magnus Group

Global Congress on

Plant Biology and Biotechnology

March 22-23, 2021

magnus Group

GPB 2021

BOOK OF ABSTRACTS

GLOBAL CONGRESS ON

PLANT BIOLOGY AND BIOTECHNOLOGY

MARCH 22-23, 2021

Theme:

A Drive to Thrive Plant Sciences

INDEX

Celia Paya Montes
Institute of Molecular and Cellular Biology,
Spain

Daniel Cantabella
IRTA,
Spain

Dawei Yan
Henan University,
China

Dunja Leljak Levanic
Faculty of Science University of Zagreb,
Croatia

Gabriela Vochita
NIRDBS, branch Institute of Biological Research Iasi,
Romania

Ivan Visentin
University of Turin,
Italy

Joseph Nana Annan
University of Education,
Ghana

Lacramioara-Carmen Ivanescu
Alexandru Ioan Cuza University,
Romania

Leda Guzman
Pontificia Universidad Catolica de Valpariso,
Chile

M Rosario Garcia-Gil
Swedish University of Agricultural Sciences,
Sweden

Marta Balsells-Llaurado
IRTA,
Spain

Marta Jankovicova
Private researcher and consultant,
Czech Republic

Nontuthuko Rosemary Ntuli
University of Zululand,
South Africa

Oprea Cristiana
Joint Institute for Nuclear Research,
Russia

Oprica Lacramioara
Alexandru Ioan Cuza University,
Romania

Sunita Chandel
Dr.Y.S.P University of Horticulture and Forestry,
India

Sushan Chowhan
Bangladesh Institute of Nuclear Agriculture,
Bangladesh

Tatyana Latsko
Moscow State University,
Russian Federation

Tim Weber
Imperial College London,
UK

Valter Henrique Marinho dos Santos
Atina - Ativos Naturais,
Brazil

Zvjezdana Stancic
University of Zagreb,
Croatia

Thank You All...

Keynote Speakers

Benigno Villalon
Texas A & M University,
USA

Danijela Poljuha
Institute of Agriculture and Tourism,
Porec, Croatia

Edward Curry
Curry Farms, 1091 E. Curry Farm
Rd, USA

Manuel Tornel Martinez
IMIDA & ITUM,
Spain

Valasia Iakovoglou
International Hellenic University,
Greece

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 GPB 2021

Plant Biology 2021 will bring all the participants an opportunity to explore the recent advancements and developments in the field of plant biology and biotechnology. Webinar consists of talks to ensure an intense interaction amongst the researchers present at the webinar. The purpose of the Plant Biology 2021 is to promote interaction and discussion among academics, researchers and professionals in the field of plant biology.

Plant Biology 2021 is an excellent coliseum for passionate researchers with its well organized scientific program. The program includes plenary talks, keynote lectures, Speaker talks, and developments in the arena as well as therapeutic aspects.

magnus Group

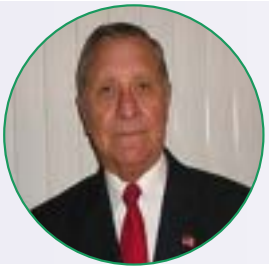
KEYNOTE FORUM | DAY 1

Global Congress on

PLANT BIOLOGY AND BIOTECHNOLOGY

March 22-23, 2021

GPB 2021



Benigno Villalon
Professor Emeritus, Texas A & M University, USA

Development of Disease and Insect Resistant Capsicums

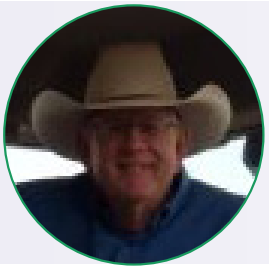
Peppers (chiles) are the number one spice food ingredient in the world because of their mild capsaicin content and the many health aspects of the pod. Mexican food is the number one ethnic food in the U.S.A. because of peppers. Bell pepper is the most highly consumed pepper type in the U.S.A, followed by long green/red chile, cayenne, jalapeño, tabasco, paprika, serrano, habanero, ancho, cherry, pimiento, yellow pickling types. Breeding peppers for the processing industry is a herculean task. Every major processing entity requires and demands peppers with their own unique characteristics with respect to types, size, color, flavor, pungency, fruit dry matter, resistance to insects, diseases, and health related issues. The product can be fresh market for all and or processed into whole, sliced pickled, picante sauces, etc.

In 1970, the Texas Agricultural Experiment Station at Weslaco placed emphasis in obtaining genetic resistance to important pepper viruses and insects. Fifteen different genotypes from Mexico, Central and South America, possessing heritable resistance to local isolates of tobacco etch virus, pepper mottle virus, cucumber mosaic virus, potato virus Y, tobacco mosaic virus, and tobacco ringspot virus were identified. Hybridization of these stocks with the best commercial cultivars of 25 different types yielded thousands of improved breeding lines utilizing the backcross method, two seasons/year, for 30 years. These lines were screened for resistance to Phytophthora root rot, leafminer, pepper weevil, white fly, and tropical environmental stresses.

As early as 1971 the Texas Agricultural Experiment Station pepper breeding program began looking at the nutritional aspects of all pepper types. Thousands of improved, superior pepper breeding lines of different types were developed and evaluated twice/year. These genetic packages contained multiple disease and insect resistance, tropically adapted (high temperature flower set), high color, flavor, high yielding (concentrated fruit, special culture practices to develop a single stem for mechanical harvest), and earliness. Health related issues included high concentrations of Vitamins C, A, anti-inflammatory cancer preventing antioxidants, i.e. flavonoids (luteolin, quercetin, etc.). Thousands of germ plasm packages were distributed throughout the world. Screening at every generation yielded nine new named cultivars: tam bell-1. Tam mild chile-1, tam mild jalapeño-1, tam bell-2, hidalgo serrano, tam mild chile-2, rio grande gold-sweet, tam veracruz –hot jalapeño, and tam jaloro-hot yellow jalapeño. The release of the “tam mild jalapeño-1” in 1981 was a major milestone. It revolutionized the entire u.s.a. salsa picante industry which outsold sugar-based tomato ketchup by 1990 and thereafter. The tam veracruz replaced most existing hot jalapeño varieties. Successful breeding efforts continue under the direction of dr. Kevin crosby at texas a&m university, texas a&m agrilife research at college station, texas. Subsistence farmers throughout the world can grow these peppers with more security and less cost. Increased food production is accomplished utilizing fewer chemicals and less acreage, making it easier to maintain environmental quality. This has important implications for more efficient production of other foods in a sustainable agricultural system.

Biography:

Dr. Benigno (BEN) Villalon is from Edcouch, Texas, reared on a vegetable farm and graduated from Edcouch-Elsa High School in 1954. Ben served our country in the United States Marine Corps from 1954 to 1958. He worked at the Texas Agricultural Experiment Station, at Weslaco for two years prior to enrolling at Texas A & M University. Degrees include B.S. in Agronomy '64, M.S. in Vegetable Plant Breeding '65, and a Ph.D. in Plant Pathology-Virology '69. Before returning to Weslaco, Ben was hired as a tomato and strawberry pathologist-breeder at the University of Florida Agricultural Research Center at Homestead and From 1971 to 1996, he was senior resident research scientist at the Texas Agricultural Research and Extension Center at Weslaco. As Professor of Plant Pathology, Breeding and Virology, at Weslaco, Dr. Villalón was Project Leader for vegetable and agronomic crops virus disease research. Research emphasis was placed on the development of new multiple virus and insect resistant hot and sweet pepper varieties for Texas and other areas. He was also involved in resistance research on viruses and other diseases of sugar cane from 1974 to 1994. Plant transformation and regeneration systems for development of disease resistant transgenic pepper and tomato plants were in initiated. Ben retired after 36 years of service at Texas A&M. Dr. Villalón, a major pepper breeder for Texas and the nation, received the "Award of Excellence for Research" from Texas A & M in January 1990. He also received the coveted 'Arthur T. Potts Award' from the Rio Grande Valley Horticultural Society in January 1992. He has also received many accolades from different civic organization. Three Texas governors and the Texas Legislative branch have recognized Dr. Ben's research. He still goes to the laboratory periodically to assist in the evaluation of improved pepper lines as needed.



Edward Curry
Owner, President, Curry Farms, 1091 E. Curry Farm R, USA

Breeding (peppers) from a farmer's perspective

Growth of the green/ red chile industry in the United States has significantly increased in the last 40 years. Phil Villa, Evert Wood, and Dr. Ben Villalon, were working simultaneously, to improve yield, flavor, size, color, flavor, pungency, resistance to insects and diseases, and nutritional aspects of the pod in the late 1960's. Curry Farm's journey in practical breeding began some 40 years ago, in early 1970's. By 1979 our journey of study and hard work on green chile at the farm level intensified. It took the passion of these mentors to another level. Their distinctly unique methods, to genetically improve Capsicum annum lead to the development of what most consider the largest germplasm bank of New Mexico type green chiles in the world. Dr. Ben Villalón, at Texas A&M working with 25 different types, developed a mild jalapeño, and a mechanical harvest system for all types. Evert Wood was working to improve paprika for the dehydration industry. All three men, working for the improvement of chile. Each one carried similar passions, work ethic and drive to improve the genetic base of their pepper of choice. Each used Gregor Mendel's basic methods, each of adding new ideas, and each contributing very distinct gene improvements to their specific types of Capsicum annuum. All three used very deliberate methods of practical crossing of chiles with distinct parental differences to recombine genetic packages from which improvements could be selected.

My mother and father, because of their love and dedication to chile, surrounded themselves with these men. Therein lies the beginning of my love for its improvement. I was 13 years old, following Evert Wood and Phil Villa in the fields, listening, learning and realizing the importance of selecting specific plants for growing out the following season to continue a very base method of improving a gene pool. Today, some 40 years later, because of these men, we continue to use practical breeding skills to furnish our industry with the best yields, flavor and improvements in green chile, paprika, cayenne, etc. Phil Villa's chile cultivars Arizona 20 and Arizona 1904, became the standard of the green chile industry, several new types are being tested as this is penned. Today I work under the supervision of Wood, Villalon, Dr. Kevin Crosby, Texas A&M U, Dr. Stephanie Walker, NMSU., Dr. Rod Wing. U of AZ, A. Guzman, NMSU, and Dr. Steve Hansen, NMSU, and many others.

