



4th ICAFS 2020

2020 International Conference on Agricultural and Food Science

4th ICAFS Oct. 28-30, 2020

Istanbul Turkey





ICAFS2020

2020 International Conference on Agricultural and Food Science

Conference Program & Abstract Book

Istanbul, Turkey

(Webinar / Online)

October 28th - 30th, 2020

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1. Welcome Message

Welcome message from Organizing Committee

Dear distinguished participants of 4th International Conference on Agricultural and Food Science,

On behalf of the Organizing Committee, I would like to say welcome to International Conference on Agricultural and Food Science. It is great pleasure for us and we are so happy to host you in this conference.

This annual conference integrates new findings in agricultural and food science. The conference is focused on: 1. Agronomy, Agriculture and Plant Biotechnology; 2. Animal Biotechnology, Veterinary and Livestock Science; 3. Aquiculture, Fishery and Marine Biotechnology; 4. Forestry Science and Wood Research; 5. Food Science; 6. Agriculture Sustainable, Resources & Environment; 7. Related Engineering, Economic & Management, etc. The purpose of this conference is to provide worldwide specialists, scholars, and researchers that are engaged in related field a chance to exchange the latest research results and advances, study the latest technology and establish international friendship.

Our congress, which is planned to be held in Istanbul under normal conditions, is unfortunately held online as a webinar due to the limitations caused by the Covid-19 pandemic. I wish this pandemic to end as soon as possible and that our next congress could be held face to face.

I hope, the 4th International Conference on Agricultural and Food Science will be an intensive conference.

With best regards.

Dr. Bülent Bülbul

Bahri Dağdaş International Agricultural Research Institute,
Konya-Turkey

Dear Friends and Colleagues,

On behalf of the Organizing Committee, it is our great pleasure to welcome you to participate in the 2020 International Conference on Agricultural and Food Science (4th ICAFS, 2020) to be held in Istanbul, Turkey (webinar/ virtual online) on October 28-30, 2020.

It has been designed to provide an innovative and comprehensive overview of agricultural and food science. Various disciplines are contributing to agricultural and food sciences. Merging interdisciplinary is the stew in which creativity and innovation thrive. In this conference, we intended to present and discuss various themes from the aspect of fundamental as well as application parts.

Over the last few months, it's felt as though the world around us has changed massively - so many things are now operating so differently and life, at least for the near future, isn't quite how we expected it to be. This is, of course, due to the ongoing Coronavirus pandemic, under this special situation, our conference has to be held as a virtual conference online.

Through the network, we can keep in contact with each other since many have taken to using video meeting software and apps, a significant amount of people experiencing video conferencing for the very first time. We are working hard to see if and how to make the meeting run virtual online during the difficult time. Hope we can all meet face by face at ICAFS 2021 next year.

Sincerely

ICAFS2020 Organizing Committee

Asia-Pacific Association of Science, Engineering and Technology

October 28, 2020

2. Introduction for Organizers

Asia-Pacific Association of Science, Engineering and Technology

The Asia-Pacific Association of Science, Engineering and Technology (APASET) is a scientific organization. APASET organizes, co-organize and technical support to multidisciplinary international conferences, workshops, summits, conferences and workshops, with a focus in the fields of biology and medicine science.

APASET aims to provide a platform for academic exchange and cooperation opportunities by organizing international workshops and conference with many of the academics and scholars all over the world. For now, APASET has hundreds of members throughout the world, including research scientists, professors, engineers, postdoctoral appointees and doctoral students, etc.

The goals of APASET are to promote the co-operation between the professionals in various fields of science and engineering, and to cultivate an environment for the advance and development of the technology. Our objective includes: Encouraging regional and international communication and collaboration; promoting professional interactions between the scholars; advancing the application of science and engineering techniques from the academics to the industry; facilitating the exchange of information and ideas among the scientists and scholars freely. For potential collaborations to organize a conference, please contact at icafs@apaset.org.

Bahri Dagdas International Agricultural Research Institute

In 1987, livestock activities continued as Livestock Central Research Institute. Winter cereals development studies activities begun at Bahri Dağdaş International Winter Cereal Research Centre. These two institutes; at 10.06.2002 merged under the name of Bahri Dağdaş International Agricultural Research Institute (BDUTAE), is connected to Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Research and Policy continuous its works a major regional research organizations.

It aims to enhance the image of agriculture in the eyes of the public; conduct national and international research projects, including all types of winter cereals.

Grain variety development, grain farming techniques, grain quality stress durability increase and cereal diseases; Research in animal breeding and diseases, animal production systems farmer training and improvement of students' knowledge.

Institute website: <https://arastirma.tarimorman.gov.tr/bahridagdas/Sayfalar/EN/AnaSayfa.aspx>

In Collaboration With

South-Central University for Nationalities, China (SCUN)

Zoological Society of Pakistan (ZSP)

Media Partners



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3. Committee Members

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Conference Secretariat

Guangfu Yan, Asia-Pacific Association of Science, Engineering and Technology, China
Yujing Shen, Asia-Pacific Association of Science, Engineering and Technology, China
Zhe Yang, Asia-Pacific Association of Science, Engineering and Technology, China

4. Conference Program

2020 International Conference on Agricultural and Food Science

4th ICAFS, Istanbul, Turkey (Virtually Online)

October 29-30, 2020

Session 1

Oral Presentation

- | | | |
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| Ilaria Marotti | Licorice sprouts as health-promoting microgreens: antioxidant compounds and in vitro bioactivity of leaf stem and root extracts | |
| | | O1002. |
| Girija Devaki | Microbial consortia for aerobic composting in KAU Smart biobin | |
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| Tarik Benabdelouahab | Spatial monitoring of wheat grain yield based on phenological metrics derived from MODIS/NDVI time series | |

Poster Presentation

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| Ketema Tilahun Zeleke | Impacts of climate change on wheat yield and agronomic adaptation strategies | |
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| Patrice Zemko Ngatsi | Varietal response of cassava genotypes (<i>Manihot esculenta</i> Crantz) infested by scale insect pest <i>Stictococcus vayssierei</i> Richard (Homoptera: Stictococcidae) and biochemical contents | |

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Ken Overturf Genetic improvement of rainbow trout for growth and disease resistance when selected for utilization of a sustainable plant based feed

Session 2

Oral Presentation

O2011.

Carmen Celis Preliminary study of ivermectin residues in bovine livers in the Bogota Savanna

O2012.

Tahereh Mohammadabadi The effect of inclusion of olive pulp on production, quality and microbial counts of milk in the dromedary camels

O2013.

Xiangrong Tian Identification of new triterpenoid saponins from genus Clematis and their insecticidal activity

Poster Presentation

P2013.

Dieudilait Metellus Activity of insecticides on coffee berry borer (*Hypothenemus hampei*) (Coleoptera: curculionidae, scolytinae).

P2014.

BAA Abdel Hamid Overview of the hygiene status of dairy cows in the wilaya of M'Sila (Algeria)

P2015.

Yuan-Yu Lin Effects of dietary supplementation of *Hydrastis canadensis* on laying performance, egg quality, biochemical parameters and cecal microbiota in laying hens

Session 3

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Wei Chean Chuah Physicochemical properties of stingless bee honeys from acacia and agarwood origins

O3017.

Ali Aberoumand Effects of vacuum packaging on proximate and minerals contents of fillet fish *Lethrinus nebulosus* in different freezing time at temperature of -18°C

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P3018.

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Session 4

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Poster Presentation

Sani Mahmud	Accuracy of system models integrant hydraulic pedotransfer functions simulations based on textural variability in Northern Guinea Savannah Ecology, Nigeria.	P4024.
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Session 5

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Peng He	Effects of different nutritional conditions on the growth of <i>Fusarium oxysporum</i> isolated from <i>Medicago sativa</i> root	P5027.

