intervention such as pre-ART counselling sessions with MMT clients was an important tool to initiate ART, improved ART adherence and increase the retention in the MMT program.

Keywords: Methadone maintenance therapy, HIV positive, harm reduction, imprisonment, positive urine drug test.

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ABSTRACT 57

TRANSHUMANISM AND TISSUE ENGINEERING: AN ETHICAL FALLACY

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ABSTRACT

Tissue engineering is a field that has undergone immense growth and development over these past years. With the aim of repairing, reconstructing or regenerating substitutes of loss or damaged tissues and organs, this promising field has obtained the attention of many, i.e. researchers, healthcare practitioners, research funders etc. Along with its progress, tissue engineering is currently perceived as a tool of more than only to treat diseases; amplifying the range of human abilities in those without pathology. Transhumanism, being the philosophical ideology that the human race can evolve beyond its current physical and mental limitations especially by means of science and technology, aims at using tissue engineering as a tool to achieve its utopian aim. This study uses textual analysis methodology to examine the field of tissue engineering and its relation to transhumanism philosophical ideology and human enhancement. The biomedical hegemony and the associated secular utilitarian bioethical discourse such as in this case, human enhancement and the transhumanist movement have largely displaced the notion of traditional virtue-based medical ethics; from initially to preserve and to restore health of patients to a merely reduced mechanical biomedical practices that serve the secular humanistic and utilitarian frameworks and objectives guised in the fallacies of progress, developments and human rights. Critical evaluations of the concepts and practices of scientific practices, especially of those coming from the Western worldview, are important to be undertaken to avoid reducing the rich meaning of medicine as the science, art and vocation of healing the patient to the mechanical techniques of applied biology.

Keywords: Tissue Engineering, Transhumanism, Enhancement Technology, Medical Ethics, Bioethics

Acknowledgement: The study was supported by the Ministry of Education through a grant TRGS16-02-003-0003.

ABSTRACT 58

ANIMAL MODELS IN ARTICULAR CARTILAGE TISSUE ENGINEERING EXPERIMENTATION: AN ONLINE DATABASES STUDY

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ABSTRACT

Tissue engineering method offers numerous plans to treat joint diseases such as osteoarthritis. The effectiveness of the intervention continues to be tested from in vitro to in vivo environment. For articular cartilage tissue engineering (ACTE), there were various animal species which has been used to evaluate the concept of the potential treatment. Each animal has its advantages and limitations in mimicking the human for articular cartilage reconstruction module. This study aims to identify the animal models used in the experimentation of ACTE. The study was done through systematic search and content analysis of relevant ACTE articles published in journals indexed in two international online databases, namely Scopus and Web of Science. There was a total of 1,644 relevant journal articles were analysed, whereby only 498 articles had reported the use of eight types of animal models. The highest use of the animal model was murine, reported in 194 articles, followed by leporine (184), porcine (35), ovine (27), caprine (18), canine (10), equine (7), and nonhuman primate (1). Meanwhile, articles were reporting on using more than one type of animal model in their works; the use of two (2) animal model was reported in 21 articles, and the use of three animal models was reported in only one article. It is complicated to choose the animal model for specific treatment evaluation as there is no perfect model to represent the human articular cartilage injury.

Keywords: Articular Cartilage, Tissue Engineering, Scopus, Web of Science, Animal Models

Acknowledgement: The researchers express their gratitude to the Ministry of Education for their support and for providing the Transdisciplinary Grant Scheme (TRGS/1/2016/UIAM/02/8 - TRGS16-02-003-0003).

ABSTRACT 59

THE EFFECT OF LOW DOSE ORGANIC ARSENIC EXPOSURE ON INFLAMMATORY GENES EXPRESSION IN RAT'S KIDNEY

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ABSTRACT

Monosodium methylarsonate (MSMA) is an organic arsenical pesticide widely used in agriculture. Exposure to arsenic has been linked with multiple health problems. Inflammatory genes such as interleukin 6 (IL-6) and interleukin 8 (IL-8) play an important role in the pathophysiology of exposure to an acute high dose arsenic-mediated nephrotoxicity, which led to the proximal tubular injury. However, studies focusing on low dose organic arsenic exposure and its adverse effects on kidneys are limited. This study aimed to evaluate the effects of low dose arsenic exposure on the inflammatory genes expression in rats' kidneys at three different duration intervals; 2 months, four months and six months. Thirty-six male Sprague-Dawley rats were randomly divided into six groups (n=6); a treatment group and its control for each interval. The treatment groups were given daily oral gavage of MSMA at 63.0 mg/kg body weight (BW) which is equivalent to 1/20 LD50 of MSMA. While control groups received distilled water via oral gavage. At the end of study intervals, the kidney tissues were harvested for arsenic level analysis and molecular analysis. The RNA integrity was confirmed with Qiaxcel analysis. The expressions of inflammatory genes were analysed using RT2 SYBR Green qPCR Mastermix. Tissue arsenic concentration was higher in all treated group. Both IL-6 and IL-8 showed a similar pattern of expressions. Organic arsenic down-regulated IL-6 and IL-8 in 2-month (both fold change -1.03) and 6-month groups (fold change -1.36,-1.15). However, in the 4-month group, both IL-6 and IL-8 were up-regulated (both fold change 1.31). Interestingly, these findings suggest that low dose arsenic exposure has shown the anti-inflammatory effect at 2-month and 6-month. However, 4-month paradoxically demonstrated a pro-inflammatory effect consistent with the tissue arsenic levels.

Keywords: MSMA, chronic kidney injury, organic arsenic, IL-6, IL-8

ABSTRACT 60

MOTHERS' EXPERIENCES IN HANDLING OF EXPRESSED BREAST MILK FOR PREMATURE INFANT IN NEONATAL INTENSIVE CARE UNIT: CONTAMINATION OF HUMAN BREASTMILK

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ABSTRACT

Expressed breast milk (EBM) is important for premature infants as it reduces morbidities and mortalities. It is the main nutritional source for them to improve their growth and neurodevelopment, decreases the risk of necrotising enterocolitis and late-onset sepsis. There is limited research found which relates to the real issues faced by mothers while handling their EBM at home. This study aims to explore the experiences of mothers in handling their EBM during the treatment period of their premature infants in NICU. This study was carried out as qualitative research. The face to face in-depth semi-structured interviews were conducted with the mothers. The data were analysed with thematic analysis. Participants: Mothers of premature infants admitted and received treatment in NICU. One of the teaching hospitals in Kuala Lumpur. Four major themes emerged from the mother's interview data in common error while handling their EBM; cleaning and sterility, expressing, packaging, storage and transportation. Expressing breast milk should be recognized as an important way to restructure motherhood with a preterm infant in NICU. However, poor hygiene on handling EBM increases the growth of bacteria and the occurrence of infections hence putting the premature infants at high risks. Exploring the experiences and compelling stories of the mothers' routines in handling EBM increased the evidence base regarding the concurrent issue. Health promotion in the NICU is necessary to increase a mother's awareness of properly managing their EBM.

Keywords: Expressed breast milk, contamination, premature infant, mother, neonatal intensive care unit, experiences

ABSTRACT 61

PRE-BED DOSING OF L-THYROXINE IN RAMADAN AND THE EFFECT ON LIPID PARAMETERS

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ABSTRACT

Pre-bed dosing of L-thyroxine is an alternative method to improve patient's compliance, especially in the month of Ramadan. Some studies reported increment of Thyroid Stimulating Hormone (TSH) on Pre-bed dosing consistent with Subclinical Hypothyroidism (SH). Hyperlipidemia is one of the markers of tissue hypothyroidism which occurs as early as four weeks of suboptimal thyroxine replacement. We aimed to investigate the effect of Pre-bed thyroxine ingestion during the month of Ramadan on thyroid hormones and lipid parameters. A total of 9 hypothyroid patients who are on daily L-thyroxine replacement (taken before breakfast) were involved in this study. During Ramadan, they were asked to take their daily dose of L-thyroxine pre-bed instead of taking it pre-sahur. At the end of Ramadan, their thyroid hormones and lipid parameters were analysed. Most of the patients were already on thyroxine for more than a year with a stable dose of L-thyroxine. Their thyroid hormones (TSH, fT3, fT4) and lipid parameters (TC, LDL, HDL, triglyceride) were comparable at baseline. At the end of Ramadan, there was a significant increment of TSH observed [TSH w0 1.8 (0.23, 5.57) vs w4 3.65 (0.45, 16.10); p=0.011] without significant change of fT3 and fT4. Despite having Subclinical Hypothyroidism (SH), there was no significant change in the lipid parameters observed at the end of Ramadan. Pre-bed dosing in Ramadan biochemically showed to cause Subclinical Hypothyroidism (SH) without significant change in the lipid parameters.

Keywords: Pre-bed, Thyroxine, Ramadan, Subclinical Hypothyroidism, Lipid

Acknowledgement: We want to thank IIUM for financial support through the Research Initiative Grant. A special thanks to the endocrine team of Hospital Tg Ampuan Afzan (HTAA) and Medical department of IIUM Medical Centre (IIUMMC) for their contributions and support.

ABSTRACT 62

MALAY VERSION OF THE MICHIGAN HAND OUTCOMES QUESTIONNAIRE: CROSS-CULTURAL ADAPTATION AND RELIABILITY TESTING IN KUANTAN, PAHANG

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ABSTRACT

The Michigan Hand Outcomes Questionnaire (MHQ), a self-reported questionnaire for patients with hand disorders, has been widely used globally. It has been cross-culturally adapted into different languages across all continents. Aims of this study were to translate the MHQ into Malay language and to evaluate its reliability in a Malay-speaking population. The MHQ was cross-culturally adapted into a Malay version based on Beaton et al. guidelines. A pre-testing involving thirty patients with hand disorders was performed to assess whether it was comprehensible to the target population. One hundred patients with hand disorders were recruited in this study to answer the MHQ twice with an interval of two weeks. Statistical analysis was performed to assess the reproducibility and internal consistency via the test-retest method (Intraclass correlation coefficient analysis) and Cronbach's alpha calculation, respectively. In the pre-testing, twenty-six patients (86.7%) understood all the questions in the Malay version of MHQ. The test-retest analysis showed good reliability across the duration of two weeks with the intraclass correlation coefficient of all subscales ranged from 0.925 to 0.984. Cronbach's alpha values of the Malay version MHQ ranged from 0.82 to 0.97, indicating a good internal consistency. The Malay version of MHQ has been successfully translated and culturally-adapted with good reliability and internal consistency.

Keywords: Michigan Hand Outcomes Questionnaire, Cross-Cultural Adaptation, Reliability Testing, Hand disorders

ABSTRACT 63

WAITING TIME AMONG DIABETIC PATIENTS IN A LOCAL HEALTH CLINIC

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ABSTRACT

Waiting time among diabetic patients is becoming an important issue considering the increasing number of this population requiring to follow up in primary care clinic. Diabetic patients have multiple stations to be visited, causing them to have a longer waiting time compared to other patients. Their dissatisfaction should be investigated for further improvement, and this should be proved. This study aims to measure the waiting and consultation time of diabetic patients attending a non-communicable disease clinic session in Klinik Kesihatan Seremban. A cross-sectional study was done among 190 diabetic patients in which their waiting and consultation time had been recorded. SPSS version 23 is used for statistical analysis. Most of the patients were age 64 (6.3%), female (63.7%) and Indian ethnicity (44.7%). 78.4% of them were also hypertensive, and 50.5% of them had dyslipidaemia. The majority had three concomitant chronic diseases (46.8%). Maximum waiting time recorded was 104 minutes, with a minimum waiting time of 2 minutes. Average waiting time was 32.73±24.37 minutes. Maximum consultation time was 45 minutes, with an average time of 9.61±6.27 minutes. There is no significant association between waiting or consultation time with age, gender, races and number of concomitant illness. This study showed that the clinic has an acceptable duration of waiting and consultation time with an average of less than 45 minutes which is fulfilling the requirements set by the Ministry of Health. The misconception of unacceptable long waiting time experienced by diabetic patients and chronic disease should be corrected. This study proved that waiting and consultation time is not determined by the demographics of the patient and disease only in which patient and public education on the acceptable waiting time should be implemented regularly.

Keywords: Waiting time, consultation time, diabetes

Acknowledgement: We would like to express our gratitude to all diabetic patients and staffs in Klinik Kesihatan Seremban for their cooperation in this study.

ABSTRACT 64

MODE OF ACTION OF LACTOBACILLUS PLANTARUM ON ANTIOXIDANT ACTIVITY OF *Curcuma caesia* FOR POTENTIAL APPLICATION IN MAKING HALAL ANTI ACNE SOAP AND CREAM

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ABSTRACT

The optimisation study with varying extraction temperature, pH and time using FCCCD showed that pH 6, a temperature of 60℃ and an extraction time of 30 minutes was the most efficient extraction parameters that exhibited high yield of phenolics and high DPPH scavenging activity. The model was verified statistically with ANOVA. All the independent variables had a significant effect ($p<0.05$) on all responses, which indicated that all extraction parameters employed in this study were important in the optimisation process. The R_2 value for DPPH scavenging activity was 0.9782. Media optimisation of *Lactobacillus plantarum* for fermenting *C. caesia* extract for increasing its DPPH scavenging activity was studied too. The highest DPPH scavenging activity of 84.25 % was obtained when the concentration of yeast extract, peptone and sucrose was at 7, 8 and 10 (g/L), respectively with *C. caesia* concentration of 2 % (v/v) and *L. plantarum* concentration of 2 % (v/v). After the fermentation media and process conditions were optimised, the supernatant was used to measure the 5-LOX inhibition activity as an indicator of anti-inflammatory activity present in the supernatant and the mean activity recorded was 76.84%. Twenty respondents with acne vulgaris were selected to test the efficacy and safety of the anti-acne facial soap and cream formulated from the fermented *C. caesia* supernatant. A split-face trial was carried out daily for seven days period. Significant lesion improvements and reduced numbers of acne lesions were observed on the treated side of the face. No erythema, burning, stinging, scaling, drying or oedema of the skin or exacerbation of the pre-existing acne were recorded. A student's paired t-test was carried out to test the reliability of the results, and the obtained p-value of less than 0.05 indicates that the result is significant and that it can be replicated in a larger population.

