EURASIA CONFERENCES

World Conference on

AGRICULTURE, AQUACULTURE AND FOOD SCIENCE

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World Conference on

BIOSCIENCE AND BIOTECHNOLOGY

Hosting Organization:
Eurasia Conferences, Kemp House, 152-160 City Road, London, EC1V 2NX

SCIENTIFIC PROGRAM

09:15-09:30 @ **Introduction, Welcome note and Conference Inauguration**
Conference Room: "Busrakam 3, 2nd floor"

NOVEMBER 10, 2022

Keynote Sessions

09:30-10:00

Title: Food Grain processing in general and Rice Technology in specific

Vasudeva Singh, Former Professor, Dept. of Bio-Engg and Technology, Food Science Division, Gauhati University, Gauhati, Assam 781 014, India

10:00-10:30

Title: Pesticides and soil fauna

Partha Pratim Chakravorty, Associate Professor, P.G. Department of Zoology, Raja Narendra Lal Khan Women's College (Autonomous), Midnapore, West Bengal, India.

10:30-11:00

Title: The effect of vermicompost and vermicompost tea on plant growth, yield, quality and plant protection – a review.

Margit Olle, Aru Agricultural Ltd. Vandu tee 17, Hulja, Lääne-Virumaa, 45203, Estonia. NPO Veggies Cultivation, Kesa 60, Tartu, 50115, Estonia.

Tea and Refreshments Break 11:00-11:20

11:20-11:50

Title: Highly tunable Pickering emulsion/polymer systems: from colloids to functional surfaces

Guy Mechrez, PhD, Department of Food Science, Institute for Postharvest and Food Science, Volcani Center, ARO, HaMaccabim Road 68, P.O 15159 Rishon LeZion, 7505101 Israel

11:50-12:20

Title: Genetic code restoration therapy by artificial RNA editases

Toshifumi Tsukahara, Md. Toufic Anam Azad, Sonali Bhakta, Ruchika and Matomo Sakari

12:20-12:50

Title: Monoclonal Antibodies targeting the Transferrin Receptor 1 for the treatment of New World Hemorrhagic Fevers

Dr. Gustavo Helguera, Laboratory of Pharmaceutical Biotechnology, Institute of Biology and Experimental Medicine, Argentina

Session Wrap 12:50-13:00

Lunch Break 13:00-13:50

Speaker Sessions

Session Chair: Vasudeva Singh, Former Professor, Dept. of Bio-Engg and Technology, Food Science Division, Gauhati University, Gauhati, Assam 781 014, India.
Session Co- chair: Partha Pratim Chakravorty, Associate Professor, P.G. Department of Zoology, Raja Narendra Lal Khan Women's College (Autonomous), Midnapore, West Bengal, India.

13:50-14:10	**Title: Effect of gum cactus and gum acacia on the dough performance and cookie baking quality** **Shahzad Hussain,** Department of Food Science and Nutrition, King Saud University, Riyadh 1145, Saudi Arabia
14:10-14:30	**Title: Evaluation of Changes in Life Cycle and Biochemical Parameters of Earthworm Eisenia fetida due to Exposure to Some Selected Pesticides** **Somanka Sanyal,** Department of Zoology, Midnapore City College, Midnapore, West Bengal, India
14:30-14:50	**Title: Genotypic variation in phosphorus efficiency among wheat cultivars grown under greenhouse conditions** **Saif Alharbi,** King Abdulaziz City for Science and Technology, 6086 Riyadh, 11442, Saudi Arabia
14:50-15:10	**Title: Sewage sludge as biomass resource for the production of energy** **Ricardo Mendes,** University of Coimbra; Association for the Development of Industrial Aerodynamics; Department of Mechanical Engineering, Coimbra, Portugal

Tea and Refreshments Break 15:00-15:30

15:30-15:50	**Title: Crop residue management: Effects of pruned frond removal on oil palm growth and productivity in Malaysia** **Chang Yu Yang,** Plantation Research and Advisory, Sime Darby Plantation Research, Carey Island, Selangor, Malaysia
15:50-16:10	**Title: MAE-seq refines regulatory elements across the genome** **Yubo Zhang,** Genome Analysis Laboratory of the Ministry of Agriculture, Animal Functional Genomics Group, Agricultural Genomics Institute at Shenzhen, Chinese Academy of Agricultural Sciences, Shenzhen, China
16:10-16:30	**Title: Estimating Crown Size Using Object Detection Derived from UAV Multispectral Imagery** **Mohamad Akmal Bin Abdul Razak,** Plantation Research and Advisory, Sime Darby Plantation Research, Carey Island, Selangor, Malaysia

Poster Presentation 16:30-16:50

Closing Ceremony 16:50-17:10

Posters

Poster 1	**Title: A Novel Therapeutic Strategy to Treat Ulcerative Colitis (Focused on In vivo Experiments)** **Il-Gyu Ko,** Department of Physiology, College of Medicine, Kyung Hee University, Seoul, Korea
Poster 2	**Title: Protective effect of PDRN on idiopathic pulmonary fibrosis induced by particulate matter (PM10) and TGF- in pulmonary epithelium cells** **Lakkyong Hwang,** Department of Physiology, College of Medicine, Kyung Hee University, Seoul, Korea