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Muhammad Hamayoon Khan Evaluation of the functional response parameters of the pupal parasitoid, *Dirhinus giffardii* against two fruit fly species, *Bactrocera zonata* and *B. cucurbitae*

P5029.

Roberta Fusco Biochemical evaluation of the *Anacardium occidentale* L. (Cashew Nuts) consumption on oxidative stress: modulation of the Nrf2/HO-1 and NF-kB pathways oxidative stress: modulation of the Nrf2/HO-1 and NF-kB pathways

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Session 6

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Yuedong Mao Preparation and in vitro evaluation of matrine nanoparticles

P6032.

Weishun Cheng Impacts of $MnSO_4$ on grain output, Protein and Mn content of quinoa strains (*Chenopodium quinoa* Willd)

P6033.

Chaobin Yang A review: Achievements and new obstacles in China's food security revealed by grain and meat production

P6034.

Yao Zhang Comparative study on main components and detection methods of pericarpium *citri reticulatae* from different habitats

P6035.

Yang Liu Effect of $CaCl_2$ on the stability and antimicrobial activity of nisin

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Jiuyun Wu Grape planting situation and regional spatial analysis in Xinjiang, China

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Yixue Xia Effects of different Calcium concentrations on the outdoor growth of *Nostoc sphaeroids* Kutz

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Kaiwen Su Effect evaluation of protected areas system construction based on comprehensive index evaluation method

P6039.

Li Qiao The effect of light spectrum on the biological learning of the adult worm

P6040.

Cuixia Li Effects of co-fermentation and sequential malolactic fermentation on antioxidant activities and phenolic components of red-fleshed apple cider

P6041.

Mingshi Liu Identification of Chemical Components in *Pericarpium Citri Reticulatae* by HPLC-MS/MS

5. Abstracts

Oral Presentations

Session 1

O1001

Licorice sprouts as health-promoting microgreens: antioxidant compounds and in vitro bioactivity of leaf, stem and root extracts

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Abstract

One of the latest product innovations in the agri-food sector is micro-greens, a new class of specialty crop, defined as tender immature edible greens produced from the seeds of vegetables or herbs, including wild species. The food value of microgreens is attributable to the bioactive compound content, including vitamins, minerals and antioxidants, with well-known beneficial effects on human health. In addition to vegetable species, numerous aromatic plants and other botanicals can be used for the production of micro-greens. Among these, licorice (*Glycyrrhiza glabra* L.) is an interesting medicinal species representative for the microgreen market, given that recent studies have highlighted how the aerial parts of the plant are rich in bioactive compounds such as flavonoids. In this work, young licorice seedlings were evaluated for the presence of antioxidant compounds (polyphenols and flavonoids) in different plant parts (roots, stems, leaves). Moreover, plant extract bioactivity was assessed by the induction of cell proliferation in intestinal in vitro models. Results showed that the leaves contained the highest polyphenol and flavonoid contents. The most represented phenolic component, responsible for the antioxidant activity of the extracts, is the free fraction. On intestinal cell models, the phytocomplex of stems and roots were the most effective in facilitating cell recovery from an induced inflammatory stress. There is still a need for more in-depth studies on the effects of growing conditions on synthesis of antioxidants in the plant. Results of the present work indicated a potential use for the aerial parts of licorice in the production of microgreens with high nutraceutical value.

Keywords: licorice, microgreens, polyphenols, bioactivity

O1002

Microbial consortia for aerobic composting in KAU Smart biobin

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Abstract

Composting process has always been commonly followed at farm and household levels for thousands of years for the effective recycling of organic matter and nutrients. The utilization of microbial inoculants could be considered for hastening the process of decomposition. In the present investigation, the efficiency of selected consortia for rapid aerobic composting was evaluated in specially designed home composter called 'KAU smart biobin', along with cow dung slurry and uninoculated treatments as positive and negative controls. The consortium of two bacteria and one fungus (*B. subtilis* BaBc-1 + *Trichoderma asperellum* + *Bacillus* sp. BaOu-1), initiated compost formation within 17 days after inoculation, whereas in the uninoculated control, it occurred after 40 days. Volume reduction of biomass was highest (74.81 per cent) after 30 days of inoculation, whereas in the treatment with cowdung slurry, it was significantly lower (64.58 per cent). Similarly, the recovery of compost was also significantly higher (16.73 per cent) in the same treatment with consortial formulation. The compost obtained from the biobin did not cause any phytotoxicity, as revealed by 100 per cent germination of tomato seeds. Moreover, there was no foul smell, oozing out of leachate or maggots present in the biomass. Based on parameters like volume reduction, duration of composting process, yield of compost, microbial population and absence of any phytotoxicity on seed germination, the above consortium was selected as best performing inoculant in for home composting using KAU smart biobin. This study proves that aerobic degradation of kitchen waste, assisted by microbial consortia in home composter called 'KAU Smart biobin' is one of the best ways to manage household biosolid waste.

Key words: KAU Smart biobin, Aerobic composting, Microbial Consortium, *Bacillus*, *Trichoderma*

O1003

Use of molecular markers to compare regeneration routes for developing sugarcane transgenic plants

María Francisca Perera, Josefina Racedo, Silvia Natalia Ovejero, Florencia Budeguer, María Inés Cuenya,
Bjorn Gunnar Welin, Atilio Pedro Castagnaro and Aldo Sergio Noguera

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Abstract

Genetic transformation in sugarcane is a valuable tool that allows overcoming the limitations associated with conventional breeding. This is mainly carried out by bombarding embryogenic callus (Indirect Somatic Embryogenesis, ISE) with genes of interest. However, an alternative technique with several advantages is direct somatic embryogenesis (DSE), which allows faster regeneration, fewer subcultures and less probability of the occurrence of somaclonal variation. In this sense, molecular markers can be used to detect the possible somaclonal variation generated during the genetic transformation process. The objective of the present study was to evaluate and compare the somaclonal variation, through the use of TRAP markers, generated by both regeneration techniques (ISE and DSE). The embryogenic calli and leaf roll discs of TUC 95-10 variety were bombarded using a plasmid containing the *epsps* and *nptII* genes, which confer resistance to glyphosate herbicide and kanamycin, respectively. Stable transformation and integration of both genes were determined by PCR with specific primers and the transgenic events were characterized by functional TRAP markers. The seven transgenic lines obtained by bombardment of calli showed 67% similarity to the parental variety; however, they shared more than 98% similarity among them, while the five lines obtained by bombardment of leaf roll discs showed more than 98% similarity to the parental genotype. This last technique has proven to be a better alternative to the currently applied methodology since the required cultivation time was shortened from 14 to 22 weeks to produce a transformed plant versus 24 to 36 weeks for the conventionally ISE technique. Furthermore, the molecular characterization of the TUC 95-10 transgenic lines confirmed that the genetic changes produced by ISE are greater than the changes induced by DSE. In addition, TRAP markers are a rapid and recommendable first approach to identify prominent transgenic lines (with more than 95% similarity to the parental genotype) before carrying out any other greenhouse tests.

Keywords: direct somatic embryogenesis, indirect somatic embryogenesis, *Saccharum* spp. hybrids, TRAP markers.