Keywords: *C. caesia*, DPPH, Ultrasound-assisted extraction, 5-LOX inhibitor, Plackett Burman Design

Acknowledgement: The author would like to express gratitude and thanks to the Kuliyyah of Engineering for facilitating the research.

ABSTRACT 65

RADIOLOGICAL AND FUNCTIONAL OUTCOME POST FIXATION IN UNSTABLE PROXIMAL FEMUR FRACTURE: COMPARISON BETWEEN PROXIMAL FEMORAL NAIL ANTIROTATION (PFNA) AND PROXIMAL FEMORAL LOCKING COMPRESSION PLATE (PFLCP)

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ABSTRACT

Incidence of unstable proximal femoral fracture is increasing in trend, and the treatment is challenging. Operative treatment offers various selection of implant including plate and intramedullary nail. The purpose of this study is to compare the radiological and functional outcome between both implants: PFNA and PFLCP. This is a single centre observational cohort study involving all patients with an unstable proximal femur fracture, who was admitted from January 2012 till December 2017 in Hospital Sultanah Nur Zahirah (HSNZ), Kuala Terengganu. Radiological outcome evaluated the prevalence of varus malalignment and quality of fracture reduction. Varus malalignment (when neck-shaft angle (NSA) measured less than 130 degree) is evaluated from the pelvic and hip plain radiographs of affected side that were taken at immediate, six months and one-year post-operation. Meanwhile, quality of fracture reduction is measured by the difference of NSA between affected and normal contralateral side at immediate post-operation, which was graded as good, satisfactory and poor reduction if the NSA difference is less than 5 degree, 5.1 to 10 degree or more than 10 degree respectively. The functional outcome is evaluated by Lower Extremity Functional Scale (LEFS) score that is ranged between 0-80 since each question carried maximum of 4 marks. There were 91 patients involved in this study, 44 patients in PFNA group (28 males, 16 females) meanwhile 47 patients in PFLCP group (33 males, 14 females). The mean age of patients in PFNA group was 57.45 years while in PFLCP was 50.23 years. The unstable proximal femur fractures were grouped into intertrochanteric fracture OTA/AO type 31.A2 (34 patients), AO type 31.A3 (35 patients), subtrochanteric fracture Seinsheimer type 3a (15 patients) and type 5 (7 patients). PFLCP group yielded higher numbers of varus malalignment at immediate, six months and one-year post-operation compared to PFNA but the p-value in this three interval time was statistically insignificant. For quality of fracture reduction, PFNA group shows good quality of reduction with 93.2% (41 patients) while in PFLCP 87.2% (41 patients) with insignificant p-value. None had shown poor quality reduction that required revision. In addition, we also evaluated the union time between both groups. PFLCP had shown significant shorter union time (p-value <0.001) compared to PFNA, which is 4.15 months while PFNA group in 5.04 months. In term of functional outcome, both groups revealed comparable mean LEFS scores with 64.19 in PFNA and 68.50 in PFLCP group, but the result was statistically insignificant. Overall, both PFNA and PFLCP revealed good and comparable outcome. PFLCP is superior to PFNA only in term of shorter union time. In conclusion, both implants were effective in treating unstable proximal femur fracture.

Keywords: PFNA, PFLCP, NSA, LEFS, Union Time

ABSTRACT 66

EFFICACY OF STEROID INJECTION VERSUS PHYSIOTHERAPY TREATMENT IN WORK RELATED TRIGGER FINGER

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ABSTRACT

Stenosing tenosynovitis or trigger finger is a common problem among patients seeking treatment in the orthopaedic clinic. Multiple approaches can be used to treat a patient with a trigger finger. This study to compare the functional outcome of steroid injection versus physiotherapy between service and professional workers with trigger finger. We use observational cohort study. Evaluating the functional outcome of treatment physiotherapy and steroid injection among professional and service workers for trigger finger grade I, II, and III. We also assess the recurrence of the affected finger. Malaysia Standard Classification of Occupation 2013 (MASCO) has been used to classify two working groups: professional and service worker. Michigan Hand Outcomes Questionnaire (MHQ) used for the finger assessment. The patient was observed with three separated visits; pre-treatment visits, six months and 12 months. The patient was divided into two groups of steroid injection and physiotherapy for evaluation of functional outcome and recurrence. The total number of patients recruited is 149 with 75 in the professional group and 74 in the service group. Out of the 149 patients, 80 were treated with physiotherapy and 69 were with steroid injection. There was no association between the occupation and the grading of trigger finger and the affected finger itself. Functional outcome using MHQ score for steroid group shows a good 12 months outcome (P values <0.01) comparing with physiotherapy group. Functional outcome in terms of physiotherapy was lower compared to steroid injection at six months and 12 months. The recurrence rate in physiotherapy was higher than in the steroid injection group. Single steroid injection had a better functional outcome after six months and 12 months post-intervention compared with physiotherapy. Physiotherapy treatment can be suggested to patients with grade 1, 2, and 3 of trigger finger who refused any steroid injection.

Keywords: Trigger Finger, Physiotherapy, Steroid Injection

ABSTRACT 67

PLANT TISSUE CULTURE AS TOOL FOR SUSTAINABLE PRODUCTION OF BENTONG GINGER (*Zingiber officinale* var. Bentong) PLANTLETS

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ABSTRACT

Bentong ginger (*Zingiber officinale* Var. Bentong) is an exotic ginger variety that can only be grown in highlands of Bentong district, Pahang due to the fertile soil and cold temperate climate. This variety of ginger is well-known for its unique characteristics. Morphologically it has larger rhizome, thinner skin and less fibrous pulp compared to the domestic gingers. Bentong ginger also has a higher content of pharmaceutically important compounds (i.e. gingerol and shogaol) when compared with other varieties of Malaysian gingers. However, cultivating this ginger through conventional agricultural practice has several constraints. Almost 40% of the harvested rhizomes are set aside every season to be used as seeds for next cycle of cultivation. This has been a major drawback, hindering the continuous supply of ginger to fulfil the increasing market demand. Thus, in this research, a systematic approach was taken to establish *in vitro* cultures of Bentong ginger plantlets. Prior to introduction into Murashige and Skoog (MS) media, young rhizome shoot bud explants were surface sterilised using few different sterilisation methods. Various responses were obtained from shoot bud explants cultured on MS basal medium supplemented with different concentrations of BAP, NAA, 2,4-D and IAA; either alone or in combinations. Augmentation of MS-medium with 3 mg/l BAP and with 1 mg/l NAA recorded the highest number of shootlets and roots multiplication. This *in vitro* regenerated Bentong ginger plantlets could serve the increasing needs of the planting materials for smallholder farmers. Indirectly, this could also improve the economic wellbeing of local farmers.

Keywords: Bentong ginger, *in vitro* plantlets, rhizome shoot buds, tissue culture, BAP

Acknowledgement: The authors acknowledge Koperasi Tok Muda Karak and IIUM Endowment Fund (IEF) for supplying the explant materials.

ABSTRACT 68

GUTTAFLOW BIOSEAL VERSUS MONOCONE OBTURATION TECHNIQUE. A SCANNING ELECTRON MICROSCOPY STUDY.

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ABSTRACT

The understanding of how well GuttaFlow Bioseal (GFB) conforms to the root canal irregularities is unclear and requires further investigation. This study compared the obturated surface area, the extrusion of root filling material and the duration of the obturation procedure between GFB and monocone. The root canal of twenty single-rooted mandibular premolars were prepared using Hyflex CM rotary files (Coltène/Whaledent). The samples were equally divided into two groups; GFB and monocone. The duration of obturation procedure was evaluated using a digital timer, and a radiograph was taken to assess the presence of extrusion. The roots were sectioned perpendicularly to obtain three root segments; apical 1/3, middle 1/3 and coronal 1/3. All resected roots were mounted on brass stubs, sputter-coated with thin gold coating and observed under scanning electron microscope (Zeiss EVO50, Germany) at 20x magnification. The images were transferred to the SketchAndCalc Area Calculator software for evaluation of obturated surface area. The data were analysed with SPSS version 25.0. The median score of obturated surface area between GFB and monocone at the apical 1/3 was 86.51 and 83.00, at the middle 1/3 was 90.48 and 87.35 and at the coronal 1/3 was 93.00 and 83.39 respectively with statistically significant difference at the coronal 1/3. The extrusion of root filling material between GFB and monocone did not show statistically significant difference. The mean score of duration of obturation procedure between GFB and monocone was 149.50 and 137.60 respectively with statistically significant difference. The obturated surface area at the apical 1/3 and middle 1/3 between GFB and monocone was comparable, but at the coronal 1/3 the former showed 11.5% better. The extrusion of root filling material between GFB and monocone was equivalent. The obturation procedure with GuttaFlow Bioseal required 8.6% longer than the monocone obturation technique.

Keywords: Guttaflow Bioseal, Monocone, Root Canal Treatment, Scanning Electron Microscopy

Acknowledgement: This work was supported by the Research Initiative Grant Scheme 2017 from International Islamic University Malaysia [RIGS 2017-063-0638].

ABSTRACT 69

MINIMALLY INVASIVE SURGERY IN TREATMENT OF TRAUMATIC THORACOLUMBAR SPINAL INJURIES: A 2-YEAR EXPERIENCE

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ABSTRACT

Majority of the traumatic spine injuries are located in the thoracolumbar region. They can be compression fractures, burst fractures, flexion-extension injuries (Chance fractures), dislocations, or any of the combination. Surgery is indicated for patients with thoracolumbar injury classification scoring (TLICS) of 4 or more. Traditionally, surgical approaches for thoracolumbar spinal injuries involve open surgery, instrumentation with/without decompression. In our previous study, open surgery for traumatic thoracolumbar injuries and a history of blood transfusion have been found to be associated with a higher risk of deep surgical site infection requiring surgical debridement. With the advent of modern implants and equipment, minimally invasive surgery (MIS) has been made possible for spine surgeries. We report our two-year experience in utilising MIS to treat traumatic thoracolumbar spinal injuries. Patients who underwent spinal surgeries at Hospital Tengku Ampuan Afzan, Kuantan from July 2017 to July 2019 were screened for suitability to be included in this study. Only patients who underwent spinal minimally invasive surgeries have been included in this study. Patients who underwent open spinal surgeries were excluded. A total of 8 patients were included in this study. There were three burst fractures and five chance fractures. All patients underwent a minimum of 4-level posterior spinal instrumented fusion with MIS techniques, and two patients had laminectomy at the injured level for decompression. All but one patient did not require a blood transfusion, and there was no incidence of surgical site infection among these patients. While minimally invasive spine surgery holds promise for reduced blood loss, faster patient recovery and shorter hospital stay, safety in spinal surgery remains paramount. Based on our two-year experience in managing patients with traumatic thoracolumbar spinal injuries with MIS technique, it has been shown to be safe and effective. Minimally invasive surgery (MIS) is a better option compared to open surgery in treating traumatic thoracolumbar spinal injuries. By minimising the surgical incision, we are able to reduce blood loss and avoid deep surgical site infection.

Keywords: Minimally Invasive Surgery, Thoracolumbar Spinal Injuries

ABSTRACT 70

MRI EVALUATION OF ANTEROLATERAL LIGAMENT OF THE KNEE: A CROSS-SECTIONAL STUDY IN MALAYSIA

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ABSTRACT

Anterolateral ligament (ALL) of the knee has been demonstrated to be an important secondary restrainer in providing rotational stability to the knee. ALL stabilises the internal tibial rotation with increasing knee flexion. ALL injuries with concomitant anterior cruciate ligament (ACL) injuries have a higher grade of pivot shift. Magnetic resonant (MR) studies on ALL have been performed, but there is no such data among the Malaysian population. We aim to investigate the reproducibility of ALL identification on 1.5T MRI and the association with other ligamentous injuries. Magnetic resonant imaging of the knees with suspected ligamentous injuries from 1st January 2017 to 30th June 2017 were reviewed for suitability of this study. Post-operative MRI and MRI of patients with suspected tumour at the knee region were excluded. 1.5T MRI (Siemens Medical Solution) was used for assessment of all the knees. All MRIs were double read and approved by a consultant radiologist. A total of 36 knee MR images were obtained from 31 patients during the study period. Five patients were excluded (3 for suspected tumour and 2 for post-operative). Mean age of the patients was 29.44. All three components of ALL were identified in 20 MRIs (55.6%): femoral component (75%); meniscal (69.4%) and tibial (58.3%). There were 11 knees identified to have ALL injury, which was associated with an ACL injury. ALLs are best visualised on coronal views (PD, PD FS and T2) with lateral inferior genicular artery as a guide to locate the bifurcation of meniscal and tibial components. Delineation of ALLs from other surrounding structures such as lateral collateral ligaments, iliotibial band and popliteus tendon was done in both coronal and axial views. ALLs of the knees are delineated in more than half of the MR images. There is an association between ALL injuries and ACL injuries.