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November 10, 2022 | Bangkok, Thailand

KEYNOTE PRESENTATIONS | DAY 1

Vasudeva Singh

Former Professor, Dept. of Bio-Engg and Technology, Food Science Division, Gauhati University, Gauhati, Assam 781 014, India

Food Grain processing in general and Rice Technology in specific

Production of Cereals in World is around 2800 million tonnes (MT) and India produces around 280 MT as on 2018-19. 750 MT of paddy rice is produced in World and India produces around 160 MT. From this, ~10% (16 MT) goes for the production of rice products like rice flakes, expanded rice and popped rice which are generally prepared in small scale industries. Around 75 MT produced is used for production of raw rice and balance (75 MT) is used for the production of parboiled rice. World rice have been classified into 8 groups based on some of their physico-chemical properties like amylose content, gelatinization temp., alkali score, pasting behavior or viscographic parameters, cooking behavior etc. Importance of brown rice along with manufacturing large scale brown rice as well as nutri rice will be highlighted. Importance of Tiny rice mill will also be informed. Parboiling, a method of improving the technological properties and nutritive values of rice will also be highlighted. Medicinal rice Njawara, a pigmented variety, having high nutrients compared to other normal pigmented and non-pigmented rice varieties, its various physicochemical properties, protein and lipid profile in comparison with non-medicinal rice will be touched upon. Preparation of pre-gelatinized starches will be informed. Usage of cereals, millets, legumes in the preparation of multi grain ready to cook (RTC) and ready to eat (RTE) products will also be touched upon. Making of dhal from whole pulses and their technologies which are generally followed all over the world in some parts of Asia will also be focused upon. Millet technology in brief, maize grits manufacture and products from maize grits, in addition manufacture of starch from tapioca, which is generally used for the manufacture of Sago will also be touched upon. If time permits weaning foods preparation will also be spoken.

Biography:

After retiring from CSIR-CFTRI as Chief Scientist during 2013, worked as an Emeritus Medical Scientist (ICMR) at University of Mysore and served as a Professor, under DBT sponsored Food Science Project, Gauhati University, Gauhati, Assam till April, 2021. Published 85 research papers, inventor of several processes, one Patent was commercialized to 30 industries. Handled several National & International projects. Guided 70-80 B.Tech, M.Tech, M.Sc Food Technology, Food Science students for their Dissertation and Investigation problems and produced 8 Ph.D candidates, including an INSA Fellow; African UNU Fellows. Faculty member and Course Co-ordinator of M.Sc Food Technology, HRD courses of CFTRI. Recipient of several awards, delivered several invited lectures, innumerable oral lectures, and presented 70-80 posters at National & International level. Serving Food Safety Standards Authority of India, New Delhi, at different capacities. Also served as a member of Research Advisory Committee, ICAR-Central Institute of Post Harvest Engg and Technology, Ludhiana, Punjab. LifeTime Achievement Awardee from the ACCTI, Dehradun, India

Partha Pratim Chakravorty
Associate Professor, P.G. Department of Zoology
Raja Narendra Lal Khan Women's College (Autonomous)Midnapore, West Bengal, India

Pesticides and soil fauna

The use of pesticides in agricultural systems is one of the most important factors contributing to the massive worldwide increase in food production. Continuing exposure to these compounds may cause serious problems and stressful environment for non-target soil organisms. The present study evaluates the acute toxicity i.e., short term toxicity evaluation of 96 hours and chronic toxicity i.e., long term toxicity bioassay for 28 days, for cocoon production, biomass reduction, and specific activity of enzyme, of cypermethrin, pendimethalin, dimethoate and pretilachlor on the Perionyx excavatus was determined following the updated standard guidelines of Organization for Economic Cooperation and Development (OECD), 2004. The specific activity and enzyme inhibition of acetylcholinesterase enzyme was evaluated following the process of Ellman et al., (1961).

The 96 hours LC50 values of the herbicides Pendimethalin and Pretilachlor for P. excavatus were found as 0.016 and 0.052 mg/kg soil. organophosphate insecticide Dimethoate was found 0.017 mg/kg soil. Synthetic pyrethroid Cypermethrin was 0.012 mg/kg soil. The degree of toxicity was found to be Cypermethrin>Pendimethalin>Dimethoate>Pretilachlor. At 25% LC50 (T1) cypermethrin shows maximum biomass reduction but at 50% LC50 (T2) pretilachlor showed maximum reduction in earthworm biomass. Cypermethrin showed the highest toxicity among the pesticides with no cocoon produced in T2 dose (50% LC50). Pendimethalin showed the maximum inhibition of specific enzyme activity of acetylcholinesterase (AchE) in both the sublethal dose exposed earthworms, i.e T1 and T2.