O1004

Plant Disease Identification in Wheat using Deep LearningSapna Nigam¹, Rajni Jain², Sudeep Marwaha³, Alka Arora⁴, Vaibhav Kumar Singh⁵¹Scientist (sapna.nigam@icar.gov.in), ICAR-Indian Agricultural Statistics Research Institute, New Delhi²Principal Scientist (rajni.jain@icar.gov.in), ICAR- National Institute of Agricultural Economics and Policy Research, New Delhi^{3,4}Principal Scientist (Sudeep@icar.gov.in, alka.arora@icar.gov.in), ICAR-Indian Agricultural Statistics Research Institute, New Delhi⁵Scientist (vaibhavsingh@iari.res.in), ICAR-Indian Agricultural Research Institute, New Delhi**Abstract**

Deep learning with convolutional neural networks (CNNs) has a huge potential in the classification of various plant diseases. Plant disease has long been one of the major threats to world food security due to reduction in the crop yield and quality. Accurate and precise diagnosis of plant diseases has been a significant challenge. Automated image-based tools are required when a human assessment of plant disease identification is an expensive, inappropriate, or unreliable way. Thus, there is a utmost need to recognize cost-effective automated computational systems and image-based tools for disease detection that would facilitate advancements in agriculture. Authors research proposes a deep learning-based model which is trained using own created dataset containing images of healthy and rust infected leaves of Wheat crop. A CNN based Deep Learning model is used on 2500 images to identify the wheat rust disease in an unseen leaf image. The model serves its objective by classifying images of leaves into diseased category and healthy leaves. In plant science, CNN can be used to understand better the diagnosis process and lead to further efficient use of deep learning for plant disease diagnosis.

Keywords: Artificial Intelligence, CNN, Plant Disease, Wheat Rust, Deep learning.

O1007

Spatial monitoring of wheat grain yield based on phenological metrics derived from MODIS/NDVI time series

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Abstract

Changes in crop yields may have important implications for future food security in Morocco. The productivity of wheat remains low and reaches on average just 25 percent to 60 percent of yields possible in rainfed and irrigated perimeters, respectively. This gap indicates that there is still substantial efforts and engagements of managers, farmers and stakeholders to increase the average yield of crops in rainfed systems in developing regions. This study intends to develop an explicit model based on phenological metrics derived from Moderate-Resolution Imaging Spectroradiometer (MODIS)/NDVI data at a grid size of 250m. The wheat grain yield data covers the 16-years span between 2000 and 2016, and the study region considered is the north western of Morocco, which contributes substantially to the country's agricultural growth. The yield data, which came from ground survey data, was used to establish a model based on spatial phenological parameters based on stepwise multiple regression. The developed model have been compared to the official Moroccan yield statistics. The stability of the proposed model was evaluated using K-fold cross validation (K-fold CV) method. Modelled wheat grain yield explained 62% of its spatial variation, with root-mean-square errors of 0.4 t ha⁻¹. The proposed model based on phenological parameters derived from NDVI time series allows overcoming missing weather, soil and yield data without losing precision and taking full advantage of the spatial resolution offered by satellite products. Such tool will allow managers and policy makers to spatialize and monitor wheat grain yield. It can also be used to define where to focus our efforts by optimizing the choices of crops and varieties in order to reach food security and close the yield gap.

Keywords: Wheat yield, MODIS, Phenological metrics, NDVI time series.

Session 2

O2011

Preliminary study of ivermectin residues in bovine livers in the Bogota Savanna

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Abstract

There are various strategies for the treatment and control of parasitic diseases in bovine production systems. The use of macrocyclic lactones due to their great therapeutic advantages is common in several areas of the world, including Colombia. This study was developed as a preliminary exploration in order to determine the presence of ivermectin residues in bovine livers and correlate them with age and gender. Further, a sample was obtained to analyze possible histopathological changes. A total of 90 livers of randomly selected cattle were sampled in a type II slaughterhouse located in the Bogota Savanna. The samples were analyzed for ivermectin residues using the competitive ELISA technique and a histopathological evaluation was performed using the H&E technique. Only the 22% (20/90) of the analyzed samples presented ivermectin residues. Of the positive individuals, the majority came from Cogua 35 % (7/20), Zipaquirá 30 % (6/20) and Sopo 20 % (4/20). The breeds with residue presence corresponded to Half-Blood 35 % (7/20), Zebu 25 % (5/20), Normande 20 % (4/20) and Jersey x Holstein 15 % (3/20). Eighty-five, 85 % (17/20) of the individuals were older than 1.5 yr. In regard to the gender variable, the majority of animals were males 65 % (13/20). Of the evaluated animals 3 % (3/90) exceeded the maximum residue limit (> 100 ppb). No association was found between the presence of residues and the gender and age variables ($P>0.05$). The majority of histopathological changes were mild or moderate, with alterations in architecture and inflammatory changes standing out. It was found associated with the presence of residue and variables microcirculatory alteration, inflammatory alteration and changes similar to the cell death ($P<0.05$). As a conclusion, the competitive ELISA test used in this study served as a screening method for the detection ivermectin residues in the analyzed samples.

Keywords: Antiparasitic drugs, ELISA, Liver, Macrocyclic lactones, Bovine

O2012

The effect of inclusion of olive pulp on production, quality and microbial counts of milk in the dromedary camels

Tahereh Mohammadabadi

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Abstract

The aim of this study was to investigate the effect of using olive pulp on the production, quality and microbial load of dromedary camel's milk. Twelve lactating camels with average body weight; 450 kg divided into 3 groups. Treatments were included grazing without and with 1.5 and 2.5 kg olive pulp per day for 30 days. The camels had access to forage in the desert and water. Milk production was recorded, and milk composition and microbial load were determined. The result indicated olive pulp enhanced milk production of the camels (6.4, 5.3 and 3.2 liter/day, respectively). Adding of olive pulp increased milk fat percentage (3.8, 3.6 and 3.46 %) ($P<0.05$), but milk lactose, protein and ash were not influenced ($P>0.05$). Using olive pulp in camels decreased microbial load of milk ($P<0.05$). The current study revealed that supplementation of olive pulp up to 2.5 kg/day in dromedary dairy camels' increased milk production and fat percentage and decreased microbial counts of milk. Hence, it is recommended in dromedary camels' diet for improving the production and milk microbial quality.

Keywords: Camel, milk production, olive pulp, microbial load.

O2013.

Identification of new triterpenoid saponins from genus *Clematis* and their insecticidal activity

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Abstract

Background: Discovering biologically active natural products with novel structures from plant resources is an effective way to develop biological pesticides. Tea saponins as a kind of pentacyclic triterpene saponins have been used in the field to control various agricultural pests, such as aphids and leafhoppers of the order Hemiptera, beetles and weevils of the order Coleoptera, and worms and moths of the order Lepidoptera. The secondary metabolites of triterpenoid saponins from genus *Clematis* are rich in structural types, showing their unique chemical diversity and drug development research value. **Method:** Column chromatography and HPLC were used to purify triterpenoid saponins, and NMR and MS spectra were used to identify their chemical structure. *Plutella xylostella* and *Acyrtosiphon pisum* were used as target pest to evaluate the insecticidal activity of triterpenoid saponins from *Clematis*. **Results:** Herein, our progress on the antifeedant, insecticidal and insect growth inhibitory activity of triterpenoid saponins from *Clematis aethusifolia* against *Plutella xylostella* was reported. Our results demonstrated that monodesmosidic saponins with a free carboxyl group at C-28 is an important functional group for their antifeedant and insecticidal activity. Furthermore, the isolated triterpenoid saponins showed insect growth inhibitory activity against *P. xylostella* through reduction of larval growth and percentage of pupation, associated with prolongation of larval and pupal stages. Besides, two new triterpenoid saponins with structurally similar with dammarane-type ginsenosides from *Clematis lasiandra*, which were firstly discovered from *Clematis* were studied. Their insecticidal activity with oral toxicity and repellent activity against aphid *Acyrtosiphon pisum* were studied. **Conclusions:** Our results provide evidence that triterpenoid saponins from *C. aethusifolia* and *C. lasiandra*, particularly monodesmosidic saponins with a free carboxyl group at C-28 have the potential to be developed as pesticides to control *P. xylostella* and *A. pisum*.

