

Plant Science Virtual 2020

July 13-14, 2020

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PLANT SCIENCE VIRTUAL 2020

JULY 13-14, 2020

Theme:

To Exchange Innovations and Emerging Novel Research
in Plant Sciences

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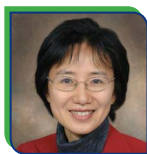
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Thank You
All...

Keynote Speakers



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ABOUT MAGNUS GROUP |

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conference and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.

About PLANT SCIENCE VIRTUAL 2020 |

Plant Science Virtual 2020 is an online plant biology platform addressed by Magnus Group which aims at bringing together all the international network scientists, botanists, professors, and other researchers in the field of Plant Science and Molecular Biology to fill the gap of knowledge sharing that has been laid down by the Covid-19.

Plant Science Virtual 2020 is composed of keynote lectures, oral and poster presentations that discuss various aspects of plant science and related topics with the theme of To exchange innovations and emerging novel research in Plant Sciences

KEYNOTE FORUM

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Claude Billeaud

Medical University of Bordeaux, France

A new high hydrostatic pressure destroyed all pathogens including spores while preserving the bioactive proteins of donated human milk

Background: The main process used to pasteurize human milk is the low-temperature, long-time Holder method (HOLDER and recently investigated, the high-temperature, short-time method. Both processes lead to an appropriated inactivation of vegetative forms but are ineffective versus the bacterial spores.

Research Aims/Questions: Find a method accomplish two main objectives: inactivation of all pathogens, including spores, and preservation of the activity of milk components.

Design/Methods: Recently, a novel approach of the High Hydrostatic Pressure processes have been developed by HPBioTECH. We compared the effect of Human Milk treatment on the same samples (raw Human milk, Holder and our novel High Hydrostatic Pressure) on vegetative and spores forms of pathogens and on bioactive components (Lipase activity, Immunes proteins).

Results: a) Pathogens destructions: two main microbial strains have been selected: *Staphylococcus aureus* (as reference for the vegetative forms) and *Bacillus cereus* (as reference for spores). This research led process adapted to the a) microbial decontamination of 6 log., either for *Staphylococcus aureus* or *Bacillus cereus*, b) Human Milk bioactive components: the main components of human milk is preserved. Activity of the lipase after this treatment (close to 80%) and that of several additional components (α -lactalbumin: 96-99%; Casein: 98-100%, Lysozyme :95-100%; lactoferrin: 93-97%; sIgA: 63-64%).

Conclusions: this novel high Hydrostatic process generate microbiologically safe human milk could potentially result in important benefits for preterm infants: (i) improved assimilation of human milk, leading to daily weight and (ii) improved resistance to infections(iii) to avoid discarding 10% of contaminated by *Bacillus Cereus* human milk collected.

Biography

Claude Billeaud received his MD degree from the Medical University of Bordeaux (France) in 1979 after a graduation in human cytogenetics (1976). He then studied pediatrics and has been the Clinical Assistant Director of Bordeaux University in the departments of Pediatrics, Neonatology and Intensive Care since 1983.He currently serves as a pediatrician in the neonatal unit at the Children's Hospital of Bordeaux, as a scientific manager of Bordeaux-Marmande human milk bank, as a lecturer and head of research (HDR : Habilitation to direct research) in neonatal nutrition at the Medical University of Bordeaux.

His particular interest in research led him to graduate in Biology and Health (1988, Bordeaux), be awarded a master in statistics applied to clinical research (1991, Montreal) and complete a PhD in nutrition and food science (2000, Bordeaux).Along his career he has often been invited as a guest professor specialised in nutrition and neonatology in various universities abroad (Montreal, Corrientes in Argentina). Over the last 35 years, he has been an active member of different scientific organisations, either French, European or American, specialised in perinatal medicine (neonatology, pediatrics and nutrition). In this instance, he has served as the President of the Association for Pediatric Education in Europe (A.P.E.E) since 2008 and behalf APEE he is Member of European Academy of Paediatrics (EAP).

He has also been very involved in the French human milk banking association (ADLF) for more than 10 years, sharing his academic knowledge focused in nutrition and his long clinical experience in neonatology. He is currently carrying out several researches on the composition of human milk.As an expert in nutrition and perinatal medicine, he is also the author and co-author of numerous scientific publications.

SPEAKERS | DAY
1

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Could your eating habits be affecting your sleep and how can we treat it without using drugs?

Huang Wei Ling

Medical Acupuncture and Pain Management Clinic, Brazil

Statement of the Problem: Insomnia is a sleep disorder that regularly affects millions of people worldwide. Individuals with insomnia find it difficult to fall asleep and stay asleep. It commonly leads to daytime sleepiness, lethargy, mood swings, anxiety, stress and a general feeling of being unwell, both mentally and physically. The purpose of this study is to demonstrate that erroneous eating habits can be one of the causes of insomnia, and that it can be treated with correction of eating habits, according to the energy of each food, whether Yin or Yang. An oriental type of treatment using Auricular Acupuncture was also approached, in order to rebalance the internal energy. With this, this study demonstrates that the effectiveness of these treatments can be achieved without the use of any allopathic or psychotropic medication.

Methodology & Theoretical Orientation: To prove that insomnia can be treated without medication, a research of over 1500 patients was made. 55 (3.66%) of these patients were selected on the basis of having insomnia and then engaged in Auricular Acupuncture treatment associated with dietary counselling all according to the teachings of Traditional Chinese Medicine.

Findings: Of the total amount, 30 (83.33%) considered their insomnia as a main symptom which affected their lives daily. The patients with insomnia who ingests Yang food energy at night time, tends to have difficulty inducing sleep, being it shallow and not restful.

Conclusion & Significance: The majority of patients who had undergone auricular acupuncture associated with dietary counselling for the treatment of insomnia, had been completely cured or had significant improvement. The study also concluded that patients not compromised by dietary changes did not achieve the same positive results as those who set out to comply with treatment.

Biography

Huang Wei Ling, born in Taiwan, raised and graduated in medicine in Brazil, specialist in infectious and parasitic diseases, General Practitioner and Parenteral and Enteral Medical Nutrition Therapist. Once in charge of the Hospital Infection Control Service of the City of Franca's General Hospital, she was responsible for the control of all prescribed antimicrobial medication and received an award for the best paper presented at the Brazilian Hospital Infection Control Congress (1998). Since 1997, she works with the approach and treatment of all chronic diseases in a holistic way, with treatment guided through teachings of Traditional Chinese Medicine and Hippocrates.



Comprehensive Two-dimensional Liquid Chromatography under Reversed-phase Conditions for Polyphenol analysis in Complex Food and Food-related Products

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Polyphenols in food and food-related products comprise a complex group of molecules associated to a plethora of pharmacological effects on human health. Also they do have important functions e.g. protection against UV radiation, inhibition of pathogen development, as well as industrial applications, e.g. natural colorants and preservatives. Several studies have focused on the chemistry and bioactivity of these molecules in various food products, thus promoting an ever increasing interest in the discovery/identification of “target” novel compounds. As a consequence, powerful and sensitive analytical methods are deemed as mandatory for their determination.

In the last three decades comprehensive two-dimensional liquid chromatography (LC×LC) has emerged as a valuable analytical tool for the analysis of complex samples. Such a technique implies the coupling of at least two stationary phases remarkably increasing the overall separation power compared to the one-dimensional liquid chromatography counterpart.

To this regard, different LC×LC methodologies with complementary column sets (e.g. NP×RP, RP×RP and HILIC×RP) including dedicated software for data processing were successfully developed by our research group, and were successfully applied for the characterization of bioactive molecules in food and food-related products.

In this contribution selected LC×LC applications for determination of the polyphenolic content in food complex samples will be presented and discussed with particular emphasis on the use of “smart” gradients in RP×RP separations.

Acknowledgment: The authors are thankful to Shimadzu and Merck Life Science Corporations for the continuous support. The researches were performed within the framework of the Research Project PRIN 2017: At the forefront of Analytical ChemisTry: disrUptive detection technoLogies to improve food safety – ACTUaL, supported by the Italian Ministry of University and Scientific Research, no. Prot. 2017RHX2E4.

Take Away Notes:

- Food analysis is the discipline dealing with the development, study and application of analytical procedures for the characterization of the properties of foods and their constituents. Emerged more than 20 years ago, comprehensive two-dimensional liquid chromatography (LC×LC) represents a valuable and powerful tool for the analysis of very complex samples. The application of such methodology to food analysis is very
- challenging. In fact LC×LC can be of valid aim in providing information about a wide variety of different characteristics of foods, including their composition, structure, physicochemical properties and sensory attributes.

- The use of advanced liquid chromatography technologies for food purposes does certainly give the wider scientific community the possibility to consider such an approach for getting a very detailed description of the samples under investigation. The applications of comprehensive two-dimensional liquid chromatography are very broad ranging from omics sciences, to different heterogeneous sectors e.g. environmental, petrochemical, pharmaceutical, etc.
- The proposed topic will be especially directed to food analysts confident in liquid chromatography. Also, beginners with a sufficient knowledge of liquid chromatography could be interested and attracted. The highest degree of interest might be foreseen for Ph.D. and post-doctorate students, permanent-position academia researchers, as well as liquid chromatography specialists.

Biography

Prof. Dr. Francesco Cacciola is Associate Professor of Food Chemistry at the University Messina, Italy. His research interests include the characterization of food bioactive molecules by conventional and innovative liquid chromatography techniques and hyphenation to mass spectrometry. In 2018 he was short-listed in the “Top 40 under 40” The Analytical Scientist “Power list”. He is member of the editorial board of Journal of Essential Oil Research (Taylor&Francis) and Molecules (MDPI). He has published more than 70 research articles in SCI(E) journals.

(Example: Dr. Edward studied Chemistry at the Sofia University, Bulgaria and graduated as MS in 1999. She then joined the research group of Prof. James at the Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences (IGIC-BAS). She received her PhD degree in 2004 at the same institution. After one year postdoctoral fellowship supervised by Dr Williams at the Catalysis and Spectrochemistry Laboratory, France she obtained the position of an Associate Professor at the IGIC. She has published more than 115 research articles in SCI(E) journals.)



Therapeutic ketosis and the broad field of applications for the ketogenic diet: Ketone ester applications & clinical updates

Raffaele Pilla

G.d'Annunzio University, Italy

It has been recently shown that nutritional ketosis is effective against seizure disorders and various acute/chronic neurological disorders. Physiologically, glucose is the primary metabolic fuel for cells. However, many neurodegenerative disorders have been associated with impaired glucose transport/metabolism and with mitochondrial dysfunction, such as Alzheimer's/ Parkinson's disease, general seizure disorders, and traumatic brain injury. Ketone bodies and tricarboxylic acid cycle intermediates represent alternative fuels for the brain and can bypass the rate limiting steps associated with impaired neuronal glucose metabolism. Therefore, therapeutic ketosis can be considered as a metabolic therapy by providing alternative energy substrates. It has been estimated that the brain derives over 60% of its total energy from ketones when glucose availability is limited. In fact, after prolonged periods of fasting or ketogenic diet (KD), the body utilizes energy obtained from free fatty acids (FFAs) released from adipose tissue. Because the brain is unable to derive significant energy from FFAs, hepatic ketogenesis converts FFAs into ketonebodies-hydroxybutyrate (BHB) and acetoacetate (AcAc)-while a percentage of AcAc spontaneously decarboxylates to acetone. Large quantities of ketone bodies accumulate in the blood through this mechanism. This represents a state of normal physiological ketosis and can be therapeutic. Ketone bodies are transported across the blood-brain barrier by monocarboxylic acid transporters to fuel brain function. Starvation or nutritional ketosis is an essential survival mechanism that ensures metabolic flexibility during prolonged fasting or lack of carbohydrate ingestion. Therapeutic ketosis leads to metabolic adaptations that may improve brain metabolism, restore mitochondrial ATP production, decrease reactive oxygen species production, reduce inflammation, and increase neurotrophic factors' function. It has been shown that KD mimics the effects of fasting and the lack of glucose/insulin signaling, promoting a metabolic shift towards fatty acid utilization. In this work, the author reports a number of successful case reports treated through metabolic ketosis.

Biography

Raffaele Pilla, Pharm.D., Ph.D., Doctor Europaeus, received his Master's degree in Pharmacy at G.d'Annunzio University in Chieti-Pescara, Italy in 2005, where he also served internships at the CellPhysiology Laboratory and Molecular Biology Laboratory. Prior, he was an Erasmus Student at Faculté de Pharmacie de Reims in Reims, France. He received his Doctor Europaeus in 2010 from Pitié-Salpêtrière Institute in Paris, France. Also in 2010, he received his Ph.D. in Biochemistry, Physiology, and Pathology of Muscle at G. d'Annunzio University in Chieti-Pescara, Italy. He was hired as a Postdoctoral Scholar in the Department of Pharmacology and Physiology at the University of South Florida in Tampa, on two research grants funded by the Office of Naval Research (US Navy) and Divers' Alert Network. He has written and lectured widely worldwide. He has been involved in ongoing research at the University of South Florida with the use of ketone esters.



Nutrition and immunity in correlation to COVID-19 epidemic: Probiotics & prebiotics in focus

Nazeha A. Khalil

Qassim University, Saudi Arabia

Malnutrition is an important risk factor for development of many chronic human diseases (e.g. cardiovascular, diabetes and obesity) that are highly associated with coronavirus (COVID-19) deaths. They showed an association with impaired barrier function and mucus secretion in addition to an alteration with the immune responses; increased exposure to many infections and enabled pathogens entrance. On the other hand, well-balanced diet with harmony of micronutrients is supporting the immune system and well-functioning gut health and all body barriers; physical barriers (skin and mucosal layers; gastrointestinal & respiratory tract); chemical barriers (stomach pH) and biological barriers (different organs secretion; saliva and tears). The gastrointestinal is the main site for diversity colonic-microbiota which influenced by dietary characteristics. Healthy diets; rich in plant foods, fibers and fermented foods are the main sources for probiotics in addition to non-digestible oligosaccharides that known as prebiotics (main fuels for probiotics growth). Indeed, diversity daily intake of vegetables, fruits and grains with/out meats, eggs and fish showed the best supportive food to the immune system functions. The current review aims to clarify and explain the colonic-microbiota composition and activities in association with COVID-19. Gut microbiota alteration termed dysbiosis; seen in diabetic and obese individuals. Interestingly, COVID-19 Chinese patient presented intestinal dysbiosis especially low lactobacilli and bifidobacteria levels. Indeed, certain supplemented probiotics (*Lactobacillus paracasei* CBA L74 & *Lactobacillus acidophilus* LB) reduced the incidence and duration of diarrhea (main symptoms of COVID-19). Again, probiotics especially lactobacilli and bifidobacteria showed decreases of respiratory tract infection levels recently in many systematic reviews and promotes gut-lung axis expiration. In conclusion, probiotics/prebiotics supplementations needed for well-balanced colonic microbiome as natural defenses and seem it could help against respiratory infection. However, COVID-19 patients did not show successfully or unsuccessfully interventions yet so relevance of probiotics/prebiotics administration clinically are needed with COVID-19 models.

Biography

Dr. Nazeha A. Khalil studied her BSc. and MSc degrees at Nutrition and food sciences department, faculty of Home Economics, Menoufiya University, Egypt (1998-2004). She received her PhD from University of Reading, UK in 2013 and that was followed later on by postdoctoral fellowship at Kobe University Japan (2015-2016). Finally, Mrs. Khalil got the position of an Associate Professor at Qassim University, Kingdom of Saudi Arabia.