Biography:

Dr. Partha Pratim Chakravorty has completed his PhD degree in the year of 1991 from Visva Bharati, Santiniketan, West Bengal, India. His broad subject of research is Soil Ecology. He has produced 7 PhD. At present 7 research scholars are pursuing PhD under his supervision and guidance. He has completed 7 major research projects. He is awarded as FZS, FNESA, member of the Royal Society of Biology, Member of Working Group of NETSOB under FAO UNO, member of the working Group of INSOP under FAO UNO. He has published more than 65 research papers in national and international journals.

Margit Olle[1,2]
[1]Aru Agricultural Ltd. Vandu tee 17, Hulja, Lääne-Virumaa, 45203, Estonia
[2]NPO Veggies Cultivation, Kesa 60, Tartu, 50115, Estonia

The effect of vermicompost and vermicompost tea on plant growth, yield, quality and plant protection – a review.

This review specialises on the influence of vermicompost on the crop production. The second aim of this review article is to describe the effect of vermicompost tea on plants growth, yield, quality and plant protection. Vermicompost is high in macro and micronutrients, vitamins, growth hormones, enzymes such as proteases, amylases, lipases, cellulase, and chitinase, and immobilized microflora. Vermicompost tea is a liquid vermicompost solution made by combining vermicompost with water and fermenting it for a set period of time. There are two kinds of compost tea: aerated compost tea and nonaerated compost tea. Nutrients and microorganisms are extracted from compost while it is steeped in water. Aerated tea is made by aerating well-matured compost suspended in water for 12 to 24 hours. Nonaerated tea is made by suspending compost or a bag of compost in a bucket of water for 14 days so that nutrients and anaerobic microorganisms are extracted, which are then used to enhance growth and strength in crops. Vermicompost can be produced "on-farm" at a low cost using simple techniques, whereas chemical fertilizers are high-tech and expensive products produced in factories. Vermicopost and vermicompost tea impoves germination, growth, biomass and yield in plants. Vermicompost and vermicompost tea increased mineral nutrients in plants. Vermicompost and vermicompost tea also resulted in higher antioxidant activity and total phenolics in plants than synthetic fertilisation. Vermicompost and vermicompost tea have been widely used for the management of plant diseases and pests. As a result, these organic fertilizers are regarded as viable alternatives to chemical pesticides and fungicides, and they should be used more frequently to prevent disease and ensure food security and safety.

Key words: plant growth, plant protection, quality, vermicompost, vermicompost tea, yield

Biography:

I studied for my B. Sc. at the Estonian Agricultural University and finished in 1993 Cum Laude. Half of Master studies were completed at the Royal Veterinary and Agricultural University in Copenhagen, Denmark. In 1995 I defended my M. Sc. at Estonian Agricultural University. I took my doctoral studies in 1995 – 1999 in Norway at the Agricultural University of Norway. Research posts were: from 1999 to 2002 I worked at Estonian Agricultural University; from 2008 to 2020, I worked as senior researcher at the Estonian Crop Research Institute. Since 2021 I work at NPO Veggies Cultivation. I speak Estonian, English, Norwegian, and some Russian. The main field of my work is scientific research in vegetable production. I have published more than 100 scientific papers, 12 research monographs. I have been invited speaker, have organized conferences, have been in scientific committees, and am a member of editorial boards of international scientific journals. I am a vice-president of CIEC.

Guy Mechrez[1]

[1]Department of Food Sciences, Institute of Postharvest and Food Sciences, Volcani Institute, Agricultural Research Organization (ARO), 68 HaMaccabim Road, Rishon Letzion 7505101, Israel.

Highly tunable Pickering emulsion/polymer systems: from colloids to functional surfaces

Pickering emulsions are stabilized by nanoparticles (NPs) that are self-assembled at the oil-water interface and act as physical barriers. Pickering emulsions come in the form of oil-in-water (o/w) or inverse emulsions. Inorganic NPs such as silica, titania, and NPs from natural origin such as virus-like particles (VLPs), can act as Pickering stabilizers. This study presents a novel highly tunable platform, based on incorporated polymers in Pickering emulsions.

Water-in-toluene/xylene emulsions stabilized by hydrophobic silica, with PDMS dissolved in the contentious phase were formulated. The application of the emulsions on polypropylene substrates followed by drying (emulsion templating) resulted in the formation of surfaces with a combination of micron-scale and nanoscale roughness, which endowed them with the property of superhydrophobicity. The antibiofilm properties of the resulting superhydrophobic coatings were investigated. Our in-vitro antibiofilm trials with E. coli exhibited up to an 83% reduction of the biofilm accumulation. In addition, toluene in water Pickering emulsion stabilized by silica particles which were co-functionalized by two trialkoxysilanes: a hydrophilic one ((3-aminopropyl) triethoxysilane) and a hydropohbic one (dodecyltriethoxysilane), formed multi-walled carbon nanotubes/silica/Polysiloxane hybrid colloidosomes with tunable electrical conductivity. To the best of our knowledge, this is the first time that MWNT/silica hollow shells have been generated using a Pickering emulsion templating approach.