Keywords: Triterpenoid saponins; insecticidal activity; *Clematis*; *Plutella xylostella*; *Acyrtosiphon pisum*

Session 3

O3016

Physicochemical Properties of Stingless Bee Honeys from Acacia and Agarwood Origins

Wei Chean Chuah¹, Mohd Rosni Sulaiman¹, Ai Ling Ho¹, and Fook Yee Chye*¹

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Abstract

Stingless bee honeys are distinctive natural products with exotic flavour, high nutrients and therapeutic values. However, their physicochemical properties can be varied from one botanical source to the another and these properties are typically important for quality indication. Thus, the present study aimed to evaluate the physicochemical properties of stingless bee honeys produced by *Heterotrigona itama* from two different predominant botanical origins namely, acacia (*Acacia mangium*) and agarwood (*Aquilaria malaccensis*). The pH (3.04 and 3.45), free acidity (291.39 and 84.72 mEq/kg), moisture (31.7 and 30.0 % w/w), and electrical conductivity (0.643 and 0.450 mS/cm) of acacia and agarwood honeys were measured, respectively. However, only agarwood honey showed the positive diastase activity (1.63 DN), while hydroxymethylfurfural was only found in the acacia honey (0.63 mg/kg). For sugar composition, both acacia and agarwood honeys contained fructose (18.5 and 22.3 g/100g), glucose (21.6 and 18.9 g/100g), and maltose (20.2 and 27.9 g/100g), respectively, but none of them contain sucrose. In comparison to the standards, the physicochemical properties of both collected stingless bee honeys were fulfilled the parameters in the Malaysia Standards 2683:2017 for stingless bee honey.

Keywords: Stingless bee honey, *Heterotrigona itama*, physicochemical, botanical origins

O3017

Effects of Vacuum Packaging On Proximate and Minerals Contents of Fillet Fish *Lethrinus Nebulosus* in Different Freezing Time at Temperature of -18°C

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Abstract

Background & Objectives: Aim of this study was to investigate the effect of vacuum packaging on proximate composition and mineral content in fish fillet stored at -18 ° C for 0, 20 and 40 days. **Method(s) and Results:** To determine the proximate composition and elements, standard and AOAC (2005), methods were used. Results showed the lowest zinc content in vacuum condition was found after 20 days ($1.95 \text{ ppm} \pm 0.27$), but the highest value was found after 40 days ($2.69 \text{ ppm} \pm 0.12$) of frozen storage. The amount of sodium also increased during this period where the amount reached to ($1318 \text{ ppm} \pm 6.00$) at end of the storage period. Potassium was found to be the most abundant mineral among the macro elements in fish tissue. Its amount in both packaging conditions did not show any significant difference, but after 20 days of experiment, amount of potassium in vacuum stored sample was higher than control ($3477 \text{ ppm} \pm 49.50$). Amount of calcium in fish tissue was also higher than other samples at the end of the frozen storage period ($398 \text{ ppm} \pm 1.52$). The protein percentage of fish fillets increased during the experiment period, except for day 0 ($\%19.31 \pm 0.04$), but frozen samples under vacuum at 20 day ($\%19.52 \pm 0.05$) and 40 day ($\%19.73 \pm 0.08$), found more than control sample, however, there was no significant difference between them ($p > 0.05$). The percentage of ash in fish fillets, were decreased during freezing, however, in all periods, ash percentage in under vacuum samples was more than the control sample, but did not differ significantly. **Conclusions:** It can be concluded that vacuum packaging can significantly influence mineral content of fish fillets, and their shelf life can be enhanced through frozen storage.

Key words: Fish *Lethrinus nebulosus*; Vacuum packaging; Freezing; Proximate composition; Minerals.

Session 4

O4022

Some Practical Issues in the Application of Short Food Supply Chains in Bulgaria

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Abstract

In the conditions of EU membership, in the process of programming the measures and activities for rural development for the period 2014-2020 it becomes clear that opportunities are open for the development of a new approach for Bulgaria to offer its own products from farmers, such as this creates a new economic mechanism that is well known to most EU Member States. This new approach works in practice in economic turnover through so-called 'short food supply chains'. The article was written in response to the question of the existence of short food supply chains (SFSC) in Bulgaria and their contribution to rural development. The authors use a variety of research methods, including primary data collection, case studies, interviews with farm managers, and desktop research. In summary, Bulgaria must make full and diverse use of the financial resources intended for absorption, namely to support and develop small farms, to encourage them to be active participants in the food trade, to ensure the quality of these innovative marketing strategies for direct supply of products and last but not least for increasing consumer confidence in Bulgarian products and manufacturers. The conclusions of the study refer to the future policies to be followed in this regard, which will ultimately lead to improved sustainability of rural areas, taking into account regional differences between actors in the supply chain, different types and organizational forms of SFSC, as well as consumer food requirements.

Keywords: Short Food Supply Chains (SFSCs), small farms and producers, rural areas, Bulgaria

O4023

Innovative approach for risk analysis related to the loss in wheat production value in a semi-arid climate

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Abstract

Wheat production is of major importance for population, given its significant contribution to national food security. However, this sector does not fully meet the population's needs and the wheat producers denounce reduced margins. In Morocco, price risk has increased for wheat producers due to the commodity prices volatility on the international market. In addition, with wheat yields uncertainty in the context of climate change, the uncertainty of farmers' incomes is felt. The objective of this research is therefore to identify, locate and assess the risk related to the loss in wheat production value. In this regards, this research constitutes a contribution to reduce the risk of wheat sales revenue through an innovative approach that takes into account the phenological stage and growth phase shifts in time and space, as well as the technological difference between different production units. To achieve this study, we considered intensity and probability of risk linked to the variation in agricultural incomes, based on trends in yield levels and wheat prices over sixteen crop years (2000/2001 to 2016/2017). The results identify four categories of agricultural areas according to their risk level of loss in wheat production value. The last one, accounting for 20.13% of total agricultural area, was the most affected by the loss in wheat production value. Overall, the results could constitute the basis for helping policy makers and wheat producers to prevent and reduce unacceptable losses in production value. This can be accomplished through the implementation of preventive or protective measures aimed at reaching a maximum security level in agricultural areas at risk.

Keywords: Risk; production value; wheat production; yields estimation; spatial scale; Morocco.

Poster Presentations

Session 1

P1005

Pollination Mechanism and Fruit Set of *Passiflora edulis* Sims (Purple Passion Fruit) in East Malaysia

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Abstract

Passiflora edulis Sims, also known as passion fruit, is an economically essential species for fresh or processed products. Pollination mechanism is a crucial factor in passion fruit, ensuring good fruit production. However, there is a gap that exists in a comprehensive knowledge of its pollination system where contradicts arguments reported by researchers from various geographical locations. Passion fruit is considered to be self-incompatible in its native and other parts of the world where it cannot accept its own pollen to pollinate and rely on pollinators. However, two authors claimed that this species exhibited self-compatible and produced fruits successfully. Similarly, observation at East-Malaysia, there were not many pollinators visited the farm yet, good fruit sets were recorded. Therefore, this study aims to investigate the mechanism of self-pollination and cross-pollination in *P. edulis* to understand its reproductive system. A total of 20 plants were randomly selected and subjected to five pollination treatments. Passionflowers were blooming all year round at 12.30-3.00 pm. The flower exhibited autonomous self-pollination where anther and stigma exhibited rhythmic movement until they touched each another to get pollinated without pollinators. Results show that passion fruits plants grown at East-Malaysia were able to perform autonomous self-pollination, became self-compatible, and successfully produced good fruit sets. Higher fruits set (81%) was yielded in T3 (assisted pollination-bagged) followed by geitonogamy (T4) 73%, where both treatments used their pollens. The T1 (self-pollination-bagged) was also yielded 54% of fruit set confirmed this species accepting its pollen and successfully produced fruits; besides, they performed cross-pollination (T5) resulted in 66% of fruits sets. However, there are no significant differences ($p>0.05$) in physicochemical properties between the treatments. The adaptation of the *P. edulis* plant from self-incompatible to self-compatible gives assurance for plants to produce good fruit sets when adapting to non-native environments with absence or lack of pollinators.