Biography:

Ed's love for chiles began at an early age when his parents planted their first chile crop in 1957. He grew up in the chile fields. His passion for chiles became a lifelong interest in chile genetics. For 25+ years, he worked closely with Phil Villa, a California chile breeder. Developing new and improved types with uniform quality, flavor, heat and increased yield. These new chiles come with pedigrees and growing guidelines to ensure that growers using them produce the best yield possible. Ed continues to work extensively in chile selections. Eighty to ninety % of these types are grown commercially in the U.S., Curry Seed & Chile Company, supplies this seed to growers in the Southwestern U.S. and in several states in Mexico.

magnus Group

SPEAKERS | DAY 1

GLOBAL CONGRESS ON

PLANT BIOLOGY AND BIOTECHNOLOGY

MARCH 22-23, 2021

GPB 2021

Marta Balsells-Llaurado*, Nuria Vall-llaura, Maria Caballol, Gemma Echeverria, Josep Usall, Neus Teixido, Rosario Torres

IRTA Postharvest Program, Edifici Fruitcentre, Parc Científic i Tecnologic Agroalimentari de Lleida, 25003 Lleida, Catalonia, Spain

Impaired terpenoid biosynthesis in two stone fruit cultivars with different susceptibility to brown rot

Brown rot is the most economically important disease of stone fruit worldwide. Monilinia laxa is the main responsible of this pathology in Europe and can infect fruit at any growth stage. The disease cycle is mainly triggered when both favourable host and environmental factors occur on fruit surfaces. Herein, we evaluated the infection course caused by artificial M. laxa inoculations on immature and mature fruit of nectarine (cv Venus), which resulted to be resistant and susceptible to the pathogen, respectively. Then, we performed a comparative transcriptomic analysis of infected tissue and control samples. We observed that in nectarine, principal component analysis distributed samples according to their developmental stage and infection status. Functional enrichments analysis for KEGG terms revealed that immature fruit responded later if compared to mature fruit, which were enriched since early time points. In this analysis, terpenoids, which are known to be implicated in abiotic and biotic stress responses, were found to be highly enriched in the resistant immature than susceptible mature tissue. To further decipher the different pattern of terpenoids in both tissues during M. laxa interaction, we analyzed some terpenoid biosynthetic genes in two nectarine varieties (cv Venus and cv Albared). While in "Venus" nectarines, the infection only progressed on mature fruit, M. laxa was able to infect and spread the disease in both immature and mature "Albared" tissues. Gene expression analysis of terpenoid biosynthetic pathway in these tissues revealed impaired expression patterns between maturity stages and varieties. Such altered regulation could ultimately explain the different susceptibility to brown rot of the two varieties. Hence, the results presented herein provide insight on terpenoid biosynthesis and may contribute to the current search for resistant cultivars of stone fruit. Overall, these results shed light on plant resistance strategies, which we believe that are key targets to consider when developing new resistant cultivars of stone fruit to brown rot.

Audience Take Away:

- We found that varieties of nectarine are able to generate different responses to brown rot. The fact of analyzing two varieties that presented different susceptibility to M. laxa elucidated some pathways such as the terpenoid biosynthetic pathway that could be importance for the resistance to the pathogen. Hence, we believe that these pathways should be considered when developing new resistant cultivars of stone fruit to brown rot
- Studies related to Monilinia spp.-stone fruit interactions and their strategies to attack the host or face the disease are increasing but are still scare. I first hope that our research give more light to the current knowledge of brown rot in stone fruit. On the other hand, sometimes, studies lack of replicate homogeneity or lack of further studies to validate their transcriptomics. In our experiments, we got consistent results and homogenized replicates. For the gene expression analysis, these ones were not only carried out to elucidate the role in a variety that was susceptible to brown rot, but also to validate our transcriptomics. So I believe that our research can help join to the current knowledge of this plant disease

Biography:

PhD student Marta Balsells-Llauradó studied Bachelor's Degree of Biotechnology at the University of Barcelona, Spain (2014). She then studied the Master of Science in Plant Biology and Biotechnology at the Universitat Autonoma de Barcelona, Spain (2015). Since 2016, she joined the Postharvest program at IRTA-Fruitcentre (Lleida, Spain) as a Laboratory Technician, from where she participated in two research articles SCI. Since 2017, she started her PhD thesis at the same institution. She has performed two abroad stays, in Antwerp, Belgium (2014) and Davis, California (2019).

M Rosario Garcia-Gil[1]*, Lynn Zhou[1], John Baison[1], Sven-Olof Lundqvist[2,3]

[1]Department of Forest Genetics and Plant Physiology, SLU, Umea, Sweden
[2]IIC, Rosenlundsgatan 48B, SE-118 63 Stockholm, Sweden
[3]RISE Bioeconomy, Box 5604, SE-114 86 Stockholm, Sweden

Genomics a tool in conifer breeding: Norway spruce a case study

Norway spruce is a boreal forest tree species of significant ecological and economic importance. Hence there is a strong imperative to dissect the genetics controlling important wood quality traits in the species. We performed a functional Genome-Wide Association Mapping (GWAS) and a Genomic Selection (GS) cross-validation study. GWAS was conducted for 17 wood traits in Norway spruce using 178101 single-nucleotide polymorphisms (SNPs) generated from exome genotyping of 517 mother trees. The wood traits were defined using functional modelling of wood properties across annual growth rings. We applied a LASSO based association mapping method using a functional multi-locus mapping approach that utilizes latent traits, with a stability selection probability method as the hypothesis testing approach to determine significant Quantitative Trait Loci (QTLs). The same SNP collection were applied in a GS cross-validation was conducted in 60 half-sib families for solid wood properties collected with Silviscan technology from pith to bark and indirect methods. The study allowed the design of a cost-effective protocol for the implementation of wood solid into conifer breeding.

Audience Take Away:

- They will learn how to design an experiment to conduct GWAS and GS. How functional data can be analysed in more elegant fashion by fitting splines or other functions. They will learn about the genetic basis of wood properties in conifers
- The task of teaching required to have a wide and state-of the art knowledge in the field of the course to be taught. These works I will present will inform about cutting-edge knowledge in the field of genomics and breeding, and how this could be implemented into an accelerated and sustainable way to conduct forest breeding. Our approaches, however, are not only limited to conifers, and similar approaches can be applied to any other species where time series of data has been collected

Biography:

M Rosario García-Gil studied at the University of Valencia Biological sciences with a master in biochemistry and microbiology. She conducted her PhD work in genomics applied to fruit tree breeding at the Instituto Valenciano de Investigaciones Agrarias (IVIA), University of Valencia, Valencia, Spain. Her postdoc work was conducted at the University of Oulu, Oulu, Finland on the topic of population genetics and local adaptation. She continued her carrier as assistant professor at the Department of Forest Genetics and Plant Physiology, University of Agricultural sciences, SLU, Umea, Sweden. She is presently associate professor at the same department and University. She has published 42 publications in peer-reviewed journals, and three book chapters.

Marta Jankovicova
Private researcher and consultant, Brno, Czech Republic

The negative effect of compaction on the physical properties of chernozem in vineyards

Monitoring of changes in the physical properties of soil and soil compaction is a modern vine-growing problem. Many of the companies does not secure an adequate level of producer deliveries of organic matter into the soil, and increasing the number of operations provided by the mechanization (defoliation, mechanical harvest of grapes, etc.). It leads to an increase in the number of times the level of mechanization, which, together with the lack of fertilizing negatively reflected on soil structure and causing her massive degradation with all the accompanying consequences. At various vineyards in South Moravia in the Czech Republic were observed physical properties of soils at various doses of compost. These were the vineyards with chernozem modal and chernozem pellic. Intact soil samples were taken by Kopecky cylinder rollers and subsequently analyzed in the laboratory. The lowest values (critical) reached porosity at all sites. The aim of the experiment is to verify the influence of the graduated benefits of biodegradable organic matter from agricultural and horticultural waste, on the selected physical properties of the soil (porosity and bulk density), with the emphasis on soil compaction in the vine-growing conditions of the Czech Republic. Three experimental sites with different soil conditions were chosen for the foundation of the experiment in the wine-growing region of Southern Moravia. In terms of timing, experimental measurements were carried out for three years. Compost was applied to cultivated intermediate rows at doses of 50 and 100 t. ha-1 at the beginning of the experiment. Sampling of intact soil samples using Kopecky's physical rollers was carried out at each site in nine variants, respecting the management of inter-row maintenance, spatial zoning and compost batches. From the physical properties, the reduced bulk density (BDR; g. cm-3) and the total porosity (P; % vol.), which predict soil compaction as important aspects, were observed. On the basis of analyzes of physical properties, the level of pedocompaction was found in all experimental vineyards. At the same time, the positive effect of organic matter in the form of compost on BDR values and overall soil porosity was found. The decrease in BDR occurred only in the second year after the application of organic matter and the overall porosity increased in correlation with the decrease in BDR. There was no permanent improvement in the physical properties of the soil even after the application 100 t. ha-1 of compost. No significant differences were found at 0.20 m and 0.30 m.

Audience Take Away:

- Apprise with the Kopecky method of determining the physical properties of soil
- To explain the fluctuations in the physical properties of the soil during the growing season of the grapevine
- Note that looking at pedocompaction is not enough to increase the physical properties of the animal, even in a large compost dose of 100 t. ha-1
- They will learn the Lhotsky limit for the physical properties of clay soils

Biography:

Ing. Jankovicova, Ph.D. got her bachelor's degree in Horticultural Engineering – Viticulture at the Faculty of Horticulture of Mendel University in Brno, Czech Republic in 2010. She completed her master's degree in Horticultural Engineering – Horticultural Technology Management at the Mendel University in Brno and she graduated with an academic degree (Ing.). She received the Certificate of Fundamentals of Scientific Work at the Academy of Sciences of the Czech Republic in 2016. She continued her doctoral program in Horticultural Engineering – Horticulture at Department of Horticulture Machinery at the Mendel University in Brno. She finished her studies with a Ph.D. in 2019.

Lacramioara-Carmen Ivanescu
Department of Biology, Alexandru Ioan Cuza University (UAIC), Iasi, Romania

Leaves'response from woody species as an indicator of environmental pollution

We are presenting the results of our research on 20 both spontaneous and cultivated woody species (Gymnosperms and Angyosperms) found near several industrial areas in Romania: Borzesti, Bacau county where the pollutants are mainly gaseous (SO2, Cl, NH3) but also solid (coal and soot), Bicaz and Tasca, Neamt county where the pollutants are sedimentable powders of lime and cement. Even if the pollutants that are involved are chemically different from each other, the placing of the three industrial areas in depression areas with atmospheric calm causes the occurance of the strongest atmospheric pollutants – vegetation impacts in the discussed areas.

We mention the following reactions the investigated species had in common responding to the gaseous and solid industrial noxes: - the foliar surfaces'micromorphology alteration caused by the solid pollutant deposits that cause through their adherence inactivate the photosynthetically active parts of the leaves; - the obstruction of the breathing and perspiration of the leaves by obturing the ostiola of the stomata; - the weakening of the tree's general state; the trees become vulnerable to late spring freezes and pathogenic fungi attack; - episodes of partial or total defoliation: there are plant species whose leaves show signs of sufferance (chloroses, necroses) but there are also species whose leaves don't manifest visible symptoms but have partial or total defoliation episodes.