Next, eco-friendly Pickering emulsions were formulated based on paraffine-in-water emulsions stabilized by silica or titania nanoparticles functionalized with (3-Aminopropyl)triethoxysilane. The controllable droplet size along with the high colloidal stability of the Pickering emulsions enabled the individual compartmentalization of fungal biopesticides (Metarhizium brunneum) by simple mechanical mixing. The Pickering emulsions with the individually compartmentalized biopesticides exhibited significantly higher pest control activity against Spodoptera littoralis larvae than the controls. The titania-based emulsions successfully protected the individually compartmentalized cells from UV radiation. The stabilization of the same paraffin-in-water emulsions by plant-based VLPs resulted in a fully biocompatible emulsion. A new two-mode approach for epitope presentation of SARS-CoV-2 was then developed based on these fully biocompatible emulsions. Covalent attachment of SARS-CoV-2 S1-peptide epitopes to the VLPs surface and the subsequent assembly of VLP/epitope conjugates at the oil/water interface of the paraffin-in-water emulsions enabled to significantly enhance the SARS-CoV-2 epitope presentation intensity. Our in-vivo assay in mice showed that the αSARS-CoV-2-S1 IgG titers of the mouse antisera taken from mice that were exposed to the studied emulsions were an order of magnitude higher compared to epitopes administered with an adjuvant. These results confirmed the effectivity of the new formulation. This novel VLP-based Pickering-emulsion-platform is a fully synthetic approach that can be readily applied for vaccine development to a wide range of pathogenic epitopes.

Biography:

Guy Mechrez earned his Ph.D. in polymer science under Prof. Moshe Narkis at the Department of Chemical Engineering and Prof. Ester Segal from the Department of Biotechnology and Food Engineering in the Technion, focused on the development of CNT/polymer nanocomposites and their implantation for bio-catalytic filtration systems and supercapacitors.

After completing his PhD in 2014 he joined Shamir optical industry serving as the manager of coating and materials R&D team. At the end of 2015 he joined the Department of Food Science in Volcani Center, ARO, Israel. At Volcani Center, He is leading a research group focusing on the research fields of polymer science, nanomaterials, soft matter and colloidal science. The expertise of his research group lies in the areas of particle-stabilized emulsions and polymer nanocomposite science, spanning the length scale from the nano to the macro regime. Emphasis is put on the elucidation of structure-property relationships of colloidal particles and polymeric nanocomposites at fluid and gas interfaces, as well as the design of Janus amphiphilic particles, and novel materials derived from them. The research group aims to implement their knowledge in material science toward challenges of food and agriculture, including Ethylene sensing, single sell encapsulation for biopesticides and self-cleaning surfaces for greenhouses. of Mental Health, Belgrade, Serbia. Assistant professor of Psychiatry at School of Medicine, University of Belgrade, Serbia. REBT psychotherapist. Professional experience is in stress and trauma, and related disorders, as well as affective disorders, psychotherapy and pharmacotherapy. Author of many articles, guidelines and book chapters and have been engaged in many research studies.

Toshifumi Tsukahara, Md. Toufic Anam Azad, Sonali Bhakta, Ruchika and Matomo Sakari

Bioscience, Biotechnology and Biomedical Engineering Research Area, Japan Advanced Institute of Science and Technology, Nomi, Ishikawa, Japan

Genetic code restoration therapy by artificial RNA editases

The era of genome editing, which restore genes, from gene therapy, which treats genetic diseases by replacing gene is coming. However, many difficulties have been pointed out in the current state. We are working on therapies that target RNAs rather than DNAs, which are permanent molecules. We are trying to alter the genetic coded of RNAs by artificial RNA editases to treat genetic diseases. We engineered the deaminase domain of ADAR1 enzyme and MS2 system to target specific adenosines to restore non-functional mRNA caused by G-to-A mutations. Upstream of the ADAR1 deaminase domain was fused with an RNA binding protein MS2, which binds to MS2 RNA. We designed a guide RNA complementary to target RNAs. Thus, the ADAR1 deaminase domain was carried to the desired editing site to convert adenosine to inosine. As a target, we mutated into TAG or TAA stop codon at 58th amino acid Trp (TGG) of EGFP. In HEK293 cells, the above system could convert stop codons to read through and turn on fluorescence. We are also success to develop an artificial system with various cytidine deaminases, for C-to-U conversion. A blue fluorescent protein gene which was generated a T-to-C mutation in a GFP gene, was used as a target for this system. The artificial cytidine deaminase-MS2-guide RNA system could restore a mutated C to U in BFP-mRNAs, then cells having green fluorescence were observed. Therefore, we conclude that artificial RNA editase system could be useful for novel genetic restoration therapy towards genetic disorders.

Biography:

Toshifumi Tsukahara obtained Ph.D on biochemistry from the University of Tokushima, then he received postdoctoral training in National Institute of Neuroscience and on molecular biology in Cold Spring Harbor Laboratory, USA. Then he became a senior staff researcher in National Institute of Neuroscience. In 2003, Dr. Tsukahara moved to Japan Advanced Institute of Science and Technology, as a professor. In 2018, founded Division of Transdisciplinary Science as a collaborative graduate school with Kanazawa University. He focused on RNA editing and genetic code restoration toward disease treatment. He succeeded non-enzymatic site-directed deamination of mRNA for genetic restoration in vitro.