Consumers' preferences for safe and organic food during and Post-COVID-19

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Since January 2020, we have been experiencing a pandemic of a new strain of coronavirus, SARS-coronavirus-2 or COVID-19. There have already been 10 million confirmed cases with more than 0.5 million deaths, which have shuttered most types of businesses worldwide. As of June 2020, researchers had not yet developed an effective vaccine against COVID-19, and despite global efforts, an antiviral drug to treat infected patients had not been approved. These realities mean that there is a pressing need to explore all relevant factors relating to healthier lifestyles during the pandemic and for the post-COVID-19 era.

The World Health Organization advises that maintaining a healthy diet is critical in preventing, fighting, and recovering from infections and supporting a strong immune system (<https://www.who.int/campaigns/connecting-the-world-to-combat-coronavirus/healthyathome/healthyathome---healthy-diet>). There has thus been increased focus on boosting host immunity, the only factor that has shown potential for containing and controlling the severity of the COVID-19 pandemic (Martinez MA. 2020. doi: 10.1128/AAC.00399-20). Previous studies highlighted that safe food and consumption of food under restricted stress conditions can positively modulate the immune system, allowing innate immunity to prevent SARS-CoV-2 from passing from the upper to the lower respiratory tract and thus lowering the incidence of pneumonia (<https://www.healthline.com/health/coronavirus-pneumonia>). Taken together, the evidence shows that the consumption of safe food may raise immunity and downregulate stress, which in combination may contain the spread of COVID-19 and block the development of infection-related complications.

Maintaining a healthy diet is gaining more attention, and several surveys by e-marketing food companies, mostly in developed countries, released in the COVID-19 era have revealed consumers' increasing interest in safe as well as organic food for boosting immunity. The changing food habits of consumers can be accelerated and continued by adopting practical measures at policy levels so that the simple message of the "new normal life" can be spread. While COVID-19 has had disastrous health and socioeconomic consequences, the pandemic has had a positive impact on the number of consumers and policymakers considering the need for providing more nutritious, safer food from "farm to fork." Consumers may now be willing to pay more for safer food to build up immunity, depending on their incomes, job security, and likelihood of a long-term recession. However, challenges remain in delivering safe, high-quality products to consumers, particularly in resource-constrained economies where trust and transparency are issues.

The COVID-19 pandemic has deepened the need to strengthen awareness of food safety and hygiene, although its implementation remains an ongoing global challenge. Studies show that practicing food safety hygiene is more important than ever, especially in relation to host immunity. If this can be properly addressed, it would help to fight other emerging novel pathogens in the future and be a potential value-adding activity for agribusiness enterprises.

Take Away Notes:

- Genesis of COVID-19 and possible role of food safety.
- How immunity can play roles in both containing the spread and controlling the severity of COVID-19 infection.

- Exploration of “safe food” and “organic food” and their role in host immunity.

Biography

Dr. Tanveer is a Program Officer of the Asian Productivity Organization, an intergovernmental organization based in Tokyo. Formerly, he was a Sustainable Agriculture Advisor of Friends In Village Development Bangladesh (FIVDB) and Senior Scientist of the Bangladesh Rice Research Institute (BRRI). Dr. Tanveer holds a PhD in Agriculture from Ehime University, Japan (2008). He was awarded the grand prize of the Organic Farming Innovation Award (OFIA) by the International Federation of Organic Agriculture Movements (IFOAM) in 2011. Currently, he serves as an Ambassador for IFOAM and Asian Local Government for Organic Agriculture (ALGOA) and was previously Vice-President of IFOAM-Asia. He has published around 50 scientific articles.



Correlation between power level of microwave oven heating and proteins aggregation in bovine meat

Emanuele Calabrò

University of Messina, Italy

This study showed a correlation between proteins aggregation in bovine meat and power level used for cooking by microwave oven. FTIR Spectroscopy was used to study the effects of microwave heating on different samples of minced bovine meat cooked in some microwave oven for 120 s at different power levels (700, 800, 900 and 1000 W). Methylene vibration bands after microwave cooking, that are representative of Maillard reaction, did not change significantly with increasing of power level value. In contrast, the β -sheet contents at 1695 and 1635 cm^{-1} in meat samples (characteristic of proteins denaturation) increased with increasing of power level. A linear regression with 95% confidence interval provided a high value of correlation coefficient ($r = 0.945$), showing that protein aggregation is strictly related to microwave heating power level. This result suggests to use microwave oven cooking at low power level values. Indeed, in previous literature it was shown that high β -sheet to α -helix ratio can induce low access to gastrointestinal digestive enzymes and a consequent low protein availability. In addition, previous study also demonstrated a correlation between proteins denaturation and colon carcinogenesis. Finally, new strategies would be evaluated to modify microwave oven working for increasing Maillard reaction during cooking meat, for instance using resonance frequencies of myoglobin (that is the main component of meat) in addition to the main frequency of 2450 Hz of microwave oven working.

Biography

Emanuele Calabrò is Full Professor of Physics at the Technological Technical Institute of Messina (Italy). He received the National Qualifications as University Professor in Applied Physics and in Experimental Physics of Matter. He received the International Prize for Excellence in Research by the Academic Brand Awards-2018. He has published more than 100 refereed papers in ISI journals and monographs.



Hypocholesterolaemic and hepatoprotective effects of virgin avocado oil in diet-induced hypercholesterolaemia rats

Chin Xuan Tan

Universiti Tunku Abdul Rahman, Malaysia

Hypercholesterolaemia is a chronic disease associated with the development of non-alcoholic fatty liver disease and atherosclerosis. This study aimed to investigate the hypocholesterolaemic and hepatoprotective effects of virgin avocado oil (VAO) using diet-induced hypercholesterolaemia rats. Male Sprague Dawley rats were fed high-cholesterol diet for 4 weeks to induce hypercholesterolaemia. After confirming the establishment of hypercholesterolaemia model, the VAO (450 and 900 mg/kg body weight per day) and simvastatin (10 mg/kg body weight per day) were given orally while maintaining the high-cholesterol diet for another 4 weeks. Changes in anthropometric, lipid profile, liver biomarkers and liver histology were determined. At the end of the experiment, the serum low-density lipoprotein cholesterol (LDL-C) and triglyceride (TG) levels were significantly reduced, while the high-density lipoprotein cholesterol (HDL-C) level was significantly increased in high-dose VAO- (900 mg/kg body weight per day) and simvastatin-treated rats when compared with their respective baseline values. The liver damage index was also markedly reduced in all treated rats. Current findings demonstrated the potential hypocholesterolaemic and hepatoprotective benefits of VAO in the preclinical study.

Biography

Dr. Tan Chin Xuan enrolled in the Faculty of Medicine and Health Science, Universiti Putra Malaysia (UPM) to pursue his undergraduate degree in Nutrition and Community Health. After graduation, he worked as a tutor in a private sector before proceeding for a doctorate degree in Food Science at the Faculty of Food Science and Technology, UPM. He currently works as an Assistant Professor at the Universiti Tunku Abdul Rahman, Malaysia.



Study of the diffusion of lactitol in osmotically dehydrated cherries

Mariela B. Maldonado

CONICET- UTN FRM, Argentina

Polyacohols are used in the food industry as nutritional sweeteners, well known for having a syrupy appearance when dissolved in water and produce less calories than sugar. Lactitol has prebiotic properties due it promotes the growth of beneficial colonic bacteria, such as *bifidobacteria* and *lactobacilli* in the gastrointestinal tract. For this reason, the objective of the work was to replace sugar with lactitol in order to obtain a product with fewer calories. The osmotic dehydration process is a technique applied to fruits and vegetables to reduce their moisture and increasing their solutes solids. So cherries were sweetened by a syrup formulated with lactitol. In this contex, the diffusion phenomenon of sucrose and lactitol was quantified using a mathematical model during cherries osmotic dehydration. The soluble solids into the flesh of cherries increased until 55 °Brix whereas the moisture diminished in all the treatments. The median diffusion coefficient of soluble solids was $D_{ss} = 10^{-12} \text{m}^2/\text{s}$ and for water, it was $D_w = 10^{-11} \text{m}^2/\text{s}$. The diffusion coefficient of water increased along the time. Conversely, it for the soluble solids decreased in all trials. For Control: 100% sucrose D started being $D_{ss} = 5,56 \times 10^{-10} \text{m}^2/\text{s}$. This one was bigger than T1: sucrose 75% lactitol 25% $D_{ss} = 3,59 \times 10^{-10} \text{m}^2/\text{s}$, and these ones, bigger than T2: lactitol 50- sucrose 50% $D_{ss} = 2,87 \times 10^{-10} \text{m}^2/\text{s}$. The final values were $D_{ss} = 1,35 \times 10^{-11} \text{m}^2/\text{s}$ for Control: 100% sucrose, $D_{ss} = 5,21 \times 10^{-12} \text{m}^2/\text{s}$ for T1: sucrose 75% lactitol 25% and $D_{ss} = 1,76 \times 10^{-12} \text{m}^2/\text{s}$.

Biography:

Dr. Maldonado studied Biological Sciences. She received her doctoral thesis with honors in 2004 at the Universidad Nacional de Cuyo. Mendoza. Argentina, She is Specialist in Quality Engineering. She received a lot of awards: GOLD PLATE AND HONOR DIPLOMA for National University of Cuyo, Honorary mention, Federation of University Women Argentina Merit for the Best graduate and Honorary member the Centro de Bromatólogos Mendoza. And She won 3rd MENTION in VI Food Congress XXI Conference Food, Nutrition and Health XXXIX for this work : “Use of low digestibility carbohydrates as sucrose substitutes in the production of preserved cherries” She has wrote a lot of papers in international magazines and Congress.



The effect of thymoquinone on the reproductive system of obesity model through pregnancy and lactation

Seba Harphoush

Al-Baath University, Syria

A global notable increment in the prevalence of overweight and obesity was documented. The adverse effects of obesity on women reproductive life are well proven and documented. Obesity induces inflammation status, insulin resistance combined with increased insulin and leptin levels, and altered metabolic function. All that leads to impaired ovulation, and deterioration of conception ability, postpartum lactation difficulties, delay in lactogenesis and shorter breast feeding period. Moreover, evidences relating maternal obesity with offspring obesity and growing metabolic problems in later life are increased (fetal programming).

Nigella sativa (NS) or black seeds is a plant that is very common in the traditional medicine in Asia. Thymoquinone (TQ) is the main active compound in this plant the essential impact of this quinine goes to its antioxidant effects. In addition, TQ is considered to be an AMPK-activator. It is widely studied and proved to its benefit and clinical use in the metabolic syndrome, diabetes, and obesity.

The goal of this work is to investigate the ability of TQ to improve fertility and lactation. Female C57BL/6 were subjected to high fat diet (HFD) supplemented with TQ 10% pmm and TQ 20% pmm. Histopathological examination was conducted on mammary and ovarian samples. Moreover metabolic and oxidant status was evaluated, qRT-PCR analysis was performed to verify AMPK/PGC1 α /SIRT1 metabolic pathway.

Obesity induced metabolic dysfunction in mammary gland and ovary leading to deteriorated reproduction process. Surprisingly TQ10 group had a better impact on lactation comparing to TQ20, TQ10 markedly ameliorated obesity negative effects on lactation performance and litters survive by establishing early lactogenesis and increasing milk yield through lactation, in addition to improved mammary glands' redox status. The equiponderant connection between mTOR pathway and AMPK pathway is obvious and necessary to launch lactogenesis, this mechanism could explain the beneficial effects of TQ lower dose intervention in establishing early lactogenesis, increasing milk production, and restoring mitochondrial function in the mammary gland of HFD mice by inducing a positive balance between the two pathways. HFD has been previously described to trigger follicle cells development and loss through activation of insulin signaling pathway and mTOR pathway and down regulating SIRT1. Improvement in reproduction performance is associated with enhance insulin sensitivity and activating SIRT1 pathway in obese individuals, the mechanism that explain the positive role of TQ20 in enhancing insulin sensitivity by increasing mRNA gene expressions of AMPK/PGC1 α /SIRT1 in ovarian tissue and decreasing AKT1/mTOR. This study is the first report about this discrimination in TQ dose effects on different organs.

Biography

Mrs. Seba Harphoush studied Health sciences and specialized in Human Nutrition at Al-Baath University, Syria Arab Republic, where she was assigned as an assistance teacher. She then joined the research group of Pro. Guowei Le at Nutrition and Functional Food department at Jiangnan University, China. She received her MS in 2019 at the same institution. Currently, she is doing her PhD in Nutrition and Food Hygiene under the supervision of Prof. Li Zhong at Nanjing Medical University, China. She published several research articles in SCI(E) journals.



Exploring therapeutic potential of millets in Post-Covid 19

Mamta Baunthiyal and Sushmita Dwivedi
GB Pant Institute of Engineering and Technology, India

Millets have immense nutraceutical and therapeutic potential to provide solutions for problems related to food insecurity and nutrition. Under present stressful environments, they can be utilized for prevention and treatment of several diseases including kidney stone disorders, cardiovascular, celiac, cancer and diabetes through their anti-inflammatory and antimicrobial activity. Over the past three decades the direct consumption millets as food has significantly declined. The major reasons are lack of awareness of nutritional merits, inconveniences in food preparation, lack of processing technologies, and also the government policy of disincentives towards millets. The important nutrients present in millets include oligosaccharides, lipids, and antioxidants such as phenolic acids, flavonoids, lignans and phytosterols which are believed to be responsible for many health benefits. Further, they are non-glutinous, non-acid forming foods that are least allergic. Immunity has become a buzzword ever since the outbreak of Covid-19 pandemic. Individuals with strong immunity have a better chance to fight and prevent Covid-19 infection. Research findings have suggested that patients with co-morbidities (diabetes, hypertension, cardiovascular diseases, kidney disorders etc.) have greater disease severity compared with those without. Therefore Post-COVID-19 pandemic is the right time to seize the opportunity and push policies that promote nutritious and sustainable food systems, value chains and create adequate demand for healthy and nutritious food, through consumer behaviour change. It has become imperative to create awareness on the millet crops to generate demand through emphasizing on their pharmacological evaluation. My presentation will discuss the immense therapeutic potential of millets and their role in prevention of many diseases. I will also discuss my research on the identification of millet derived pharmacologically important compounds with special emphasis on *Macrotyloma uniflorum* and *Sorghum bicolor* for the treatment of anti-nephrolithiasis and hyperuricemia respectively.

Audience Take Away:

- The talk and experimental evidence can be of immense utility to various stakeholders, researchers, academic fraternity, consumers and entrepreneurs which is timely.
- My research is expected to help various researchers and nutritionist towards identifying and isolating pharmacologically important compounds from millets.
- It is hoped that the results discussed will create awareness and ensure that the highly nutritious millets consumption is popularized worldwide.
- Till date diabetes was the most promoted health benefit of millets, but my presentation would be an eye opener for researchers that there are many other diseases also that can be prevented/cured by using "Therapeutic dietary modifications".

Biography

Dr. Mamta Baunthiyal completed her Master's degree in Biochemistry from Kurukshetra University, India and PhD in Biotechnology from Banasthali University, Rajasthan, India. She has 25 years of experience of teaching undergraduate and post-graduate classes in Biotechnology. Her research is focused on the environmental biotechnology, food and herbal biotechnology. She has about 50 research articles published in reputed international journals and has authored three books. Besides she has written popular articles for various magazines. Presently she is working as Head and Associate Professor in the department of Biotechnology, GB Pant Institute of Engineering and Technology, Pauri, Uttarakhand, India.