Our S.E.M. (Tescan Vega SBH, Faculty of Biology) research show the major role of foreign deposits in defoliation process.The installing on such solid deposits of a pathogen phyllosphere represents an indicator of the early ageing process of the leaves and also a possible cause of the defoliation or even death of the trees.

The identification of the polyphenolic compounds in the leaves of the species that don't show visible foliar sufferance signs through histo-chemical methods can be considered, according to our research, a true bioindicator that announces future defoliation phenomena.

Regardless of the chemical nature of the atmospheric pollutant, the structural changes of the leaves are almost the same as the epidermis (upper and lower), the mesophyll and the vascular tissues are affected; as a particularity there are changes in the secretory ducts of the needles of the Gymnosperms and in the Caspary endodermis around vascular tissues.

In conclusion, when it comes to chronically aggression from the atmospheric pollutants, regardless of their nature, the responses can be extremely different but very similar at the same time.

Audience Take Away:

- The purpose of our paper is to educate the audience regarding the less-noticeable aspects of pollution.While people tend to view pollution as a victimless factor, our studies prove that the plants surrounding us are the quiet yet suffering victims. By making the connection between the human life and the environment, the audience acknowledges that one cannot exist without the other. People can use the information our paper provides not only professionally–wise by improving their knowledge or research methods (meticulously detailed in our work) but also by starting to make small yet impactful every day decisions in their own life (choosing walking or taking the bus instead of using a car, adopting a lower waste life style)

- Teachers can use (with the author's permission) data from our presentation to complete the one in their course about environmental pollution. Collaborations can be established between the departments of institutes from different countries with the purpose of studying cross-border pollution and plant responses
- The scientific papers regarding the influence of atmospheric pollution from industrial and urban areas has on plant species is rich and diverse but lacking complex interdisciplinary research to link the chemistry, physics and the environmental engineering of the pollutants (gaseous and solid ones) to the biology and leaves'response of cultivated/spontaneous plants. In other words, the studies regarding ecophysiological and structural aspects of the leaves from species cultivated or spontaneous in these areas may provide information concerning the state of health or chronic illness by linking these answers with the pollutants characteristics to a certain area, these pollutants being constantly monitorized by the Environment Protection Agency (L. Ivănescu, 2019, 8th International Symposium of Ecologists of Montenegro – ISEM8, Budva, Muntenegru, 2-6 October)

Biography:

Academic position: Senior Lecturer to Department of Biology, Faculty of Biology, Alexandru Ioan Cuza University (UAIC), Iasi, Romania.

Fields of competence: morphology and plant anatomy; microscopy; industrial and urban pollution; halophytes.

Scientific activities: PhD Thesis in Biology Science, Research on the Influence of Atmospheric Pollutants on the Foliar Apparatus of Species of Cultivated and Spontaneous Plants, 1999, November 23, UAIC (I presented the results regarding the effects of atmospheric pollutants on the structure of more than 50 species of wooden and herbal plants located in the industrial areas from Romania. Scanning electronic microscopy (S.E.M.) investigations were performed for the first time in Romania, monitoring the reactions on the foliar cuticular surfaces as a marker bioindicator. A part of these results were re-evaluated in my research project Cyto-histo-anatomical research on vegetative organs of Gymnosperm species from forest areas with a searing risk and published into a book in 2003, Influenţa poluării atmosferice asupra structurii plantelor (Influence of Atmospheric Pollution on Plant Structure), Andrei Şaguna Foundation Publishing House, Constanţa, 394 pp., ISBN 973-8146-67-4 (Lăcrămioara Ivănescu & Constantin Toma).Member in Editorial Board: International Program Committee al WSEAS Conference, Bucharest, Romania, June 2008. Member in Editorial Board: International Program Committee al WSEAS Conference, RES, Corfu, Grecia, 26-28 October 2008 (2nd International conference on WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION,INDOOR CLIMATE, WWAI' 08)

Chairman, International Conference WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION, INDOOR CLIMATE (WWAI 2007), Arcachon, Franţa, 14 – 16 October, 2007.Published papers: over 100 out of which 35 about the influence of the atmospheric pollution on plant structure in journals contributed as author/co-author; over 300 citations of my scientific papers. 2016, EMIL RACOVITA PRIZE of the ROMANIAN ACADEMY, Halophytes: An Integrative Anatomical Study, Springer International Publishing, 2014,548 pp., ISBN: 978-3-319-05728-6 (print), ISBN: 978-3-319-05729-3 (online) (M.N. Grigore, Lacramioara Ivanescu & C. Toma); over 80 citation of the book; Book Performance Report (2019) indicates over 22,000 downloads of the book (in full and by chapters) in the period 2014-2019.

Mateja Jagic, Lucija Markulin, Andreja Skiljaica, Karlo Miskec, Tamara Vuk, Mirta Tokic, Natasa Bauer, Dunja Leljak Levanic*

University of Zagreb, Croatia

A novel ubiquitin-independent role of MATH-BTB protein family in RNA-directed DNA methylation

MATH-BTB protein family is encoded by the genomes of nearly all eukaryotes. The best known function of MATH BTB proteins is their role as substrate-specific adaptors of cullin3-based E3 ligases in the ubiquitin proteasome pathway. BTB domain enables assembly with the cullin while less conserved MATH domain serves as an adaptor and binds substrates destined for degradation via 26S proteasome. The know downstream targets for functionally described MATH-BTB proteins are a cytoskeletal protein katanin for ZmMAB1, eukaryotic translation initiation factors for TaMAB2 while Arabidopsis BPM1 interacts and modulate the turnover of a distinct TFs. Earlier results showed that BPM1 predominantly localizes in nucleus indicating cullin independent function of BPM1. Co immunoprecipitation and mass spectrometry revealed interaction of BPM1 with DMS3 and RDM1, key components of RNA-directed DNA methylation (RdDM). However, exact role of BPM1 interaction with DMS3 and RDM1 and possible implications for RdDM pathway remain unknown. To furthermore elucidate putative role of BPM1 protein in RdDM yeast two hybrid and pull down assays were used to confirm direct interactions of BPM1 with DMS3 and RDM1. Additionally, role of MATH and BTB domain in the interaction with DMS3 and RDM1 was tested using truncated version of BPM1 protein with a single domain deletion. The results showed that BTB domain had higher affinity for interaction with RDM1, while both MATH and BTB domains appear to be equally important for interaction with DMS3. In addition, co-localization assay showed overlap of BPM1 and RdDM components while overexpression of BPM1 revealed change in DNA methylation pattern. These results indicate a novel, cullin-independent role of BPM1 protein in RNA-directed DNA methylation pathway. Several DNA sites where transcription or RdDM methylation could be influenced by BPM1 protein determined by ChIP will be analysed for expression and methylation pattern.

Audience Take Away:

- The audience will get an introduction to the process of RNA directed DNA Methylation (RdDM), which is a plant specific mechanism that has to be included in courses of Plant Developmental Biology
- The newly discovered role of BPM protein family will be presented
- The audience will learn about new potential link in a cobweb of methylation regulation
- Newly obtained knowledge the audience will be able to implement when investigating balance between DNA methylation and transcription

Biography:

Dunja Leljak Levanic studied Molecular Biology at University of Zagreb, Croatia and graduated in 1994. She received MsC in 1997 and a PhD degree in 2001 at the same institution. As a Humboldt fellow, she spent 20 months in a group of Thomas Dresselhaus at Hamburg University, Germany. She obtained the position of an Assistant Professor at the Faculty of Science University of Zagreb in 2005. She has published 26 research articles in Journals listed in WoS (core collection).

Zvjezdana Stancic[1]*, Zeljka Fiket[2], Nevenka Mikac[2]

[1]Faculty of Geotechnical Engineering, University of Zagreb, Hallerova aleja 7, HR-42000 Varazdin, Croatia

[2]Ruder Boskovic Institute, Division for Marine and Environmental Research, Bijenicka 54, HR-10000 Zagreb, Croatia

How much can some wild plant species accumulate chemical elements and why is this important to us?

During 2014, the wild plant species were collected along the railways in northwestern Croatia. In habitats with different management types (under more or less influence of railway traffic), the seven most common herbaceous species were selected: *Ambrosia artemisiifolia* L., *Equisetum arvense* L., *Erigeron annuus (*L.*) Desf., Lepidium sp., Solidago gigantea Aiton, Taraxacum officinale agg.* and *Urtica dioica* L. Total concentrations of 25 elements were determined in collected plants using a high resolution inductively coupled plasma mass spectrometer (HR-ICP-MS). The results showed that most (19) elements in the highest total mass concentrations were assimilated by *Ambrosia artemisiifolia* (mg/kg dry weight, average values): Ag 0.036, Al 1099, As 0.96, Cd 0.30, Co 0.67, Cr 22.9, Cu 19.7, Fe 3680, Li 1.24, Mn 57.1, Ni 9.06, Pb 4.05, Sb 0.62, Sn 1.17, Sr 63.0, Ti 75.9, U 0.11, V 2.96, and Zn 108; followed by *Equisetum arvense* with the highest values for four elements: Bi 0.04, Cs 0.45, Mo 14.3, and Rb 48.6; *Solidago gigantea* for Tl 0.038, and Lepidium sp. for Ba 37.4. The obtained values indicate the possibility of using ragweed (*Ambrosia artemisiifolia*) in the phytoremediation and/or phytomining of certain chemical elements, some of which are pollutants in the soil and can be extracted from the soil by plants. However, the problem is that ragweed is a foreign invasive species in Europe that has multiple negative effects: it suppresses indigenous flora, is a very aggressive weed on agricultural land, and has a very negative effect on human health because its pollen causes allergies. One possible solution is to sow and grow this annual species under strictly controlled conditions, by removing the adult plants before they start to bloom and create pollen and later seeds.

Audience Take Away:

- There are many solutions to environmental problems in nature, we just need to find them
- Phytoremediation is a new and promising method for the removal of heavy metals from the top soil layer. The advantages of the method: ecologically and environmentally acceptable, low costs and applicability over large areas. Disadvantages: lengthy and not sufficiently investigated
- One of the aims of this research was to find among wild plant species those that have the ability to accumulate pollutants

Biography:

From 1987 to 1992, I studied biology at the Faculty of Science in Zagreb and acquired the qualification of graduate engineer of biology, specializing in ecology. I defended my doctoral thesis in 2000. Now, I am employed at the Faculty of Geotechnical Engineering in Varaždin (2010-present). In 2017 I was elected to the academic title of associate professor. The topics of my scientific interest are: non-forest vegetation, vegetation ecology, vascular plants, invasive alien plant species, nature protection and phytoremediation. As author and co-author I have published about 40 scientific papers.