Keywords: Fruit production, *Passiflora*, pollination, purple passion fruit, self-compatibility

P1006

**Profiling the Volatile Metabolome in Pear Leaves with Different Resistance to the Pear Psylla
Cacopsylla bidens (Šulc) and Characterization of Phenolic Acid Decarboxylase**

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Pear Psylla is the most important pest of pear in all pear-growing regions, in Asian, European, and the USA. Pear psylla damages pears in several ways: High-density populations of these insects can cause premature leaf and fruit drop, diminish plant growth, and reduce fruit size. In addition, their honeydew promotes sooty mold on leaves and russetting on fruit. Pear psyllas are also considered vectors of pear pathogens such as *Candidatus Phytoplasma pyri* causing pear decline that can lead to loss of crop and tree vigor, and sometimes loss of trees. Psylla control is a major obstacle to efficient Integrated Pest Management. Recently we have identified two naturally resistance pear accessions (Py.760-261 and Py.701-202) in the Newe Ya'ar live collection. GC-MS volatile metabolic profiling identified several volatile compounds common in these accessions but lacking, or much less common, in a sensitive accession, the commercial Spadona variety. Among these volatiles were styrene and its derivatives. When the resistant accessions were used as inter-stock, the volatile compounds appear in commercial Spadona scion leaves and it showed reduced susceptibility to pear psylla. Laboratory experiments and applications of some of these volatile compounds were very effective against psylla eggs, nymphs and adults. The genes and enzymes involved in the specific reactions that lead to the biosynthesis of styrene in plant are unknown. We have identified a phenolic acid decarboxylase that catalyzes the formation of *p*-hydroxystyrene, which occurs as a styrene analog in resistant pear genotypes. The His-tagged and affinity chromatography purified *E. coli*-expressed pear PyPAD1 protein could decarboxylate *p*-coumaric acid, and ferulic acid to *p*-hydroxystyrene and 3-methoxy-4-hydroxystyrene. In addition, PyPAD1 had the highest activity towards *p*-coumaric acid. Expression analysis of the *PyPAD* gene revealed that its expressed as expected, i.e. high when styrene levels, and psylla resistance were high.

P1008

Impacts of climate change on wheat yield and agronomic adaptation strategies

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Abstract

With around 49% of the total grains industry tonnage, wheat is the second valuable agricultural commodity in Australia, after beef. Rising air temperature and change in rainfall pattern due to climate change are expected to have impact on agricultural production. In this study, the impact of climate change on wheat production in south-eastern Australia is investigated using a bio-physical model APSIM and agronomic adaptation strategies evaluated. For six major wheat producing locations, daily weather data down-scaled from a composite of global circulation models for different projection periods (2030, 2050, 2070 with 1971-2000 as baseline period) and two carbon emission scenarios (RCP4.5 and RCP8.5) were used. Two spring wheat cultivars, an early flowering/maturing cultivar livingston and a late flowering/maturing cultivar sunbrook were used under six weekly sowing times. Under the intermediate emission scenario RCP4.5, the winter crop growing season rainfall would decrease by 9%, 15%, and 19% in 2030, 2050, and 2070, respectively. The air temperature during this period would increase by 0.7°C, 1.2 °C and 1.4 °C, respectively. In 2030, DTM would decrease by 6 days at the low rainfall locations and by 7 days in the high rainfall locations. In 2050, at low rainfall locations, the DTM for the RCP4.5 would decrease by 10 days while the decrease is 12 days under the RCP8.5; at high rainfall locations, these values would be 12 and 14 days. In 2070, these values would be 13 days, 17 days, 14 days and 20 days, respectively. The days to flowering (DTF) would decrease by 6, 9, and 11 days in 2030, 2050, and 2070, respectively. In 2030, wheat yield would decrease by 9% under both RCP4.5 and RCP8.5. In 2050, the yield decrease would be 15% and 18%, under RCP4.5 and RCP8.5. In 2070, the yield decrease would be 19% and 27%, under RCP4.5 and RCP8.5. Generally, the yield reduction would be much higher in low-rainfall environments compared to the high-rainfall environments and short-season cultivars would be suitable for the low-rainfall environments (Hillston and Jerilderie) and long-season cultivars for the high-rainfall environments (Tarcutta and Temora). In 2050 under RCP4.5 scenario: at Hillston, a low rainfall location, the yield of livingston and sunbrook would decrease by 11% and 31%, respectively; at Tarcutta, a high rainfall location, these values would be a decrease by 9% and an increase by 1%, respectively. Generally, sowing time would have significant effect on the yield of the short-season variety in the low-rainfall locations. At high-rainfall locations, it would have significant effect on both varieties. At Hillston, the yield reduction of livingston is 14% for early sowing and 23% for late sowing. At Tarcutta, the yield reduction of livingston is 3% for early sowing and 15% for late sowing; for sunbrook these values are 1% and 2%, respectively. Generally, the future climate would have significant impact on wheat yield in the region and change in agronomic practices can mitigate the impact of climate change on wheat yield.

Keywords: climate change; adaptation; wheat; Australia; APSIM

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P1009

Varietal response of cassava genotypes (*Manihot esculenta* Crantz) infested by scale insect pest *Stictococcus vayssierei* Richard (Hemiptera: Stictococcidae) and biochemical contents

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Abstract

Background: Cassava (*Manihot esculenta* Crantz) grown for its starchy roots, which ensure food security, is heavily attacked by the African root and tuber scale (ARTS) *Stictococcus vayssierei* in Central Africa. Several control strategies have already been used. Genetic control through varietal selection and production of certain secondary metabolites is a promising approach. A comparative study was carried out on six cassava varieties (two local and four improved) to determine the concentrations of certain biochemical markers in response to *S. vayssierei*. **Methods:** The completely randomized Fisher block design with four replications was used to screen the varieties in field. Biochemical markers were also determined in laboratory. **Results:** As a result, the improved Excel variety recorded the highest average number of scale insects per plant with 105.12 ARTS/P. A high activity of catalase (CAT), phenylalanine ammonia-lyase (PAL) and total cyanide (HCN) in the tuberous cortex of the roots was observed in the improved varieties TMS 96/0023 and TMS 92/0057. The local variety Douma has a high content of total phenols ($44.87 \pm 1.15 \mu\text{g/g}$), flavonoids ($34.75 \pm 1.66 \mu\text{g/g}$) in the pith and has highest yield ($23.8 \pm 2.9 \text{ t ha}^{-1}$). **Conclusions:** The production of secondary metabolites depends on the variety and the level of ARTS infestation. Varieties TMS 96/0023, TMS 92/0057 and Douma showed a level of tolerance to ARTS attacks and a good response to ARTS stress compared to the improved Excel variety.

Keywords: *Manihot esculenta*, scale insect, enzyme activity, secondary metabolites, yield

P1010

Genetic improvement of rainbow trout for growth and disease resistance when selected for utilization of a sustainable plant based feed

Ken Overturf

Even though fish meal and fish oil have proven to be ideal protein and oil sources for aquaculture, as production continues to grow the paucity of these fish derived products makes them less than ideal as protein and oil sources in aquaculture feeds. Through genetic selection we have generated a strain of rainbow trout that grows well on an all plant-based diet containing high levels of soy protein. Utilizing our unique strain of selected rainbow trout, we have been able to distinguish differences in the physiology of non-selected trout versus selected trout when fed soy-based plant feeds with and without fish oil. Most discernible is the development of intestinal enteritis in non-selected fish reared on these high soy feeds. Evaluation of transcriptomic, proteomic, histologic, and microbiota data generated from dietary comparative studies between selected and non-selected strains reveals distinct changes related to nutrient utilization and metabolism. These changes are also reflective in microbiota colonization throughout the entire intestine. Correlative changes in gene and protein expression reveal some of the underlying regulation related to the phenotypic changes.