The identification of a novel mechanism underlying the control of manganese homeostasis

Ningning Zhao

The University of Arizona, USA

Manganese is essential for life. Tight homeostatic regulation is required to prevent manganese deficiency and avoid manganese overload. ZIP14 is a newly identified manganese importer. It is abundantly expressed in the liver and small intestine, the two major organs involved in the control of manganese metabolism. Patients with loss-of-function mutations in *ZIP14* developed severe childhood-onset neurological disorder due to manganese hyper-accumulation in the brain; similarly, mice with whole-body *Zip14* knockout displayed manganese loading in the blood and brain, indicating an indispensable role for ZIP14 in maintaining systemic Mn homeostasis. Through the deletion of ZIP14 in enterocytes, we have identified ZIP14 as the major transporter mediating basolateral manganese uptake. Lack of ZIP14 impaired basolateral-to-apical manganese transport, but enhanced manganese transport in the apical-to-basolateral direction. Mechanistic studies demonstrated that ZIP14 limits manganese absorption via direct reuptake of freshly absorbed manganese. We propose a model for the control of systemic manganese homeostasis by ZIP14 that includes both manganese absorption by enterocytes and manganese clearance from the portal blood by hepatocytes.

Biography

Ningning Zhao received his Ph.D. in Nutritional Science from the University of Florida. His postdoctoral training at Oregon Health & Science University was focused on molecular cell biology of metal metabolism. The research in his lab has been focused on examining the basic cell biology of membrane proteins involved in metal metabolism and investigating the role of these proteins in human diseases including hereditary hemochromatosis, cancer, and metal-related neurodegeneration.



Increased acid-producing diet and past smoking intensity are associated with worse prognoses among breast cancer survivors: A prospective cohort study

Tianying Wu

San Diego State University, USA

Current dietary guidelines do not consider cancer survivors' and past smokers' low capacity to regulate their acid–base balance. People with a low capacity to regulate their acid–base balance are more susceptible to acid-producing diets. We studied a cohort of 2950 early stage breast cancer survivors who provided dietary information at baseline and during follow-up. We assessed the intakes of acid-producing diets via two commonly used dietary acid load scores: potential renal acid load (PRAL) and net endogenous acid production (NEAP). We assessed past smoking intensity by pack-years of smoking. After an average of 7.3 years of follow-up, there were 295 total deaths, 249 breast cancer-specific deaths, and 490 cases of recurrent breast cancer. Increased intakes of dietary acid load and pack-years of smoking were each independently and jointly associated with increased total mortality and breast cancer-specific mortality; tests for trends and overall associations were statistically significant for NEAP and marginally significant for PRAL. Compared to women in the lowest tertile of NEAP and pack-year of smoking = 0, women in the highest tertile of NEAP and pack-years of smoking >15 had the greatest increased risk of total mortality (HR = 3.23, 95%CI 1.99–5.26). Further, dietary acid scores were associated with increased breast cancer recurrence among women with pack-years of smoking >0 but not in those with pack-years of smoking = 0 (pvalues for interactions <0.05). Our study provides valuable evidence for adding dietary acid load scores to dietary guidelines for breast cancer survivors and developing specific guidelines for past smokers among these survivors.

Biography

Dr. Wu is a molecular and nutritional epidemiologist with training in medicine, epidemiology, and nutritional biochemistry. She received her M.D. from China, PhD in nutrition from the University of North Carolina and Master of Epidemiology from Harvard School of Public Health. She finished her postdoctoral training at Harvard School of Public Health focusing on nutritional and molecular epidemiology. She has received several grants and published many papers focusing on dietary and biochemical predictors of aging related chronic diseases in the past 15 years.

Dr. Wu was awarded several prestigious awards for her contribution on identifying fluorescent oxidation products as a strong predictor for heart disease and hip fractures. Examples of her awards are Jeremiah & Rose Stamler Research award and Elizabeth Barrett-Connor Research Award nomination from American Heart Association. She is currently an Associate Professor of Epidemiology at School of Public Health, San Diego State University.



Can blood levels of apolipoproteins AI and AII serve as early biomarkers for the metabolic syndrome in adults?

Dalia El Khoury

University of Guelph, Canada

Worldwide, there is an alarming increase in the prevalence of the metabolic syndrome (MetS), a constellation of cardiovascular risk factors including central obesity, insulin resistance, dyslipidaemia and hypertension. The use of multiple MetS definitions has led to challenges with determining MetS prevalence. MetS is thus likely underreported and an even greater global health issue. A key limitation is the lack of validated markers for effective prediction of MetS. Valid, more sensitive and easy-to-implement biomarkers for early detection and management of MetS are thus needed. Among emerging biomarkers to date, there is strong evidence on the role of the apolipoprotein (apo) components of high-density lipoprotein, apo AI and apo AII, in the physiopathology of a number of chronic diseases including MetS. However, human studies are limited. Our team has generated pilot data, on 89 adults, from the CIHR-funded family-based obesity prevention intervention Guelph Family Health Study. We analysed the associations of anthropometric and biochemical measurements with blood apo AI and apo AII. A major finding was that the ratio of apo AII to apo AI negatively associated with features of MetS and was the only marker with a negative predictive value for MetS. While promising, this remains to be confirmed in a larger sample of adults. Data from this project will support improved diagnosis of MetS. These biomarkers will also guide the design of lifestyle-based interventions for better prevention/management of the syndrome. Over the longer term, this research could provide a sustainable model for the prevention of MetS, leading to reduced risk for cardiovascular diseases. This translates to reductions in costs to the health care system and the society as a whole.

Biography

Dr. Dalia El Khoury received a BSc in Nutrition and Dietetics (2002) and an MSc in Nutrition (2005) at the American University of Beirut, Lebanon. Afterward, she completed her PhD in Physiology and Physiopathology at the University of Pierre et Marie Curie, France (2008). Dr. El Khoury then served as a lecturer at the American University of Beirut (2009-2010), and as a postdoctoral fellow and sessional lecturer at the University of Toronto, Canada (2010-2014). Later, she joined an international leading company in infant and child nutrition, Mead Johnson Nutrition, as senior scientist in Global Regulatory and Nutrition Science for approximately two years (2014-2016). Currently, Dr. El Khoury is an assistant professor in the department of Family Relations and Applied Nutrition at the University of Guelph, Canada. One of her lines of research aims at identifying novel biomarkers for the metabolic syndrome both in children and adults.



Dietary behaviors and healthy lifestyles of school children and adolescents in rural areas

Hani J. Hamad
Jerash University, Jordan

Dietary behaviors of the young population are affected by numerous factors. Living in rural areas also influences the lifestyle of adolescents, including diet. **Aim:** The objective of this study was to explore dietary behaviors of young school populations; living in rural areas. **Methodology:** 200 school children and adolescents (80 females and 120 males) aged 13-17 years were recruited from different rural areas; Al-Shounih Al-Shamaliyyah and Mukhayyam Al-Shaheed Azmi Almofti. They were asked to answer questions concerning healthy dietary behavior. **Results:** the students' school levels range from 7th to 11th. The dietary behaviors varied throughout these levels with overall results including; preferring eating fast foods, carbonated beverages, potato chips, chocolates, cakes, sweets in parallel of snacking on sandwiches (brought from homes), donuts, nuts, etc. 45.8%, 74% and 62.5% of study samples were regularly consuming breakfast, lunch and dinner meals, respectively. From our observation of the school canteen, there are good facilities of food preserving and processing including availability of refrigerators, healthy drinking water. **Conclusion:** The study samples are practicing both healthy and unhealthy dietary behaviors. Hence, the results of the study emphasize on the importance of assessing and re-evaluating of national health programs toward the school children and adolescents.

Key words: Dietary behaviors, Diet, School children, Adolescents, Rural area, Lifestyle.

Aquaculture as best nutritional resource

Naheed Bano

MNS-University of Agriculture, Pakistan

The world population is increasing and with increasing population we are also fighting with new issues related to environment and health. All the issues are related with each other and main problem is nutrition. More than half of the population of earth is facing the problem of malnutrition. Agriculture sector is working in this regard and fisheries and aquaculture sector is also growing rapidly so utilizing water for growing food. Each country having costal belt has a potential for costal farming with capture fisheries. Smart farming systems are needed with less impact on climate and environment. We need to focus on increasing aquaculture to fight against malnutrition with less harming our environment.



The effect of PAQ-Tivate™ (organic acids and their salts) as a preservative agent against bacteria and fungi/molds in commercial tilapia feed

Yechiam Shapira¹, Ron Mor¹ and Allan Heres¹

¹Phibro Animal Health Corporation, Yoqneam, Tavor 4, Israel

In this study, we investigated PAQ-Tivate™, a feed additive of organic acids, as a preservative agent against bacteria and fungi in formulated tilapia feed. The feed samples were moistened with 15% distilled water (v/w) and the appropriate amount (5 g/kg feed) of the feed additive was added to the pellets. A sample with no water and no additive served as a negative control, while a sample which included 15% distilled water (v/w) but without any feed additive served as the positive control. All the samples were incubated at 28°C and the humidity level was maintained at 75-85%. Each treatment was sampled at days 1, 3, 7 and 14 from wetting. The test parameters were visual presence of fungi on the pellets, total yeast/mold count (TYMC) and total aerobic microbial count (TAMC). The results showed that at day 3, the levels of bacteria in the positive control samples were significantly higher compared to the PAQ-Tivate™ treatments. At day 14, PAQ-Tivate™ treatment had a significantly lower levels of bacteria compared to the positive control group. With respect to fungal levels on day 14, the treatment of PAQ-Tivate™ had a significantly lower count of fungi compared to the positive control groups. The treatment of PAQ-Tivate™ resulted in a significant reduction in the fungi/molds count from day 7 to day 14. At day 14, there was a clear growth of fungi on the feed samples of the positive control. There was no visible growth of fungi in the treatment of PAQ-Tivate™ on day 14.

Biography

Yechiam Shapira has a master degree (M.Sc.) in fish health and fish genetics from the Hebrew University of Jerusalem. He has more than 30 years of experience in fish culture in ponds and in cages in Israel and abroad. Between the years 2006-2010 he was the CEO of Subflex, offshore cages company. At the years 2011-2013 he was the health manager in an offshore cages farm in Campeche, Mexico. Since 2014, Yechiam is working in Phibro, in the aquaculture department. First as the R&D manager, and later as a senior researcher and professional manager for the aquaculture sector in Israel.



Plant based diets and bioactive compounds in Diabetes

Daniela de Almeida

Department of Functional Nutrition and Gastronomy, Brasil

The prevalence of type 2 diabetes is rising worldwide, especially in older adults. Lifestyle changes, particularly in diet, can be highly effective in preventing, treatment, and even reversing type 2 diabetes. Lifestyle changes address the root causes of type 2 diabetes and can ameliorate comorbidities while reducing the risk of polypharmacy, particularly in the elderly. A variety of eating patterns are acceptable for the management of diabetes, like for example, plant-based diets. This kind of diet is especially potent in preventing and treating type 2 diabetes and have been associated with much lower rates of obesity, hypertension, hyperlipidemia and cardiovascular mortality.

Animal products, both meat and dairy, in general require more resources and cause higher emissions than plant-based alternatives. In addition, a diet with a high content of bioactive compounds, found in vegetables and functional foods, can be an appropriate strategy. Functional foods contain bioactive compounds associated with physiological health benefits for preventing and managing chronic diseases, such as type 2 diabetes mellitus (T2DM). A bioactive compound is a substance which has physiological benefit or provides protection against chronic diseases, or specific clinical conditions. Functional Foods may be used to improve health, delay the aging process and prevent chronic diseases, like type 2 diabetes. Various functional foods have been studied to evaluate their impact on type 2 diabetes, glycemic control in people with diabetes, and on the various complications of diabetes. Specific functional foods have proven to be of benefit, like curcuma, ginger, cocoa, cinnamon, plantago ovata, and others. Better knowledge of selected functional foods and more appropriate plant based recipes leading to improved bioavailability and natural flavor will certainly widen the use of these foods, already in large use for the management of these very frequent patient groups. These products are promising and merit consideration and further research.

Biography

Daniela de Almeida is registered nutritionist, President of INUG (Nutrition and Gastronomy Institute) Professor in Faculty of Technology Ipê FAIPE. Supervisor of the Post Graduation of Nutraceuticals and Nutricosmetics in Clinical Practice. She is since 2008 organizer and scientific director of the Functional Nutrition Congress and the Symposium of Sports Nutrition and Functional Gastronomy of RJ INUG. She has extensive experience in clinical nutrition and plant based diets, bioactive compounds and functional foods in clinical practice and Functional and Health Gastronomy. She is educator in Diabetes by the International Diabetes Federation.



The cooking sensitivity of ω -3 fatty acids in fish

Aydin Kilic

University of Recep Tayyip Erdogan, Turkey

These studies include some different new cooking applications on smoked fish lipids and especially total Unsaturated Fatty Acid (UFA), Polyunsaturated Fatty Acid (PUFA), PUFA ω -3 and PUFA ω -6 were determined. In this regard, Thiobarbituric acid reactive substance (TBARS), Polyunsaturated Fatty Acid (PUFA), PUFA ω -3, PUFA ω -6 and Unsaturated Fatty Acid(UFA) were determined. The results showed that PUFA ω -3, PUFA ω -6 were more stable during the Spg than Gg, Fg, Sg cooking. Accordingly, it is expected that, in terms of PUFA ω -3 and PUFA ω -6 the most stable group was steam pressure cooking. Keywords: Food, Smoked Fish, Cooking, Steam Pressure Cooking, Polyunsaturated Fatty Acid

Biography

Aydin Kilic is an Assistant Professor at the University of RTE, Faculty of Engineering and Department of Food Engineering in Turkey. He received his Bachelor of Science (1992) in Marine Science from the Karadeniz Technical University in Turkey, Master of Science (1995) in Food Engineering from the Selcuk University in Turkey and PhD (2004) in Food Engineering from the Hacettepe University in Ankara, Turkey. He has been an active Researcher and Supervisor in University of RTE, Faculty of Tourism and Department of Gastronomy and Culinary Arts in Rize- Turkey. His research areas include food process, food quality, safety and food sustainability. He has authored/co-authored papers and book chapters, many journal and conference papers and numerous technical reports. He has chaired many conferences, symposia, workshops and technical meetings. He is an active member of various international scientific organizations and societies.



A case study for verification of “ $E = mc^2$ ”: Calculation of food shortage

Cemil Koyunoğlu

Yalova University, Turkey

Earth Overshoot Day” means that we will begin to manage with the foods that are produced in 1 year in our world on August 4, which we passed, and only the foods that are stocked in the markets. Albert Einstein tried to draw attention to the use of energy stored in the form of carbohydrates as nutrients in addition to the fertility-enhancing features of the bees, with a question mark from many years ago with the interpretation of “all bees have vanished, and humanity has four years left.” The depletion of the agricultural resources declared on August 4 has turned out to be a threat to humanity. According to the Ecological Footprint Atlas, we have lived in a state of ecological overshoot since the 1970s, which means that human demands have exceeded the Earth’s biocapacity. Human needs measure the environmental assets that a given population requires to produce the natural resources it uses, and biocapacity refers to the productivity of that ecological asset. Human demands alter ecosystems by creating environmental pressures such as land-use changes, resource extraction and depletion (such as deforestation and overfishing), emissions of waste and pollution, and the modification and movement of organisms. The resulting environmental impacts include, but are not limited to, climate change, land degradation, loss of biodiversity, and pollution. Consequences affect primarily the very poor and vulnerable populations in developing countries through, for instance, famine, water shortages, and competition over resources. The following sections are explained due to the below physical laws used to calculate the food shortage according to Einstein’s famous quote; Stefan-Boltzmann radiation law, Doppler effect, Stefan-Boltzmann distribution law Section, $E=mc^2$ defines as rest energy.