Sibongokuhle Ndlovu[1], Viswanadha SR Rajasekhar Pullabotla[2], Nontuthuko R Ntuli[1]*

[1]Department of Botany, University of Zululand, KwaDlangezwa, KwaZulu-Natal Province, South Africa

[2]Department of Chemistry, University of Zululand, KwaDlangezwa, KwaZulu-Natal Province, South Africa

Agro-morphological changes caused by the accumulation of lead in Corchorus olitorius, a leafy vegetable with phytoremediation properties

Lead (Pb) can enter food chain through the consumption of contaminated plants and can cause serious health issues. However, research on how Pb accumulation affects morphology of leafy vegetables in the country is minimal. This study tested the effect of lead accumulation on vegetative and reproductive traits of Corchorus olitorius. Plants were grown under varying Pb concentrations, and studied for their variation in vegetative and reproductive traits as well as, Pb accumulation in leaves, stems and roots. Plants grown within allowable soil concentrations of 150 mg kg–1 Pb, accumulated toxic (≥ 10 mg kg–1) Pb in all plant parts without any morphological defect, except for decrease in chlorophyll content. Minor reductions in growth and yield were evident only at 900–1000 mg kg–1 concentration. Pb accumulation increased as its concentration increased in the soil; with the highest accumulation in roots than aerial parts. In conclusion, C. olitorius can grow and reproduce under toxic Pb levels (≥ 300 mg kg–1) and accumulate toxic amounts of Pb (≥ 10 mg kg–1) without visible morphological defects. Therefore, it is good for phytoremediation but unsafe for consumption when it is collected from sites prone to Pb contamination.

Audience Take Away:

- The audience need to be careful about consuming wild leafy vegetables which their source of collection is unknown
- Collection of wild vegetables from dumping sites is dangerous to human as they result in heavy metal intoxication including lead
- Other researchers can further invent the practical (easier) ways of identifying toxicity in edible plants with phytoremediation properties, when their morphology is still appealing or not altered

Biography:

Dr. Ntuli studied Botany at the University of Zululand and obtained her PhD degree in 2014. She is a Senior Lecturer in the same department and institution. Her research focus is on morpho-agronomic, nutritional and genetic diversity among leafy vegetables and fruit trees that are indigenous and indigenized to South Africa. She has published several papers in recognized journal either as a sole author or co-author with students under her supervision and colleagues.

Marouane Ben Massoud[1, 2*], Oussama Kharbech[1], Abdelilah Chaoui[1], Astrid Wingler[2]

[1]University of Carthage, Faculty of Sciences of Bizerte, LR18ES38 Plant Toxicology and Environmental Microbiology, 7021, Bizerte, Tunisia
[2]School of Biological, Earth & Environmental Sciences, University College Cork, Distillery Fields, North Mall, Cork, T23 N73K, Ireland

Effect of exogenous treatment with nitric oxide (NO) on redox homeostasis in barley seedlings (*Hordeum vulgare* L.) under copper stress

The present research investigates the protective mechanism of nitric oxide (NO) in regulating tolerance to Cu-induced toxicity in shoots of barley (*Hordeum vulgare* L.). After 10 days, treatment with 200 µM $CuCl_2$ caused a significant reduction in growth and photosynthetic efficiency concomitant with a strong increase in the contents of reactive oxygen species (ROS), antioxidant enzymes activities such as catalase (CAT), superoxide dismutase (SOD), guaiacol peroxidase (GPOX) and glutathione peroxidase (GPX). An increase in the lipid peroxidation markers malondialdehyde (MDA) and lipoxygenase activity (LOX) indicated oxidative stress. Furthermore, inhibition of growth in 200 µM Cu-treated plants was associated with a reduction in carotenoids, chlorophyll and maximum photosystem II efficiency. However, copper treatment provoked a strong increase in activity of the glutathione-ascorbate cycle enzymes ascorbate peroxidase (APX), dehydroascorbate reductase (DHAR), monodehydroascorbate reductase (MDAR) and glutathione reductase (GR), but a decrease in levels of the non-enzymatic antioxidant compounds glutathione (GSH), ascorbate (AsA). The addition of 500 µM of the nitric oxide (NO) donor, sodium nitroprusside (SNP), to the growth medium alleviated Cu toxicity by reducing Cu uptake and enhancing antioxidant capacity, as indicated by increased contents of GSH and AsA. The current results show that NO addition can alleviate Cu toxicity by affecting the antioxidant defense system, photosynthetic system and maintaining the glutathione-ascorbate cycle status, suggesting that NO treatment protects proteins against oxidation by regulating the cellular redox homeostasis.

Biography:

Dr. Marouane Ben Massoud studied Biology at the University of Carthage, Tunisia and the University College Cork, Ireland. He currently works at the School of Biological, Earth and Environmental Sciences, University College Cork. Marouane does research in Cell Biology, Physiology, Molecular Biology and Proteomics. Their current project is 'alleviation of heavy metals toxicity in germinating seeds by exogenous chemical effectors'.

Mirana Akhter Sumi[1], Sushan Chowhan[2*], S. M. Kamrul Hasan[1], Md. Musfiqur Rahman[1], S. M. Rakibul Jubair[3], Md. Salahuddin[4], Sadia Afrin Jui[5]

[1]Bangladesh Agricultural Research Institute.
[2]Bangladesh Institute of Nuclear Agriculture
[3]Bangladesh Forest Research Institute.
[4]Cotton Development Board, Bangladesh.
[5]Bangladesh Jute Research Institute.

Impact of Air Pollution on Environment and Human Health

Bangladesh is an overpopulated country with a population density of greater than 1200/km^2; and current ranking is 8th in the world. To feed the continuously increasing mouths there's a big challenge ahead to create employment; thus, more industrialization is under process. The main aim of this seminar was to create public awareness on air pollution & it's effects, help the community to save people from different complex diseases, including tuberculosis, asthma, bronchitis and other skin diseases and to improve our own health. Origin of pollution were found as air, water, sound and soil. Causes of air pollution were natural (dust and smoke) and manmade (burning of fossil fuels, agricultural activities, exhaust from factories industries and indoor air pollution). Main pollutants were seen as CO, SO_2, NO_2, O_3 and particulate matter. Smog, Greenhouse effect, Accidental, industrial and transport are the five types of air pollution. Human effects of air pollution were found as- asthma attacks, reduced lung function, pulmonary cancer, coughing, pneumonia and bronchitis on the other hand environmental effects were global warming, acid rain, eutrophication, effect on wildlife, depletion of ozone layer. Vehicles were found to contribute major source of air pollution (over 40%) which creates NOx gases. Some key solutions to reduce air pollution was using public transportation, applying reduce-reuse-recycle theory, utilizing clean energy resource, walking, introducing hybrid vehicles, filtering smoke before releasing into the atmosphere by the industries. Banning old vehicles, relocation of industries away from main cities, afforestation, using green technology, public awareness on pollution, law enforcement, emphasis on research works were prime recommended points to keep a clean environment.

Audience Take Away:

- Preventing different sorts of air pollution
- Being aware of air pollution and its and health related issues
- Possible solution and recommendation of minimizing air pollution and keeping a healthy environment

Biography:

Sushan Chowhan is a Senior Scientific Officer in the Adaptive Research and Extension Division at Bangladesh Institute of Nuclear Agriculture. He completed his BS (Ag.) and MS (Horticulture) from the BSMR Agricultural University, Gazipur. He has experience in the field of crop production, management, seed technology, adaptive research, designing of experiments and technology transfer. His area of research interest is on agronomy and farming system research. He has published more than 25 research articles in reputed national and international journals.

magnus Group

POSTERS | DAY 1

GLOBAL CONGRESS ON

PLANT BIOLOGY AND BIOTECHNOLOGY

MARCH 22-23, 2021

GPB 2021

Tim Weber[1,2*], Jernej Jakse[3], Barbara Sladonja[1], Nediljko Landeka[4], Slavko Brana[5], Dalibor Vladovic[6], Milenko Milovic[7], Dario Hrusevar[8], Bozena Mitic[8], Danijela Poljuha[1]

[1]Institute of Agriculture and Tourism, Karla Huguesa 8, HR-52440 Porec, Croatia
[2]Department of Life Sciences, Imperial College London, South Kensington Campus, London, SW7 2AZ United Kingdom
[3]Biotechnical Faculty, University of Ljubljana, Jamnikarjeva 101, SI-1000 Ljubljana, Slovenia
[4]Public Health Institute of the Istrian Region, Nazorova 23, p.p.192, HR-52100 Pula
[5]Public institution Natura Histrica, Riva 8, HR-52100 Pula, Croatia
[6]Nature History Museum Split, Poljana kneza Trpimira 3, HR-21000 Split, Croatia
[7]Medical and Chemical School, Ante Šupuk Street 29, HR-22000 Šibenik, Croatia
[8]University of Zagreb, Faculty of Science, Department of Biology, Rooseveltov trg 6, HR-10000 Zagreb, Croatia

Molecular study of several taxa of the genus *Iris* L. based on SSR markers and chloroplast DNA barcodes – phylogenetic implications

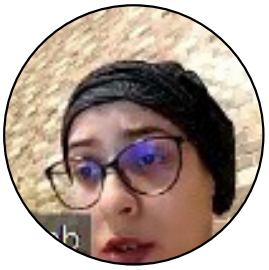
Iris L. is a very diverse genus with over 300 taxa distributed worldwide. It is an important horticultural genus of vascular plants long present in European wild habitats and home gardens. Recently, several species have been identified to contain potential pharmacological compounds, further emphasising the need for conservation. A study of phylogenetic relationships of *Iris* species has been complicated due to extreme morpho-ecological diversity, wide distribution, multiple hybridizations, and convergent evolution processes in the genus. The objectives of the present study were: (i) to characterize the existing *Iris* germplasm through nuclear (SSR) markers and (ii) to clarify the genetic divergence between several wild (local endemic) and cultivated populations through chloroplast DNA (cpDNA) markers in order to provide insights into phylogenetic relationships of *Iris* spp. occurring in Croatia and Slovenia. Thanks to our field research and collaboration with national botanical gardens in Zagreb (Croatia) and Ljubljana (Slovenia), we gathered a set of 32 *Iris* samples growing across the region. Among the collected samples we analysed 12 specimens of the endemic *Iris* adriatica Trinajstić ex Mitić, a strictly endemic Croatian rhizomatous dwarf plant from the I. pumila complex. All samples were genotyped using eight SSR markers which were able to identify a total of 71 alleles. The observed number of alleles per locus ranged from 6 (at locus IM123) to 12 (at loci IM196 and IM327) with an average of 8.8 alleles per locus. The UPGMA clustering analysis discriminated 28 genotypes and revealed three distinct groups of samples. All samples of I. adriatica were clustered in the same group. The maximum likelihood analysis was employed in reconstructing phylogenetic relationships of a heterogeneous group of *Iris* species based on two plastid markers (*rpoC1*, *ndhJ*). Results obtained in this study could contribute to the knowledge of taxonomy and phylogeny of the genus *Iris* L. in the Mediterranean and Alpine-Dinaric area. Additionally, we hope that our results will help in further understanding the importance of wild *Iris* species and encourage their more intensive conservation efforts.