Gustavo Helguera, Ph.D.
Laboratory of Pharmaceutical Biotechnology, Institute of Biology and Experimental Medicine

Monoclonal Antibodies targeting the Transferrin Receptor 1 for the treatment of New World Hemorrhagic Fevers

Pathogenic New World Mammarenaviruses (NWM) can cause severe hemorrhagic fever in humans. Although there is a significant sequence variability among NWM glycoproteins (GP), they all bind at same site at the apical domain of human transferrin receptor 1 (hTfR1/CD71), which mediates the cellular entry of these viruses. Here, we demonstrate that monoclonal antibodies targeting the apical domain of hTfR1, can efficiently block the entry of viral particles pseudotyped with the GP of pathogenic NWM, including the recently reported Sabia-like virus. Moreover, these monoclonal antibodies could also inhibit infection with attenuated and pathogenic Junín virus strains. Structural studies of one of these antibodies, the murine hybridoma OKT9, showed that binding to dimeric soluble hTfR1 ectodomain form stable complexes that could be observed by negative-stain electron microscopy. Using the crystal structure of the OKT9 Fab fragment we could build a model of the OKT9-sTfR1 complex, which suggests that the OKT9 and the Machupo virus GP1 binding sites overlap on the hTfR1 apical domain. Moreover, in vivo studies with the chimeric anti-hTfR1 ch128.1 showed that it can protect hTfR1-expressing transgenic mice against challenge with lethal NWM. These findings suggest the feasibility of developing broadly acting host receptor-targeted therapeutic antibodies for the treatment of neglected hemorrhagic fevers caused by pathogenic NWM.

Biography:

Dr. Gustavo Helguera is the Head of the Laboratory of Pharmaceutical Biotechnology at the Institute of Experimental Biology and Medicine (IBYME-CONICET) in Buenos Aires, Argentina. He worked in membrane protein biophysics obtaining his bachelor's degree (1992) and his Ph.D. degree (1998) in Biology at the National University of Córdoba, Argentina. During his postdoc at UCLA in 2002 he worked on therapeutic recombinant monoclonal antibodies, and in 2005 became Assistant Researcher in the Division of Surgical Oncology at UCLA. Since 2013 he has his research group at IBYME, working on recombinant proteins and monoclonal antibodies for infectious diseases and cancer.

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Session Co- chair: Partha Pratim Chakravorty, Associate Professor, P.G. Department of Zoology, Raja Narendra Lal Khan Women's College (Autonomous), Midnapore, West Bengal, India

SPEAKER PRESENTATIONS | DAY 1

Effect of gum cactus and gum acacia on the dough performance and cookie baking quality

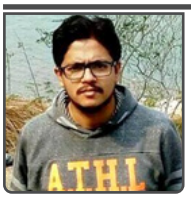
Shahzad Hussain*, Mohamed Saleh Alamri, Abdellatif A. Mohamed, Mohamed A. Ibraheem, Akram A. Abdo Qasem

[1]Department of Food Science and Nutrition, King Saud University, Riyadh 1145, Saudi Arabia

The study was executed to explore the role of locally collected acacia and cactus gums on the dough performance and quality attributes of cookies. The gums were replaced at 3 and 6% levels in wheat flour. The resultant blends were evaluated for pasting properties using rapid viscoanalyzer, mixing behavior using Micro-DoughLab, extensibility using Kieffer rig and solvent retention capacities. The cookies were baked from the blends and evaluated for their physical, textural, and sensory attributes. The addition of both types of gums reduced the setback viscosities, water absorption and Farinograph quality numbers while increase in water retention capacity, dough development time and extensibility was noticed. Cookies hardness was increased with the addition of higher level of gums whereas their fracturability decreased. All types of cookies were acceptable for all the studies sensory attributes. The color of cookies with higher level of gums was more liked by panelist when compared to control. The cookies containing higher levels of gums can deliver 6% extra soluble fiber without compromising the overall acceptability of cookies.

Biography:

Since September 2010, I have served as an Associate Professor in the College of Food and Agricultural Sciences' Department of Food Science and Nutrition at King Saud University in Riyadh, Saudi Arabia. I hold a degree in food science and technology, and I've penned more than 150 publications about nutrition and food science. Numerous international conferences hosted the presentation of my research. The development of gluten-free bread, regional baby cereals, low-carb bakery goods, and the investigation of hydrocolloids as an additive to bakery goods are all current research goals. I have taught several courses on the technology of cereals, food quality and safety, nutrition, composition, and chemistry.