Biography

Cemil Koyunoğlu was one of the main people who established Inonu-Pal accredited fuel-oil laboratory with his willingness after his bachelor’s degree graduation. Then, he graduated from his Master’s degree position in the same department during his proficiency testing connection between SGS Netherland and Inonu-Pal. After the fuel-oil first accepted as an accredited laboratory. He received as a research assistant in Yalova University Energy System Engineering Department. When he started his doctor of philosophy position in Energy Institute, Istanbul Technical University, in 2011, he was moved his staff position to Istanbul Technical University, Energy Institute, in 2013.



Highlighting the need for community nutrition research and intervention: Healthy schools for a healthier future

Lia Correia

Instituto Universitário Egas Moniz, Portugal

Prevalence of overweight and obesity have been increasing in the last decades and constitute a public health problem of high relevance worldwide, especially among children. Researchers and clinicians should increase their efforts to fight a situation that is undoubtedly reducing health-related aspects of children life's. Our group have been studying this problematic for several years, in schools surrounding our University campus. We will focus our discussion in the role of school nutritionists as researchers and preventive agents in paediatric obesity and overweight, and as educators to improve nutrition-related knowledge and choices.

We have studied 2 elementary and 1 secondary schools, enrolling a total of 1155 students for the last 4 years. In 2019-2020, from 634 children, only 63,7% had a normal weight, meaning that 36,3% of the students needed nutritional intervention to address their low weight (2,5%), overweight (20,7%) and obesity (13,1%). In two elementary schools (n=280), in same school year, only 54,7% of the students had a normal weight, which means 45,3% of the students also needed a nutritional intervention to address their low weight (10%), overweight (17,1%) and obesity (18,2%).

These numbers are reflecting an urgent school nutrition intervention, that for several reasons is being delayed. We have gathered all factors that may be contributing to the resistance in having a school-nutritionist and we are working to overcome them. We will present some of the preliminary nutrition-education experiences developed in the first semester of 2020 in order to promote healthy eating habits to all students and the efforts made to intervene in an individual setting to improve their health status. Also, our research on community nutrition reflects the need of structured health promotion interventions in schools, that are innovative and capable of motivating the students for health-related issues. Therefore, we are truly convinced that it's time to integrate nutritionists and other health professionals in Portuguese schools and to give them a chance to innovatively promote the health literacy and health status of students.

Biography

Dr.^a Lia Correia, is a Nutritionist, and yield her degree in Nutrition Sciences at Egas Moniz Higher Education School. She had the great opportunity to do her under graduation internship in Maternidade Alfredo da Costa, Lisbon, Portugal, devoted to Paediatric Nutrition. She was integrated in Neonatal Critical Care Unit and in Paediatric Nutrition Consultation. She is Post Graduated in *StartUp* Research by NOVA University, Lisbon. At this time, she is a junior researcher in Applied Nutrition Studies Group (G.E.N.A.- IUEM) at Egas Moniz Higher Education School and is devoted to Community Nutrition research and Health Promotion.



Sustainability: Assessment tool in food services

Dayanne da Costa Maynard

University of Brasília, Brazil

A presentation will be held addressing the importance of sustainability in the production of meals, showing the concept of sustainability, data from food services in Brazil, stamps and certificates existing in the world and what the current problem is. It is worth mentioning that the high impact of the use of natural resources, as well as the high production of solid waste caused by the production of meals in food services, show the importance and the need to evaluate the sustainability indicators that are being adopted by these organizations. Increasingly, nutritionists involved in the production of meals are looking for more sustainable alternatives to implement in restaurants, since these actions will serve as a subsidy for a healthier and more sustainable diet. Thus, a checklist-type instrument that was built by the authors to assess the sustainability indicators in food services will also be presented. In this topic, the construction process will be addressed and the final instrument will be presented. Whereas activities in food services use a large number of natural resources at all stages of production, and whereas it is of interest to nutritionists, entrepreneurs and the population in general to assess the sustainability indicators in restaurants, this instrument becomes useful for the food industry. From this assessment, it is possible to know the panorama regarding sustainability in restaurants, in this way, the food services will be able to become aware of the need to implement safe agroecological practices and will act as future agents of environmental transformation. Finally, it should be noted that, to date, the number of studies evaluating the practices adopted in food services is still small, in contrast, this is a productive sector on the rise.

Biography

Dayanne da Costa Maynard graduated in Nutrition and Master by the Federal University of Sergipe, Post-graduated by the University Gama Filho. He has experience in teaching, being a professor at the Federal University of Sergipe, University Tiradentes, UNIEURO and University Cruzeiro do Sul. He worked as a Nutritionist at FHS / HUSE and a consultant at EMBRAPA. Currently a doctoral student at the University of Brasília (UnB) working on the theme of Sustainability in meal production and professor at the University Center of Brasília (UniCEUB). Published more than 20 articles and is a reviewer and editorial member of journals.



Anti-Inflammatory activity of *Rumex abyssinicus* (Ra), *Lipidium sativum* (Ls), *Guizotia abyssinica* (Ga) on Lps-induced inflammation in Bv-2 microglia cells

Jolly Ninsiima

Duksung Womens University, South Korea

Background: The activated microglia cells are likely to contribute to the neurodegenerative diseases and neural damage including Parkinson's disease, Alzheimer, Amyotrophic lateralsclerosis, Pain, Infection, stroke and other real potential dangers to the CNS. Considering the preliminary research on the biological properties of Medicinal plants, it's also been recognized in the development of human culture and diseases management. The inhibition of the release of Pro-inflammatory molecules may prevent the progression of these diseases.

Objective: The purpose of this study was to examine the anti-inflammatory effects on LPS caused inflammation of BV-2 microglia cells by RA, LS, and GA.

Method: All the three plants were selected among other commonly used Ethiopian medicinal plant species and taken to South Korea for examination and kept at Duksung women's university, department of Food and Nutrition Laboratory. Their aqueous extracts were experimentally examined with chemical reagents to verify their efficiency in inhibiting the production of pro-cytokines (IL-I , IL-6, TNF-)

Results: The decreased expression of GAPDH in LPS-activated microglia BV-2 cells was observed in the presence of curcumin (used as control) and significantly inhibited the release of pro-inflammatory cytokines and attenuated expression of IL-I , IL-6 and iNOS in a dose dependent manner.

Conclusions: In the Investigations to find whether these particular plants are effective, RA effect was much higher than LS and GA potency in attenuating multiple pro-inflammatory agents hence indicating their potentiality against neurodegenerative diseases. In general, these plants have manifested protective effects on microglial cells' remarkably.

Keywords: *Rumex Abyssinicus* (RA), *Lipidium Sativum* (LS), *Guizotia Abyssinica* (GA), pro-inflammatory cytokines, Microglia cells, ROS, Nitric oxide, and Anti-inflammatory.

Biography

Mrs. NINSIIMA Jolly (MS) graduated in Food and Nutrition at Duksung Womens' University South Korea 2015-2017; thereafter, i worked with KOICA, Duksung Women's University Research team in Ethiopia, Gondar University to establish Food Bio-resource and Drug Development center. I have also worked with Envirom Green Holding Africa in Rwanda as nutritionist and currently I am working with Wakati Foundation in Uganda, Nakivale refugee settlement as Research and Nutrition Facilitator, I have published two books and two articles

Rwanda Tea; Consumption, Production, export trends and additive Value/*Journal of Korean Tea Society*, Anti-inflammatory activity of Rumex A, Lipidium S and Guizotia A with Lambert Academy publishing.



Assessment of impact of national home grown school feeding programme on the academic performance of pupils in selected primary schools, orire local Government, Oyo State, Nigeria

Mubarakat Iyabode Alabede*, Henry Olawale Sawyerr, Mercy Itunu Ogunraku, Adiamo Babatunde Yusuf

Department of Environmental Health Science, School of Allied Health and Environmental Science, Kwara State University, Malete, Nigeria,

Hunger during school may prevent children from benefiting from education. Although many countries have implemented school feeding programs, school-feeding programs are popular development assistance programs in both developed and developing countries, but have previously had few sound, empirical assessment and analyses of their effectiveness on academic performance in most developing countries like Nigeria. The study assessed the National Home Grown School Feeding Programme of primary school pupils in Oyo State, Nigeria. It was done with a view to determine its impacts on academic achievement of the pupils as well as the impact of the programme on the attendance of pupils and learning environment of the selected schools, the study also elicited the limitations of the programme in implementation. The study is a descriptive research design and obtained data through a structured questionnaire and checklist administered in 30 randomly selected schools in Orire Local Government of Oyo state. The retrieved data were analyzed using descriptive statistics, chi-square. The results showed that 10% out of the 88 students that were Poor academically before the programme 10.2% remained Poor, 9.1% moved to Below Average while 42% moved to Good in their academic also, out of the 30 pupils that were below average before the school feeding programme started 6.7% dropped to Poor, 13.3% remained in the level of Below Average, 30% moved to Average, 23.3% improved in their academic to Good and 16.7% excellent. Also, in the result showing the effect of the programme on attendance, 508 pupils were regular before and 93.7% of the regular ones remained regular and out of the 242 that were irregular before the programme 88.8% of them became regular. Generally, the research reveals that the school feeding programme has more impact on attendance than on academic achievement of pupils.

Audience Take Away:

- To identify ways of improving the academic performance of school aged children in Nigeria so they will be able compete with their international contemporaries.
- Important to legislators/government, researchers, students, educationist, e.t.c, to know effectiveness of the NHGSF programme and to help in implementing new policies towards the improvement of the programme.
- To justify the effectiveness of the NHGSFP based on their goals

Biography

Mrs. Mubarakat studied Microbiology at Al-hikma University Ilorin Kwara State, Nigeria and graduated with a second class upper division in 2013. She had her M.sc in Environmental health science with a specialization of food hygiene safety and quality assurance at Kwara State University in 2017 and graduated with distinction. During her M.sc she joined the Environmental Health Association of Nigeria (EHOAN) and Project Management Professional Institute (PMPI). She is currently working at Kwara State University as a lecturer in the department of Environmental health science. She is also rounding up her PhD in Environmental Health Science with food hygiene safety and quality assurance as her specialization at the same University. She has published some research articles in various journals.)



Pasting properties of starch-okra pectin system

Gilbert Owiah Sampson

University of Science and Technology

Starch has diverse food applications such as stabilizers; thickeners and binders. However, starch retrogradation, which occurs as a result of re-association of disrupted starch molecules, causes undesirable effect in starch-rich foods. Starch-pectin interaction in food system can alter the pasting properties and retard retrogradation. In this study, the effect of the addition of varieties of okra pectin at concentrations 0, 5, 10, and 15% on the pasting properties of starch was studied. The pasting properties of the starch-okra pectin system were determined using the Rapid Visco-Analyzer and results were analyzed statistically with one-way ANOVA. The results obtained showed that okra pectin had decreased the peak viscosity and setback value with Agbagoma and Asontem exhibiting highest effect respectively. The final viscosity of starch was increased except for 10% and 15% Agbagoma and 15% Asontem pectin varieties. Overall, okra pectin affected the pasting properties of starch and decreased starch retrogradation.

What will audience learn from your presentation?

- The undesirable effect of starch retrogradation in food systems will be corrected by the use of okra pectin
- Value addition of okra and diversification in okra utilization
- The role okra pectin plays in stabilizing the pasting profile of starch concentrations

Biography

Dr. Gilbert Owiah Sampson studied Food Science and Technology at the Kwame Nkrumah University of Science and Technology, Kumasi, Ghana and graduated in 2013. He then joined the University of Education, Winneba as a Lecturer in August 2014. He is currently the Acting Dean of the Faculty of Vocational Education.



Functional roles of dietary fibres from selected agro-residual materials in the development of low Gi food products

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Presently, there is a swift increase in the prevalence of non-communicable diseases with the number of diabetic individuals estimated to doubly increase from 171 million in 2000 to 366 million in 2030. It is the major cause of morbidity and mortality worldwide as it may lead to health complications and affect the quality of life. Recently, many populations of the world are not eating sufficient fruits, vegetables and legumes (20-30g) which are the major sources of dietary fibre (DF). High intake of refined carbohydrates and fats coupled with low intake of dietary fibres especially from fruits and vegetables have increases the risk of CVD, diabetes and other illnesses. A diet increase in the amounts and varieties of fibre-containing foods can prevent or treat many of the non-communicable diseases (including obesity, CVD and diabetes mellitus). Recommended intakes of dietary fibre for adults are 20-35g/day. Nevertheless, the usual intake for DF among populations especially Malaysian is low, which is only 16g/day. Incorporation of vegetable DF is one of the simplest efforts to enhance the level of DF in processed food products. The DF improves glycemic response by reducing the rate of glucose absorption in the small intestine, hence lowering the GI value. The DF improves glycemic response by reducing the rate of glucose absorption in the small intestine, hence lowering the GI value. Low GI diet can make us feeling full for a longer time while at the same time reduces overeating. Low GI diet is beneficial in reducing risks and complications of various health conditions like diabetes. Our research reveals that incorporation of agro-residual materials from banana (over-ripe banana), oyster mushroom and cornlettes in a few baked-based products such as cookies, pasta, cakes, muffins and flatbread already successful and scientifically proven in lowering GI values. In brief, physically active, eating properly and regularly sufficient amount of dietary fibres from fruits and vegetables are vital; what we consume and drink now, affects our health in the future.

POSTERS

PLANT SCIENCE VIRTUAL 2020

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Food safety and proper nutrition during (COVID-19)

Moustafa A. El-Shenawy
National Research Center, Egypt

There is no accurate and confirmed information about that emerging coronavirus (Covid-19), or about reaching an appropriate treatment that eliminates it. Till this moment, the global medical authorities have agreed that simple prevention methods are the application of precautionary measures, especially in the absence of a preventive serum, which prompted many questions about the food handling/safety issues you should deal with during this crisis. Moreover, the proper nutrition is vital and important. Thus eating a balanced diet lead to healthier and stronger immunity and less exposed to the risk of chronic and infectious diseases including viral infection. This poster shortly outline the rules that dealing with your purchases of food, in order to be safe, during this Pandemic outbreak. Also, it sheds light on types of healthy stock foods you can buy and some of the nutritional rules could be followed in order to raise your immunity, which is a key factor to resist the virus.

Biography:

Emeritus professor, Food science & Bacteriology at National Research Center, Cairo-Egypt. PhD Sanitary Veterinary and Food Safety (Microbiology), University of Bucharest, Faculty of Veterinary Medicine. Romania. Post-doctoral fellow at Univ. of Wisconsin-Madison USA for four years, Researcher at Univ. of Wisconsin-Madison USA for other three years. Have more than 100 publications, 42 of them have been published in International journals. Supervised many Diploma, M.Sc. and Ph.D. thesis in both Egypt and abroad. Attended many scientific conferences in all European countries, U.S.A., Canada and in some Asian and African and Arabic countries. Principal investigator of many National research projects. Principal investigator of 4 European collaborative projects. Reviewer for 6 international Journals and some national Journals. Member of the editorial board in 8 international Journals. Editor in Chief of three International Journal. One of international distinguished experts in food safety.