Keywords: MRI Evaluation, Anterolateral Ligament, Knee, Cross-sectional Study, Malaysia

ABSTRACT 71

QUANTITATIVE EVALUATION OF EFFECTIVENESS OF HOSPITAL MESRA IBADAH COURSE: A PRE-POST STUDY

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ABSTRACT

Solat or prayer, as one of the five pillars of Islam, and it is associated with bio-psycho-social benefits in Muslim patients. Many Muslim patients neglected solat while being hospitalised as they are unaware of the convenience (rukhsoh) available for them. Ibadah Friendly Hospital Courses have been conducted in different states of Malaysia to impart knowledge to the hospital staff who can, in turn, educate their patients. This study aims to construct a content-validated assessment tool and to assess the effectiveness of a state-level Hospital Mesra Ibadah course. A self-administered questionnaire was constructed and content-validated by a panel of three experts (two religious teachers and one consultant spine surgeon). All 15 questions achieved item-level content validity index (I-CVI) of 1.00 after two rounds of validation. The questionnaires were distributed to participants of a state-level Hospital Mesra Ibadah course to compare the participants' pre-course test score and post-course test score. The participants were from tertiary hospitals (Hospital Tengku Ampuan Afzan, Hospital Sultan Ahmad Shah and Hospital Kuala Lipis), district hospitals (Hospital Jengka, Hospital Jerantut, Hospital Rompin, Hospital Bentong and Hospital Raub) and other health clinics. A total of 88 participants (48.9%) were included in this study. There was a significant difference in the pre-course test mean score and post-course test mean score among the participants. There was also a significant reduction of unsure answer after the course. This study is the first of its kind in Malaysia that quantitatively assess the initial knowledge and subsequent improvement after the course. Although the sample size was adequate to get a significant result, response bias may limit the generalizability of this study results. Response bias due to sampling method involving a self-administered questionnaire is possible as those with a greater interest in the course may have been more likely to respond to the questionnaire. Since the post-course assessment was performed immediately after the completion of the course, it was not known whether the course had any long term effect on the participants. On top of that, the knowledge questions just tested certain important pieces of knowledge and may not adequately represent overall knowledge of the participants. Despite these limitations, this is the first-of-its-kind study in Malaysia that quantitatively assesses the effectiveness of the Hospital Mesra Ibadah Course with a content-validated questionnaire. This study demonstrates that the Hospital Mesra Ibadah course is effective in imparting as well as consolidating the knowledge among participants, hence it should be routinely organised to benefit more participants.

Keywords: Quantitative Evaluation, Hospital Mesra Ibadah

ABSTRACT 72

TRANSFORAMINAL ENDOSCOPIC DISCECTOMY: A TARGETED SPINAL SURGERY

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Introduction
Open discectomy has been the gold standard of care for cases of the prolapsed intervertebral disc. Tissue dissection is unavoidable in order to access the pathologic disc material. After skin incision, subcutaneous fat tissue, paraspinal muscles, ligamentum flavum, epidural fat, dura and nerve roots have to be encountered before reaching the disc material. With the in-out transforaminal endoscopic technique, only skin and subcutaneous tissue need to be bridged before reaching the disc material. Also known as the targeted surgical technique, this technique minimised the trauma to the soft tissue. We present three case series of the prolapsed intervertebral disc which was treated with transforaminal endoscopic technique. Case 1: 49-year-old lady presented with a one-year history of low back pain and left lower limb sciatica. Straight leg raising sign was positive. MRI showed 2 level disc bulge at L4L5, L5S1 with annular tear at L5S1. At two weeks, post-op pain was improved by 60%, and SLR test was negative. Case 2: 26-year-old lady presented with six months history of low back pain and left lower limb sciatica. Straight leg raising sign was positive. MRI showed extruded disc at L4L5. At post-op day one, her sciatica completely resolved and SLR test was negative. Case 3: 28-year-old lady presented with eight months history of low back pain and left lower limb sciatica. Straight leg raising sign was positive. MRI showed extruded disc at L5S1 with annular tear. At post-op day one, her sciatica completely resolved and SLR test was negative. All three patients underwent transforaminal discectomy. Case 1 and 2 were done under monitored anaesthesia control (MAC), and case 3 was done under epidural anaesthesia. All three patients had satisfactory pain relief. The 1st patient had longer recovery period possibly because of its disease chronicity. Early recovery is expected hence early return to work can be accomplished. In the future, this might be the gold standard of treating prolapsed intervertebral disc.

Keywords: Transforaminal Endoscopic Discectomy, Spinal Surgery

ABSTRACT 73

METACHRONOUS OSTEOSARCOMA: A RARE CASE REPORT

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ABSTRACT

Osteosarcoma is a common primary sarcoma of the bone, constituting approximately 0.07% of all neoplasms. Rarely, some patients with osteosarcoma have multiple skeletal sites involvement, either synchronous or metachronous. Metachronous osteosarcoma is a rare form of osteosarcoma in which osteosarcomatous lesions occur distant from the primary osteosarcoma site more than six months after the initial treatment without pulmonary manifestation. Case Report: We present a case of metachronous osteosarcoma in a 16-year-old female who was initially treated for non-metastatic osteosarcoma of the left distal femur with neoadjuvant chemotherapy, wide excision, endoprosthesis and followed by adjuvant chemotherapy. The serial follow-up did not show evidence of distant metastasis. Nevertheless, she presented three years later with a progressively enlarging left proximal forearm mass and re-staging revealed osteosarcoma of the same histological type. She underwent a combination of chemo- and radio-therapy but subsequently succumbed to the disease due to lung metastasis. With the advent of diagnostic and therapeutic techniques, the 5-year survival rate of non-metastatic osteosarcoma ranges around 60-70%. Albeit it is rare, metachronous osteosarcoma can present difficult challenges to the treating physician.

Keywords: Metachronous Osteosarcoma, Case Report

ABSTRACT 74

ADVANCED SACRAL CHORDOMA: A MULTIDISCIPLINARY TEAM APPROACH

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ABSTRACT

Sacral chordomas are rare, low-grade and slow-growing malignant bone tumours arising from the sacral bone. They are locally aggressive with the tendency to metastasise to the lungs. Surgical resection remains the mainstay of treatment of sacral chordomas. However, most patients presented late with large tumours and intra-abdominal extension-making en bloc resection highly challenging. Besides that, surgical resection poses risk of injury to the surrounding structures such as major blood vessels, bladder, ureters and rectum due to their proximity to the tumour. Therefore, multidisciplinary team approach is vital in anticipating possible complications and preventing surgical morbidity. We present a case of advanced sacral chordoma which has been successfully resected with the assistance of pre-operative selective arterial embolisation as a preemptive therapy. Case Report: A 58-year-old lady presented with a large sacral chordoma (17.17 cm x 27.3 cm x 30.5 cm) with sacral erosion, infiltration to gluteus maximus, medius and minimus muscles and lung metastasis. A decision to perform a surgical resection was made to alleviate the pain secondary to sacral nerve compression. Anticipating massive bleeding intra-operatively, pre-operative arterial embolisation was performed involving one branch of right internal iliac artery as well as five branches of left internal and external iliac arteries using endovascular coils. The tumour was resected with partial sacrectomy from the lower border of S1. Intra-operatively, 6 pints of packed cells were transfused with estimated blood loss of 4 litres.The patient recovered well after the surgery. She was pain-free post-operatively with no lower limb neurological deficit. Surgical resection remains the treatment of choice for sacral chordoma. Pre-operative selective arterial embolisation can reduce intraoperative bleeding and avoid potentially convoluted surgery.

Keywords: Advanced Sacral Chordoma, Multidisciplinary Team Approach

ABSTRACT 75

SURGICAL MANAGEMENT OF PAEDIATRIC NEGLECTED HUMERAL SUPRACONDYLAR FRACTURE: A SERIES OF 3 CASES IN 3 YEARS

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ABSTRACT

Supracondylar fracture of the humerus is common among the paediatric population. It accounts for 17.9% of all fractures in children.[2] They commonly present in extension type, in which the distal metaphyses are forced into extension resulting from falls on outstretched hands. Due to the close proximity between the proximal fracture fragment and the surrounding soft tissues in extension-type fracture, various neurovascular injuries are often reported. Incidence of nerve injuries has been reported to be 12-20% while up to 20% of patients having vascular compromise in displaced supracondylar humeral fractures. In our country, it is not uncommon for patients to present late to the hospital after an injury. Devnani reported a case series of 28 children who sustained supracondylar humeral fractures and presented late (mean 5.6 days) to the hospital. We present three cases of paediatric neglected humeral supracondylar fracture and their subsequent surgical management. Case Series, Case 1: NAU, a 5-year-old right-hand dominant girl presented with malunion of the left humeral supracondylar fracture for the one month after a fall from bicycle. She underwent open reduction, corrective osteotomy and cross K wire insertion and subsequently recovered. Case 2: MP, a 5-year-old boy presented with neglected left humeral supracondylar fracture for 8 months after a fall on left elbow while playing. He presented with varus deformity of the left elbow with limited range of movement. He underwent open reduction, corrective osteotomy and lateral K wire insertion. He subsequently recovered with good carrying angle and range of movement of the left elbow. Case 3: MS, a 10-year-old right-hand dominant boy presented with a left humeral supracondylar fracture for 14 days after a fall from monkey bar at school. Clinically, the fracture was immobile with callus formation noted on the plain radiograph. He underwent open reduction, callus removal and cross K wire insertion and subsequently recovered. Surgical correction should be used to treat paediatric patients presented with neglected humeral supracondylar humerus fracture to obtain the best functional outcomes.

Keywords: Surgical Management, Paediatric, Humeral Supracondylar Fracture, Case Report

ABSTRACT 76

HIGH GROWTH RATE AND LOW FEED CONVERSION RATES USING NEW TYPE DEMAND FEEDING SYSTEM WITH IMAGE PROCESSING PROGRAM AND FISH BEHAVIOR

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ABSTRACT

Demand feeding system serves feeds to fish, when fish switch on feeders. Although demand feeding system has advantages, it still has problems, e.g. hierarchy problem of fish school and system learning period problem for fish. New type of demand feeding system was develop to solve these problems using fish behaviour and image processing system. At first, behaviour experiment was conducted using the image processing software Roborealm to obtain the optimum parameter for computer program. Through the behaviour experiment, two typical behaviour patterns were detected. When fish was hungry, fish group came to the water surface (H: parameter >63%), and when fish was not hungry, fish came to bottom (L: <45%) of fish tank. These two parameters were obtained and were put into the computer program in the workstation. HD Wi-Fi camera continuously recorded the real-time fish behaviour in fish tank, and when fish group came to above the "H", then the command was sent from workstation to microcomputer to send the order to feeding device to feed on. The results of feeding experiment showed this system could provide pellets to fish day and night time equally following fish behaviour. This feeding system could provide the pellets to fish based on fish requirements. This system showed higher growth rate and lower FCR than other feeding systems (timer feeder and demand feeder using an infrared light sensor).

Keywords: Demand feeder, behaviour, image processing system, computer program

Acknowledgement: This study is funded by PRGS15-010-0020.

ABSTRACT 77

THE OPTIMUM LIGHT CONDITION FOR SUTCHI CATFISH LARVAL REARING

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ABSTRACT

Sutchi catfish Pangasianodon hypophthalmus (Sauvage, 1878) is one of the most important freshwater fish species cultured in Southeast Asia. Artificial seed production of sutchi catfish is very important in the aquaculture industry. However, the larval survival rates were low when reared in the hatchery. Providing optimum rearing condition for sutchi catfish larvae in the hatchery can increase the seeds production. The light condition was reported to influence the survival and growth of fish. Hence, this study was conducted to examine the optimum light condition in term of light wavelength and light intensity for sutchi catfish larval rearing. The sutchi catfish larvae were reared under five different light wavelengths (white, blue, green, yellow and red lights) and four different light intensities (1.40×10^{-4}, 1.40×10^{-3}, 1.40×10^{-2}, and 1.40×10^{-1} µmol/m²/s). The results showed that the survival rates (SR), growth rates (SGR_{TL} and SGR_{BW}) and production index (PI) were higher in red light than other wavelengths. For light intensity, only PI showed a significant effect on the larvae. The light intensity of 1.40×10^{-3} µmol/m²/s was significantly higher than 1.40×10^{-1} µmol/m²/s intensity. Apart from that, there was a tendency for high SR, SGR_{TL} and SGR_{BW} under low light intensities (1.40×10^{-4} and 1.40×10^{-3} µmoles/m²/s) when compared to high light intensities (1.40×10^{-2}, and 1.40×10^{-1} µmol/m²/s). Therefore, red light wavelength and low light intensities (1.40×10^{-4} and 1.40×10^{-3} µmoles/m²/s) were the optimum light condition for sutchi catfish larval rearing.

Keywords: Sutchi catfish larvae, aquaculture, light condition

Acknowledgement: This study is funded by ScienceFund04-01-08-SF025.

ABSTRACT 78

STARTER DIET FOR ASIAN SEABASS LARVAE

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ABSTRACT

Seed production of marine finfish in Malaysia is still facing problem particularly live feed for starter diet. Currently, aquaculturists use S or SS type rotifers, which have sizes from 100 to 200µm. Early stage larvae of some marine finfish species select feed less than 100 µm. Protozoa is a collective term of aquatic microorganism that has been identified to be suitable live feed, as their body sizes are less than 100µm. Thus, the objective of this experiment is to compare the survival rates of Asian seabass larvae using four types of live feeds. Four types of live feed; rotifer, protozoa, *E. encysticus*, and mixed (rotifer, protozoa, and *E. encysticus*) were used in this experiment. The larvae were fed from 2 to 10 day-after-hatching. Asian seabass larvae were given the same amount of live feed in each larval rearing tank; twice a day. The feeding densities were 20 individual / mL for rotifers, protozoa, *E. encysticus*, and mixed group. The number of seabass larvae in each group was counted every day, and their survival rates were determined. Starting from 3 DAH until 10 DAH, mixed group showed higher survival rates than other groups. The most recommended live feed was mixed group.