Session 2

P2013

Activity of insecticides on coffee berry borer (*Hypothenemus hampei*) (Coleoptera: curculionidae, scolytinae).

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Abstract:

The objective of this work was to evaluate the topical, residual and agronomic effects of the insecticides with design completely randomized and four replicates were used in the trials. In the laboratory, a direct spray was sprayed on the insect (topical effect) and applied to the fruits of the coffee (residual contamination). In both experiments, each plot consisted of a Petri dish lined with filter paper, 10 fruits in the green stage and 10 adult females of the berry borer (BB). Two field experiments were carried out at Campus Glória Experimental Farm. The number of perforated fruits, dead females, number of eggs and larvae were evaluated in laboratory and field experiments. The second field experiment had as objective to evaluate the effectiveness in controlling the natural population of BB. Two applications were performed with a 30-day interval (motorized turbocharger). In the laboratory, all insecticides provided mortality higher than 80% in topical application and greater than 73% by residual contamination, except the insecticide Polo 500 SC (55%). In the field experiment with artificial infestation, all the insecticides differed from the control, maintaining residual control until 30 days after application. The insecticides Voliam Targo, Lorsban 480 BR, Curbix 200 SC, Sperto, Polytrin 400/40 CE and Verismo presented the best control results, being indicated for use in the management of the BB of coffee in the world.

Keywords: *Coffea arabica*, IPM, chemical control.

P2014

Overview of the hygiene status of dairy cows in the wilaya of M'Sila (Algeria)

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Abstract

Our work aimed at appreciating the cleanliness of dairy cows in the wilaya of M'Sila (Algeria), based on the hygienic state of the udders, sides, hocks and thighs by the use of notation of the anatomical regions concerned and the study of impact factors. For this aim, a survey was conducted within ten (10) farms and follow-up of 324 dairy cows during a period of three months. The results found showed that more than 91% of dairy cows have clean udders (8.33% A score) and (82.71% B score). Hocks, thighs and flanks considered dirty, with respectively 41.04%; 33.94% and 33.32% of scores (C + D). The proportion of clean shanks is zero in the farms visited with 41% “dirty to very dirty”, the sides and thighs are considered “dirty” with 33.32% and 33.94%, respectively (scores C and D). The type of livestock building and the frequency of changing the litter are very significantly ($p < 0.000$) influence the cleanliness of dairy cows, namely udders, hocks, sides and thighs, the frequency of cleaning animals also has a very significant influence ($p < 0.004$) all parts of the cow's body, except the hocks which are not influenced. The type of soil, the exercise area and the nature of the litter do not influence the cleanliness of the udders. The cleanliness of dairy cows is an asset for certifying animal welfare and ensuring healthy products.

Keywords: Algeria, cleanliness, dairy cows, udder, score.

P2015

Effects of dietary supplementation of *Hydrastis canadensis* on laying performance, egg quality, biochemical parameters and cecal microbiota in laying hens

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Abstract

This study investigated the effects of *Hydrastis canadensis* on the laying performance and fecal microbial community of laying hens. Twenty-four Longman laying hens were reared from 40 weeks of age to 48 weeks of age and randomly allotted to 4 dietary treatments (6 birds/pen). The dietary treatments comprised a basal diet with no treatment as control, a basal diet plus 0.6% root of *Hydrastis canadensis* (R), the basal diet plus 0.6% leaf of *Hydrastis canadensis* (L) and the basal diet plus 0.3% leaf and 0.3% root of *Hydrastis canadensis* (LR). The results indicated that albumen height in LR group to be significantly greater than that of the control group. The diet supplemented with *Hydrastis canadensis* had no significant effects on egg production rate, egg weight, eggshell strength, eggshell thickness, Haugh unit and yolk height during the whole experimental phases. However, principal coordinate analysis, comparative heat map analysis and cluster Dendrogram analysis showed distinct clusters between the groups treated with *Hydrastis canadensis*. For blood biochemical parameters, the serum cholesterol was significant lower in all *Hydrastis canadensis* treated groups compared to the control group. Relative to control, serum low-density lipoprotein was lower by supplemented with leaf of *Hydrastis canadensis*. The abundance of the phylum Fusobacteria and Kiritimatiellaeota were increased ($P < 0.05$) in laying hens fed with 0.6% *Hydrastis canadensis* leaf, whereas the abundance of the phyla Firmicutes in cecum feces decreased in response to treatment with *Hydrastis canadensis* root and leaf. The relative abundance of the *Fusobacterium* genus was higher in *Hydrastis canadensis* leaf and root group compared to the control. On the contrary, we found different trend in the Synergistes genus. The results demonstrate that *Hydrastis canadensis* can improve the egg albumen height and modulate cecum fecal microflora composition of laying hens.

Key words: Gut health, *Hydrastis canadensis*, microbial community, laying hens.

Session 3

P3018

Co-culture strategy of *Lactobacillus kefiranofaciens* HL1 for developing functional fermented milk

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Abstract

In addition to containing abundant nutrients and functional ingredients, fermented milk is considered an excellent vector for the delivery of adjunct probiotics with health benefits. However, it is generally difficult to utilize certain probiotics for milk fermentation, due to their lack of metabolic activity and poor viability during manufacture or storage. Therefore, it is necessary to take approaches to enhance probiotic applicability in fermentation and thereby develop the desired products for consumers. Our previous studies indicated that *Lactobacillus kefiranofaciens* HL1, which is isolated from kefir grain, exhibited great antioxidant activities and anti-aging effects. All of these indicating that strain HL1 implied the potential as probiotics. Thus, the purpose of this study was to apply co-culture strategy in making of novel probiotic fermented milk that rich in *L. kefiranofaciens* HL1. Each of four selected starter cultures was co-cultured with strain HL1 in different medium to evaluate their effects on microbial activity and availability of milk fermentation. The results of colony size test on MRS agar, microbial viability and acidification performance in MRS broth as well as skim milk suggested that *Lactococcus lactis* subsp. *cremoris* APL15 was suitable for co-culturing. This co-culture combination showed remarkably improved fermentation ability and no negative impact on viability of strain HL1 in the later fermentation kinetics experiment. Moreover, physicochemical properties of final products, such as titratable acidity and syneresis, were slightly enhanced while there was no quality deterioration in textural and rheological properties compared to starter cultures and control group. In conclusion, we developed a novel fermented milk product through co-culturing strain HL1 with *Lc. lactis* subsp. *cremoris* APL15 which fulfilled the requirements of good quality and sufficient probiotics.

Keywords: *L. kefiranofaciens*; Probiotics; Co-culture; Fermented milk

P3019

Evaluation of Nutritional, Phytochemicals and Functional Properties of Flour Blends Produced From Unripe Plantain, Soybean and Ginger