Evaluation of Changes in Life Cycle and Biochemical Parameters of Earthworm Eisenia fetida due to Exposure to Some Selected Pesticides

Somanka Sanyal[1] and Partha Pratim Chakravorty[2]

[1]Department of Zoology, Midnapore City College, Midnapore, West Bengal, India
[2]P.G. Department of Zoology, Raja Narendra Lal Khan Women's College (Autonomous), Midnapore, West Bengal, India

Earthworm plays important role in soil fauna communities in ecosystem and they are known for sustaining the life of the soil and increasing soil fertility. They are used as model organism in assessing environmental risk of chemicals and soil toxicity. Soil provides support to agriculture systems both physical and nutritive through regulation of biogeochemical cycles, nutrients cycles, waste degradation and organic matter degradation. Pesticides impose one of the biggest threats to soil health and are toxic to non-target plants and soil organisms. In the present study short term toxicity evaluation was done for 96 hours and long term toxicity for 28 days, for cocoon production, biomass reduction, and changes in specific activity of enzyme, on Eisenia fetida exposed to sublethal doses of chlorpyrifos, cypermethrin and carbofuran The changes in specific activity of acid phosphatase, alkaline phosphatase and acetylcholinesterase was evaluated following the process of Walter and Schutt, 1974 and Ellman et. al., 1961.

The 96 hours LC50 value of the organophosphate pesticide Chlorpyrifos for Eisenia fetida was found as 0.072 mg/kg soil, for synthetic pyrethroid Cypermethrin was 0.020 mg/kg soil and for the carbaryl pesticide Carbofuran was found to be 0.010 mg/kg soil. The degree of toxicity was found to be Carbofuran>Cypermethrin>Chlorpyrifos. At sub-lethal doses Carbofuran showed maximum biomass reduction with the least number of cocoon produced. It also exhibited the maximum response of specific enzyme activity in the exposed earthworms in both the sublethal dose T1 (25 % of LC50) and T2 (50 % of LC50).

Biography:

Dr. Somanka Sanyal has completed his PhD degree in the year of 2018 from University of Kalyani, West Bengal India. He has 4 years of experience in research in the field of ecotoxicology. At present, he is working as an Assistant Professor in Zoology, Department of Biological Sciences, Midnapore City College. His research interests are studying the effects of different chemical toxicants on soil organisms especially earthworms on different morphological, physiological and biochemical aspects. His teaching interests are classical zoology, ecology and entomology.

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Genotypic variation in phosphorus efficiency among wheat cultivars grown under greenhouse conditions

Saif Alharbi,[1]* Hailin Zhang,[2] Daryl Brian Arnall[2] and Chad J. Penn[3]

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[2]Department of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK, USA
[3]USDA National Soil Erosion Research Laboratories, West Lafayette, IN, USA

Nationwide, most agricultural areas for wheat production are limited by the low phosphorus (P) availability. In addition, the P use efficiency (PUE) for cereal crops rarely exceeds 16%. Thus, farmers usually apply P fertilizers in excess plant requirements rates. Breeding cultivars to grow under low phosphorus conditions may be beneficial to ensure global wheat production and increase PUE. The main purpose of this study was to simulate soil with insoluble P to evaluate the ability of wheat varieties to uptake or utilize P and distinguish between P uptake efficiency and P utilization efficiency based on the different amounts of total P present in the soil. In a growth chamber, wheat cultivars were grown in coated sand with aluminum for 30 days. Results of this study proved the ability of some wheat varieties to uptake and/or utilize the unavailable P. Gallagher and Endurance were the most efficient varieties for both P uptake efficiency and P utilization efficiency. In addition, the Ok11755W was the most P utilization efficient, while OK10430-2 was consistently the most P uptake efficient. Other varieties evaluated in this study showed less efficiency under the condition of this study. This observation proved the genetic variation among these varieties; further studies might be conducted based on this observation to identify genes responsible for elevating P uptake as a promising approach to increase P use efficiency under acidic soil conditions.

Keywords: Phosphorus uptake, phosphorus utilization, phosphorus use efficiency, winter wheat

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Bioscience and Biotechnology

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Sewage sludge as biomass resource for the production of energy

José Góis[1] and Ricardo Mendes[1]

[1]University of Coimbra; Association for the Development of Industrial Aerodynamics; Department of Mechanical Engineering, Coimbra, Portugal

The growth of the world population and the number of WWTPs has led to an increase in sludge production. By 2020 it is estimated that in the European Union the production of WWTP sludge has been about 13 Mt (dry basis).

While in the southern European countries the recovery of sewage sludge is mostly through agricultural use as a soil conditioner, incineration is the widespread option in central and northern European countries. Depending on its origin and the time of year, the composition of sludge varies, but generally includes water, microorganisms, heavy metals, organic matter, fats and inorganic solids. Once the water content is reduced, sludge with higher carbon concentrations and lower ash concentrations can be an alternative energy source among renewable energies.

In this study, the lower heating value (LHV) of four samples of sewage sludge (two digested and two undigested) were measured using a calorimeter. Thermal decomposition in nitrogen atmosphere up to 900 °C, for three temperature rates (10, 20, 30 °C/min), was also evaluated by simultaneous TG and DSC tests.

The results show, comparatively, that the undigested sludge has higher LHV, which is in agreement with the higher percentage of carbon. The mass loss as a function of temperature were similar for both types of sludge, with the greatest mass loss occurring between 173 and 600 °C, being this period characterized by smooth exothermic reaction. Quite significant was the high value of the ash content at the end of the reaction (above 40%).