Keywords: Live feed, Starter diet, Asian seabass, Protozoa, *Euplotes encysticus*

Acknowledgement: This study is funded by FRGS17-034-0600.

ABSTRACT 79

MARINE DEBRIS MONITORING AND ASSESSMENT USING STANDING-STOCK SURVEY METHOD AT SELECTED RECREATIONAL BEACHES ALONG PAHANG COASTLINE

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ABSTRACT

Marine debris is becoming one of the major problems for the communities residing along coastal and marine environment, affecting the beaches aesthetic value and economic. Marine debris can be found in most beaches not restricted to Malaysia, but other international coastal areas. This research is conducted to determine major types and possible source of marine debris, to study the relationship of seasonal pattern to debris density within Pahang coastline and to study the debris density changes between northern and southern of Pahang beaches. The study was conducted on 2 selected beaches located both of northern and southern of Pahang. NOAA marine debris monitoring protocol which is the standing-stock method used to collect relevant data. Beach profiling using Total Station Theodolite was conducted to monitor the beach profile and relationship with debris concentration. Data collected were then subjected to statistical analysis using one-way ANOVA focusing on spatial differences where two groups were determined based on their location within northern and southern Pahang coastline. Debris density recorded on monthly basis for over a period of 10 months with seasonal variation separated into Northeast (Oct-Mar) and Southwest Monsoon (May-Sept). Results within 8 months monitoring revealed a decreased in trendline of debris concentration due to seasonal change (monsoon). Findings further reveal an increment in trendline between different beaches where sites closer to the river, Cherok Paloh beach (0.269 ± 0.18) and Air Leleh (0.300 ± 0.18) beach have higher debris concentration than Gebeng beach (0.035 ± 0.02) and Batu Hitam beach (0.07 ± 0.018). Plastic is the most abundance debris observed and recorded in all monitoring sites throughout the sampling campaigns. In conclusion, results show significant relationship between debris concentration with seasonal pattern and spatial difference. Several trends identified such as accumulating rate along the shoreline decreased during Southwest Monsoon and concentration is higher in heavily developed areas.

Keywords: Marine debris, Plastic, Standing-stock, Beach pollution, Pahang coastline

Acknowledgement: I would like to thank my supervisors, Dr. Zahir Ramli and Dr. Siti Fairuz for their extraordinary support in this thesis process, also my siblings and friends for helping me to finish this project. Finally, not to forget my parents for supporting me spiritually throughout my life.

ABSTRACT 80

CORRELATION ANALYSIS BETWEEN ANTIHYPERTENSIVE EFFECT WITH TOTAL PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF *Syzygium* polyanthum (SERAI KAYU) LEAVES FRACTIONS

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ABSTRACT

Syzygium polyanthum (Wight) Walp leaves are consumed by locals as fresh salad (*ulam*) and as decoction for hypertension remedy. The leaves were previously reported with antihypertensive and antioxidant properties, but the relation between these two effects is unknown. The present study aimed to examine correlation between magnitude of antihypertensive effect with total phenolic content (TPC) and ferric reducing antioxidant power (FRAP) activity for *S. polyanthum*. Aqueous crude extract from *S. polyanthum* leaves (ASP) was fractionated using silica-based column chromatography with binary solvent system of ethyl acetate and methanol, followed by thin-layer chromatography (TLC) for qualitative analysis on the fractions' chemical profiles. These fractions and ASP were analysed for TPC and tested using FRAP assay (n=3); while for antihypertensive study, these fractions were intravenously administered into pentobarbital-anaesthetized Spontaneously Hypertensive rats (n=5) for recording of mean arterial pressure (MAP), systolic blood pressure (SBP) and diastolic blood pressure (SBP). Correlation between the maximum antihypertensive activity (measured as maximum percent (%) reduction in MAP, SBP and DBP) with the level of TPC and antioxidant activity was analysed using Spearman Rank Correlation test in GraphPad® PRISM Version 6. Fractionation of ASP afforded nine fractions, later combined into three fractions (F1ASP, F2ASP and F3ASP) according to their TLC profiles. Maximum antihypertensive effect was exerted by F2ASP with the reductions of 37.94 ± 5.84%, 38.54 ± 7.26% and 35.81 ± 4.86% for MAP, SBP and DBP, respectively. TPC and FRAP activity were recorded highest in ASP by 232.80 ± 0.39 mg GAE/g and 5.50 ± 0.15 Fe mM/mg, respectively, while the lowest was recorded by F2ASP. TPC was positively correlated ($P<0.001$, $r=+0.9228$) with antioxidant activity, but they had no significant correlations with the magnitude of antihypertensive effects. TPC of *S. polyanthum* leaves has significant association with its antioxidant activity only, but not with its antihypertensive effect.

Keywords: *Syzygium polyanthum*, Antihypertensive, Antioxidant, FRAP, TPC

Acknowledgement: This research was funded by FRGS19-025-0633 by the Ministry of Higher Education, Malaysia.

ABSTRACT 81

THE POTENTIAL EFFECT OF DIFFERENT TYPES OF FLAXSEED (Linum usitatissimum) EXTRACT ON THE CELL VIABILITY OF ORAL FIBROBLASTS HUMAN CELL LINE

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ABSTRACT

Herbal medication and natural products have been successfully demonstrated to have general health beneficial effects. The bioactivities of flaxseed (*linum usitatissimum*) extract have been reported, as previous studies have shown that *l. usitatissimum* extract has many health and beneficial effects such as antimicrobial, anti-oxidant and anti-inflammatory effect. *L. usitatissimum* extract makes a great skin wound healing agent in addition to that it has good effect on the oral cavity in treating ulcers and general oral health benefits. *L. usitatissimum* is extracted using ethanol in three different concentration via soxhlet method, gas chromatography mass spectrum (GC-MS) is used to illustrate the components of *l. usitatissimum* extract. 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay is used to assess the oral fibroblasts cell viability in three different time lines. The results illustrate the major component present in *l. usitatissimum* extract and the effect of the different ethanol concentrations of flaxseed extract on oral fibroblasts human cell line. *L. usitatissimum* extract show proliferating effect, the 70% flaxseed ethanolic extract produced the highest proliferating effect on fibroblast cells at 24 hours followed by 100% followed by 90% ethanol flaxseed extract, at 48 hours and 72 hours 100% ethanoic extract produced the highest proliferating effect followed by 70% then 90% ethanol flaxseed extract. The results show proliferating effect by *l. usitatissimum* extract on human oral fibroblast cell line.

Keywords: *L. usitatissimum*, GC-MS, MTT

ABSTRACT 82

ANALYSIS OF THE FATTY ACID COMPOSITION OF *Caulerpa lentillifera* USING GAS CHROMATOGRAPHY MASS SPECTROMETRY

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ABSTRACT

Caulerpa lentillifera, also known as Sea Grape or Green Caviar is a type of green seaweed from the class of *Caurlepacea* and species of *Lentillifera.* They are common seaweed communities in tropical and subtropical waters. They have different biochemical compounds from various seaweed species. However, the study on phytochemical components and the biological activity of *C. lentillifera* are not fully understood yet. This study was carried out to determine the best extraction solvents and to evaluate the phytocomponent in the *n*- hexane, Dichloromethane (DCM) and methanol extract of *C. lentillifera* using Gas Chromatography-Mass Spectrometry (GC-MS) analysis. *C. lentillifera* was collected from the coastal area of Sabah, Malaysia. Then, it was subjected for purification, drying and soxhlet extraction process using *n*- hexane, DCM and methanol. Only fatty acid compound was analysed using a Perkin Elmer Turbo Mass Spectrophotometer. It showed that, methanol is the most efficient solvent as it recorded the highest extraction yield in *C. lentillifera.* Twenty phytocomponents have been identified from all extracts of *C. lentillifera* by GC-MS analysis. This analysis discovered the presence of major constituents like palmitic acid, oleic acid, pentadecanoic acid, behenic acid, myristic acid, etc. Many studies have shown that, most of the identified major compounds were proven to exhibit antibacterial, antifungal, anti- inflammatory, antiviral, etc. Thus, it is apparent that *C. lentillifera* has the potential to be used as seaweed of phytopharmaceutical importance as it contains numerous bioactive compounds.

Keywords: *Caulerpa lentillifera*, Fatty acid, Gas Chromatography-Mass Spectrometry, Phytoconstituents, Seaweeds

Acknowledgement: This work was supported by the International Islamic University Malaysia [RIGS 16-129-0293].

ABSTRACT 83

KNOWLEDGE, ATTITUDE AND PRACTICE ON CARBONATED DRINKS CONSUMPTION AMONG YOUNG ADULTS IN PEKAN, PAHANG

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ABSTRACT

Consumption of carbonated drinks among young adults increases due to a variety of carbonated drinks available in the markets. This situation can put health condition of young adults at risk which may expose them to non-communicable disease such as diabetes. This study aimed at assessing knowledge, attitude and practice (KAP) on carbonated drinks consumption among young adults in Pekan, Pahang. A comparison between young adults males and females on knowledge, attitude and practice of carbonated drinks intake was studied. A total of 94 respondents consisting of 47 males and 47 females aged 18 to 35 years old participated in this study. The KAP questionnaires were distributed to various housing area around Pekan, Pahang. Data analysis involved descriptive statistics, Independent T-test (parametric test) and Mann-Whitney U test (non-parametric test). P-value was set at $p<0.05$ as statistically significant. Result obtained for knowledge showed that there was no significant difference in knowledge score in percentage between males and females ($p=0.831$). It indicated that there was no difference among males and females regarding knowledge and understanding level on carbonated drinks. Meanwhile, there were significant differences for both attitude ($p=0.049$) and practice ($p=0.032$) score in percentage between males and females. This study demonstrated that males have negative attitude and high practice on consumption of carbonated drinks compared to females. In conclusion, an awareness program is required to be implemented in this population in order to reduce the consumption of carbonated drinks as it can lead to adverse health effects. Besides, involvement from various agencies which include health professionals and media are important in order to make the community aware of the importance of good nutritional status and health.

Keywords: Carbonated drinks, Young adults, Knowledge, Attitude, Practice

Acknowledgement: We would like to thank the participants for their participation.

ABSTRACT 85

POTENTIAL EFFECT OF MANGOSTEEN PROANTHOCYANIDINS INCORPORATION INTO SELF-ETCH ADHESIVE ON DENTIN BONDING

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ABSTRACT

The aim of this study was to investigate the effect of incorporation of natural proanthocyanidins into the primer of a self-etching adhesive on resin-dentine bond strength. Flat dentine surfaces were prepared from fifteen extracted human molar teeth and were applied with the following self-etching primers. The 0.5% Mangosteen proanthocyanidins (MPA), or 0.5% Chlorhexidine (CHX) was incorporated into Kerr Optibond Versa (Kerr, USA) to formulate two experimental primers. The original Kerr primer served as control. After primer application, the teeth were bonded with Kerr Optibond, build up with resin composite incrementally and stored in water for 24 hours in 37 ^{o}C incubator. The bonded specimens were sectioned into beams and subjected to micro tensile bond testing (μTBS). Failure analysis was performed using a scanning electron microscope (SEM). Two-way ANOVA showed significant differences in μTBS among the tested and control group ($p<0.05$). A post-hoc comparison test revealed that incorporation of MPA significantly increased μTBS when compared with the other two groups ($p<0.001$). Incorporation of MPA into Kerr Optibond primer potentially positive influence on the immediate bond strength of the bonded interface.

Keywords: Resin-dentin interface, Dentine bond strength, Proanthocyanidins, Self-etching adhesive

Acknowledgement: This work was supported by internal grant RIGS 050-0050 from the International Islamic University of Malaysia.

ABSTRACT 86

HEALTHCARE PROFESSIONALS VIEW ON PROVISION PRECONCEPTION CARE FOR DIABETES CHILDBEARING WOMEN

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ABSTRACT

Diabetes is one of the chronic metabolic disorders of multiple aetiologies characterised by chronic hyperglycemia, from defects in insulin secretion, insulin action, or both. Diabetes is a growing public health concern. Both developed and developing countries are affected by the estimated increase for several decades. The national and international recommendation had been that women of reproductive age should offer diabetes preconception care prior conceive. The purpose of this review is to identify any study been carried out on the view of healthcare professionals on preconception care for diabetes childbearing women in different countries. The methodology includes a systematic search of databases from PubMed, MEDLINE, Wiley Online Library, Science Direct, Scopus and Pro-quest, discussed research studies that analysed healthcare professionals views on preconception care, with thirteen studies chosen for this review. Results represent both qualitative and mixed methods published between 2014-2019. Themes generated explained healthcare professionals' views on preconception care. The concept of preconception care is beneficiary and important for diabetes women. Meanwhile, professionals' role ambiguity might hinder the care, but primarily midwives should be responsible for providing the provision. However, some professionals perceived barriers were limited awareness and inadequate knowledge regarding diabetes preconception care as this aspect was not properly taught during professional training. In conclusion, effective preconception care is a primary prevention and has proven to reduce adverse pregnancy outcomes related to diabetes and improve glycemic control with great improvement on the intake of preconception folic acid supplement in developed countries. However, the reality to provide the proper provision of preconception care into regular consultation requires further investigation on how to achieve proper integration considering in-course professional training, time and incentives for further study.