Audience Take Away:

- The audience will learn about the ongoing efforts to genetically delineate genus *Iris* L
- We will present the first phylogenetic account of the taxa of the genus *Iris* in Croatia and Slovenia, confirmed by both molecular and taxonomic methods
- We will present the first molecular descriptions of endemic *Iris* adriatica

Biography:

Tim Weber, AMRSB, is a recent graduate of Biological Sciences from The University of Westminster, London. He is currently undertaking an MRes in Systems and Synthetic Biology at Imperial College London for which he was awarded the Ad futura scholarship. He has worked in the field of conservation in cooperation with The Institute of Agriculture and Tourism Poreč and Ruđer Bosković Institute (Croatia). He is an active member of the Royal Society of Biology and a grant recipient from the UK Genetics Society. He actively volunteers in youth education across Europe.



Hadjer Chenini-Bendiab[1]*, Noureddine Djebli[1], Yakup Kara[2] and Sevgi Kolayli[2]

[1]Pharmacognosy & apiphytotherapy laboratory, Mostaganem University –Algeria

[2]Department of Chemistry, Karadeniz Technical University, Trabzon -turkey

Phenolic profile and in vivo anti-inflammatory activity of aqueous seed extract of date fruit (*Phoenix dactylifera* L.)

Different diseases provide multiple examples of inflammatory reactions, this process is very variable depending on their etiology. Usually steroidal and nonsteroidal anti-inflammatory drugs treat the inflammation, however these treatments most often cause undesirable effect. We are interested in natural products. The aim of this study is identified phenolic compounds and to evaluate *in vivo* anti-inflammatory activity of aqueous seed extract of *Phoenix dactylifera* L from Algeria. Total phenolic constituents of seed extract was determined by the high-performance liquid chromatography (HPLC-UV Elite LaChrom Hitachi, Japan). Edema induction in mice's paw by carrageenan at 1%. The aqueouse extract (100, 200, and 300 mg/kg) were administered intragastrically to mice one hour before the subplantar injection of carrageenan. Diclofenac (50 mg/kg) was used as reference standard drug. The major phenolic acids and flavonoids of seed extract identified by HPLC are Protocatechuic, Caffeic and Gallic acids and Catechin, Epicatechin, Daidzein, Chrysin and Rutin. Concerning anti-inflammatory activity, the reduction of paw volume is highly significant ($P \leq 0.001$) from the second to sixth hour of the experiment as a response to intragastric administration of aqueous extract at 100mg/kg compared to diclofenac treatment. Our results are confirmed by histological sections of paw skin. It reveals a discreet inflammation with slight leukocyte infiltrate disseminate at some inflammatory site in the group treated with aqueous extract compared to the group treated with Diclofenac. The study suggests a possible correlation between the content of phenolic compounds and the potential anti-inflammatory activity of seed date extracts from Algeria.

Key words: *Phoenix dactylifera L.*, phenolic compounds, anti-inflammatory activity, histology *in vivo*.

Biography:

Mrs Hadjer Chenini-Bendiab is PhD student in biological sciences - experimental pharmacology-. She is a researcher member at the pharmacognosy and api-phytotherapy laboratory of Mostaganem University (Algeria).

Latsko T.A.*[1], Zubkova T.A.[2], Malovichko S.M.[3]
[1]Dr., Private Entrepreneur, Krasnodar, Russian Federation
[2]Faculty of Soil Science, Moscow State University, Moscow, Russian Federation
[3]Natural Cosmetics Ltd, Gvardeysk, Russian Federation

Biological features of Maclura pomifera (Rafin.) Schneider in the southern European part of Russia

The work is devoted to the study of ecological and morphometric features of the Maclura pomifera (Rafin.) Schneider: its yield, seed productivity, as well as the content and characteristics of seeds oil. It was found that the M. pomifera was introduced into the southern region of Russia in the 19th century. At first, it grew on the southern coast of the Crimean Peninsula, and in the middle of the twentieth century, the maclure was moved to the steppe zone. The plants have already successfully taken root, adapted and acclimatized. Mass plantings of the maclura were carried out in the 60s of the twentieth century along the roads as the creation of hedges and windbreaks.

The object of this study was the M. pomifera plantings, 35-65 years old, in the urban-type settlement of Gvardeysky (20 km east of Simferopol). The research was conducted in the southern European steppe natural zone. The soil is represented by low-humus southern chernozems on brown and reddish-brown Pliocene clays. The soil solution has a neutral or slightly alkaline reaction of the medium (pH 7.0-8.0). The climate here is arid, with a moderately hot growing season and a short, mild, unstable winter. So, maclura plants were unpretentious to agrotechnical care, relatively drought-resistant, durable, and growing, trees create impassable thorny thickets. The maclura vegetation was starting in March and finishing in November with the onset of frost. At the end of April, it bloomed, in mid-August, the fruits already reached a removable size of 12-15 cm. The maturation of the maclure fruits occurred in mid-September – October. Fruit collection was carried out in October-December. Maclura fruits are not edible for humans. Currently, they are not used on an industrial scale, but only in folk medicine. Maclura yield was 25-500 kg per tree. Fruit weights were 115-406 g. In the fruit there was 2,4-3,9% by weight of seeds. As a result of this study, for the first time in Russia, oil from maclura seeds was obtained. Maclura seeds contained 30-33% of oil, which had a rich chemical composition: valuable fatty acid included linoleic (77.6%), oleic (12.3%), palmitic (6.6%), stearic (2.3%), etc. The oil contained α-linolenic acid (0,55%), i.e. omega-3, valuable and rarely founding in plant objects. The high ratio of polyunsaturated to saturated fatty acids (8.77) can be used to lower serum cholesterol levels, reduce atherosclerosis, and prevent heart disease. Finally, a significant proportion of oleic acid in the oil makes it desirable in the diet. Maclure seed oil is a rich source of sterols, polyphenols, and α-, β-, γ-, δ-tocopherols.

The study of the biology of maclura, its chemical composition, the effect of various components on animals and humans, as well as technological issues is very important both in a theoretical and practical sense, since the components that make up the fruits and other parts of maclura plants have great prospects for use in medicine, cosmetics and food industry.

Keywords: Maclura orange, Maclura aurantiaca, maclura seed oil, γ-tocopherol, vitamin E

Audience Take Away:

- Valuable substances contained in the maclura fruits can improve the quality of human life, they can be used in medicine, cosmetics and the food industry
- This work can initiate breeding, agronomic research, the technology of creating new drugs to solve pharmacological, cosmetics problems, as well as issues of healthy nutrition

Biography:

Dr. Latsko studied Biology at the Petrozavodsk University, Karelian Republic Russian Federation and graduated as MS in 1979. She then joined the research group of Prof. Smykov at the Steep department of the Nikitsky Botanical Garden, Ukrainian Academy of Agrarian Sciences (UAAS). In 1993, she received a Ph.D. degree for studying the biological characteristics of new apple cultivars and hybrids at the same institution. For a long time, she was engaged in peach breeding. She is the co-author of two cultivars of apple and 18 peach, has patents. Since 2012, she headed the department of steppe crop production. Since 2018, T. A. Latsko has been studying the biology of M. pomifera in a private laboratory. She has published more than 70 research articles in SCI (E) journals.

Gabriela Vochita[1]*, Cosmin-Teodor Mihai[1,2], Lacramioara Oprica[3], Daniela Gherghel[1]

[1]NIRDBS, branch Institute of Biological Research Iasi, Romania
[2]CEMEX Department, "Grigore T. Popa"
[3]"Alexandru Ioan Cuza" University, Faculty of Biology, Romania

Preliminary data regarding the karyotype of some spontaneous medicinal plants from North-East of Romania

The karyotype studies represent the first and useful step that provides the cyto-taxonomic status of the species in order to establish the phylogeny. With this technique it may be possible to discover installation of some numerical and morphological aberrations on the chromosome level. Also, cytogenetic studies aimed at establishing the number of chromosomes of the species, elucidating their conformation and ordering them in karyotype and idiogram, are of particular importance in initiating and directing of the plant breeding amelioration for obtain the hybrids with agricultural and economic role (salt and drought-tolerance/resistance, etc.). According with above mentioned, the aim of present study was to determine the somatic chromosome number, analysis of the morphological features of mitotic chromosomes, construction of karyotypes and idiogram of five spontaneous medicinal plants, such as: *Anthemis tinctoria* L., *Cichorium intybus* L. *Datura stramonium* L., *Echium vulgare* L., *and Humulus lupulus* L. 1. *For Anthemis tinctoria* L. (2n=18), according to the ratio between long and short arm, we established the following three chromosome types: median - m (pairs I, III, IV and VII), arms ratio between 1.10 (I) and 1.42 (VII); submedian - sm (II, V, VI, VIII) with arms ratio 1.51 (VI) and 2.93 (V); subtelocentric - st (IX) having 3.10 arms ratio. No secondary constriction was observed. 2. The diploid set of *Cichorium intybus* L. was 2n=18 chromosomes, having small dimension, according to literature data (Bernardes et al., 2013). 3. In the case of Datura stramonium L. (2n=24), we established two morphological types of chromosomes: median - m (pairs I, II, IV, V, VI, VII, VIII, IX and XI) and submedian - sm (pairs III, X and XI), this species having symmetrical karyotype. Flow cytometric analysis identified also diploid and tetraploid plants of Datura stramonium calus and hairy root *in vitro* cultures (Weber et al., 2008). 4. *Echium vulgare* L. is a tetraploid species (2n=4x=32) with very small chromosomes. It is considered pseudometallophyte plant which commonly occurred on dry, coarse textured soils as well as on heavy metal contaminated substrates. Comparatively study between *E. vulgare* originating from Zn-Pb mining and smelting waste deposits and from uncontaminated soil showed increasing of the genetic diversity in the plants from contaminated soil (Dresler et al., 2015). 5. *Humulus lupulus* L. (2n=20) is a plant with heteromorphic sex chromosomes, the genotypes carrying XX or XY chromosomes correspond to female and male plants, respectively (Divashuk et al., 2011). In our study we identified also diploid (2n=20, XX) and aneuploid (2n=21, 26 and 27 chromosomes) **metacentric – M**, r=1.0, **median – m**, and **submedian - sm**. Very recent studies of meiotic chromosomes (Easterling et al., 2018) revealed segregation distortion in H. lupulus, including aneuploidy, segmental aneuploidy, or chromosome rearrangements. This classical cytogenetic investigations will be must completed and correlated with some advanced approaches such as DAPI banding, fluorescence in situ hybridization (FISH) or flow cytometric determinations in order to formulation of an accurate view on the karyotype evolution of some medicinal plants from North-East Region of Romania.