Identification of lime and rape honeys by using Self-Organizing Maps

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As a natural food, honey can provide various human health benefits and it plays an important role in human diet. The safety and quality of the food, which human daily consumes, is essential to the health and quality of his life. Monofloral honeys (like lime, acacia, rape, thistle, etc.) are preferred from consumers because of their different medicinal uses, as well as taste and flavour. In the recent years identification and authentication of monofloral honeys deserved greater attention but also is an extremely difficult analytical task. Pollen analysis is the first method and only one certified approach for honey identification. The method is very expensive, time consuming and requires highly qualified specialists in order to obtain accurate and useful results.

The aim of the present study is to find an alternative approach for monofloral honeys identification combining some specific and easy to perform analysis with intelligent statistical treatment. A number of 34 monofloral honey samples (22 samples lime and 12 samples rape honey) with determined botanical origin are analysed for 9 physico-chemical parameters, 12 macro elements and 14 micro elements content. The results obtained are processed using Self-Organizing Maps. After several selections the following parameters pH, electrical conductivity, K and Na are chosen to be a good descriptors for separation and identification of monofloral honeys' botanical origin.

Audience Take Away:

- Self-Organizing Maps have not been used yet in honey science
- The results from this research could be used to identify botanical origin of monofloral honeys instead of classical pollen analysis
- The whole analysis is much cheaper and needs less competence than pollen analysis

Biography:

Dr. Mladenova studied Chemistry at the Sofia University "St. Kliment Ohridski", Bulgaria and graduated as MS in 2008. She had joined the research group of Prof. Karadjova in the Laboratory of Analytical Atomic Spectrometry in Faculty of Chemistry and Pharmacy at Sofia University. She received her PhD degree in 2013 at the same institution. In the same year she obtained the position of an Associate Professor in Department of Analytical chemistry in Faculty of Chemistry and Pharmacy at Sofia University. She has published 5 articles in International scientific journals with IF with more than 140 citations.

KEYNOTE FORUM

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Samir C. Debnath

St. John's Research and Development Centre, Agriculture and Agri-Food Canada, Canada

Strategic approaches of plant tissue culture and molecular techniques for propagation and improvement of horticultural crops

The in vitro techniques combined with molecular approaches for producing true-to-type tissue culture plants are now well accepted worldwide for commercial propagation and production of various crop plants. Fruits and vegetables are valuable sources for health-promoting bioactive components. Although significant progress in plant tissue culture techniques for producing true-to-type horticultural crops has been achieved, somaclonal variation including genetic and epigenetic variations in micropropagules, are a major concern in commercial production of tissue culture plants. The present review deals with in depth progress of various methods of micropropagation using semi-solid and liquid media along with somaclonal variation in in vitro-derived small fruit crops. It also describes various molecular approaches used to monitor clonal fidelity and DNA methylation in micropropagated plants. The possible application of epigenetic variation in small fruit crop micropropagation has been described.

Take Away Notes:

- Plant tissue culture; molecular biology; genetic and epigenetic variations; micropropagated plants; DNA methylation
- Applications of plant tissue culture and epigenetics in horticultural crop improvement

Biography

Dr. Samir C. Debnath, P.Ag. is a Research Scientist at the St. John's Research and Development Centre of Agriculture and Agri-Food Canada (AAFC) in Newfoundland and Labrador and an Adjunct Professor of Biology at the Memorial University of Newfoundland. He has authored and co-authored around 120 publications in peer-reviewed journals including review papers and book chapters. He has been a keynote speaker and an invited speaker at a number of international and national conferences and meetings, was the President of the Newfoundland and Labrador Institute of Agrologists (P.Ag.) and the Canadian Society for Horticultural Science; the Editor-in-Chief of the journal: *Scientia Horticulturae*, and a Special Issue Editor of *Agronomy* (MDPI). He was the Country Representative for Canada and the Council Member of the International Society for Horticultural Science. His research concerns biotechnology along with conventional method-based value-added small fruit and medicinal plant production, propagation and genetic enhancement. Much of his current work focuses on wild germplasm, antioxidant activity, biodiversity and micropropagation for berry crop improvement using in vitro and molecular techniques combined with conventional methods.



Valasia Iakovoglou

Department of Forestry & Natural Environment, International Hellenic University (IHU), Greece

Seedling transplanting responses under irrigation treatments to successfully transplant semi-arid Mediterranean ecosystems under the challenges of climate change

Abiotic factors such as water deficit conditions are frequent phenomena for the Mediterranean semi-arid region. Specifically, Greek ecosystems are characterized by frequent and intense drought events particularly during summers. Those conditions pose additional obstacles to restoration/reforestation efforts that become more intense under the impacts of climate change. The aim of this book-chapter is to inform on seedling performance of forest species that have been subjected to irrigation treatments. It was hypothesized that reduced irrigation frequencies help trigger physiological cues that prepare the seedling to overcome stressed environments. The Root Growth Potential (RGP) is used as an indexed characteristic to address the physiological species' response as related to its ability to overcome transplanting stress. Seedlings were subjected to irrigation frequencies for a period of a month and were analyzed on their performance. Based on the research outcome, it has been indicated that the species maintained their welfare for a month, even under the intense stressed conditions of one watering every two weeks. Nonetheless, the results according to the morpho-physiology of each species based on their ability to tolerate reduced irrigation frequencies prior to transplanting efforts

Take Away Notes:

- Being informed on Mediterranean ecosystems and the difficulties in preserving biodiversity levels under the challenges of climate change
- Solutions to preserve water while maintaining seedling growth and increasing transplanting success
- Use the Root Growth Potential (RGP) as an indicator for field transplanting success

Biography

Dr. Valasia Iakovoglou is a graduate of Iowa State University, USA. She has more than 20-yrs of national/international research and teaching experience and has received numerous scholarships, awards and recognitions. She is an editor at five international journals and a reviewer in more than ten with one of them being the Intergovernmental Panel on Climate Change (IPCC). She has numerous publications with more than ten books/book chapters and 30 peer-reviewed papers. She is active in many scientific societies such as the Mediterranean Experts of Climate and environmental Change (MedECC) and associations such as the "Association of Inter-Balkan Woman's Cooperation Societies (AIWCS)" of UNESCO Center, where she serves as Board Member.

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Seeds technologies for nitrogen fixation

Narváez-Reinaldo JJ^{1*}, Estévez-Geffraud V¹, Moreno-Bascones G¹, Ballester J¹

Seed Technology Department, Semillas Fitó SA, Spain

Excessive nitrogen fertilization has led to a widespread problem of nitrate contamination of aquifers. For example 41% of aquifers from catalan region are contaminated by nitrates. With the aim to attenuate this problem, EU announced as a priority environmental objective to decrease the level of nitrate fertilization based on the Directive 91/676/ECC1.

Different studies have shown that the use of plant growth promoting microorganism and (among them) nitrogen fixers microorganism, they are a powerful tool to reduce the level of external & chemical nitrogen fertilization. In this sense, it is possible to find different successful experiences in the state of the art through the use of bioaugmentation (inoculation of nitrogen fixer microorganisms) and biostimulation (promotion of natural nitrogen fixer microorganisms from soils) techniques2.

Seed technology is the technical area composes by different techniques that facilitate the sowing process with the aim to improve the establishment of germinated seedlings. One of those techniques is the seed treatment or seed coating. There are different types of seed treatments: film coating (where seeds keep their original size and weight), encrusting (seeds keep original shape but suffer an increase of their weight) and pelleting (seeds becomes completely spherical and suffer a relevant increase of their weight). In all of them, it is possible to add different active substances (fertilizers, microorganisms or/and phytosanitaries)3.

In the current oral communication, we present the results of two seed treatments developed by Semillas Fitó with the ability to facilitate the nitrogen fixation. The combination of FitoPower™ and FitoOptima™ by encrusting, they allow the bioaugmentation on lucerne/clover seeds with rhizobium and they ensure the nodulation of leguminous crops. On the other hand, the seed treatment named as RootMaximizer™ for broad bean seeds, it has the ability to biostimulate the natural population of rhizobium from soils and, as a consequence, to increase the final yielding.

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Transposon Frequency of *Botrytis cinerea* and their relation to fungicide resistance on strawberries

Bahadır Törün*, H.Halil Bıyık

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Strawberry is a delicious fruit that can be consumed fresh or/and can be used in industry. One of the important factors that effects yield is the plant protection problems. Fungicides because of the metabolites they produce, especially their presence in foods, they pose a threat to health and also cause economic problems. *Botrytis cinerea* causes grey mold disease in over 220 plant species. Samples were collected from five different localities from Aydın and Mersin province. Samples were incubated on um and then isolated from mixed cultures. Morphological and molecular identification of the samples were made. Transposon sites were amplified with PCR. In total 154 *B.cinerea* samples were isolated of which *Transposa* 20.1 %, *Boty* 46.1 %, *Flipper* 10.4 % and *Vacuma* 23.4 %, in Aydın population *Transposa* 19.5 %, *Boty* 48.3 %, *Flipper* 9.2 % and *Vacuma* 23.0 %, in Mersin *Transposa* 20.9 %, *Boty* 43.3 %, *Flipper* 11.9 % and *Vacuma* 23.9 % was found. Fungicide resistance depends on both fungicide used and transposon type, and also it changes according to growth stage.

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Sunflower yield and weed control affected by mechanical and chemical cultivation and spraying fertilizer using combine equipment

Abdulrazzak A. Jasim*, Shrook K. Mahde

Dept of Agricultural Machines and Equipment, College of Agricultural Engineering Sciences, University of Baghdad

The experiment was conducted to evaluate the effect of an assembling and modify combine equipment which used for mechanical and chemical cultivation and spraying fertilizer, on weed control and sunflower height and Sun flower yield. Cultivation treatments included: mechanical chemical cultivation and spraying fertilizers, mechanical and chemical cultivation, mechanical and spraying fertilizers and control treatment were studied in this experiment. Slippage percentage, field efficiency, fuel consumption, total costs, soil bulk density, soil moisture content, Plant height, plant yield, weed control percentage and weed inhabiting percentage were measured in this experiment. Nested design under randomized, complete block design (RCBD) with, three replications was used in this study. The results showed as follows: 1- Mechanical, chemical and spraying fertilizer treatment was significantly superior on mechanical and chemical treatment and mechanical and spraying fertilizer treatment in soil moisture content, soil bulk density, plant height and plant yield. Mechanical and chemical cultivation treatment was significant superior in increasing weed control percentage and weed inhabiting percentage. There was no significant effect in slippage percentage, field efficiency and fuel consumption attributed by cultivation treatments. 2- There are significant differences between cultivation treatment and the control treatment. Mechanical, chemical cultivation and was significant superior and got almost the best in all studied properties comparing with control treatment.

Biography

Prof. PhD. Abdulrazzak Abdullatif Jasim has completed his master degree at the age of 28 years from the University of Nebraska, USA, and his PhD at the age of 49 years from the University of Baghdad. He is the head of farm machinery experts and scientists; he has published more than 184 researches at different scientific journals and conferences, and published 23 patents, and published 4 books as first author, and has been serving as an editorial board member of several scientific journals as well as a reviewer in also several scientific journals. He is a member in inventors' society and forum, and several scientific organizations.



Abiotic stress breeding in chickpea using genomic tools

C. Bharadwaj^{1*}, Manish Roorkiwal², P. R. Sneha Priya³, Neeraj Kumar⁴, Jorben, J⁵., Supriya Sachdeva⁶, B. S. Patil⁷, P. K. Jain⁸, V. S. Hegde⁹, K. R. Soren¹⁰, Aditya Pratap¹¹, Sarvajit Singh¹², Inderjit Singh¹³, Shayla Bindra¹⁴, Rajeev Varshney¹⁵, G. P. Dixit¹⁶, N. P. Singh¹⁷

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⁸ICAR-National Institute for Plant Biotechnology, India

^{10,11, 15, 16}ICAR-Indian Institute of Pulses Research, India

^{12, 13, 14}Punjab Agricultural University, Ludhiana

The accomplishment of feeding nutritious food to the expected 9 billion people by 2050 will be particularly more challenging in view of hunger, malnutrition and environmental change, worldwide. Plant breeders need to focus more on the approaches greatest potential to increase the crop yields in minimum possible time. In recent years, rapid progress has been made in frontier areas of chickpea research including development of genetic and genomic resources, development of throughput phenotyping techniques against heat and drought stress besides identification of tolerant genotypes/varieties against these stresses. With the availability of information on chickpea genome sequence, now large number of SSR markers linked to drought, heat, salinity, cold and responsive ESTs are available. The SNP platform is also in place that has boosted application of genomic resources in chickpea improvement. Development of mapping populations and association panels for the traits responsible to confer tolerance against these abiotic is providing greater insights into abiotic stress' breeding in chickpea. Work on introgression of root trait QTLs conferring drought tolerance in chickpea has been successfully accomplished and the introgressed lines have been entered into National Testing Programmes. QTLs for other biotic stresses viz., wilt and ascochyta blight is also available. However, the breeder requires per se higher yield performance of these lines or derivatives in varied stress environment. Many of these stresses go together and what is required is multiple stress tolerant variety. Lines with tolerance to terminal drought and heat will play a major role in improving productivity of in major chickpea growing areas. In India, to expand chickpea to the rice fallow regions the varieties having suitability to delayed sowing are required. There is an urgent need to revisit germplasm accessions particularly land races and wild species to identify diverse sources of resistance. Genomic selection being practices in wheat, maize and soybean internationally needs to be exploited for increasing the gains per breeding cycle in chickpea as well.

Take Away Notes:

- Application of genomic tools in plant breeding
- The efficacy and efficiency of plant breeding programmes can greatly be increased
- Genomic selection as a tool to increase the genetic gains

Biography

Bharadwaj has 22 years of scientific experience in breeding legumes and pulses and developed eight chickpea varieties. He is the Principal investigator for the ICAR-Bill & Melinda Gates Foundation project on "Application of next generation breeding, genotyping and digitalization approaches for improving the genetic gain in Indian staple crops". He leads several other projects in collaboration with ICRISAT, ICARDA, UWA Perth, and GCP, CIMMYT. He is the ICRISAT Steering Team Member for GOBII program, Elected Fellow of Indian Society of Pulses Research and Development, Kanpur, India and Fellow of Indian Society Genetics and Plant Breeding, New Delhi India. He has published more than 120 papers. He guided/guiding eight Doctoral students and three MSc students as Chairman.