Keywords: Health care professional view, Diabetes, Preconception care

ABSTRACT 87

COLLAGEN-CHITOSAN SCAFFOLD FOR ORAL MUCOSA REGENERATION: A BRIEF REVIEW

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ABSTRACT

Collagen plays vital roles in epithelial cell adhesion. Previous research demonstrated excellent collagen capabilities in promoting re-epithelization of open wounds in pathological conditions which may circumvent the use of skin grafts. Nevertheless, pure collagen scaffolds demonstrated relatively weak mechanical strength especially upon hydration. Chitosan, on the other hand, is the second most common biopolymer found in nature and is known to be biodegradable, biocompatible and possess anti-bacterial properties. Incorporation of chitosan onto collagen bioscaffold may potentiate better usage for oral mucosa application. This study aimed to systematically review the use of collagen-chitosan scaffold for treatment of oral mucosa. Specific emphasis was given to the type of study involved in assessing its potential to be used as a bioscaffold. The methodology used is the search for articles published was performed using PubMed and Scopus databases using three keywords; "collagen", "chitosan" and "oral mucosa". Initial search yield in seventeen articles from both databases (Pubmed = 7, Scopus = 12). After careful scrutinisation, only ten articles were selected combining both databases. Collectively, the papers included in vitro and animal studies. All of the in vitro studies had cells cultured on a certain type of collagen chitosan scaffold and obtained positive results. In animal studies, articles showed successful reconstruction of full-thickness porcine oral mucosa equivalent using collagen-GAG-chitosan porous scaffold and repaired buccal mucosal full-thickness defects in rats using tissue engineered oral mucosa lamina propria cultured on chitosan-collagen. In conclusion, collagen-chitosan has the potential to create better scaffolds for oral mucosa regeneration than the ones previously used and is relevant to be furthered explored and studied using more databases.

Keywords: Collagen, Chitosan, Wound, Oral mucosa

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ABSTRACT 89

INFLUENCE OF DIFFERENT METALS TOWARD SENSITIVITY PERFORMANCE OF FIBER OPTIC SURFACE PLASMON RESONANCE (SPR) BASED SENSOR

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ABSTRACT

The influence of different metals toward the sensitivity performance of fiber optic refractive index sensor based on Surface Plasmon Resonance (SPR) is examined theoretically and numerically being simulated using MATLAB programming software. Four different metals such as gold, silver, aluminum and copper are tested and their sensitivity are evaluated.The simulation is performed by penetrating visible light of wavelength range from 0.3µm to 1.0µm in refractive index media ranging from 1.330 to 1.380 respectively.In this research, the normalized transmitted power are calculated and their resonance wavelength been investigated. The sensitivity performance of the sensor is analysed through the shift in the resonance wavelength produced over certain changes of the index of refraction in sensing media.The metal that capable of producing of a higher shifting in resonance wavelength over a small refractive index changes will be selected as an ideal metal and thus can be utilized in SPR fiber optic system to produce sensor with high sensitivity detection.In this study, it shows that gold produced the highest sensitivity among the other three metals with sensitivity of 4.3724µm/RIU.

Keywords: Surface Plasmon Resonance (SPR), Optical Fiber, Metals, Sensitivity, Resonance Wavelength

ABSTRACT 90

PERIODONTAL HEALTH AWARENESS AMONG INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA MEDICAL STUDENTS

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ABSTRACT

Proper knowledge and awareness of oral diseases are crucial in medical practice because periodontal disease is associated with multiple systemic conditions. Systemic diseases and drugs have oral manifestations as well as adverse reactions. This study aims to assess periodontal health awareness among medical students of International Islamic University Malaysia (IIUM). This cross-sectional study utilised questionnaires which were distributed to fourth and final year medical students of IIUM Kuantan. Questions pertaining to oral health, periodontal disease and its relation with systemic conditions were given. A total of 93 students completed the survey questionnaires. 3% of them have an awareness that periodontal disease is related to the gingiva. 10% of respondents agreed that dental plaque is the primary cause of periodontal disease. 80% of respondents have knowledge of associations between periodontal disease and systemic conditions. 97% of respondents showed a positive attitude for a referral to a dentist in the future. The participants have superficial knowledge and awareness about periodontal disease and its relation to systemic conditions. However, they have a positive attitude for future practice towards their patients. Hopefully, this research may provide a direct suggestion to incorporate basic periodontal knowledge in their medical syllabus.

Keywords: periodontal disease, awareness, knowledge, attitude.
Acknowledgement: We would like to thank Kulliyyah of Dentistry, Kulliyyah of Medicine and the IIUM medical students that contribute to this study.

ABSTRACT 91

LONELINESS AND COGNITIVE IMPAIRMENT AMONG OLDER PEOPLE LIVING IN LONG-TERM CARE

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ABSTRACT

Loneliness and cognitive impairment are common among older people. However, the study on the association between cognitive impairment and loneliness among older people in long-term care in Malaysia is limited. This study aimed to explore the association between socio-demographic, cognitive impairment and loneliness among older people in long-term care. A cross-sectional study was conducted on 167 older people aged 60 years and over living in long-term care (Rumah Seri Kenangan Ulu Kinta, Perak and Rumah Seri Kenangan Cheras, Selangor). A questionnaire consists of three parts; socio-demographic background, Elderly Cognitive Assessment Questionnaire (ECAQ) and University of California, Los Angeles (UCLA) Loneliness Scale were used for data collection. Data were analysed by using IBM Statistical Package Social Science (SPSS) version 20. It was found that 51.5% of older people experienced a severe high degree of loneliness. For the cognitive level, 49.1% older people reported having cognitive impairment. There was a significant association between age and loneliness ($p = 0.001$). It was reported that there was a significant association between age ($p = 0.003$), marital status ($p = 0.006$) and cognitive level. This study also found that there was a strong positive correlation between cognitive impairment and loneliness ($r = 0.832$, $p = 0.001$). The findings suggest a pressing need for interventions designed to decrease loneliness that may be particularly beneficial for the reduction of cognitive impairment among older people living in long-term care.

Keywords: Loneliness, cognitive impairment, older people, long-term care

ABSTRACT 92

ADHERENCE TOWARDS LIFESTYLE CHANGES RECOMMENDATION AMONG TYPE 2 DIABETES PATIENTS: A QUALITATIVE STUDY.

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ABSTRACT

Lifestyle modification is one of the components in diabetes patients' self-care practice, yet the essential element to prolonged diabetes complications. Despite new intervention strategies, most of the diabetic patients worldwide tend to ignore this component, which includes diet and physical activity changes. Adherence to lifestyle recommendations is necessary to ensure the effectiveness of the treatment, but many patients were having a problem in starting and maintaining their changes. Hence, this study elucidates in detail diabetes patients' facilitator and difficulties in implementing lifestyle changes. Type 2 diabetes patients, both male and female who consulted dietitian, were recruited (N=30) for this study. The semi-structured interviews were developed based on the systematic review outcomes which provide comprehensive coverage of diabetes patient's issues in adhering lifestyle changes, includes knowledge, practice, barrier, facilitator, and motivation. Face to face interview was conducted at the selected places, and the in-depth interview session took around 30 - 90 minutes to be completed. Results discovered four main themes using the content analysis technique, include; self-care practices, lifestyle changes inhibitor, preventative action, and lifestyle changes enablers. Among the barrier in implementing lifestyle changes are due to food culture, food preference or habit, food availability and accessibility, lack of support and will power whereas few facilitating factors highlighted by the patients are high self-efficacy, support and have a motivating factor. Generally, with proper knowledge and strong self-efficacy could help the patient to start, adhere and maintain the lifestyle changes.

Keywords: Type 2 diabetes, lifestyle changes, adherence, barrier, motivation.

Acknowledgement: This research was supported by IIUM, Research Initiative Grant Scheme (RIGS17-149-0724)

ABSTRACT 93

IMPACTS OF INDUCED MONOCULAR BLUR ON VISUAL FUNCTIONS

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ABSTRACT

Anisometropia relates to the differences in refractive power between both eyes. Hence, anisometropia is expected to have deleterious effects on visual functions due to dissimilar retinal images formed on both eyes. This study explored the outcome of induced blur in terms of a refractive defocus on visual functions. Imposing different levels of blur was believed to mimic the anisometropia condition. Twenty emmetropic adults enrolled in this study. Myopia, hyperopia and astigmatism were induced using soft contact lenses in steps of 1.0 Dioptre (D) ranging from 1.00DS until 4.00DS as well soft toric contact lenses 1.00DC until 4.00DC (with the rule (WTR). Visual acuity (Standard logMAR), contrast sensitivity (Pelli Robson), stereoacuity (TNO stereotest) and aniseikonia (retinal image sizes) (Smart Optometry application) were assessed at baseline and each level of defocus. **Results:** All myopic, hyperopic and astigmatic anisometropia resulted in significant deterioration of visual acuity, and stereoacuity at all level refractive defocuses ($p<0.05$). With a maximal of 4D anisometropia magnitude, visual acuity in myopic and hyperopic anisometropia reduced by 9 lines and 5 lines for astigmatic anisometropia. Contrast sensitivity remained steady throughout all level of defocuses in all mimicked anisometropia groups. The stereoacuity was lost among the 4D magnitude of myopic and hyperopic anisometropia while astigmatic anisometropia retained the stereoacuity. Highest slope value obtained from linear regression of stereoacuity for each myopic, hyperopic and astigmatic anisometropia (slope value of 0.33, 0.30 and 0.26) respectively corresponding with logMAR acuity and contrast sensitivity. Aniseikonia also was significant in all anisometropia groups ($p<0.05$). Mimicked myopic anisometropia experienced aniseikonia at each magnitude of anisometropia but, the cut off magnitude for hyperopic and WTR astigmatic anisometropia were 3D. **Conclusion:** Small amount of anisometropia was accountable in affecting visual functions. Even at the low magnitude of mimicked myopic anisometropia, stereoacuity affected the most as compared to visual acuity and contrast sensitivity, thus contributing to the high prevalence of anisometropic amblyopia.

Keywords: Monocular defocus, mimicked anisometropia, visual function, binocular function

Acknowledgement: We gratefully acknowledge the participation of all our subjects.

ABSTRACT 94

MORPHOMETRIC APPROACHES AS TOOLS IN REVEALING THREE-CLOSELY RELATED CATFISH SPECIES (CLARIIDAE)

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ABSTRACT

African catfish (*Clarias gariepinus*) was introduced into Malaysia for aquaculture purposes. They often used to produce a hybrid with indigenous catfish (*C. batrachus, C. macrocephalus*) due to their rapid growth rate. There are difficulties in differentiating these three species in their morphology. An experimental study was conducted to identify morphometric characteristics between these three species. Specimens of each species (*C. gariepinus, C. batrachus and C. macrocephalus*) were collected and analysed in term of their morphological differences. Seventeen characters have been used for conventional morphometric measurements. Truss morphometric characters for the body consist of 36 characters. Five meristic characters were counted. All data were converted into a ratio and undergo Discriminant Function Analysis. Meristic data also tested by non-parametric Kruskal-Wallis. All analysis were using SPSS 20V. Conventional morphometrics suggested three characters (Head Widht, Anal Fin Base Lenght and Outer mandibular barbell length) to differentiate the three species. Meristic characters showed significant differences in dorsal fin rays, anal fin rays and caudal fin rays. Conventional and truss agreed on similar morphological characteristics in species identification. Meristic counting can be used as additional characteristics in identifying these three species.

Keywords: Aquaculture, Catfish, Morphometric, Truss, Meristic

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ABSTRACT 95

DIVERSITY OF JUVENILE DECAPODS IN PENOR RIVER ESTUARIES IN PAHANG

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ABSTRACT

Studies of decapods diversity are important to understand the species composition in a particular habitat. However, this information is very minute in Pahang estuaries area. This study was conducted to identify diversity and abundance of juvenile decapods in Penor River of Pahang. Specimens were collected from three different locations of the rivers using a traditional fish trap. The samples collected and identified into genus based on their morphological characteristics before analysed by using the Shannon-Wiener Diversity Index and Simpson's Diversity Indices. The highest diversity of decapods found at Penor River at middle and inner rivermouth in the middle of the year respectively, while the lowest diversity of decapods recorded at this river is outer rivermouth in May. The result gives an impact on which months the decapods inhabit river estuaries.

Keywords: Decapod; River Estuaries; Species Diversity

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ABSTRACT 96

POPULATION STRUCTURE OF LANDLOCKED MASU SALMON (ONCHORHYNCHUS MASOU) IN TOHOKU REGION AFTER FUKUSHIMA NUCLEAR POWER PLANT INCIDENT

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ABSTRACT

Tohoku region has been impacted by heavy tsunami during 2011 which caused explosion of Nuclear Power Plant in Fukushima prefecture. Due to safety reason, evacuation has been enacted in several towns in. This study aim to understand the population structure of landlocked masu salmon *(Onchorhynchus masou*) in from four population of rivers (Hirose, Abukuma, Ukedo and Mano). Eleven microsatellite markers and two mitochondrial markers (D-loop and Cytb) were used to identify genetic variation of each population. Out of twenty eight (28) loci, eleven (11) showed consistent amplification and variation between population and used in analysis. Number of alleles ranged from 1 to 23 in each microsatellite locus whereas Hirose population showed highest number of alleles. Haplotype diversity also showed highest number of D-loop and CytB haplotype in Hirose population (6). Molecular variances largely found within individuals (66%) and only 5% molecular variation found among population. Population differentiation (Fst) showed little genetic differentiation between four rivers. STRUCTURE analysis showed admixture largely between three rivers (Mano, Ukedo, Abukuma). This result suggest reduction of genetic diversity of landlocked masu salmon in three rivers (Abukuma, Mano, Ukedo) in comparison to Hirose population.