Acknowledgments:

This work was supported by Romanian Ministry of Research and Innovation (25N/2019 and 22PFE/2018 projects).

Biography:

Gabriela Vochita, senior researcher at the Institute of Biological Research Iasi, Experimental and Applied Biology Department. She has completed her PhD at "Alexandru Ioan Cuza" University, Faculty of Biology. Her thesis title is: "*Cytogenetic and physiological effects induced by pesticides treatments at barley, two row barley and rye*". Her research activity includes studies in animal and plant cytogenetics field (karyotype, idiogram, physical and chemical mutagenesis, in situ hybridization, electrophoresis), molecular biology, biochemistry, *in vitro* cell cultures. She has written many scientific papers, participated in national and international congresses/conferences. The managerial activity was carried out as a leader of national and international projects.

Celia Paya*, Maria Pilar Lopez-Gresa, Ismael Rodrigo, Jose Maria Belles, and Purificacion Lison

Institute of Molecular and Cellular Biology, Spain

Applications of the (Z)-3-hexenyl butyrate in agriculture

In response to biotic stress, plants synthesize defense proteins and metabolites. Volatile organic compounds (VOCs) belong to this defensive compounds group.

Some esters of (Z)-3-hexenol were identified to be differentially emitted by tomato cv. Rio Grande plants upon infection with the avirulent strain of the bacterium *Pseudomonas syringae* DC3000 pv. *tomato* (Lopez-Gresa *et al.*, 2017). Exogenous treatments with esters of (Z)-3-hexenol with acetic, propionic, isobutyric or butyric acid showed an induction of resistance against this bacterium. Particularly, treatments with (Z)-3-hexenyl butyrate (HB), resulted in significant stomatal closure, defense genes induction and enhanced resistance to the bacteria (Lopez-Gresa *et al.*, 2018), leading us to patent this compound due to its defensive properties (Lisón *et al.*, 2017).

We have focused on the mode of action of HB and its ability to close stomata in different plant species, resulting in HB-mediated stomatal closure in several plant species belonging to *Nicotiana, Arabidopsis, Medicago, Zea* and *Citrus* genus, or against different stresses, such as drought. Its efficacy as phyto-protector has also been tested in open field conditions and against other pathogens, such as potato and infection with the fungus *Phytophthora infestans*.

Our results reinforce the importance of VOCs as fundamental compounds in the plant defense response, proposing HB as a new natural product for the sustainable control of stresses in agriculture.

Audience Take Away:

- The importance of Volatile Organic Compounds (VOCs) in plant defense
- The study of different plant stresses
- The potential of HB as a new biotechnological product for agriculture

Biography:

Celia Paya studied Biotechnology at Polytechnic University of Valencia, Spain and studied MSc in Plant Cellular andMolecular Biotechnology in "Instituto de Biología Molecular y Celular de Plantas" (IBMCP). She joined the research group of Prof. José María Bellés and Prof. Purificación Lisón at the IBMCP in 2016, and she did her bachelor and MSc thesis in this research group. Recently, she has obtained a grant for her PhD studies by the Generalitat Valenciana

Lacramioara Oprica[1]*, Marius-Nicusor Grigore[1], Babusca Daniela[2], Mihaela Munteanu[1], Maria Balasoiu[3,4], Dorina Creanga[2]

[1]Alexandru Ioan Cuza University, Biology Faculty, Iasi, Romania
[2]Alexandru Ioan Cuza University, Physics Faculty, Iasi, Romania
[3]Joint Institute for Nuclear Research, Dubna, Russia
[4]"Horia Hulubei" Institute of Physics and Nuclear Engineering, Bucharest, Romania

Synthesis of silver nanoparticles using *Vaccinium myrtillus* L. fruits extract: characterization of particles and study of fungi effect

The production of silver nanoparticles (AgNPs) from bilberry (*Vaccinium myrtillus* L.) fruits extract was studied. The aqueous 10mM $AgNO_3$ solution when subjected to *V. myrtillus* extract was bio-reduced and ensued in green synthesis of AgNPs. The aqueous bilberry solution was enriched with polyphenols (6.89mg/g gallic acid equivalent) and flavonoids (1.51 mg/g catechin equivalent). The AgNPs synthesis was manifested by a color change from colorless to yellow brown after the introduction of fruits extract of *V. myrtillus*. The formation of nanoparticles was monitored spectrophotometrically by measuring the intensity of the surface plasmon resonance band (SPR) of silver. This green procedure has high yields without application of toxic reagents or surfactant template.

As methods of study the AgNPs interactions with environmental microorganisms, like *Phanerochaete chrysosporium*, the biochemical assays of defense systems of antioxidative activity and proteins contents were applied. The lipid peroxidation, expressed as malondialdehyde content has been also evaluated. Overall, results showed a variation of activity of superoxide dismutase and catalase in fungus mycelium depending on the concentration of AgNPs and the age of fungus after inoculation.

Audience Take Away:

- By participating with this paper at the conference in Valencia, the aim is to promote the research carried out at Alexandru Ioan Cuza University in Iasi, the Faculty of Biology/Faculty of Physics in the field of nanotechnologies, more precisely the obtaining and characterization of nanoparticles by biological means. Through this communication there will be the possibility of an in-depth reflection and a mutual exchange of information with researchers from related fields participating in the conference
- The presentation of the results obtained so far at an important international scientific event may attract the attention of potential collaborators for future collaborations with European funding in which our university has a significant role.
- A clear picture will be provided regarding the research activity at our institution, as well as a comparison with the research process at the participating institutions

Biography:

Lacramioara Oprica obtained her PhD degree at Alexandru Ioan Cuza University Iasi where she works, in present, as lecturer at Biochemistry Department, Biology Faculty. Her researches are focuses on quantification of physiological and biochemical parameters involved in oxidative stress (enzymatic and non-enzymatic antioxidants) occurring in plants and microorganisms under abiotic stress conditions. The dissemination of the obtained results was done by publishing over 150 peer-reviewed journal papers (as author or co-author) in the areas of Plant Environmental Stress Physiology, Natural Product Chemistry, Cellulolitytic Fungi Biotechnology and Green Biosynthesis of Nanoparticles. She has acted as a scientific referee for national and international journals in the fields of biochemistry.

magnus Group

KEYNOTE FORUM | DAY 2

Global Congress on

PLANT BIOLOGY AND BIOTECHNOLOGY

March 22-23, 2021

GPB 2021

Tornel, M.[1,2*], Crespo, P.[1] and Serrano, M.[2]

[1]Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario, La Alberca, Murcia, Spain

[2]Investigción y Tecnología de Uva de Mesa, Blanca, Murcia, Spain

New trends in table grapes breeding

About thirty years ago, table grape growers grew traditional grapes with seeds, soft texture and low productivity. Currently, the main characteristics are seedless grapes, crunchy texture, good color and extraordinary flavor, available throughout the year in supermarkets. By satisfying the needs of the producers, the vineyards are more productive and need less cultivation work

Fungal resistance has been the main topic among grape breeders. Downy and powdery mildews are the two fungal pathogens breeding addressed most intensively during past decades. With this, less phytosanitary treatment will be needed, they will have less waste and less environmental impact. The development of these new varieties is through crosses but we use in vitro culture to obtain seedlings and the use of molecular markers for assisted selection, these being the main biotechnological tools used. Breeding new varieties is a worldwide achievement.

Biography:

Agronomist engineer and phD in agricultural research, I lead the table grapes team of IMIDA, public institute of agrarian research. We developed a genetic breeding program to obtain new seedless table grapes varieties with the use of biotechnological techniques such as in vitro culture and molecular markers for obtaining hybrids; in the field we use hormonal growth regulators (PGR). Breeder of 17 new varieties of which around 1.000 ha are grown in Spain; the first commercial farms are being planted in Chile, Peru and Australia; and in coming years in South Africa and Brazil; 2 of the varieties have powdery mildew resistance genes, we are now focused on biological agriculture. Speaker at international congresses in Mexico, Chile, Italy, Germany, Brazil, Argentina, Peru and Greece; and poster in Australia, Hong Kong and France.

Danijela Poljuha[1]*, Barbara Sladonja[1], Tim Weber[1,2], Tihomir Vukelja[3]

[1]Institute of Agriculture and Tourism, Karla Huguesa 8, HR-52440 Porec, Croatia

[2]Department of Life Sciences, Imperial College London, South Kensington Campus, London, SW7 2AZ United

[3]Department of Physics, Faculty of Science, University of Zagreb, Bijenička cesta 32, HR-10000 Zagreb, Croatia

Ahead of their time: Women pioneers in plant biology

Alien species invasion is recognised as one of the most severe and challenging global environmental threats. Introduced species may become invasive and displace native species, modify habitats, change community structure, affect ecosystem processes or wider ecosystem functioning. Further invasive species often impede the provision of ecosystem services and cause substantial economic losses. Tree of Heaven, *Ailanthus altissima* (Mill.) Swingle, native to Southeast Asia is today considered one of the most widespread invasive plant species in Europe and North America and is a subject of modern invasion ecology research. *A. altissima* happens to be the research subject of the first PhD thesis in plant biology made by a woman in Croatia in the beginning of the 20th century, when the tree was cultivated as an ornament. Vjera Petaj, a passionate botanist and one of the first female students at the Royal University of Francis Joseph I in Zagreb (Croatia) used microscopy techniques for the investigation of morphology, anatomy, microchemistry, and biology of its extrafloral nectaries. All her results were later confirmed by modern microscopy techniques and contributed to the knowledge of their morphology and role in species physiology. A half century later, a similar topic of extrafloral nectaries on *Vicia faba* L., and similar techniques of electron microscopy, were the focus of interest for another Croatian female scientist, Mercedes Wrischer. She was one of the pioneers of plant electron microscopy, whose electron micrographs of cell organelles were displayed in European biology textbooks.