Biography:

José Góis has a PhD in mechanical engineering. He is assistant professor at Mechanical Engineering Department of the Faculty of Science and Technology, University of Coimbra, Portugal and researcher on energetic materials at the Association for the Development of Industrial Aerodynamics and at LAETA - Associated Laboratory for Energy, Transports and Aeronautics.

He collaborates as teacher and supervisor of master and PhD research projects in courses on Mechanical, Chemical, Environmental and Safety Engineering courses at University of Coimbra.

He has publications in journals and proceedings of national and international conferences on energetic materials, energy systems and waste management.

Crop residue management: Effects of pruned frond removal on oil palm growth and productivity in Malaysia

Chang Yu Yang[1], Norhayati Abdullah[1], Cheah Chee Siang[1], Siti Aishah Abdul Wahid[1], and Sim Choon Cheak[1]

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Oil palm cultivation generates large amount of biomass that can be repurpose into bio-based products. Oil palm pruned frond is one of the potential crop residues to be removed from the field for animal feed production. However, the removal of pruned frond could result in considerable organic matter and nutrient losses which could affect crop performance. This study was initiated to evaluate the effects of pruned frond removal on oil palm growth and productivity in Malaysia. The study was laid out in a randomised complete block design with three replications on Rengam soil series (Typic Kandiudults) in Kempas Estate, Melaka over a six-year period. The treatments include three pruned frond removal rates (0%, 50%, and 100%), while baseline chemical fertilisers were applied as per standard practice. The results show that pruned frond removal had no significant impacts on oil palm vegetative growth (palm height, petiole cross section, and leaf area) and foliar nutrient (N, P, K, and Mg). The fresh fruit bunch (FFB) yield was equally unaffected by pruned frond removal. The results suggested that pruned fronds can be removed from oil palm cultivated under Peninsula inland soil (Rengam series) for other purposes.

Biography:

Yu Yang Chang is a leading young agronomist in Oil Palm Research Unit, Sime Darby Plantation Research. He executes, manages, and analyses field agronomic experiments and translate findings to practical estate practices. His current research interests include

(i) Plant nutrition: Utilising remote sensing technology for precision manuring program

(ii) Carbon studies: Understanding the carbon management throughout the entire carbon cycle (sources, processes and sinks) in oil palm plantation.

MAE-seq refines regulatory elements across the genome

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Proper cell fate determination relies on precise spatial and temporal genome-wide cooperativities among regulatory elements (REs) and their targeted genes. However, the lengths of REs defined using different methods are varied, which indicates sequence redundancy is contained and the context of the genome will be unintelligible. We developed a method termed MAE-seq (Massive Active Enhancers by Sequencing) to experimentally identify functional REs at a 25-bp scale. In this study, we used MAE-seq to identify 626,879 and 554,826 25 bp enhancers in mESCs and HEK293T, respectively. Take mouse embryonic stem cells as an example. We used ~1.6 trillion 25 bp DNA fragments and screened 12 billion cells. 626,879 were identified as active ones. Comparative analysis indicated most of the histone modification datasets could be annotated by MAE-Seq loci. And, 35.03% (219,623) were identified as de novo ones without any epigenetic modification. Validation results show that these 25-bp sequences could act as a functional unit, which shows identical or similar expression patterns as the previously defined larger elements. Additionally, we examined the functions of some novel elements. By integrating with Hi-C data, we found that the Cdh1 gene interacts with one novel and two known REs in mESCs. Their biological effects were investigated via CRISPR-Cas9. This indicates that these distal associations can coordinate Cdh1 gene expression and mESC proliferation. Our study provides an experimental approach to refine the REs at 25-bp resolution, and it will advance the precise genome annotation and unscramble the underlying genome context.

Biography:

Yubo Zhang, received the B.S. degree in Animal Husbandry from Huazhong Agricultural University, Wuhan, China, in 2000, the M.S. degree in Animal Genetics and Breeding from Huazhong Agricultural University, Wuhan, China, in 2004 and the PhD degree in Hydrobiology from the Chinese Academy of Sciences, Beijing, China, in 2007. At present, he is a principal researcher and doctoral supervisor at the Institute of Agricultural Genome Research, Chinese Academy of Agricultural Sciences. His main research area is animal 3D genomics, focusing on 3D genomic technology development, 3D gene transcriptional regulatory network analysis, and non-coding DNA regulatory elements in the gene transcriptional regulation process.

Estimating Crown Size Using Object Detection Derived from UAV Multispectral Imagery

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The Palm area is one of the vegetative measurement parameters that are crucial for oil palm sampling. This sampling activity required a lot of manpower and a very tedious task to gain an accurate result. By using a UAV approach, this problem can be reduced by extracting information for imagery data. Deriving individual oil palm information from Multispectral Imagery data is of great significance to estate resource assessment and smart management. The presence of deep learning methods, it shown to have high efficiency and accuracy in remote sensing data analysis and geospatial problem-solving. We evaluated our method by using multispectral drone images of an oil palm to be compared with the ground measurement known as Leaf Area (LA). This study proposed a detection method called Convolutional Neural Networks (CNN) for image segmentation as we aimed to estimate the crown size of an oil palm through an object mask (Region of interest). This study simultaneously detects the size of the crown and estimates the radius of the crown. Palm area and radius are highly correlated with leaf area, calculated from parameters collected during vegetative measurement with a correlation of 76.39% and 77.77% respectively. The future approach of this study is to construct a more precise detection of the crown shape so that it can represent the true canopy area of an individual palm.