Keywords: Microsatellite markers, Masu Salmon, Population genetic, Mitochondrial DNA, Fukushima Incident

Acknowledgement: Author would like to thanks Graduate School of Agriculture, Tohoku University and Fukushima Inland Fisheries Research Station in providing the research materials and collaboration. This work was supported by International Islamic University of Malaysia for publication under RIGS16-318-0482 grant for publication.

ABSTRACT 97

APPLICATION OF METRONIDAZOLE LOADED MEMBRANE FOR PERIODONTAL DISEASE: A BRIEF REVIEW

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ABSTRACT

Periodontitis is the inflammation of periodontal tissues that support the teeth. 86% of adults over the age of 70 suffer at least one case of moderate periodontitis leading to the 25% cases of teeth loss. Guided bone regeneration (GBR) is an effective technique used for periodontium reconstruction. This technique uses barrier membranes which prevent epithelial growth in the wound site and can be supplemented with antibiotics to protect the wound against opportunistic infections. Traditionally, the clinic therapy for anti-infection is to use antibiotics through injection or oral administration resulted in poor delivery of antibiotic to the defect site leading to cytotoxicity. Metronidazole (MNA), commonly used antibiotics, offer the benefits of a high degree of efficacy and with limited adverse side effects. This paper aimed to systematically review the current use of metronidazole loaded onto membranes in periodontitis treatment. SCOPUS and PubMed databases were used to search the articles systematically. The search strategy performed using the following keywords: "metronidazole", "membrane" and "periodontal disease". The inclusion criteria were all original studies published in English within five years. The exclusion criteria were any dissertations, unpublished documents, and review articles. Initial screening of papers yielded 15 papers (Scopus=9 and Pubmed=6), but only five articles met the inclusion criteria dealing with MNA antibiotics delivery. Many of the papers reported MNA in forms of mucoadhesive tablet or gel loaded onto different types of membranes (poly 3-hydroxybutyrate, collagen, and chitosan) as topical application of sustained release of antibiotic. The drug delivery employed were able to deliver the desired antibiotics dose to the infected site with an extended period while minimising cytotoxicity. However, a high amount of MNA delivered to the defect site leading to cytotoxicity. In conclusion, the use of MNA loaded membrane demonstrated promising results for periodontitis, but improvement is needed in terms of drug delivery mechanism.

Keywords: Metronidazole, Membrane, Periodontitis.

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ABSTRACT 98

PRODUCTION OF MITOTIC GYNOGENESIS OF MASU SALMON IN JAPAN USING PRESSURE SHOCK

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ABSTRACT

Chromosome manipulation techniques have been adopted in aquaculture to improve breeding selection and performance. One of the approaches in chromosome manipulation is gynogenesis. This study aims to identify the time duration of pressure shock applied to the eggs after fertilisation. UV irradiated sperm was used to fertilised eggs of masu salmon (*Oncorhynchus masou*). Pressure shock of 650 kg/cm2 for 6 minutes 30 seconds was given on 56, 58, 60, 62 and 64 minutes after fertilisation (AF). Intact Control (IC) and Gynogenetic Control (GC) were produced by fertilising eggs with fertile sperm and inducing retention of second polar body (haploid) respectively. Ploidy level was verified using microsatellite markers while the percentage of hatching rate, swim-up rate and normal fries were analysed using One Way ANOVA. Results showed 100% success in producing diploid mitotic gynogen for all different time duration. Yet, hatching rate, swim-up rate and the normal rate of all treatment significantly low in comparison to normal control (IC). This study suggests the effectiveness of pressure shock in producing diploid mitotic gynogen and its verification using microsatellite markers. However, further study is needed to improve the success rate.

Keywords: Aquaculture; Mitotic ; Gynogenesis ; Microsatellite Markers; Masu Salmon

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ABSTRACT 99

THE EFFECT OF SYNBIOTIC *Streptococcus salivarius* K12 AND YACON (*Smallanthus sonchifoliuson*) ON Candida albicans BIOFILM FORMATION

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ABSTRACT

Candida albicans is an opportunistic fungus that is known for its ability to form biofilms. *Streptococcus salivarius* K12 is an oral probiotic while yacon is a source of prebiotic. The objective of this study is to investigate the effect of *S. salivarius* K12 and yacon aqueous extract (synbiotic) on *C. albicans* with the hypothesis that *S. salivarius* K12 and yacon inhibit *C. albicans* biofilm formation. To develop mono-species biofilm, *C. albicans* (ATCC MYA-4901 and cancer isolates, ALC2 and ALC3 strains) and *S. salivarius* K12 were standardised to 10^5 cells and 10^6 cells, respectively and grown in 96-well plate in nutrient broth (NB) or RPMI at 37 °C for 72 h. Polymicrobial biofilms were developed by inoculating both microorganisms in the same well with similar cell number as in mono-species. To determine the effect of the synbiotic, a similar protocol was repeated by mixing with 800 mg mL^{-1} of yacon extract and incubated at 37 °C for 72 h. The medium was replenished at every 24 h, aseptically. Finally, the biofilms were assessed using the crystal violet assay, and the optical density was measured at OD620nm. The combination of both prebiotic and probiotic has effectively reduced all the *C. albicans* strain (MYA-4901, ALC2 and ALC3) in both NB and RPMI. All *C. albicans* strain when grown in polymicrobial with *S. salivarius* K12 in NB that is predominated by yeast-form *C. albicans*, exhibited decreased biofilms by 51.34±11.6, 8.20±43.9 and 11.3±82.7%, respectively when compared to the expected biofilms. Meanwhile in RPMI, which *C. albicans* strain ATCC MYA-4901, ALC2 and ALC3 were predominated by hyphal-form showed decreased biofilms by 43.3±12.1%, 39.4±15.7% and 25.7±56.8%, respectively when compared to the expected biofilms. *S. salivarius* K12 and yacon extract synbiotic inhibits biofilm formation of *C. albicans* yeast and hyphal forms thus supported the hypothesis of the present study.

Keywords: *Candida albicans, S. salivarius* K12, oral cancer, probiotic, biofilm

Acknowledgement: The author would like to acknowledge International Islamic University Malaysia (IIUM) and Ministry of Education for the funding.

ABSTRACT 100

PREVALENCE OF RISKS FOR OBSTRUCTIVE SLEEP APNOEA AND ITS ASSOCIATION WITH CARDIOVASCULAR RISK FACTORS AMONG ADULTS ATTENDING GOVERNMENT PRIMARY HEALTH CLINICS IN KUANTAN

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ABSTRACT

Obstructive sleep apnoea (OSA) is a sleep-related breathing disorder with recurrent episodes of apnoea or hypopnoea occurring during sleep. It is associated with an increased risk of cardiovascular disease (CVD). However, there is no applicable study that assesses the risk for OSA and CVD among adults at the primary care level. This study aims to assess the prevalence of risk for OSA and its associated cardiovascular risk factors among adults attending primary care clinics. This cross-sectional study was conducted among 252 adults attending four Klinik Kesihatan in Kuantan, Pahang. The inclusion criteria were adults age 30 years old and above. The exclusion criteria were a known case of Hypothyroidism, Depression and pregnancy. A self-administered validated Malay version of Berlin Questionnaire (BQ) was used to screen for high risk of OSA. The statistical analyses were done using IBM SPSS version 23.0. Majority of the respondents were male (54%), Malay (87.7%), and married (79.4%). The prevalence of High Risk for OSA was 32.9%. The cardiovascular risk factors that were found significantly associated with High Risk of OSA include higher BMI classification with obese type 1 (AOR=2.604 CI=1.278-5.308), obese type 2 (AOR=3.882 CI=1.078-13.975) and obese type 3 (AOR=6.800 CI=1.164-39.717) compared to normal; hypertension (AOR=2.297 CI=1.122-4.702); and hypercholesterolaemia (AOR=2.040 CI=1.050-3.965). However, advancing age showed a reduced risk for High Risk of OSA (AOR=0.951 CI=0.923-0.980). Male gender, smoking and Diabetes Mellitus was not associated with High Risk of OSA. This study shows that nearly one-third of the adults attending primary health clinic are at High Risk of OSA. Although advancing age showed reduced risk, other cardiovascular risk factors such as higher BMI status, presence of hypertension and hypercholesterolaemia showed an increased risk for High Risk of OSA.

Keywords: Obstructive Sleep Apnoea, Belin Questionnaire, Primary Health Clinic

ABSTRACT 101

THE USE OF NEOCARTILAGE IMPLANTS TO TREAT OSTEOCHONDRAL DEFECT: MACROSCOPIC AND MICROSCOPIC OBSERVATIONS USING UNDECALCIFIED TISSUE PREPARATION

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ABSTRACT

Osteoarthritis is a condition characterised by gradual loss of articular cartilage within the synovial joints. The earliest sign of degeneration is when the superficial or the outer layer of the cartilage is disrupted. Once cartilage morphological structure collapses, the cartilaginous properties, including extracellular matrix content and collagen type II, are also disturbed. The currently available treatments only resolute the pain instead of treating the underlying problem. Tissue engineering and regenerative medicine have been introduced as an alternative modality in treating this degenerative disorder. This study aimed to evaluate the use of tissue-engineered neocartilage constructs (or implants) for cartilage repair in an animal model. A combination of autologous chondrocytes, poly(lactic-co-glycolic acid) (PLGA) based scaffolds, and chondrogenic-facilitating culture medium was used to form the neocartilage constructs. The constructs were implanted into the osteochondral defect in the knee of the rabbits. The orthotopic implants were harvested at 4-, 8- and 12-week post-implantation. The evaluation includes macroscopic and microscopic observations of tissue structures. The scoring assessment was done using the International Cartilage Repair Society (ICRS) macroscopic evaluation of cartilage repair. For the histology, the constructs were processed using undecalcified tissue processing and stain with H&E. The degree of defect repair achieved more than 50% of the defect depth within 8-week implantation. Complete integration between native tissue and neocartilage implant was observed after 12-week implantation. However, the outer layer of the defect has yet to achieve the entire smooth surface to signify the hyaline cartilage morphology. In this study, the ability for cartilage-to-cartilage and cartilage-to-bone tissues to integrate indicates good healing response for cartilage repair in vivo.

Keywords: articular cartilage, gene transfer, tissue engineering, animal study, PLGA

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ABSTRACT 102

EFFECT OF SURFACTANTS ON THE CHARACTERISTICS OF MESOPOROUS SILICA DURING SYNTHESIS

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ABSTRACT

Mesoporous silica (MPS), a carrier for active pharmaceutical ingredients, can be synthesised in a variety of particle and pore morphologies. Despite being a simple synthesis system, successful tuning of MPS still needs a better understanding of ingredients during controlled synthesis for achieving desired particle size, shape, pore arrangement and size. The present study aimed to synthesise ordered MPS with large pore size >5 nm and to evaluate the effect of surfactants on the characteristics of MPS during synthesis. Two forms of mesoporous silica particles (MPS) were synthesised separately using different surfactant templates (Cetyltrimethylammonium bromide & Pluronic P123) and Tetraethyl orthosilicate precursor by Stober Sol-Gel approach. The synthesised samples were analysed in comparison for their morphology (SEM), particle size, surface area (BET), functional groups (ATR/FTIR), crystallinity (XRD), and their drug loading efficiency percentage. MPS synthesised with CTAB template (MPS_{CTAB}) were short cubic-shaped particles with size <800 nm and BET surface area 858.94±1.57 m^2g^{-1}, while MPS synthesised with P123 template (MPS_{P123}) were long rod-shaped particles with length >1 µm, and BET surface area 631.32±1.88 m^2g^{-1}. The BJH adsorption-desorption pore size and pore volume of MPS_{P123} were higher than MPS_{CTAB}. The drug loading efficiency of MPS_{P123} was significantly higher than that of MPS_{CTAB}. XRD diffraction patterns and IR spectrums described the amorphous nature of silica for both forms of MPS samples. Advantages of MPS_{CTAB} were having smaller particle size and larger surface area, which can lead to higher drug dissolution and the faster drug release. In contrast, MPS_{P123} had larger pore volume and pore size, which resulted in having better loading efficiency. In conclusion, ordered MPS particles were successfully developed as a promising carrier for loading biologics with emphasis on the details of the synthesis process.

Keywords: Mesoporous silica, Carrier, Biologics, Tunable, Synthesis

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ABSTRACT 103

AN ASSOCIATION BETWEEN SLEEP QUALITY AND FUNCTIONAL STATUS AMONG OLDER PEOPLE IN AGRICULTURAL PLANTATION

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ABSTRACT

The phenomena of the ageing population all over the world, including Malaysia, bring a significant impact on the wellbeing of older people. The sleep deviation happens at older people with the increasing of their age. Older people may face other health complication due to sleep deterioration. The purpose of this study was to determine the association between functional status and sleep quality among older people in the agricultural plantation. In a cross-sectional study, 245 subjects were selected by convenience sampling from one agricultural plantation in Malaysia. The instruments used in this study included the Pittsburgh Sleep Quality Index (PSQI), Barthel Index, list of questions about socio-demographic data and self-reported medical conditions. Data were encoded, entered onto a computer, and analysed with SPSS 22.0 software. The mean age of respondents was 69 years (SD=5.443) with a range of age from 60 to 85. It was found that the majority of respondents had poor sleep quality (64.5%) in comparison with good sleep quality (35.5%). Sociodemographic factors (age, gender, marital status and educational level), comorbid condition (hypertension, diabetes, pulmonary disease and musculoskeletal disease) and functional status were associated with sleep quality. Respondents with totally dependency functional status had more percentage of having poor sleep quality. The result indicated the important role of functional status on sleep quality among older people. Health care providers are responsible for assessing the level of independence to preserve and control the quality of sleep among older people.

Keywords: sleep quality, functional status, agricultural plantation, older people.