This presentation will offer an insight into social elements, particularly the status of women in the Croatian and European academic community in the early 20th century. The beginnings of the once highly appreciated, so-called Zagreb School of Electron Microscopy will also be presented. The results of those early microscopy works will be shown and linked with current research on the topic. The presentation will also focus on the ecology of *A. altissima* and its negative impact on the environment and human health. Conversely, potential ecosystem services, that this invasive plant species can provide, will also be discussed.

Audience Take Away:

- This presentation will be a tribute to gender equality in STEM. By highlighting women pioneers in plant biology and STEM the hope is to provide inspirational role models for women scientists. The two stories will shed light on the difficulties women faced in tackling scientific problems, but also in overcoming social and professional obstacles just because of their gender. The aim of the talk is thus also to raise awareness and encourage further discussion on the ongoing gender based obstacles in STEM and science in general
- The presentation will provide insight into the still not entirely clarified role and function of extrafloral nectaries in plant physiology
- On the example of A. altissima, the audience will get an overview of the highly destructive global impacts of alien invasive plant species and also an insight into the possibilities to balance their invasive (negative) properties with possible uses in boosting ecosystem services

Biography:

Dr. Poljuha graduated from molecular biology at the Faculty of Science, University of Zagreb (Croatia), where she also holds a PhD degree in natural sciences in the field of biology. She has worked as a researcher at the Faculty of Science, University of Zagreb, The Institute of Agriculture and Tourism Poreč, and The Materials Research Center METRIS Pula. She has participated in 25 national and international projects and has published over 50 scientific papers. She is the founder of two laboratories and a Biotechnical Department. Her research interests are focused on plant genetics and the application of molecular markers in the conservation of plant genetic resources. She is also involved with the popularization of science.

Valasia Iakovoglou
UNESCO chair Con-E-Ect, International Hellenic University, Drama, Greece

Plant species and humans in Urban settings

In urban settings, plants substantially contribute in improving our lives mainly by enhancing the aesthetic value and cleaning the air. In addition, plants also result in increasing property value. Nonetheless, wrong planting choices by not careful plant species selection could lead to unpleasant results to the users, such as accidents. This study focuses on providing information on species planted in urban settings at the Northern part of Greece. Further, it provides potential solution to the problem by informing on what plant species should be avoided when planting in urban settings. Particular emphasis is given at school yards that makes them of great importance since the main users are children. Further, information is also provided on the species that can cause poisoning, fatal allergic reactions and other types of accidents. The study benefits people by guiding and providing information on what to "avoid" when planting in urban areas, particularly where children are the main users.

Keywords: Biodiversity, Mediterranean ecosystems, Plant species, Sustainable ecosystems, Urban forestry

Audience Take Away:

- They will be informed on species to avoid when planting in Urban settings
- This will help them minimize possible accidents
- It will help Inform on existing planting problems and potential solutions

Biography:

Dr. Valasia Iakovoglou is a graduate of Iowa State University, USA. She has more than 25-yrs of national/international research and teaching experience as an Ecophysiologist/Silviculture expert in seedling production and Restoration/Conservation of Ecosystems with emphasis on Biodiversity under the challenges of Climate Change. She 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 more than 100 publication publications of books/book chapters and 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. Currently she is the Director of the Ecotourism Sector of the UNESCO chair Con-E-Ect and a visiting professor at the MSc program "Man and Water".

magnus Group

SPEAKERS | DAY 2

GLOBAL CONGRESS ON

PLANT BIOLOGY AND BIOTECHNOLOGY

MARCH 22-23, 2021

GPB 2021

Dawei Yan[1]*, Shuang Kou[1], Yao Liu[1], Shri Ram Yadav[2], Andrea Paterlini[3], William J. Nicolas[4], Jonathan E. Markham[5], Jung-Youn Lee[6], Emmanuelle M. Bayer[7], Yka Helariutta[3]

[1]State Key Laboratory of Crop Stress Adaptation and Improvement, Henan University, Kaifeng, Henan, China
[2]Department of Biotechnology, Indian Institute of Technology, Roorkee, India
[3]The Sainsbury Laboratory, University of Cambridge, Cambridge, UK
[4]Division of Biology and Biological Engineering, California Institute of Technology, Pasadena, CA, USA
[5] Department of Biochemistry, University of Nebraska-Lincoln, Lincoln, NE, USA
[6]Department of Plant and Soil Sciences, Delaware Biotechnology Institute, University of Delaware, Newark, DE, USA
[7]Laboratoire de Biogenèse Membranaire, UMR 5200, CNRS, Université de Bordeaux, Villenave d'Ornon, France.

Regulation of plasmodesmata-mediated phloem unloading in roots

In plants, the products of photosynthesis such as sucrose are loaded in source organs and delivered to sink organs by phloem. However, the following unloading process in sink is still unclear. Previously our collaboration work indicated a key role of phloem pore pericycle (PPP) in regulating phloem unloading in roots. Our data provided strong evidence that phloem unloading occurs predominantly via the PPP, not companion cells(CC). Following by a screen using a gain-of-function mutations in Arabidopsis CALS3 CALLOSE SYNTHASE 3 (CALS3) gene (cals3d), we identified a suppressors of cals3-d and have identified a second mutation in plm (PHLOEM UNLOADING MODULATOR), which could partially suppress the cals3-d phenotype. The plm knockout mutant carrying pSUC2:GFP exhibits enhanced unloading of GFP in the root tip. Further examination showed only type I plasmodesmata was found at the PPP-Endodermis interface in roots, which resulting in enhanced plasmodesmal permeability. PLM encodes an ER-localized protein containing a lipid phosphatase domain. It indicates a so far uncharacterized phosphatase family which was highly conserved in plant kingdom. The lipid profiling indicated that the sphingolipid homeostasis was affected in plm mutant. Our results suggest a role of sphingolipids in PD ultrastructure and permeability regulation that finally modulates phloem unloading in roots.

Moreover, we found the phloem unloading in roots was supressed by heat stress and the root meristem zone was shorter consequently. The following characterization of plasmodesmal change and transcript profiling will uncover the underlying regulation mechanism.

Audience Take Away:

- Methods and tools to evaluate the change of phloem unloading in plants
- Increase plant growth by regulating plasmodesmal structure and permeability
- My research will extend our knowledge about phloem unloading, which is different from pervious text-book views. It also raised new interesting questions in this research field. So the updated information would be used in further research and teaching. My finding could also be used in agriculture and breeding to increase plant growth and biomass

Biography:

Dr. Dawei Yan received his PhD degree in Chinese Academy of Sciences in 2013. Then he joined the research group of Prof. Yka Helariutta in the University of Helsinki and moved to University of Cambridge in 2014, working on phloem unloading in roots. Dr. Dawei Yan established his own lab as a group leader since 2019 at Henan University in China.

Cantabella, Daniel*, Teixido, Neus[1], Casanovas, Maria[2], Solsona, Cristina[1], Torres, Rosario[1], Dolcet-Sanjuan, Ramon[2]

[1]IRTA, 1XaRTA-Postharvest, 2Plant In Vitro Culture Laboratory-Fruticulture Program

[2]Edifici Fruitcentre, Parc Científic i Tecnologic Agroalimentari de Lleida, 25003 Lleida, Catalonia, Spain

Morphological changes induced by the inoculation of rhizospheric microorganisms in *Prunus* and *Pyrus* in vitro plantlets obtained by embryo rescue

The present study shows results concerning changes in root morphology and plant growth on in vitro growing plantlets induced by the application of rhizospheric microorganisms, isolated from *Pyrus* and *Prunus* contaminated seedlings. These plants displayed better growth than those non-contaminated seedlings. The subsequent identification revealed that *Pseudomonas oryzihabitans, Cladosporium ramotenellum* and *Phoma* spp. were involved in these morphological changes. Moreover, these three microorganisms were applied to pear (*Pyrus communis* L.) in vitro rooted plantlets, as well as to embryos derived from two directed crosses between early ripening nectarine varieties (*Prunus persica* cv. Nectarina). The concentrations of microorganisms applied were $2x10^7$ esp/ml for both fungi, and $2x10^8$ CFU/ml in the case of bacterium. The three microorganisms increased in different ways plant growth parameters including plant fresh weight, stem length and root length of in vitro rooted pear plantlets. Instead, only the inoculation with *P. oryzihabitans* improved root development in nectarine embryo derived plantlets, leading to plants with higher root volume and thickness, which also enhanced their acclimation efficiency to soil, since it increased plant survival rate and growth after 4 weeks in the greenhouse acclimation conditions. This approach could represent a breakthrough in the use of microorganisms in the in vitro embryo rescue, applied to early ripening stone and pit fruits breeding programmes, and the production of plants more resistant to the stressful conditions of the acclimation process.

Audience Take Away:

- As is it presented here, combining the in vitro culture of plants and their controlled inoculation with isolated microorganisms is a novelty in the field of plant biotechnology oriented to improve plant breeding programs, extend the understanding in plant physiology, plant-microbe interactions, and biological control
- By this presentation, the audience will be aware about the use of natural sources to improve plant growth, as well as different techniques to improve rate germination of early ripening varieties
- Since this study involves the combination of microorganisms and plants under a controlled environment, it allows to study the impact in plant growth mainly due to the application of these microorganisms, avoiding external factors
- Moreover, the application of microorganisms which produced more resistant plants to acclimation conditions could represent a promising approach to reduce losses of plant material in this step of plant in vitro culture

Biography:

Daniel Cantabella Velázquez studied Biochemistry at the Murcia University and he was graduated in 2015. After finishing his master in Plant stress Biology and Biotechnology at the same institution, he joined the Fruit Tree Biotechnology group of Jose Antonio Hernández Cortés in CEBAS-CSIC in 2017. A year later, he received a scholarship from the Catalonia's Government to work as a PhD student in both Pathology of Postharvest and In Vitro Culture of Plants groups lead by Neus Teixidó and Ramon Dolcet-Sanjuan respectively as supervisors.

Valter Henrique Marinho dos Santos[1]*, Paulo Benevides[2]
[1,2]Research and Development Sector, Atina - Ativos Naturais, Pouso Alegre, Minas Gerais, Brazil
[1]Faculdade Pouso Alegre - Unis Group, Pouso Alegre, Minas Gerais, Brazil

Phenolic compounds of plants as bioactive for the cosmetic industry

The use of natural actives for the formulation of cosmetic is increasingly gaining prominence. The last decades have registered a growing interest in products under the label of "natural" and in the case of biodiversity, it has gained strategic value over its possible industrial and economic uses in various segments. Phenolic compounds represent one of the most important and groups of plant actives. They can be found in different parts of plants such as seeds, leaves, flowers, roots, stems and fruits.