Underutilized wonder plants of North East India and their ethno-medicinal uses

B N Hazarika

Central Agricultural University, College of Horticulture and Forestry, Pasighat -7911102, Arunachal Pradesh, India

The North-East India is a part of both Himalaya as well as Indo-Burma biodiversity hotspots in the world. It has the richest reservoir of plant diversity in India and is one of the 'biodiversity hotspots' of the world supporting about 50 % of India's biodiversity. Northeastern region occupy 7.7 % of total geographical area of country and harbours 50 % of Indian flora (8,000 species) of which about 4 % is endemic (2,526 species). The distinct tribes in the region have rich indigenous knowledge system on the use of components of biodiversity for their daily sustenance like food, fodder, shelter and healthcare. The region has several unique features such as fertile land, abundant water resources, evergreen dense forests of about 66%, high rainfall, and agriculture-friendly climate. Its unique phyto-geographical positions, topography and high degree of precipitation are some of the important factors which are mainly responsible for its enormous biological diversity. As a result, an array of wonder plants are grown across the region ranging from tropical to alpine. A large number of diversity in fruits belonging to the genera *Artocarpus*, *Annona*, *Averrhoa*, *Garcinia*, *Musa*, *Passiflora*, *Phyllanthus*, etc. are reported from the region. Besides diverse vegetables particularly wild leafy vegetables, rare genotypes of cucurbits, solanaceous vegetables, chilli, ginger, turmeric, etc. are there with some unique quality because of their locational advantage. The region has a great ethno-cultural diversity with major and sub-tribes, which explains the wealth of traditional ecological knowledge among farmers. People of region have their own culture, tradition and medicinal system of treatment and knowledge acquired through close observation of nature. Its ethnic people living in the remote forest areas still depend to a greater extent on the forest ecosystems for their livelihood. They collect different medicinal plants and use them in traditional ways to cure their health related forms. The minor and wild fruits are mostly used to cure various gastrointestinal disorders, respiratory problems, cardiovascular compliance, muscular illness, bone diseases, gynaecological problem, cancers, snake bite, allergy and malaria etc. by local people of the region. This indigenous system of treatment based on such fruits is still an important part in social life and culture of the tribal people. However, this traditional knowledge of the local people has been transferred from generation to generation without proper technological interventions.

This paper provides the information on some of the wonder plants of the region and their ethno medicinal uses for the treatment of various health ailments by the tribes of the region

Take Away Notes:

- Audience will be excited to know the wisdom of tribal people of the region and will be happy to know how these people remain healthy in close connect with the nature with the help of some underutilized wonder plant. Audience will be able to know some endangered plants like *Phoebe Cooperiana*: An Economically Important Wild Edible Fruit of Arunachal Pradesh (Original Research Article <https://doi.org/10.20546/ijcmas.2019.804.314>)
- This deliberation will help audience by giving the information on unique plants which are yet to explore and thus give them job of utilizing them. This information can be taken as base for further advanced research. By the deliberation a new direction on wisdom of tribal people with plants can be known which may provide practical solution of some problem relating to nutrition or health. Further it will provide new information on local healing technique

Biography:

Prof. B N Hazarika, PhD presently working as Dean, College of Horticulture and Forestry, CAU, Pasighat, Arunachal Pradesh. Prof. B N Hazarika guided a number of PG & Ph D students, handled several externally funded research projects and organized 90 trainings. He has published 80 research papers, published 20 books, 25 conference papers and book chapter, 11 practical manual, 25 Bulletins, edited 13 souvenir and 245 popular articles. He contributed significantly in collection, morphological and molecular characterization of diverse genotype of various fruit crops, standardized good agricultural practices for some major fruit crops; introduced new fruit crops in the region.



Delineating the long non-coding network in the interaction between plant and fungal phytopathogen

Raj Kumar Joshi

Department of Biotechnology, Rama Devi Women's University, Bhubaneswar, India

While the small RNAs and the associated pathway components has been established as major regulators of gene expression, the functions of long non-coding RNAs (lncRNAs) generally remains uncharted in the plant systems. Recent evidences indicate that lncRNAs are implicated in the regulation of biotic stress responses. To explore this further, we have performed stranded RNA profiling to identify lncRNAs responsive to *Brassica napus*-*Sclerotinia sclerotiorum* infection, a pathosystem with great economic significance. More than 3000 lncRNAs were located in different regions of *B. napus* genome. Twenty-eight lncRNAs were identified as miRNA precursors mediating defense gene expression during fungal infection. Sense and antisense transcript pairs demonstrated reciprocal expression pattern suggesting that steric clash between the transcriptional system of lncRNA and functional gene facilitates inactivation of sense promoter during pathogen attack. Additionally, silencing of lncRNAs using RNAi knock-down approach demonstrate their possible role in immunity of canola against *S. sclerotiorum*. Overall, we will discuss various experimental characterizations to prove that lncRNAs are imperative elements in the defense network of plants against pathogenic fungi.

Take Away Notes:

- The audience will have a firsthand knowledge about the regulatory role of lncRNAs in plants
- The identified lncRNAs could be used as markers for diagnosis of critical plant diseases at an early stage
- Exploration of the lncRNA mechanism in plants will pave the way of lncRNA based molecular breeding for crop improvement

Biography:

Raj Kumar Joshi is Associate Professor at the Dept. of Biotechnology, Rama Devi Women's University, India where he teaches graduate level courses on Plant Genomics and Genetic Engineering. He also serves as the Group Leader of the Plant Functional Genomics Group, and in that capacity he supervises the overall research activities on the functional aspects of molecular plant-microbe interactions. He has been awarded with the prestigious SERB early career grant and SERB extramural grant from the Dept. of Science and technology, Govt. of India and CREST award from Dept. of Biotechnology, Govt. of India. In collaboration with Prof. Nat Kav from University of Alberta, Canada, he is running a successful programme on the delineation of molecular networks in the interaction between plants and fungal phytopathogens. His recent forays into genome editing and precise base editing towards improvement of these crops has been highly productive.



Caribbean Traditional Medicine (CTM) compared to Ayurveda, the traditional Indian medicine (TIM) and Chinese medicine (TCM) highlighting developmental and sustainable issues

Sylvia Adjoa Mitchell

The Biotechnology Centre, 2 St John's Close, The University of the West Indies, Mona Campus, Kingston 6, St Andrew, Jamaica

Caribbean traditional medicine (CTM) has many local names – herbal medicine, bush medicine, herbal remedies, folk medicine, healing plants, medicinal plants, or traditional Caribbean medicine. CTM is not static, it incorporates traditional knowledge of many cultures, and can respond quickly to new diseases. CTM is preventative as well as curative and includes many modalities – foods, nutraceuticals, herbs and spices, infusions, decoctions, cooling herbs, root tonics and liquors. Five TRAMIL studies will be described to show how CTM has developed in the Caribbean Region.. Ethnobotanical studies and botanical publications indicate that 3,566 plant species in the Caribbean have been identified that have at least one ethnomedicinal use, and that the most used plant recipes are: *Citrus aurantifolia* juice for foot mycosis (Guadeloupe) *Anona muricata* leaves for nerves (Jamaica), *Plantago major* leaves for ocular infection (Martinique), *Citrus aurantifolia* juice for rhinopharyngitis (Puerto Rico) and *Leonotis nepetifolia* leaves for cough and common cold (Trinidad and Tobago). CTM is coming of age – the TRAMIL Caribbean pharmacopeia is available in three languages – French, Spanish and English, and they have an online botanical database. Cuba has integrated CTM into their medical system but the rest of the Caribbean has a long way to go towards this aim. Plant research done in the region include anti-oxidant, anti-microbial and anti-cancer bioactivity, and glycemic index. The following plants: bottle brush (*Callistemon viminalis*), cannabis (*Cannabis sativa*), cerasee (*Momordica charantia*), ginger (*Zingiber officinale*), guinea hen weed (*Petiveria alliacea*), moringa (*Moringa oleifera*), neem (*Azadirachta indica*), pineapple (*Ananas comosus*), search mi heart (*Rhytidophyllum tomentosum*), turmeric (*Curcuma longa*), and yam (*Dioscorea spp.*) will be highlighted. CTM will then be compared and contrasted with TIM and TCM to highlight opportunities, challenges and to suggest a sustainable way forward.

Take Away Notes:

- Caribbean traditional medicine (CTM) is not well known. CTM draws from multiple traditional cultures including the West Indians (Caribs and Tainos), Africans, Europeans, East Indians and Chinese utilizing the plants of the islands. The audience can use this information to better understand herbal remedies emanating from the Caribbean Region, to easier find information on how to describe and use them safely, for their betterment and for the Caribbean. It will also serve as an introduction of CTM research institutions for future collaborations
- This information will help plant scientists in their jobs by making them aware of traditional knowledge, research and institutions in the Caribbean who are knowledgeable and looking for collaborations. Anyone involved with using plants for health should be aware of the differences of using the fresh product with minimal extraction, products made from the dried plant parts, and drugs made from the isolated biochemicals. By learning how plant recipes have been developed over generations and then tested for efficacy and toxicology shows how traditional science (generational testing and practise) and laboratory science (identification of actives, biofarming, bioactive screens) can be integrated and how the Nagoya Protocol for access and benefit sharing can be used to return profits to the local communities. Research is needed along this value-chain, including propagation and conservation techniques. By sharing our experiences, this will expand international research and we need to teach this to the youth – to appreciate their heritage. There are many practical and affordable solutions that have been found in the Caribbean that are not well-known and others that have been forgotten. Of specific import, is the skills developed over the years, of how to apply old remedies and well-known plant recipes to new diseases. We are open to sharing what we have learnt and to continue these discussions

Biography:

Dr. Sylvia Adjoa Mitchell studied Botany / Geography (BSc) and Biotechnology (PhD) at The University of the West Indies (UWI) graduating in 2000. After 7 years at the Scientific Research Council and 3 years at the Sugar Industry Research Institute, Jamaica she was given the opportunity in 1999 to initiate the Medicinal Plant Biotechnology research group, at the Biotechnology Centre, UWI. After two years running the MPBRG, she obtained the position of Assistant Lecturer, and in 2014 of Senior Lecturer in Biotechnology. Her publications include 27 research articles in refereed journals, one ebook, 3 book chapters and six international technical reports.



Tropical Plant Ontogeny – the case of the two shoot types of *Smilacaceae* and *Dioscoreaceae*

Sylvia Mitchell

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As plants grow, their development from one phase of growth to another (their ontogeny) can be gradual without noticeable changes, or can exhibit distinct changes where several morphological features change at the same time. Such is the case for two tropical monocotyledonous plant families: *Smilacaceae* and *Dioscoreaceae*. In these two families, there are genera where only the juvenile vegetative form is seen and no vine develops. For *Smilax* and *Dioscorea*, the two main genera respectively of these families, there is a juvenile vegetative form which is distinctively different from an adult vegetative form, designated type I and type II. Interestingly, for both genera mentioned, the juvenile vegetative type I form (seedling) is similar – being a rosette with short internodes although details vary, even within each genera, as to leaf shape and stem characteristics. The adult vegetative type II form is also similar, as both exhibit as vines, although again leaf and vine characteristics may vary. Of great import is that they both also behave similarly in tissue culture, although the level of recalcitrance to *in vitro* conditions varies with species. Nodal explants excised from adult type II vines become more juvenile as they are sub-cultured *in vitro*, and growth slows. Increasing the cytokinin concentration in tissue culture (to 0.5 mg/L benzylaminine) supported the growth of type II vinelets, and the multiplication rate increased. Interestingly, these type II vinelets, if transferred to media without plant growth hormones or with minimal auxin, produced type I shoots although reversal was not as easy as progression. These type II vinelets could not be hardened for either genera, and transfer to media with no cytokinin was necessary. Type I shoots were then produced which could be successfully hardened. These type I shoots, *ex vitro*, then produced type II vines. These phase changes are compared with results from other species to suggest biochemical changes that could be happening as a foundation for further work on this phenomena..

Take Away Notes:

- Phase change is a plant phenomena that still needs to be explored. The audience will now be looking for how plants change form, not only between vegetative and flowering, but also between seedling and vegetative adult plant. This system is pliable, so can be used to explore what is happening, while trees phase change is more rigid. I am hoping this research will encourage other scientists to examine shoot tips anew to explore what is happening right under our noses
- Plant ontogeny – from juvenile vegetative to adult vegetative to flowering – are fundamental to plant science. I expect other faculty can explore their own plants to see how phase change affects their ontogeny, both morphologically and at the molecular level. This is a practical solution as we know how to manipulate both growth forms and we are willing to collaborate with others

Biography:

Dr. Mitchell studied Botany / Geography (BSc) and Biotechnology (PhD) at The University of the West Indies (UWI) graduating in 2000. After 7 years at the Scientific Research Council and 3 years at the Sugar Industry Research Institute, Jamaica she was given the opportunity in 1999 to initiate the Medicinal Plant Biotechnology research group, at the Biotechnology Centre, UWI. After two years running the MPBRG, she obtained the position of Assistant Lecturer, and in 2014 as Senior Lecturer in Biotechnology. Her publications include 27 research articles in refereed journals, one book, 3 book chapters and six international technical reports.



Systemic Acquired Chemicals (SAR) in managing foliar plant diseases of Onion and Roses

Sunita Chandel

Department of Plant Pathology, Dr.Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan (Himachal Pradesh)-India

Downy mildew and powdery mildew are two major diseases recorded in onion and roses grown in Himachal Pradesh-India. Adverse effects of diseases on their hosts have been noticed which utilizes their nutrients, reduce photosynthesis, increase respiration and transpiration, impair growth and finally reduce the yield 60 to 75 % in short span of time in the midst of cool and humid climatic conditions in case of downy mildew whereas powdery mildew flourish in warm humid weather causing losses 25 to 40%. Both the pathogens are obligate and are considered in most conspicuous groups of plant pathogens. Conventional techniques for disease administration have met with considerable success in managing plant diseases, but not true with downy mildew and powdery mildew management in particular. Moreover injudicious use of fungicides has raised a larger scale concern for plants and human health. Host resistance also face the issue of resistance breakdown due to continuous use of chemicals. Bio control is restricted due to lack of commercial formulations and has not been successful much under field conditions due to loss of viability, poor competitiveness, lack of proper delivery systems and environmental factors. Recently the systemic resistance has shown a protection, which is dependable and active against wide spectrum of pathogens. The induced state is corroborated by an increase in production of a range of defense related products like pathogenesis related proteins (Pr-proteins), phytoalexins and signalling compounds. Exogenous application of chemicals like β aminobutyric acid (BABA), Acibenzolar-S-methyl (ASM), Sodium salicylate (SS), Isonicotinic acid (INA), K_2HPO_4 , KH_2PO_4 plus KOH, or $NaHCO_3$, all plus Tween 20 (0.5 ml/l) or bupirimate (Nimrod) and Salicylic acid (SA) etc. have shown a multitude of defense responses and can protect various crops against viruses, fungi and bacteria by triggering a huge number of guard reaction as well as activation of various enzymes. Hence, there is a need to investigate new techniques based on activating the plant's own immune and defense barrier mechanism to control serious kind of plant diseases. Superior control of onion downy mildew with foliar sprays of SAR chemicals –(Chitosan) was achieved than fungicides under field evaluation followed by Ridomil Gold and Cabrio Top by giving disease reduction upto 81.93 per cent. Chitosan also supported an improvement in plant growth parameters such as maximum height (43.89 cm) and highest yield (26.7 t/ha) followed by Ridomil Gold (40.06 cm, 24.5 t/ha) and Cabrio Top (37.36 cm, 23.3 t/ha). Encouraging results were obtained in powdery mildew infection in rose where minimum disease (16.97%) with maximum disease control (78.48%) was observed in the plants treated with dipotassium orthophosphate @ 0.075%. Other best treatments in order of their effectiveness were salicylic acid (20.00%), β -aminobutyric acid (21.93%), potassium bicarbonate (26.17%) and potassium silicate (27.83%) by giving 74.62, 72.16, 66.79 and 64.69 per cent disease control. Dipotassium orthophosphate treated rose leaves developed highest amount of the reducing sugar (146.33 μ g/g) which was followed by salicylic acid (133.72 μ g/g) and β -aminobutyric acid (128.50 μ g/g). Similar trend in the levels of non-reducing sugar (65.00 μ g/g), total phenol (182.00 μ g/g), polyphenol activity, peroxidase activity, PAL activity was estimated followed by salicylic acid and β -aminobutyric acid indicating the activation of the resistance in plants.