ABSTRACT 104

TEACHERS' KNOWLEDGE AND CONFIDENCE IN CONDUCTING ORAL HEALTH ACTIVITIES IN KINDERGARTENS

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ABSTRACT

Teachers play an important role in promoting good oral health practices among preschool children as they are one of the most influential people in a child's life. This study aims to assess preschool teachers' oral health knowledge and confidence in conducting oral health promotion activities in kindergartens. A cross-sectional study was conducted among 111 preschool teachers (Government = 60, Private = 51) from selected kindergartens. Stratified random cluster sampling was used to select the participants. Their knowledge and confidence in conducting oral health activities were assessed using self-administered questionnaires. Data were analysed using SPSS Statistics version 23.0. Preschool teachers in Kuantan had moderate oral health knowledge (Mean score 62.6%, SD 19.2%) and high confidence in conducting oral health-related activities (Mean score 77.7%, SD 13.7%) at the kindergartens. Significant relationships were reported between teachers' oral health knowledge and age ($p=0.008$), and type of preschool ($p<0.01$). There was also a significant relationship between a teacher's confidence and type of preschool ($p<0.01$). However, there was no significant relationship reported between confidence and teacher's age ($p=0.057$). Preschool teachers in Kuantan have high oral health knowledge and confidence in conducting oral health activities. Younger and private teachers were less confident than older and government teachers.

Keywords: Teachers, Preschool Children, Kindergartens, Oral health

ABSTRACT 105

MORPHOLOGICAL TOOL TO ELUCIDATE TWO CLOSELY RELATED PANGASIUS CATFISH

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ABSTRACT

Pangasius catfish are commonly cultured in most Asian countries due to fast growth and edible flesh. The commonly cultured catfish is *Pangasius hypopthalmus* while the expensive and endemic species is *P. nasutus*. However, hybridisation and lack of knowledge in species identification caused misidentification and profit loss. The purpose is to find characters that help in differentiating these two species to avoid confusion among fish farmers. Analyses of conventional morphometric, meristic and truss morphometric were performed on two species. Three morphometric approaches (conventional, meristic and truss morphometric) were employed to identify the morphological differences. Conventional morphometric suggested eye diameter, body width, body depth, dorsal fin base length and barbells as characters that showed significant differences ($P < 0.05$) between the species, make them as potential diagnostic markers. Truss morphometric analyses approved that *P. nasutus* have larger dorsal fin base length as suggested by conventional morphometry data. The meristic analysis showed a significant difference ($P<0.05$) in the number of dorsal fin rays, pelvic fin rays, anal fin rays and caudal fin rays. All three types of morphometric prove to support in elucidating the two species.

Keywords: Aquaculture, Catfish, Morphometric, Truss, Meristic

Acknowledgement: This work was supported by the International Islamic University of Malaysia for publication under RIGS16-318-0482 grant for publication.

ABSTRACT 106

PROMOTING COMMUNITY HEALTH THROUGH PREVENTIVE MEDICINE

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ABSTRACT

This study aims to highlight the potential role of physicians and healthcare providers in promoting health within the community, especially using preventive medicine. Preventive medicine is defined as practices used to prevent diseases. Doctors have a unique place within the community based on respect and trust. Most often, doctors think of patients as individuals who present themselves differently to doctors in clinics and hospitals. But, in terms of public health, the community is the patient, and doctors can treat the whole community using preventive medicine. In addition, doctors have a role in determining the general policy on health services, and they can use their position to influence and push different groups within the community to utilise beneficial health care policies and promote health conditions to the various segments of society. Accordingly, the application of the preventive medicine model is instrumental in promoting health within the community, can help doctors understand different health issues, monitor improvements in health status indicators and reduce disparities within the community. All of these goals are fully consistent with the philosophy of Islam through the general purposes, which emphasize on the protection of life, mind and wealth, which are preserved only through the rationalization of public health behaviour and the provision of distinctive medical services, help to preserve the human element and intellect and maintain its existence. Moreover, it can reduce public expenditures that often burden countries and weaken the fabric of society.

Keywords: Community Health, Preventive Medicine

ABSTRACT 107

NEXT-GENERATION SEQUENCING (NGS) IN HUMAN ORAL MICROBIOME RESEARCH: A SYSTEMATIC REVIEW

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ABSTRACT

Human oral microbiome research has been conducted using different methodologies. One of them is next-generation sequencing (NGS), which is the state-of-the-art methodology that allows more comprehensive analysis than the traditional Sanger sequencing to characterise the constituents of human diverse microbial communities. However, no systematic reviews have been conducted to discuss the advantages of this methodology in relation to genetic richness of human oral microbiome and the benefits of this data for human health and diseases. Therefore, this systematic review was conducted to systematically learn the trends in using NGS with regards to human oral microbiome since its very first publication until the most recent ones. Literature related to oral microbiome and NGS were searched on Scopus and Web of Science (WOS), resulting in a total of 42 unique, open-access original articles, 29 from Scopus and 13 from WOS, published since 2009 until 2019. The microbiome in the studies was characterised on the basis of VI, V2, V3 and V4 hypervariable region of the 16S rRNA gene by using paired-end sequencing on Illumina MiSeq platform. The sequencing method, specifically NGS, was able to give insights about the diversity and uniqueness of oral microbiomes of individuals, in health and in diseased states such as caries, carcinoma, coronary artery disease (CAD), and atherosclerosis. Firmicutes, Proteobacteria, Fusobacteria, Bacteroidetes, and Actinobacteria were some of the common phyla detected using NGS, as reported in the literature. NGS is the most recent technology that opens the door to better characterise the oral microbiome in human for better diagnostics and prognostics in cases of diseases and to find ways to maintain human health.

Keywords: Next-Generation Sequencing (NGS), Human Oral Microbiome Research, A Systematic Review

ABSTRACT 108

THE IMPACT OF FINANCIAL CRISIS ON BURSA MALAYSIA USING MINIMAL SPANNING TREE

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ABSTRACT

In recent years, there has been a growing interest in the financial network. The financial network helps to visualise the complex relationship between stocks traded in the market. This paper investigates the stock market network in Bursa Malaysia during the 2008 global financial crisis. The financial network is based on the top hundred companies listed on Bursa Malaysia. Minimal spanning tree (MST) is employed to construct the financial network and uses cross-correlation as an input. The impact of the global financial crisis on the companies is evaluated using centrality measurements such as degree, betweenness, closeness and eigenvector centrality. The results indicate that there are some changes on the linkages between securities after the financial crisis, that can have any significant effect on investment decision making. Promoting some alternative investment strategies to investors can achieve sustainable development goals (SDG). For instance, the investment in infrastructure and innovation are crucial drivers of economic growth and development in which related to SDG 9. Achieving the SDGs will create a world that is more sustainable, equitable, and prosperous. In order to get there, investors must adapt their strategies to deliver not only financial results but positive social and environmental outcomes as well

Keywords: Financial Network, Minimal Spanning Tree, Centrality Measures

ABSTRACT 110

EPISOMAL AND INTEGRATIVE DNA TRANSFORMATION IN *C. albicans* USING FROZEN EZ YEAST TRANSFORMATION KIT II

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ABSTRACT

C. albicans is an important opportunistic fungus that is virulent in immunocompromised individuals such as HIV, cancer or transplant patients. Transformation of *C. albicans* is fundamental to genetic manipulation of *C. albicans* since it lacks a complete sexual cycle. Homologous recombination is the predominant method for transformation and expression of exogenous DNA, however, the expression of episomal plasmids have been reported. Genetic transformation of *C. albicans* is traditionally done via lithium acetate/spheroplast/electoporation methods that are time- consuming and/or complicated. The Frozen EZ Yeast Transformation II kit is a fast, broad spectrum, high transformation efficiency method for preparing competent cells and performing multiple plasmid transformations in yeast cells. The kit allows for easier and more efficient yeast circular and linear plasmid transformations compared to protocols. However, its effectiveness in *C. albicans* has not been reported. Here we report transformation of circular episomal DNA and linear integrative DNA into *C. albicans* using the Frozen EZ Yeast Transformation II kit. Heat shock at 44 °C, overnight incubation and outgrowth step were added as modifications specific to *C. albicans* transformation to increase transformation efficiency using the kit. The results with and without modification to the general kit protocol were compared. Transformation efficiency of episomal DNA using the general kit protocol was 40%, while for linear DNA, transformation did not occur. Addition of *C. albicans*- specific steps to the transformation protocol increased transformation efficiency. In conclusion, the Frozen EZ Yeast Transformation II kit is suitable for *C. albicans* transformation of circular DNA. Addition of *C. albicans*-specific modification steps increases transformation efficiency of *C. albicans* using the kit.

Keywords: *C. albicans*, transformation, circular plasmid, linear plasmid, Frozen EZ Yeast Transformation II Kit

ABSTRACT 111

CHARACTERIZATION OF OSTEOMYELITIS MICROBIOME USING SPECIFIC GROWTH MEDIA

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ABSTRACT

Osteomyelitis is an inflammation of the bone caused by microbial infection. The objective of the study is to characterise the microbiome from osteomyelitis with the hypothesis that osteomyelitis is induced by polymicrobial infection. To identify the microbiome, sample was initially isolated from pin site of ortophaedic patients with osteomyelitis using sterile swab. Following that, the sample was inoculated into nutrient broth and incubated at 37° C for 24 h aerobically. Later, the sample was cultured on CHROMagar, mitis salivarius agar (MSA) and lactobacillus specific agar (LSA) for identification of *Candida* species, *Streptococcus* species and *Lactobacillus* species, respectively. Gram-staining was conducted to identify its phenotype under light microscope. Finally, disc diffusion test was conducted on each isolate to assess its sensitivity towards nystatin, amphotericin B, gentamicin and tetracyclin. Based on the study, only *Candida albicans* and *Streptococcus* species were identified. *Candida albicans* and *Streptococcus* species were isolated from the sample with *C. albicans* exhibited resistance to amphotericin B, gentamicin and tetracyclin while *Streptococcus* species were resistance to nystatin, amphotericin B and tetracyclin. In conclusion, ostemomyelitis is induced by polymicrobial infection, with the microbial isolates possess various susceptibility towards common antimicrobial agents.

Keywords: Osteomyelitis, polymicrobial infection, disc diffusion assay

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ABSTRACT 112

INFLUENCE OF DIFFERENT METALS TOWARD SENSITIVITY PERFORMANCE OF FIBER OPTIC SURFACE PLASMON RESONANCE (SPR) BASED SENSOR

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ABSTRACT

The influence of different metals toward the sensitivity performance of fiber optic refractive index sensor based on Surface Plasmon Resonance (SPR) is examined theoretically and numerically being simulated using MATLAB programming software. Four different metals such as gold, silver, aluminium and copper are tested and their sensitivity is evaluated. The simulation is performed by penetrating visible light of wavelength range from 0.3µm to 1.0µm in refractive index media ranging from 1.330 to 1.380 respectively.In this research, the normalised transmitted power is calculated and their resonance wavelength been investigated. The sensitivity performance of the sensor is analysed through the shift in the resonance wavelength produced over certain changes of the index of refraction in sensing media. The metal that capable of producing of a higher shifting in resonance wavelength over a small refractive index changes will be selected as an ideal metal and thus can be utilised in SPR fiber optic system to produce sensor with high sensitivity detection.In this study, it shows that gold produced the highest sensitivity among the other three metals with sensitivity of 4.3724µm/RIU.

Keywords: Surface Plasmon Resonance (SPR), Optical Fiber, Metals, Sensitivity, Resonance Wavelength

ABSTRACT 113

TRICHOME MORPHOLOGY OF *Durio zibethinus*

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ABSTRACT

Knowledge on taxonomy such as trichome morphology of plant species has been increasing greatly in recent years. Taxonomic is the science that deals with the classification of organism according to their similarity and difference. It provides significant information for a majority of the classification systems in plant classification such as Durian species. Durian is one of the popular fruits in Malaysia. Thus, this taxonomic study will be acting as a tool to complement the assessment of variation of *D. zibethinus* species. Therefore, this study aims to examine the variation of trichome morphology of D. zibethinus. Samples of *Durio zibethinus* were collected from Jelebu and were kept as herbarium vouchers. Observation on trichome morphology was carried out by using microscope. The result showed there is a presence of stellate hair trichome on abaxial leaf epidermis of *Durio zibethinus*. In conclusion, trichome morphology of *D. zibethinus* can be used in characterisation of *D. zibethinus*.

Keywords: *Durio zibethinus,* leaf morphology, trichome

ABSTRACT 114

ANTIMICROBIAL ACTIVITY OF *Nigella sativa*-GENTAMICIN NANOEMULSION AGAINST OSTEOMYELITIC *Staphylococcus aureus*

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ABSTRACT

Osteomyelitis is a serious bone infection commonly caused by *Staphylococcus aureus*. The treatment of osteomyelitis remains challenging despite recent advances due to the prevalence of antibacterial resistance. Therefore, a novel drug against osteomyelitic bacteria has been formulated to offer a new treatment option for osteomyelitis. The present study aimed to investigate antibacterial properties of *Nigella sativa*-gentamicin emulsion (GNE) containing 50% *N. Sativa* and 0.1% gentamicin against osteomyelitic *S. aureus*. Formulation of GNE (30 µg sample/disc) was tested firstly using the disk diffusion test on Mueller Hinton. 3 strains of *S. aureus* were used namely ATCC 29213, gentamicin sensitive (SC01) and gentamicin resistant (SC03). The zone of inhibition was measured and the MIC and MBC were calculated by using microplate reader. We observed that the zone of inhibition of GNE vs gentamicin-alone was 7.5 vs 21.5 mm (ATCC 29213), 7.5 vs 22.5 mm (SC01) and 9 vs 17.5 mm (SC03). For GNE-alone, MIC and MBC were 937.5 and 1875 ng/mL for ATCC 29213 and SC01, respectively; and 1875 and 3750 ng/mL for SC03. For gentamicin, MIC and MBC were equal for ATCC 29213 at 117.2 gm/mL and SC01 at 58.6 ng/mL. In contrast, SC03 showed MIC of 468.8 ng/mL and MBC of 3750 ng/mL). The results indicated that GNE has the efficacy to kill osteomyelitic bacteria, even at low dose. Hence, GNE would be a suitable carrier to deliver antibiotics for osteomyelitis although further investigation for *in vivo* efficacy and toxicity should be considered.