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This study was conducted to evaluate the nutritive value, phytochemicals and functional properties of flour blends from unripe plantain, soybean and ginger. Unripe plantain and ginger roots were bought from Jattu market in Auchi, Edo State, Nigeria. Defatted soy bean flour (Variety TGX 1448-2E) and other reagents were purchased from Benin City, Edo State, Nigeria. Fresh unripe plantain was peeled, and dried in an oven at 60°C for 48 hours. Dried sample was ground into powder (Plantain flour). Soybean seeds were cleaned and sorted manually to remove dirt such as leaves and stones. The cleaned soybean seeds were coarsely milled to separate the coat from the cotyledon. The dehulled seeds were milled to fine soybean flour using an attrition mill. The fine soybean flour was then defatted using cold extraction with n-hexane. The defatted flour was air-dried and the clumps broken into fine flour, then sieved through a mesh screen. Fresh samples of unripe plantain, soybean and ginger were dried and milled to produce five flour blends i.e A=100% unripe plantain, B=80% unripe plantain, 14% soybean, 6% ginger, C=70% unripe plantain, 26% soybean, 4% ginger, D= 60% unripe plantain, 38% soybean, 2% ginger, E= 50% unripe plantain, 50% soybean. Laboratory analyses of functional properties, phytochemicals and chemical proximate were determined according to standard procedures. Data generated were subjected to analysis of variance. The results showed that there were significant differences ($P<0.05$) among the samples. Sample A showed higher carbohydrate content (84.21%), while the other flour blends had lower values with sample B (75.15%), C (68.71%), D (60.57%) and E (57.40%) in decreasing order. The protein content observed in the samples were; sample E (23.91%), D (22.53%), C (15.54%), B (11.81%) and sample A was the least (5.25%). The mineral analysis showed that flour blends B, C, D and E had higher values for all minerals determined except for sodium. The highest alkaloid content (6.43%) was observed in blend A and was followed by B (6.23%), C (5.99%), D (5.75%), and E (4.84mg/kg) in that decreasing order. Blends B and C had the same flavonoid content (0.42mg/kg) which was higher than the other blends. The lowest flavonoid content (0.11mg/kg) was observed in blend A; this was followed by E (0.31mg/kg) and D (0.35mg/kg). Blend A (0.16) had the lowest saponin content and was followed by B (2.39mg/kg), C (3.99mg/kg), D (4.22mg/kg), and E (6.33mg/kg) in increasing order. The phytochemical observed in these flour blends was too low to cause any deleterious effects.

KEY WORDS: Processing, Formulation, Phytochemical, Minerals, Ginger

P3020

Enterotoxin genes and antimicrobial resistance in *Staphylococcus aureus* isolated from food products in Algeria

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Abstract

The aim of this study was to characterize *S. aureus* isolates of food origin (dairy and meat products, pastries, and sandwiches) determining the carriage in enterotoxin genes and the antimicrobial resistance pheno/genotypes. For this, 300 samples were collected and submitted for the isolation of *S. aureus* strains. The presence of enterotoxin genes was investigated by multiplex-PCRs. Antibiotic susceptibility of isolates was determined by disc diffusion method and molecular characterization of methicillin-resistant *S. aureus* was carried out by *spa* and MLST. Overall, 51 out of 300 samples (17%) were contaminated with *S. aureus*, and 104 isolates were recovered. Sixty-five of these isolates (62.5%) harbored one or more genes encoding for staphylococcal enterotoxins, being *seg* and *sei* the most observed genes. Most of isolates showed resistance for penicillin (95.19%) and 5 isolates were methicillin-resistant (MRSA) harbouring the *mecA* gene. All MRSA isolates belonged to the sequence-type ST5 and to two different *spa*-types (t450 and t688); the MRSA-t450 isolate carried the *scn* gene (specific marker of the immune evasion cluster system), but the four MRSA-t688 isolates were *scn*-negative. The MRSA isolates carried enterotoxin genes but were negative for the genes of the Panton Valentine leukocidine (*lukF/S-PV*). The presence of enterotoxigenic *S. aureus* isolates, including MRSA, in food samples can represent a risk for public health. For this, the application of good manufacturing practices and hazard analysis and critical control point (HACCP) systems are crucial for ensuring the microbial safety and quality of food products.

Key words : food products, *S. aureus*, enterotoxin genes, methicillin-resistant *S. aureus*, antimicrobial sensitivity.

P3021

The flavor chemistry of pork broth: A review

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Abstract

Pork is widely consumed in the world. The unique and attractive flavor is one of the major drivers of consumer liking for pork. While the flavor of pork products varies heavily depending on the processing and cooking method, pork broth is very popular in East Asian countries and could serve as a perfect model for studying the flavor chemistry of pork. While quite a number of studies have been carried out on this topic, only a few meet the basic criteria of modern flavor chemistry approaches. By reviewing these publications, 12 volatile compounds, including 4 sulfur containing compounds, 4 aldehydes, 1 alcohol, 1 ester, 1 lactone, and 1 carboxylic acid, were selected as the major aroma active components in pork broth. While the taste of pork broth mainly comes from the basic tastants such as amino acids, organic acids, inorganic minerals, and nucleotides, the role of taste modifiers in pork broth has yet to be investigated. More research is needed to further clarify the flavor chemistry of pork broth.

Keywords: flavor, pork broth, taste, solvent assisted flavor evaporation (SAFE), aroma extraction dilatation analysis (AEDA).

Session 4

P4024

Accuracy of System Models integrant Hydraulic Pedotransfer Functions simulations based on Textural variability in Northern Guinea Savannah Ecology, Nigeria.

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Abstract

Reliance on Crop Simulation Model estimations of soil moisture is rising with researchers' consistent inquisition into system modeling. An investigation was carried out in the Northern Guinea Savannah (NGS) of Nigeria with the aim of understanding the impact of texture on the validity and accuracy of such estimations, and comparing some selected models performances on the textures. Hydraulic models of the Decision Support System for Agrotechnology Transfer (DSSAT), Cropping Systems Simulation Model (CropSyst) and Soil Water Assessment Tool (SOILWAT) were evaluated and degree of fitness between observed and simulated values were evaluated. DSSAT integrated hydraulic model was found to be the most accurate in estimating Plant Available Water Content (PAWC) than matric potentials moisture through signified preeminence over the other models in the order; Clay Loam (CL) with a good accuracy ($R^2 = 0.986$, RMSE = 2.3 and $d = 0.690$). Loamy Sand (LS) with $R^2 = 0.926$, RMSE = 3.2 and $d = 0.743$. Prediction in Loam (L) was also good with $R^2 = 0.721$, RMSE = 1.3 and $d = 0.681$. Fair accuracy was obtained in Sandy Loam (SL) with $R^2 = 0.337$, RMSE = 2.8 and $d = 0.665$. The exception was Sandy Clay Loam (SCL) where SOILWAT model made the single valid estimation ($R^2 = 0.306$, RMSE = 3.7 and $d = 1.51$) among the models. Although SOILWAT integrated hydraulic model was found to be the only valid PAWC estimator in SCL and simulate PAWC fairly well in L texture ($R^2 = 0.328$, RMSE = 1.8 and $d = 0.687$), it was relatively more accurate at matric potentials moisture estimation especially at Drained Upper Limit (DUL) and Drained Lower Limit (DLL). CropSyst's hydraulic model estimated PAWC significantly only in CL texture with $R^2 = 0.736$, RMSE = 3.3 and $d = 0.487$, but was fine in matric potentials moisture estimations especially moisture at Drained Upper Limit (DUL). DSSAT's integrated hydraulic model was better than both CropSyst's and SOILWAT's hydraulic models for PAWC moisture simulations in all the textures except the SCL where SOILWAT's excelled. CropSyst's and SOILWAT's hydraulic models were relatively better in matric potential moisture estimations than PAWC across the textures of the NGS. The findings led to recommending the use of DSSAT for PAWC modeling in all but SCL texture where the only suitable hydraulic model was that of SOILWAT.

Key words: Models, Pedotransfer Functions, Simulation, Soil Moisture, Textures

P4025

Livelihood diversity strategy and potential agricultural environmental risk assessment of farmers in scenic spots

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Abstract

By investigating the land use transformation strategies of farmers in scenic area, this paper explores the basic ways of farmers' livelihood transformation. Based on the background of tourism development in Mount Tai scenic area in China, this paper focuses on the impact of tourism on farmers. Through the participatory rural appraisal (PRA), combined with systematic research and analysis, our study obtained 357 groups of survey data through field survey. On the basis of combining with the production mode of farmers, farmers were divided into five basic types: traditional agricultural type (TA), sightseeing agriculture type (SA), agricultural part-time type (AP), non-agricultural part-time type (NAP) and non-agricultural type (NA). Using the non-parameter data envelopment analysis (DEA) common frontier model, our study incorporated the environmental risk in the production process, investigated the impact of farmers' agricultural production behavior on tourism development, and calculated the technical efficiency of environmental production of different planting types under the common frontier and group frontier of different groups of farmers. At the same time, the technology gap ratio (TGR) is used to analyze the production technology gap among farmers with different livelihood strategies. The results showed that: the overall technical efficiency of farmers in traditional agricultural production showed differences, among which garden planting environmental benefits were the highest; under the common frontier, the technical efficiency level of different groups of grain growers from high to low was as follows: SA > AP > NAP > TA. Under the group frontier, the technical efficiency values of the four groups were higher than those under the common frontier, and the efficiency values under the group frontier were overestimated. There was a significant difference in the production technology of Large Grain Growers among the four groups with different livelihood patterns. This study shows that the agricultural production behavior under the background of rural tourism has different impacts. There is a certain correlation between the agricultural production process and the livelihood capital of farmers, which is directly related to the degree of dependence on the environment. The study provides a new research idea and method system for the transformation of agricultural development and regional sustainability.