Take Away Notes:

- The plant science fraternity or community will definitely get benefitted with the practical applicability of eco-friendly systemic acquired chemicals which are also known as bioinducers or biorational chemicals, tested under field conditions. This innovative practice of exploring such chemicals will be able to enhance the resistance ability of the plants by activating the salicylic acid pathways against the major devastating plant pathogens such as downy mildew of onion and powdery mildew of rose especially of foliar nature as undertaken in this present study. The standard protocols of delivery system of using these chemicals have been followed in different host –pathotype interactions. It will be a new

intervention in plant disease management strategy in India with use of very less concentrations to curtail the excessive use of chemicals that are causing numerous kinds of hazardous effects. To name few of the effects of SAR chemicals, one can very well assess their eco-friendly impact on improving soil health, environment, no eruption of serious or more virulent strains or pathovars of the pathogens, no residual toxicity in the agricultural produce etc. and ultimately improvement in overall plant and human health. This way we can achieve the alternative methods to be applicable in integrated disease management modules, which are considered as the best approach in mitigating magnitude of losses experienced by the plants against large number of plant pathogens, fungi, bacteria viruses, nematodes etc.

Biography:

Dr. Sunita Chandel studied her BSc Agriculture from Himachal Pradesh Krishi Vishvidhalaya, Palampur, India and obtained her post graduate degrees in MSc and Ph.D in Mycology & Plant Pathology in years 1987 & 1991 from Dr.Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan (H.P). She joined as Assistant Professor in 1992 in Department of Plant Pathology of the same University, and presently working as Professor. She was awarded University Merit Fellowship in B.Sc Agriculture, ICAR Junior Fellowship for Master's Research, Research fellowship for Ph.D and worked as Research Associate. Selected for Commonwealth Academic Staff Fellowship (2005-06) programme at University of Aberdeen, Scotland, U.K. and worked under supervision of Steve Woodward. Received SERC Fast track research proposal of DST for Young Scientists in Life Sciences and published 105 research articles in SCI journals of National and International repute.



Wood anatomy of hardwood tree species

V. Vishnuprasad

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Wood or the secondary xylem of woody species is a remarkable structure in plants with varied functions. It is a result of secondary growth and detailed studies on wood anatomy can reveal exhaustive data which can be correlated to taxonomy, phylogeny, ecology, etc. India is a country with abundant floral diversity across its different phytogeographical regions. Hardwood timber species are found in plenty in the forests of India. Many such forests are exposed to extensive stresses caused by anthropogenic activities, one of which is mining and excavation. There are a lot of large and old mines in the tropical and subtropical regions of India, especially in the Chhota Nagpur plateau traversing across states like Chattisgarh, Jharkhand, Odisha and Bihar. Various trees in these forests are quite old and have been facing stressful conditions for many decades. It is most often the reproductive morphology which is considered more reliable features for study. It should also be noted that anatomy of wood is also a highly conservative feature for a given species and does not change significantly under changing environmental conditions. The study carried out in the iron ore mining regions of Odisha tried to investigate this important characteristic across 22 tree species. Different criteria like qualitative and quantitative wood anatomical features provided by the International Association of Wood Anatomists (IAWA, 1989), physical feature like specific gravity and quantification of iron element uptake into the woody tissues were observed and analysed for all the species after comparison with the control samples of the same species, some of which were collected from the Xylarium (DDw) of Forest Research Institute, Dehradun while some others were collected from the forest areas of Jharkhand state, which experienced negligible amount of mining or any other stress. The extensive comparative research work with statistical tools revealed fascinating results, based on which it was possible to shortlist species which are tolerant and adaptive to the existing conditions. Such species were suggested to be used for restoration of the forests in those mining regions rather than introducing exotic or non-native species. This substantial work carried out on the wood anatomical aspects was published in the esteemed journal *Trees – Structure and Function* in 2017.

Take Away Notes:

- Audience, especially students and budding researchers would be able to get more insight into this fascinating field of study i.e. wood anatomy
- Lot of correlation can be carried out by pursuing more research work associating wood anatomy with other disciplines of botany, forestry and ecology
- Field research would be highlighted for its significance w.r.t planning of sample collection in forest areas, collection of wood samples which is physically tough, etc
- More research projects can be put forth based on wood anatomy across different regions, the main advantage being less requirements of apparatus and chemicals, thereby reducing handling and maintenance costs
- The importance of Xylarium would be highlighted

Biography:

Dr. V. Vishnuprasad studied Botany at the SIES College of Arts, Science and Commerce, Sion (West) affiliated to University of Mumbai and graduated in 2007 followed by post-graduation in Environmental Botany in 2009. He then went on to pursue Ph.D. in Forest Botany at the Forest Research Institute (Deemed) University, Dehradun, Uttarakhand in 2013 under the guidance of Dr. Sangeeta Gupta, Scientist - G, Wood Anatomy. His research work has been published in the esteemed journal *Trees – Structure and Function* in 2017. He later joined Botany department of SIES College of Arts, Science and Commerce (Autonomous), Mumbai as an Assistant Professor and has been engaged in academics and research.



Genetic improvement in *Eucalyptus* clones through Mutation Breeding

Khanna N K, Shukla O P*, Narkhede S L and Chauhan SKS

JK Paper Limited, Unit- CPM, Gujarat- India

JK Paper Ltd. Unit: CPM, Gujarat, India was earlier has put in pioneering efforts and working with the farming communities in Gujarat and Maharashtra states of India for meeting its raw material requirement by promoting short rotation pulpwood plantations on their farm lands. This has created a win-win relationship for farmers as well as industry by helping farmers realize value from their wastelands and helping industry meet its ever increasing demand for raw material on a sustainable basis.

JKPL had put in placed robust plantation R&D network for increasing wood productivity & pulping qualities through Mutation breeding for tree improvement initiatives with improved silvicultural practices for wood productivity & quality improvement like density, pulp yield, improved fibre morphology etc.

JKPL have studied effects of gamma rays irradiation with doses in KGy (T1, T2, T3, T4, and T5) on 10 nos of high productive Eucalyptus clones, which were irradiate in Nuclear Research Laboratory, Indian Agriculture Research Institute (IARI), New Delhi, India. Progeny trials planted at R&D experimental plot JK Paper Ltd, Gujarat, India. All higher doses irradiated plants (T4 and T5) were died after 3-4 month of plantings. Smaller doses shows faster growth (volume increment) over its control (TC) planted under statistical design of experiment. DNA fingerprinting studies using different polymers were done for 2 clones with positive mutant's shows variation in PCR with its control. The chemical analysis of wood (3.5 year age) also shows improvement in wood density & fiber % in mutant clones over its control due to mutagenesis.

Keywords: Gamma rays, Irradiation, mutation breeding, Eucalyptus clones, pulp yield, wood density DNA Fingerprinting.

Take Away Notes:

- Eucalyptus is most widely distributed species in all over the world and main source of raw material for manufacturing of pulp and paper
- As it is exotic in India only few species are available in India
- In present era of globalization productivity of plantations are very important and availability of wide range of clones and superior varieties with broad genetic base is critical
- This paper presents the importance of mutation breeding and its application in eucalyptus clonal forestry and also emphasizes on use of biotechnology tool for tree improvement
- Audiences can able to know various treatments of Gamma radiations and its application in mutation breeding in Eucalyptus
- At last it represents mutation breeding, its progeny trial, its data according, its data processing, its physical and chemical properties analysis and identification of best clones for future plantations

Biography:

Mr. Om Prakash Shukla studied Master of Science (Genetics) from School of Biological sciences, Bhopal- India in 1982 and completed his State Forest Rangers Course (SFRC) from Forest Rangers College, Jabalpur in 1985. He has started his career with Nepa Limited, Napanagar under taken of Govt. of India as Officer trainee in 1983 and with vast knowledge and increasing experience he has served various paper companies like Sirpur Paper Mills Ltd, JK Paper Ltd, Rayagada, Ballarpur Industries Ltd, in India and as on date he is designated as Chief General Manager (Raw Material) at JK Paper Ltd, Unit CPM in India. He has attended, presented papers national and international conferences and published various research papers in National and International Journals/books.



Ecofriendly strategies for the management of postharvest disease incursions in Citrus

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Citrus is one of the major horticultural tree crops grown globally. Many postharvest pathogens are found associated with Citrus. Common postharvest pathogens include *Colletotrichum gloeosporioides*, *Botryodiplodia theobromae*, *Geotrichum candidum*, *Penicillium digitatum*, *P. italicum* and *Phytophthora nicotianae*. Among these, Blue mold (*Penicillium italicum*) and Green mould (*P. digitatum*) are important postharvest pathogens causing colossal losses every year. Currently, fungicides are applied for the control of these diseases but due to serious health and environmental concerns, scientists are engaged to find out safe alternatives to combat postharvest diseases. In the present study organic elicitors, inorganic salts and plant extracts were used to manage blue and green mould of citrus. Salicylic acid at 10 and 15 mM concentrations proved to be the best in reducing mycelial growth and blue or green mass density on inoculated Kinnow (*Citrus reticulata* Blanco) fruit. Among plant extracts, *Lantana camara* exhibited 54.42% inhibition of *Penicillium digitatum* fungus. It is inferred from the present study that elicitors, inorganic salts and plant extracts alone or combined with commercial wax appear to be the best alternate to manage postharvest disease incursions in citrus.

Keywords: *Penicillium digitatum*, elicitors, extracts, postharvest, antifungal

Take Away Notes:

- The paper elucidates postharvest disease problems posing threat to orchardists and exporters
- This study provides good alternative to synthetic chemicals which are polluting environment, eliminating biodiversity and causing server health hazards
- It presents comprehensive and solution-oriented information equally beneficial for researchers and stakeholders
- This presentation also includes detail of Mobile app as part of Outreach program for benefit of end users

Biography:

Dr. Zafar Iqbal cherishes good memories of early life enjoying studentship and education in the most memorable institutions of the country. Later he completed Ph.D. from Bahauddin Zakariya University, Multan, Pakistan and Post Doctorate from Curtin University, Australia. He earned respect, dignity and honour among the students and colleagues alike. He owns many attributes including rich experience of 32 years which is a blended mix of teaching, research, leadership and good governance. He has scooped different prizes and awards from national and international organization. He has 189 publications at his credit. He has delivered keynote lectures in many national and international scientific events.



Conservation and exploitation of plant genetic diversity for sustainable food and agriculture

Ijaz Rasool Noorka

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Biodiversity has impact on our daily life starting from food, fibre and fuel to conservation of genetic resources. It also generates new avenues of research and development to combat food insecurity. There are many pressures on biodiversity like population increase at alarming rate, climate change, pre and post-harvest losses, genetic erosion, attack of insect/pests, and many more. The genetic erosion is most important factor to shake the food security in many societies because it is the gradual loss of variability from cultivated species, wild forms and wild relatives. If once it is lost, it is impossible to create again e.g Replacement of Desi varieties, improved crop management practices etc. The state of food security, revolves round the ggermplasm of a crop, that is a sum total of hereditary material. It is amalgamation of all the alleles of various genes, present in a crop species & its wild relatives. Germplasm consist of, Land races, Obsolete varieties, Varieties in cultivation, Breeding lines and Wild forms & wild relatives. Biodiversity and food for all, mainly depends upon the gene pool. The gene pool consists of all the genes and their alleles present in all such individual which can hybridize with each other to ensure food security. The major components are, GP1 (hybridize easily and give fertile hybrid), GP2(GP2-GP1 difficulty may be used in breeding) and GP3(GP3-GP2 easier than GP3-GP1. Under present COVID-19 situation, it is global need of hour to come forward with associated policies and institutional reforms and institutional strengthening; so that post COVID food security can be confirmed. These may be the, integration of biodiversity conservation measures into sectoral initiatives; Better understanding of all aspects of biodiversity, their sustainable use; Developing community-based biodiversity management systems; Better implementation of existing plans and Bringing the total number of Biodiversity Hotspots in the world.

Audience Take Away:

- Major global challenges.
- Biodiversity role in ecosystem
- Essential role of biodiversity for providing food security
- Threats to biodiversity
- Climate change and biodiversity
- Food security, how?

Biography:

Dr. Ijaz Rasool Noorka graduated, post graduated in Plant breeding and Genetics at University of Agriculture, Faisalabad, while Post Doctorate in Molecular Biology and Cyto-genetics from University of Leicester, UK. Dr Noorka was honored, to be Coordinator in National and International conferences, and to present Pakistan throughout the World, particularly in FAO (United Nation), Japan, China, Morocco, Iran, Turkey, Egypt, South Africa, India, Abu Dhabi, Scotland, Saudia, Sri Lanka, Kuwait, Italy, France, Singapore, Malaysia, Sudan, Dubai (Thrice), Bangkok, United Kingdom. Dr Noorka has published more than 11 chapters, 150 research articles in leading journals and books and 200 popular articles.



Marine Macroalgae: A sustainable bioresource for food and value-added products

Nitin Trivedi

Institute of Chemical Technology, India,

Marine macroalgae or seaweeds are emerging as a potential candidate for meeting the future needs of food, feed, bioenergy, and value-added biomaterials. Seaweeds have a different structural and biochemical composition which strengthens their applications in phycocolloid, food, and agro-industries. Seaweeds have a global distribution with high biomass productivity and CO₂ sequestration potential, and they do not require arable land, fertilizer, and freshwater for their growth. These properties provide a suitable platform to make them an attractive candidate for future seaweed-based industries. Seaweeds contain several bioactive components like soluble fibers, vitamins, minerals antioxidants, proteins, fatty acids, and hydrocolloids like agar, carrageenan, alginates which have proven food applications. In recent times, seaweed research has been shifted mainly to use it as a source of functional food and value-added products for food and nutraceutical applications. Therefore, the researchers across the globe have now focused on seaweed growth engineering and cultivation in both sea and land-based systems followed by value addition in a bio-refinery model to achieve increased sustainability and return on investment (ROI). The talk will cover the introduction of seaweeds, their different applications with major emphasis on food and value-added products, market status, seaweed R & D activities at my Centre, and major challenges associated with seaweed research

Audience Take Away:

- A piece of systematic information on seaweeds, their food applications, and current R & D in the area of seaweeds
- Marine based resources will be the future for supplying food, feed, bioenergy, and biomaterials therefore the young students and faculty may develop their interest in the field of phycology.
- The challenges associated with seaweed research across the globe will get solutions if the audience or faculty will critically work in specific directions
- The acceptability of seaweeds in their daily life promotes seaweed research globally

Biography:

Dr. Trivedi has completed Postgraduation in Microbiology from the University of Rajasthan, Jaipur, India in 2008. He then joined CSIR-CSMCRI, Bhavnagar, Gujarat, India as Project Fellow in 2009 and completed his Ph.D. degree in Biological Science from AcSIR, New Delhi under the guidance of Dr. CRK Reddy in 2015. Dr. Trivedi received several national and international postdoctoral fellowships like DSKPDF (UGC, India), ARO PDF (Israel), PDF at Dalhousie University (Canada). In 2017, Dr. Trivedi received India's prestigious DST INSPIRE Faculty award by the DST, New Delhi, India and currently working at DBT-ICT CEB, Institute of Chemical Technology, Mumbai, India. He is working in the area of Seaweed biotechnology and Microbial biotechnology. Dr. Trivedi published 18 research articles in SCI journals, 4 book chapter/review articles, and 2 patents as lead and co-author.