Keywords: *N. sativa* oil, Gentamicin, Emulsion, Drug delivery, Osteomyelitis

Acknowledgements: This work is supported by Science Fund SF16-001-0070 from the Ministry of Energy, Science, Technology, Environment, and Climate Change (MESTECC).

ABSTRACT 115

Applying an Innovative Educational Procedure in Medical Biochemistry: Can First Year Pharmacy Students Gain the Benefits?

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ABSTRACT

Peer tutoring programs have been installed in Medical Biochemistry course and aligned with traditional teaching methods in order to maintain the quality of teaching. Reciprocal peer tutoring, cross-age peer tutoring methods were aimed to increase student engagement in the learning process and greater understanding. This cross-sectional study consisted of questionnaires and assessment was conducted. Total of 28 topics that covered major part of Biochemistry was distributed to all students. They were divided into 15 groups. They had four weeks to discuss the assigned topics. At the end of the discussion, questionnaires that consisted of knowledge and benefit, peer tutors' preparation and participation, perception of interaction were distributed. The quiz consisted of MCQs, and short questions were asked to assess their performance additionally. More than 75 (70.1%) agreed that they gained the benefits such as more mutual respect among peers, more confidence in learning and knowledgeable. Almost 100 (93-95%) responded that peers prepared their assigned tasks well and actively participated in the discussion. Hundred students (94-95%) showed their positive thoughts towards peer interaction and dynamics. More than ninety (85%) were satisfied with peers' evaluation, learning environment and leading skills. The mean score of quiz (8.63 ± 0.74 out of 10) was higher than that of scoring before peer tutoring (5.62 ± 1.47). Though good students maintained their good scores and weak students performed much better after peer tutoring, the correlation was weak. Peer tutoring guided both peers and tutors to engage in their active learning, developing their communication and interpersonal skills.

Key Words: Reciprocal-peer tutoring, Cross-age peer tutoring, Medical Biochemistry, Academic Performance

Acknowledgement: We acknowledge with thank to Dean of Kulliyyah of Pharmacy and all first-year Pharmacy students who willingly participated in this study. Last, but not least, we are thankful to RMC for organising this event.

ABSTRACT 116

BURSA MALAYSIA NETWORK ANALYSIS: EVIDENCE FROM MINIMUM SPANNING TREE (MST) METHOD

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ABSTRACT

This paper aims to investigate the topological structure of Malaysian shariah stock market in the year 2014 until 2018 by using daily closing prices of the 122 shariah stocks. The method used to construct the network is the minimum spanning tree (MST) by using Kruskal's algorithm. Besides, the important stocks in the network were determined using centrality measures such as degree, betweenness, closeness, eigenvector and eccentricity centrality measures. In order to identify the overall role of each stock, the overall centrality measure was calculated using principal component analysis (PCA). The results show that, during the five years of study, twelve main clusters are determined, and the most important stock in the network was Muhibbah Engineering (5703) from the construction sector. This study will help the investors, policy-makers, academicians and others to identify the current five years the latest topological structure of shariah-compliant stocks in Malaysia as well as the most critical stocks and sectors in Malaysia market.

Keywords: Bursa Malaysia, shariah-compliant stock, minimum spanning tree, centrality measure, principle component analysis.

ABSTRACT 117

SCREENING OF POTENTIAL LOCAL SEAWEEDS FOR NANOCELLULOSE PRODUCTION

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ABSTRACT

Act as multifunctional materials, nanocellulose offers important benefits such as low-priced, biodegradable, good mechanical characteristics and a high degree of surface polarity. Due to its biodegradable properties, nanocellulose is a suitable alternative to substitute plastic bags and food wrapper. It also has been found to be not harmful for application in biomedical and food industry. Among sources of cellulose, seaweed is proven to have roughly 95% of crystallinity which is the highest. Hence this study aims to screen local seaweeds for nanocellulose production. Around 13 seaweed samples were collected from Teluk Bidara, Dungun and Fisheries Research Institute Langkawi and were identified morphologically. Among the identified seaweeds were *Padina minor*, *Dictyota dichotoma*, *Laurencia intricata*, *Sargassum polycystum* and *Caulerpa lentillifera*. The identified samples were then subjected to vacuum filtration, hydrolysis and bleaching to obtain nanocellulose. Using particle size analyser, particles with the size of 50 – 100 nm were measured and proved that nanocellulose was successfully obtained from local seaweeds.

Keywords: Seaweeds; nanocellulose; biodegradable; crystallinity

Acknowledgement: We would like to thank Fisheries Research Institute Langkawi for providing us with seaweed samples.

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CORRELATION ANALYSIS BETWEEN ANTIHYPERTENSIVE EFFECT WITH TOTAL PHENOLIC CONTENT AND ANTIOXIDANT ACTIVITY OF *Syzygium polyanthum* (SERAI KAYU) LEAVES FRACTIONS

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Introduction

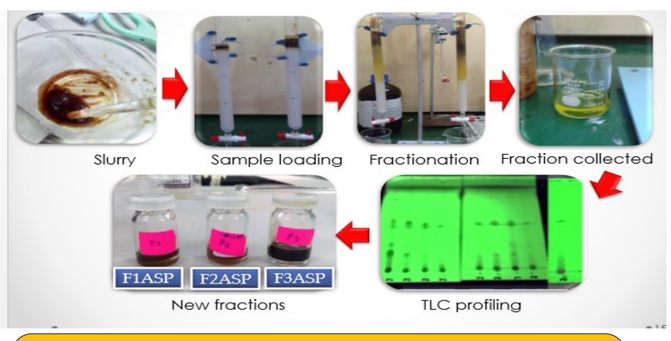
- Syzygium polyanthum (Wight) Walp. (serai kayu or salam) leaves are consumed by locals as fresh salad (ulam) and as decoction for hypertension remedy.
- The leaves were previously reported with antihypertensive and antioxidant (Ismail & Wan Ahmad, 2019) properties, but the relation between these two effects is unknown.
- The present study aimed to **examine correlation between magnitude of antihypertensive effect** of *S. polyanthum* leaves crude extract and fractions with **total phenolic content (TPC) and ferric reducing antioxidant power (FRAP)** activity for *S. polyanthum*.

Materials & Methods

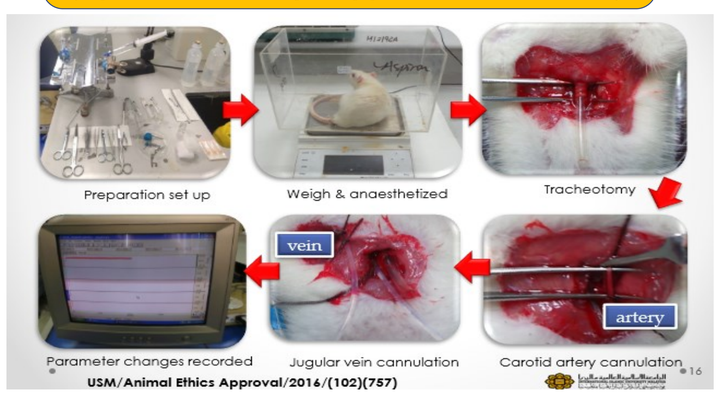
1 Collection & Authentication

2 Ultrasound-Assisted Extraction using Water

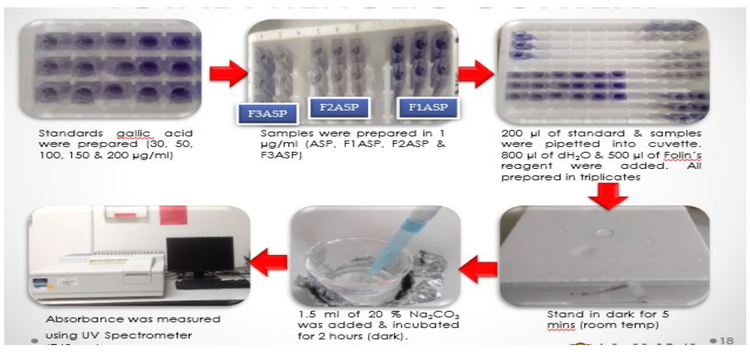
3 Fractionation using Column Chromatography



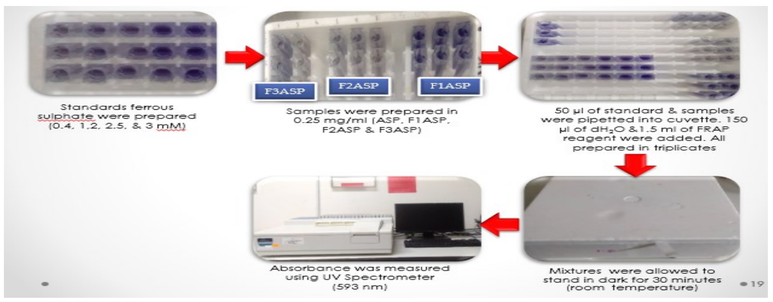
4 Antihypertensive Effect Study (Spontaneously Hypertensive Rats)



5 Total Phenolic Content (TPC)



6 Ferric Reducing Antioxidant Power Assay (FRAP)



7 *CORRELATION* Analysis using Spearman Rank test

Results & Discussion

- Yield of ASP from 1.45 kg of dried *S. polyanthum* leaves was **5.00 ± 2.59 % w/w.**
- Nine fractions were obtained via fractionation, then pooled based on TLC profiles into three fractions (**F1ASP, F2ASP and F3ASP**).
- Fractions with highest yield was F2ASP (2.80 g) while lowest yield was F1ASP (2.11 g) as shown in **TABLE 1**.

TABLE 1: Yield of fractions from crude ASP

Solvents (Gradient elution)	Ethyl acetate (100 %)	Ethyl acetate : metOH (7 : 3)	Ethyl acetate : metOH (5 : 5)		Ethyl acetate : metOH (3 : 7)			MetOH (100%)			MetOH (Wash) (100 %)
Volume of binary solvent (ml)	25	50	50		50			50			100
Fractions	-	-	F1	F2	F3	F4	F5	F6	F7	F8	F9
Weight (g)	-	-	0.34	0.84	0.48	0.45	0.76	0.64	0.88	0.52	2.57
New fractions after pooling	-	-	Fraction 1 (F1ASP) (2.11g)		highest			Fraction 2 (F2ASP) (2.80g)			Fraction 3 (F3ASP) (2.57g)
Yield (%)	-	-	7.03 %					9.33 %			8.57 %

- **TABLE 2** shows TPC, FRAP activity and the maximum magnitude of blood pressure reductions by ASP, F1ASP, F2ASP and F3ASP.
- Highest TPC and FRAP activity was recorded in ASP, while the lowest was recorded in F2ASP. Conversely, F2ASP showed greatest reduction in MAP, SBP and DBP compared to other fractions and ASP.

TABLE 2: TPC, FRAP and magnitude of blood pressure reduction

Sample	Total phenolic content (GAE mg/gram) Mean± SD	Conc. of Fe^{2+} (Fe mM/mg) Mean ± SD	Maximum MAP reduction (%) Mean ± SD	Maximum SBP Reduction (%) Mean ± SD	Maximum DBP Reduction (%) Mean ± SD
F1ASP	76.15 ± 3.75	3.76 ± 0.07	32.05 ± 14.89	33.79 ± 14.70	30.98 ± 3.89
F2ASP	30.52 ± 5.83	1.79 ± 0.14	37.94 ± 13.05	38.54 ± 16.22	35.81 ± 10.87
F3ASP	36.45 ± 1.35	1.98 ± 0.05	25.64 ± 12.67	35.11 ± 14.97	31.80 ± 11.91
ASP	232.81 ± 0.67	5.50 ± 0.26	32.85 ± 8.39	32.80 ± 7.93	26.36 ± 15.65

highest (DBP) highest (TPC, Conc. of Fe^{2+})

- TPC of *S. polyanthum* leaves has significant association with FRAP activity, but not with magnitude of antihypertensive effect (**TABLE 3**).
- This is supported by Khalid et al. (2018) where TPC and FRAP activities of selected Malaysian ulam, vegetables and herbs were significantly correlated.
- Fidelis et al. (2018) found a negligible correlation between magnitude of antihypertensive effect and antioxidant activity of camu-camu seed extract.

TABLE 3: Correlation analysis between TPC, FRAP and magnitude of blood pressure reduction

	FRAP	Maximum MAP reduction	Maximum SBP reduction	Maximum DBP reduction
TPC	r = + 0.9228 P<0.001	r = -0.1399 P-value= 0.6673 (P>0.05)	r = -0.5315 P-value = 0.0794 (P>0.05)	r = -0.4336 P-value = 0.1616 (P>0.05)
FRAP	Highly significant positive correlation	r=-0.0842 P-value = 0. 7864 (P>0.05)	r=-0.3684 P-value = 0.2326 (P>0.05)	r=-0.4117 P-value = 0.1618 (P>0.05)

Conclusion

- TPC of *S. polyanthum* leaves has significant association with its antioxidant activity only, but not with its antihypertensive effect.

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