Key Words: livelihood diversity, agricultural environmental risk, data envelopment analysis

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Session 5

P5026

The effect of pretreatment and temperature in the preparation of non-oil coated noodle on dried noodle's quality

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Abstract

The support towards gluten-free food in health developing conscious countries such as Malaysia has been increasingly paid attention to more demand for rice noodle throughout the world. Unfortunately, rice noodle was usually prepared in high volume of oil. In this study, the effect of pre-treatment which was to represent the non-oil coated noodle on dried noodle's quality was investigated. The non-oil coated noodle was obtained by subjecting the rice noodle to pre-treatment (soaking in distilled water for 5 minutes and rinsed immediately for 2 minutes). The non-oil soaked noodle and original noodle were then subjected to hot air drying at the temperatures of 30, 60, and 90 °C, heat pump drying at 38 °C and 51 °C, and freeze drying at -10 °C and -40 °C. The texture analysis, colour analysis and starch gelatinization of the dried noodle was determined. Results revealed there were significant differences ($P < 0.05\%$) in texture, colour and starch gelatinization in non-oil coated noodle compared to original noodle subjected to different drying procedures. Furthermore, the texture, colour and starch gelatinization recorded significant difference ($P < 0.05\%$) in freeze drying compared to hot air drying and heat pump drying. The obtained results indicated that the developed dried noodle prepared through pre-treatment and different drying temperature can compare favourably with conventional noodle.

Keywords: hot air drying; heat pump drying; rice noodle; quality analysis; pretreatment.

P5027

Effects of different nutritional conditions on the growth of *Fusarium oxysporum* isolated from *Medicago sativa* root

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Abstract: Diseased plants with typical symptoms of *Medicago sativa* root rot were collected for pathogen isolation and purification. The pathogen of alfalfa root rot was identified as *Fusarium oxysporum* by morphology and rDNA-ITS sequence analysis. The aim was to use 9 microbial medium(CA, PSA, CMA, PCA, DMA, WHDA, WA, PDA, V8) to investigate the growth of *F. oxysporum* under different nutrient conditions, and the cross method was used to determine the growth of *F. oxysporum* at intervals of 24 hours for 7 days. Taking colony diameter as experimental measurement index, the morphological characteristics were observed and the colony growth under different treatments was compared. The results showed that the slowest growth rate of *F. oxysporum* on WA medium was $1.18\text{cm}\cdot\text{d}^{-1}$ and the highest growth rate on PSA medium was $1.41\text{cm}\cdot\text{d}^{-1}$ at the same time. The diameter of colonies were 7.12 cm and 8.50 cm respectively. Compared with PDA medium, the growth rate of strains on PCA and WHDA medium was significantly different in the first 3 days. The diameter of colonies on PDA was 5.50 cm, and that on PCA ,WHDA medium was only 4.92 cm, 4.72 cm. But the growth rate of the strain on PDA medium showed a decreasing trend, which was reduced by 58.33%. There was no significant difference in colony growth rate between CA, CMA and V8 medium at the same time ($P>0.05$). In summary, The most suitable nutritional conditions of the root rot pathogen (*F.oxysporum*) was the PSA medium, which is conducive to the growth of colony. The most unfavorable for growth was the WA medium, but it was suitable for production spore under the condition of nutrient stress.

Key words: *Medicago sativa*; root rot; *Fusarium oxysporum*; nutritional conditions

P5028

Evaluation of the Functional Response parameters of the pupal parasitoid, *Dirhinus giffardii* against two fruit fly species, *Bactrocera zonata* and *B. cucurbitae*

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Abstract

Functional response is usually used to evaluate the potential of a parasitoid or predator in regulating the population of a pest and hence, is an important tool in the selection of appropriate biological control agents for a particular pest. This study aimed to investigate the functional response of the parasitoid, *Dirhinus giffardii* Silvestri (Hymenoptera: Chalcididae) towards two *Bactrocera* species (Diptera: Tephritidae), *B. zonata* (Saunders) and *B. cucurbitae* (Coquillett); each offered at seven different densities (10, 20, 30, 40, 50, 70 or 100 pupae) for a period of 24 h in cylindrical plastic cages in the laboratory. The results showed a type II functional response of *D. giffardii* towards both the fruit fly species, *B. zonata* and *B. cucurbitae*. The parasitoid exhibited a higher attack rate (a) (0.8235 vs. 0.6798), a shorter handling time (T_h) (0.05160 vs. 0.7344) and a higher maximum parasitism rate (T/T_h) (46.52 vs. 32.69) on the pupae of *B. zonata* than on the pupae of *B. cucurbitae*. Consequently, the parasitoid was more effective on *B. zonata* than on *B. cucurbitae*. Offspring sex ratio of the parasitoids was female biased regardless of the host fruit fly species. The results suggest that *D. giffardii* could be a more efficient biological control agent for *B. zonata* than for *B. cucurbitae*.

Keywords: functional response, biological control, host density, parasitism, tephritid fruit fly, *Dirhinus giffardii*

P5029

Biochemical evaluation of the *Anacardium Occidentale* L. (Cashew Nuts) Consumption on Oxidative Stress: Modulation of the Nrf2/HO-1 and NF-kB Pathways

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Abstract

Several antioxidant and pharmacological properties of cashew nuts (*Anacardium occidentale* L.) and its metabolites from different countries have recently been described. It is a medicinal plant with important therapeutic effects. In our recent publications we evaluated the antioxidant effects of the *Anacardium occidentale* L. consumption on the gastrointestinal tract (colitis, intestinal ischemia-reperfusion injury, pancreatitis) and on the induced pain-like behavior (carrageen paw edema and osteoarthritis rat model). Oral treatment with cashew nuts reduced colon histological and macroscopic damage, neutrophil infiltration, pro-inflammatory cytokines and MDA levels, as well as nitrotyrosine, PARP and ICAM-1, and P-selectin expressions. Administration of cashew nuts significantly reduced the mortality rate, the fall in arterial blood pressure, and oxidative stress and restored the antioxidant enzyme activities by a mechanism involving both NRF2 and NF-kB pathways. Cashew nuts treatments reduced cytokines plasma levels, nitrotyrosine, and PARP expression as well as adhesion molecules expressions. Additionally, cashew nuts decreased the intestinal barrier dysfunction and mucosal damage, the translocation of toxins and bacteria, which leads to systemic inflammation and associated organs injuries in particular of liver and kidney. Our study demonstrates that cashew nuts administration exerts antioxidant and pharmacological protective effects in superior mesenteric artery occlusion–reperfusion shock. Additionally, cashew nuts administration reduced pain-like behavior and showed antioxidant activities, restoring biochemical serum parameters: glutathione (GSH), catalase (CAT) levels, glutathione peroxidase (GPx) activity and lipid peroxidation. Moreover, cashew nuts ameliorated radiographic and histological alteration, resulting in decreased cartilage degradation, pro-inflammatory cytokines and metalloproteinases levels and mast cells recruitment. Our results demonstrated that the oral assumption of cashew nuts counteracts the inflammatory and oxidative process.