Enhancing vegetables production by hydroponic farming to ensure nutrition food security during covid-19 pandemic in Bangladesh

S. M. Rezaul Karim, Md. Salauddin Palash, and Laila Naher
SHF Global Agrotech Ltd., Bangladesh,

The ongoing covid-19 pandemic has brought widespread disruption to the global supply chain causing disastrous shortages of protective foods. Nutrition food security is a key for alleviating malnutrition and improving immunity of human body. To fight against the deadliest pandemic of covid-19, body immunity plays an important role. The mass production of nutrition-rich vegetables round the year is, therefore, necessary to improve the disrupted supply chain of vegetable during and aftershock of the pandemic. The production of vegetables through conventional farming system in Bangladesh is disrupted every year due to unavoidable circumstances of climate change and conversion of agricultural land to non-agricultural usages. In addition, covid-19 created a havoc on the supply of vegetables in the country. Therefore, an early intervention is necessary from the policymakers to keep up the vegetables production round the year and to engage unemployed labour in production agriculture to maintain the pace of the national economy. This paper will focus on the comparative advantages of hydroponic vegetables production system in respect of grower's profitability, market availability and market acceptance by the consumers.

Audience Take Away:

- The benefits of hydroponic farming over conventional soil-based farming in vegetable production,
- How much profit can be earned from a unit area of hydroponic farming technique in Bangladesh,
- What are the risks of the technique and how these can be overcome?
- How can the growers/shareholders can easily pay the debt to the bank keeping a standard profit for the shareholders?
- They will also have an idea about how the low-income rural community can establish the polyhouse for running a hydroponic vegetable farm.

The information will be helpful to those who are interested to do profitable agro-business with hydroponic farming technique. The government/policy makers can also adopt the concept and ensure year-round supply of nutrient-rich vegetables in the markets through providing low-interest bank loan or allocation of special finance for this kind of project. The rural community can improve their livelihood by making a cooperative society and then establishing the hydroponic farm through their cooperative society.

Biography:

S. M. Rezaul Karim is a Professor of Agronomy, has teaching and research experience for 35 years at Bangladesh Agricultural University (BAU), and Universiti Malaysia Kelantan (UMK). He is a Weed Scientist, has innovated the killer weed, *Parthenium hysterophorus* in Malaysia in 2013. He has secured the 2015 ITEX Silver Award in 2015, and the Best Research Award at UMK in 2017 for his research achievements. Prof. Karim did his M.Sc. Ag. (Agronomy) in 1981 from BAU, M.Phil in 1991 from University of Reading, UK and PhD from University of Aberdeen, UK in 2000. He has published 100 scientific articles, three book chapters and five books in Weed Science.

Varietal performances on yield and agronomic attributes of aus rice

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Aus, aman and boro are three rice growing seasons in Bangladesh. Among them aus is the least cultivated due to prevailing drought and limitations for irrigation in kharif season. Mostly produced aus rice are modern varieties (MV) and a few are of local cultivars. This experiment evaluated the yield and agronomic characteristics of six high yielding modern aus rice varieties (Binadhan-19, Binadhan-14, BRRI dhan43, BRRI dhan48, BRRI dhan55 and BRRI dhan65) to compare the yield, duration and growth attributes. Experiment was setup at farmers field of satvaiyapara under khagrachari sadar upazila followed RCB design. Seedlings were transplanted at 25 DAS. Results indicated that, shortest and longest plant height was observed with BRRI dhan65 (91.80 cm) and BRRI dhan43 (105.70 cm), maximum and minimum total number of tillers in Binadhan-19 (17.00) and BRRI dhan43 (8.20), highest and lowest panicle weight from BRRI dhan48 (25.33 g) and Binadhan-19 (12.47 g), most and least number of grains/panicle were recorded with BRRI dhan55 (261.85) and BRRI dhan43 (145.54), Thousand seed weight was higher in BRRI dhan43 (27.01 g) and lower in Binadhan-19 (19.46 g). BRRI dhan55 (4.49 t/ha) and BRRI dhan48 (4.48 t/ha) yielded statistically identical production with lowest grain yield by BRRI dhan65 (3.06 t/ha). BRRI dhan48 gave maximal straw yield of 9.20 t/ha; contrary minimal yield of straw was obtained from BRRI dhan65 (4.12 t/ha). Days to maturity was earlier in Binadhan-19 (99.33 days), BRRI dhan65 (99.67 days) and Binadhan-14 (101.00 days) than BRRI dhan48 (113.67 days), BRRI dhan55 (106.67 days). Most of the farmers preferred Binadhan-19 and Binadhan-14 over BRRI dhan43 and BRRI dhan48 for their earliness, long, slender and premium grain outlook. Binadhan-19 may be a potential modern aus variety in the Khagrachari hill tracts for gaining optimum yield within a short time. Therefore further studies are needed in jhum cultivation with local cultivars for greater comparison and acceptability to the farm community.

Key Words: organic carbon, humic acid, fulvic acid, humin, humification, paddy soils

Audience Take Away:

- The benefits of hydroponic farming over conventional soil-based farming in vegetable production,
- How much profit can be earned from a unit area of hydroponic farming technique in Bangladesh,
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- How can the growers/shareholders can easily pay the debt to the bank keeping a standard profit for the shareholders?
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An assessment of organic carbon fractions in Paddy and associated non-paddy soil of the Brahmaputra valley of Assam

Zenesia Phillips

University of Guyana, Guyana

An investigation was carried out to study the soil organic carbon fractions in paddy and associated non-paddy soils of Assam, India. Three districts viz. Sivasagar, Jorhat and Golaghat in the Brahmaputra valley of Assam were selected for this study. Soil samples were collected from six profiles, three each from mono-cropped paddy and associated non-paddy areas. Horizon -wise, soil samples were analyzed for organic carbon fractions. Organic carbon, Humus C, Humin C, Humic acid C and Fulvic acid C were all analyzed from the samples. Organic carbon content in soil varied from 0.90 -7.90g kg⁻¹. Surface horizons of paddy soils contained lower amounts of humus C (0.255-0.330 per cent) and fulvic acid C (CFA) (0.135 – 0.180 per cent) and higher amounts of humin carbon (0.210 -0.475 per cent) and humic acid C (CHA) (0.120-0.150 per cent) as compared to that of non-paddy soils (0.300-0.435 and 0.195-0.300, 0.180-0.490 and 0.105-0.135 per cent respectively). It was concluded that the ratio of (CHA+CFA)/CTOC indicated less humification on the surface horizons of paddy soils. This is a direct result of prolonged submergence which led to humic acid carbon becoming less oxidized or humified.

Key Words: organic carbon, humic acid, fulvic acid, humin, humification, paddy soils

Soil fertility – the basis for transition to a more sustainable agriculture

Boris Boincean

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Agriculture in the majority of countries isn't sustainable from economic, ecologic and social points of view. The dominant concept of agricultural intensification named „green revolution” was directed towards higher yields by using industrial inputs without taking in consideration the negative environmental and social consequences. The economic competitiveness of farmers has decreased in the conditions of discrepancy between prices for industrial inputs related to limited nonrenewable sources of energy and prices for agricultural products. The industrial model of agricultural intensification doesn't work. Yields stabilization became typical for the majority of countries, including for Moldova. Farmers in all over the world are looking for alternatives to the dominant industrial model of agricultural intensification. We are considering that one of the main reason of the problems faced by modern agriculture is neglecting the role of soil fertility. Soil organic matter is the integral index of soil fertility. Unfortunately soil is treated until now as the substrate where water and mineral nutrients are added for crop nutrition and crop production. The diversity of crops including perennial legumes and grasses in crop rotations, was replaced by higher rates of mineral fertilizers for crop nutrition and pesticides for weed, pest and disease control moldboard ploughing etc NPK mentality is typical for conventional agriculture.

Control of pests, diseases, weeds soil compaction; soil erosion etc are dominating, instead of their prevention. Soil health (soil quality) became one of the limiting factors in achieving a higher level of agriculture sustainability. By improving soil health through a better soil management it is possible to reduce the application of mineral fertilizers for crop nutrition, pesticides for weed pest and disease control, moldboard ploughing and irrigation in agriculture. Data obtained in the long-term field experiments (more than 60 years) with different crop rotation and permanent cropping (monocropping) on Chernozem soils in the Balti steppe of the Republic of Moldova have proved the highest share of inherent soil fertility in yield formation for different crops (from 75 up to 95%). Nitrogen-use efficiency from mineral fertilizers is the lowest in a good crop rotation after favorable predecessors and with higher level of soil fertility, which makes their application unreasonable. Soil nutrition with carbon sources of energy for soil biota is more efficient than soil nutrition with mineral fertilizers. Good soil quality (soil health) can provide ecosystem and social services, including resilience to global warming. They should be the subject for agricultural subsidies.

Biography

Prof. Boris Boincean is agronomist. After graduating Moscow Agricultural Academy by name of K. A. Timireazev he was recommended for postgraduate studies. He has received his PhD degree in 1982 in the same institution. In 1983 he began to work as the senior research worker at Selectia Research Institute of Field Crops, Balti, Republic of Moldova. Since 1990 Dr. Boris Boincean was nominated as the Head of the Department of Sustainable Farming System, scientific secretary, research director and director in the same institution. He has published more than 400 scientific publications, including six books. In 1988 he has defended his postdoctoral thesis as doctor habilitate of agricultural sciences at Moscow Agricultural Academy by name of K. A. Timireazev.



Earthworm vermicompost to enhance shrimp white shrimp *Litopenaeus vannamei* growth and inhibit AHPND disease in a experimental culture

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In Mexico the annual shrimp aquaculture rate production is growing, and thus demands more feeding inputs and diseases inhibitors. Among organic fertilizers, *Eisenia foetida* solid humus is considered as a great promoter for plankton growth, helping to develop these aquatic organisms. In other hand, the excessive use of antibiotics in aquaculture has affected negatively those species who are farmed (Marshall y Levy, 2011), and also has decreased shrimp growth (Bray et al., 2006) because bacteria are more resistant to antibiotics (Karunasagar et al., 1994). That's why it is important to find environmental alternatives to reduce shrimp diseases. The aim of this study was to evaluate different solid earthworm vermicompost doses as growth promoter and AHPND inhibitor.

Five treatments with three replicates each one were seeded with 120 shrimp larvae in 120L tanks with zero water exchange. The tanks were fertilized with initial doses of: control, 0.00mg•L⁻¹ solid Vermicompost [VC], 275, 550, 825 and 1100 mg/L-1. The doses were, thereafter, reduced by half at day fifteen. The experiment lasted 45 days. Growth, Food Conversion Ratio and survival were measured. After the growth experiment, mortality accumulation was evaluated for each treatment when shrimp were challenged against *Vibrio parahaemolyticus* in three liters bowls with three replicates with 10 shrimp of 1.5g each bowl.

Water quality parameters were not constant during the experiment and had significant difference ($P>0.05$) between oxygen and pH treatments. We found that shrimp reared with the organic fertilizer had the best growth (Figure 1), and the lowest food conversion average.

On the other hand, we have that treatment over 550mg/l of vermicompost were effective against *V. parahaemolyticus*. Less than three shrimps died in this treatments in a period of 72h, contrary to treatments less than 550mg/l who had over 50% of the mortality in the first 18h of the challenge. Control had the highest mortality with 80% of the shrimp dead before the 24h trail.

Some studies suggest that vermicompost is an important food resource for juvenile shrimp (Chakrabarty, 2008). This organic fertilizers improves water quality and enhanced phytoplankton production (Bwala and Omoregie, 2009; Chakrabarty et al. 2009). We find that vermicompost is a real option to shrimp growth and can lower productions costs. It also can enhance shrimp survival and increase shrimp production when is used in the first stages of shrimp when it is more susceptible to diseases, but further investigation must be done to find what bacterium conglomerate in the vermicompost acts as inhibitor to AHPND.



Plumular meristem transformation methods to develop insect resistant transgenic pigeonpea (*Cajanus cajan* L.)

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Pigeonpea production has not been increased markedly in the past few decades, in spite of its large global demand. The most crucial yield constraint of pigeonpea is the devastating Lepidopteran pest *Helicoverpa armigera* which causes severe economic loss every year. Lack of reproducible in vitro transformation method in pigeonpea limits the application of transgenic approaches for *H. armigera* resistance. The present study was undertaken to establish *H. armigera* resistant transgenic pigeonpea through efficient transformation methods. A novel method of transgenic pigeonpea development, named as plumular meristem transformation, was established, where the combination of culture based *Agrobacterium tumefaciens*-infection and culture independent plant establishment, coupled with PCR based plant selection were found to be most preferable method for faster and frequent establishment of transgenic plants. Transformation was also accomplished using cotyledonary node explants, cultured on BAP supplemented modified MS medium followed by plant establishment through micro-shoot grafting on rootstocks. Independent *A. tumefaciens* binary vectors, harboring *cry1Ac* and *cry2Aa* genes, were used to develop transgenic events of pigeonpea. Transgenic events were conformed through molecular analyses in subsequent four generations. The level of Cry-protein expression in single copy transgenic events were 0.14 - 0.17% of total soluble protein. Expressed *Cry1Ac* and *Cry2Aa* proteins in T2 and T3 transgenic pigeonpea exhibited significant weight loss of 2nd - 4th instar larvae of *H. armigera* and ultimately 80-100% mortality in detached leaf bioassay. Immunohistofluorescence localization demonstrated constitutive accumulation of both the Cry-proteins in leaf tissues of transgenic events. The plumular meristem transformation method exhibited more than 70% transformation frequency, reported for the first time in pigeonpea. This study is also the first report of transgenic pigeonpea development, where stable integration, effective expression and biological activity of Cry-proteins were demonstrated in subsequent three generations.

Take Away Notes:

- The described transformation method will contribute to large scale transgenic pigeonpea development for its improvement and satisfy the requirement of routine transformation experiments for T-DNA insertion mutagenesis
- This work will help to learn about analytical approaches to find out best performing transgenic events with desired foreign gene activity
- This research work will be helpful for sustainable agriculture using biotechnology based tools
- The basic understanding of transgenic development strategy in legume will be explained, which will be helpful for teaching and research purposes
- This transformation technique has the potential to solve the problem of transformation related recalcitrant responses in legume as we have extended the same method successfully to other legumes also
- The presently explained transformation techniques is novel one and can be exploited in leguminous plants

Biography

Dr. Dipankar Chakraborti studied Botany at the University of North Bengal, West Bengal, India and graduated as Master of Science in 2000. He then joined the research group of Prof. Sampa Das at the Bose Institute, Kolkata, India. He received his Ph.D. degree in 2008 at Jadavpur University, Kolkata, India. He joined as postdoctoral fellow in a Carl Trygger Foundation project under the supervision of Prof. Catherine Bellini at the Umea Plant Science Centre, Umea, Sweden. He also worked as a visiting researcher at the INRA, Versailles, France under the supervision of Dr. Sylvie Dinant. After two years postdoctoral fellowship, he obtained the position of an Assistant Professor of Biotechnology at the St. Xavier's College, Kolkata, India, during 2009. He joined as an Associate Professor of Genetics at University of Calcutta, India during October, 2019. He published 25 research articles in peer reviewed journals, several book chapters and articles and has an Indian Patent on mannose binding lectin from *Allium sativum* leaves.

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