Biography:

Akmal Razak is a Scientist in Precision Agriculture Unit, under Sime Darby Plantation Research. His current work mainly in processing and analyzing drone images including multispectral and hyperspectral imagery. His area field of interests includes:

1. Extraction of oil palm height and health monitoring using deep learning algorithm.
2. Hyperspectral imagery for palm nutrition and disease.

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A Novel Therapeutic Strategy to Treat Ulcerative Colitis (Focused on In vivo Experiments)

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Ulcerative colitis (UC) are chronic inflammatory disorders of the gastrointestinal tract that cause significant morbidity due to the high incidence of diarrhoea, abdominal pain, rectal bleeding. Various drugs have been applied for the treatment of UC, but side effects and low efficacy have been problematic. Therefore, new therapeutic modality needed that maintain a normal state by improving homeostasis in the colon. Adenosine A2A receptor agonist, polydeoxyribonucleotide (PDRN), suppresses the secretion of pro-inflammatory cytokines and exhibits anti-inflammatory effect. In this study, the therapeutic effect of PDRN on UC was evaluated using mice. For the induction of UC, mice received 2% (body weight/volume) dextran sulfate sodium (DSS) dissolved in their drinking water for 7 days. The mice in PDRN-treated groups were received PDRN by enema injection using polyethylene catheter with 200 μL capacity once a day for 14 days. In order to confirm the participation of the adenosine A2A receptor in the effects mediated by PDRN, 8 mg/kg DMPX, adenosine A2A receptor antagonist, was treated with PDRN. Induction of UC by DSS injection caused histological damage, resulting increased body weight, colon weight, and length, whereas decreased the DAI score and collagen deposition. DSS injection increased secretion of pro-inflammatory cytokines and enhanced PI3K/Akt pathways. However, PDRN treatment alleviated histological damage and colon condition. Secretion of pro-inflammatory cytokines and expressions of PI3K/Akt pathway-related factors were suppressed by PDRN treatment. The conclusion of this experiment suggests the possibility that PDRN could be used as an effective therapeutic agent for UC.

Biography:

Graduate School of Medicine, Kyung Hee University (Ph.D)/Neurodegeneration Control Research Center, Kyung Hee University (Post-doc)/School of Medicine, Kyung Hee University (Researcher professor)

Protective effect of PDRN on idiopathic pulmonary fibrosis induced by particulate matter (PM10) and TGF-β in pulmonary epithelium cells

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Background. Idiopathic pulmonary fibrosis (IPF) is a pathophysiological continuous response of immune cells to external stimuli, leading to cell death and fibrosis of pulmonary cells due to repetition of inflammation and damage. Thus, present study aimed to identify whether there was an anti-inflammatory and anti-fibrosis effect of polydeoxyribonucleotide (PDRN) or pirfenidone on IPF environments.

Methods. To confirm the drug effect, particulate matter (PM10) and TGF-β were applied after PDRN or pirfenidone pretreatment to confirm the change in A549 cells. Moreover. Adenosine A2A receptor (A2AR) inhibitor 3,7-dimethyl-1-propargilxanthine (DMPX) was applied before PDRN or pirfenidone treatment. WST-8 assay was used for cell viability, and LDH assay was used to cytotoxicity. Additionally, changes in inflammatory cytokines and fibrosis factors were confirmed through ELISA assay.

Results. Cell death, cytotoxicity, inflammatory factors and fibrosis were increased after PM10 and TGF-β exposure. However, PDRN or pirfenidone pretreatment was enhanced WST-8 and LDH levels were reduced by PDRN or pirfenidone pretreatment. In ELISA studies, inflammatory factors such as TNF-β and IL-6 and fibrotic factors such as hydroxyproline and CTGF were decreased by pretreatment with PDRN or pirfenidone. Furthermore, beneficial PDRN effects were significantly blocked by DMPX treatment.

Conclusions. The pretreatment PDRN or pirfenidone exerted stronger protective effect against PM10 and TGF-β-induced IPF environment. The protective effect of PDRN or pirfenidone on IPF was shown by promoting the rapid anti-inflammatory effect and inhibiting the fibrotic processes. In addition, it is thought that the pharmacological action of PDRN can make a significant contribution to IPF damage through A2AR regulation.

Biography:

Lakkyong Hwang received master's degree and Ph.D. degrees from the department of basic medical sciences, Kyung Hee University College of Medicine, in 2009 and 2013 respectively. He is currently a researcher in the department of physiology, Kyung Hee University School of Medicine, where he is involved in joint research with neurology, respiratory internal medicine, and gastroenterology department.

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