For extraction of plant actives, there are several methods, among which, the traditional extraction methods using organic solvents (such as water, ethanol, ketone, ether and methanol), supercritical extraction and steam distillation. In the case of phenolic compounds, several researches use methanol solutions for the extraction of such compounds, however, depending on the purpose of the extract the reagent should be replaced by ethanol, since it has a lower degree of toxicity in contrast to methanol. Depending on the polarity of phenolic compounds present in plant material, ethanol/water mixtures are more effective than pure ethanol in the extraction process.

Standardization and quantification of phenolic compounds in different extractions can be performed by spectrophotometry, which is a widely used technique due to its simplicity, speed and low cost or more sophisticated and precise techniques such as liquid chromatography (HPLC) and gas chromatography (GC).

The extracts with high concentrations of phenolic compounds present several proven biological activities such as antimicrobial, antiviral, cytotoxic, antioxidant, anti-inflammatory, among others. Because it has a number of beneficial effects on the biological system, mainly the antioxidant, there is great economic interest for the production of cosmetic, pharmaceutical and food products from this class of compounds. Many scientific articles highlight the application of the antioxidant activity of phenolic compounds in the production of formulations to retard of skin aging, antimicrobial and anti-inflammatory activities, disorders that can has its basis the formation of free radical. The free radicals cause a disorganization of the defence mechanism, that consequently it can generate damage to its structures, such as lipids, proteins and DNA.

Among the several plant species that are used in the nutritional and dermatological areas with antioxidant properties, can cite: Juçara (*Euterpe edulis*), Anise (*Pimpinella anisum*), Chamomile (*Matricaria recutita*) and Green coffee (*Coffea arabica*). Juçara palm (*Euterpe edulis*) is native to the Atlantic forest, which has a high concentration of anthocyanins, a flavonoid class known for its antioxidant activity. Anise extracts (*Pimpinella anisum*) are known for their antioxidant activities, analgesic and antimicrobial properties generated by the polyphenols present in its different organs. Quercetin is a most abundant flavonoid in Chamomile (*Matricaria recutita*) extracts and it has anti-inflammatory, antiviral, antioxidant and antimicrobial properties. Finally, green coffee (*Coffea arabica*), the plant has high concentrations of chlorogenic acids and caffeic acid, actives known for their antioxidant and thermogenic activities.

Audience Take Away:

- The public may use knowledge in prospecting for plants with actives of economic interest, in the extraction of phenolic compounds of plant extracts and in the quantification and standardization of phenolic compounds in plant extracts
- The work will approach an innovative subject that can be employed in various areas of science and can make the work of many scientists more applicable and multidisciplinary. The work will provide information on extraction techniques, quantifications and standardization of phenolic compounds, one of the most widely applied plant actives in the pharmaceutical, food and cosmetic industries

Biography:

Valter Henrique Marinho dos Santos, graduated in Biological Sciences from Unesp, specialist in Chemistry from the Federal University of Lavras and PhD in Biological Sciences (Botany) with emphasis in phytochemistry from Unesp. Researcher at Atina - Ativos Naturais, responsible for the development of raw materials of plant origin for the pharmaceutical, food and cosmetic industries. Professor at Unis College - Pouso Alegre.

Ivan Visentin
University of Turin, Department of Agricultural, Forest and Food Sciences, Largo Paolo Braccini 2, 10095 Grugliasco (Turin) Italy

Role of the strigolactones under drought in tomato

Strigolactones (SL) are a class of plant hormones with various functions in plant development and in the interaction with (micro) organisms in the rhizosphere. As developmental regulators the SLs control above- and below-ground morphology, the inhibition of shoot branching, the modulation of the root morphology and the promotion of the shoot secondary growth. Recently, a role of SL in plant responses to drought stress has been also demonstrated. SL biosynthetic mutants show a decreased stomatal sensitivity to ABA and therefore a more sensitive to drought. They are also hypothesized to contribute to the root-to shoot drought communication. The differential induction of SL production in the root and shoot under water stress in several model plants, supports this hypothesis. The SL involvement in the drought acclimatization has been also in part described: they influence stomatal activity in ABA-dependent and independent ways but so far, the knowledge about the molecular factors involved in this modulation are little. In our studies we are investigating about the downstream possible effectors of SL action under drought stress in tomato plants. The miR156, a small RNA with a characterized role in the plant development and stress responses is resulted a good candidate of the ABA-dependent subset of drought responses triggered by SL. Analysis of its effects on target mRNA stability, tomato ecophysiology and stomatal behaviour confirmed this possible role. Finally, in our very recent study the module SL/miR156 seems to be involved also for full memory of stress at the guard-cell level in tomato plants subjected to more dehydration cycles.

Audience Take Away:

- My talk will give an overview about the general endogenous and exogenous activities of the strigolactones
- My talk could be interesting for the researchers studying the molecular/physiological mechanisms involved in the water stress responses (possibly by involving another hormone signaling pathways)
- I will focus my talk about the "recovery mechanisms" by highlighting the behavior of the plants submitted a reiterated water stress ("memory of the stress")
- My talk could be the starting point to discuss about a possible agronomical exploitation of the role of the strigolactones in the water stress tolerance

Biography:

Dr. Ivan Visentin studied and graduated in Plant biotechnology at the University of Turin in the 2004. He obtained the PhD in the Biology and Biotechnology in the 2008 at the University of Turin with a study on the mycotoxigenic fungi in maize. Successively he joined to the research group of the Prof. Andrea Schubert before as post-doc and today as Staff Researcher Associate in the Plant Physiology at Turin University. Expertise in molecular plant physiology, his researches focus on the interaction between strigolactones (SL), abscisic acid (ABA) and some microRNAs under drought conditions in tomato and Arabidopsis plants. Recently, his research has been investigating the role played by mir156 and the SL under recurring water stress conditions in tomato. He is also involved in the management of StrigoLab, an academic spin-off focused on the production and developing of synthetic SL-related molecules and of SL-enriched biostimulants (www.strigolab.eu).

Cristiana Oprea
Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research,
141980 Dubna, Moscow Region, Russian Federation,

Multivariate geostatistical approach to assess the spatial occurrence of trace heavy metals in Crisuri Basin

The Crisuri Basin, with a total length of 1093 km among which 670 km in Romania, is monitored throughout 18 stations. The pollution indicators as dissolved organic substances, biochemical consumption of oxygen, ammonia, phosphor, nitrogen and heavy metals, exceed the allowed limits in some running water ecosystems. The present paper will focus on sources identification and evaluation of environmental pollution with heavy metals in Crisuri Basin. The goal of this research is the determination of the most important factors causing the change of the state of some components of local ecosystems, the setting of observation variables and control parameters in the Crisuri water natural complexes. This suppose that environmental contamination and its preservation are largely applicative and not of marginal theoretical concern. Understanding that the causes of environmental damage and their reversal potential are closely linked to population growth, prosperity, technology and resources, they need to be analyzed through multidisciplinary approaches to identifying the emission sources. An analytical approach to assay the abundance of the inorganic and organic components has to be applied in order to obtain featured measures of environmental consciousness. The analysis includes multivariate statistical modeling applied to a list of variables collected in the done environmental surveys. The factors were assigned to pollution sources as municipal waste leachate in running waters, local industry discharges, agriculture pollution and geological fingerprints. For example, the biogeochemical survey showed that in the monitored area bordering a high industrialized urban area there are zones with significantly higher concentrations of Ni and Pb and other trace heavy metals as As, Cr, Cu, Fe, Sb and Zn linked to anthropogenic activities linked to local industries and urban traffic. This kind of studies is very requested regarding the vegetable meant for human dietary.

Audience Take Away:

The issues to be analyzed here include

- The global trends of health transformation in geochemical environment of nowadays biosphere
- Risk assessment approaches for classifications of the various variables of environmental consciousness to quantify the risk of diseases derived from anthropogenic origin and comparison with other areas;
- Horizontal evolution and interrelationships taking place in the consciousness of humanity – nature; criteria for determining the general pollution level linked to the human health
- The problem of geostatistical mapping of risk zones, related to negative medical effects due to both excess and deficiency of certain natural chemical elements or compounds
- Environmental monitoring and protection

Biography:

Dr. Oprea studied Physics at the Bucharest University, Romania and graduated as MS in 1991. She then joined the research group of Prof. Mihul at the Joint Institute Nuclear Research. She received her PhD degree in 2002 at the Bucharest University. With more than 30 years of professional experience, Dr Oprea's research focuses on nuclear reactions applied in multidisciplinary fields of fundamental and applied sciences. In addition to her primary role, she is the leader of more than 40 international nuclear and environmental projects. Dr Oprea is author and co-author of more than 400 scientific papers and communications.

Leda Guzman[1]*, Cristobal Balada[1], Monica Castro[2], Claudia Fassio[2], Maria Jose Marchant[1,2], Miriam Montecinos[2], Paula Molina[2], and Waldo Acevedo[1]

[1]Laboratorio de Biomedicina y Biocatalisis, Facultad de Ciencias, Pontificia Universidad Catolica De Valparaiso, Valparaiso, Chile
[2]Laboratorio Propagación, Escuela de Agronomia, Pontificia Universidad Catolica de Valparaiso, Valparaiso, Chile

Chemical characterization and evaluation of biological activity of Microsorum scolopendria sp on a cellular damage model in vitro induced by opportunist pathogen

In Chile, plants or natural extracts are used for therapeutic purposes based on an ancestral knowledge, but without solid scientific basis as the chemical composition, biological activity or adverse effects. In Rapa Nui, preparations based on a Microsorum scolopendria (MS) or "Matu'a pua'a" are used by native people to treatment several diseases as gastric cancer, diabetes, muscle pain and other illness. In order to scientifically support its potential medicinal and sustainable use in Rapa Nui, the aim of this work is to determine the phenolic content of MS extracts, and evaluate their biological potential in a model of epithelial damage produced by opportunistic pathogens that cause serious skin conditions.

Methodology: The plant material of MS was collected from Rapa Nui and the metabolites were extracted from leaves and rhizomes using ethyl acetate, generating two extracts; leaves (HAE) and rhizome (RAE). Liquid chromatography coupled to negative and positive electrospray ionization (ESI) tandem mass spectrometry (MS/MS) was employed to the structural determination of phenolic compounds in the extracts from MS. The effect on cell viability was evaluate on Primary Human Dermal Fibroblasts HDFa cells by MTS assay, the antioxidant properties of MS extracts was evaluated by DPPH and ORAC assay and its protective -anti-reactive oxygen species (ROS) and antibacterial capacity was evaluated in a cellular model of human epithelial damage generated S. aureus and S. epidermis using HDFa cells. Additionally, we analysed the anti-inflammatory properties of extracts MS through spectrophotometric methods and cyclooxygenase 2 (COX-2) inhibition activity assay

Results: The results by RP-HPLC-MS/MS showed that MRS extract has approximately 1000 compounds. Leaves extracts contain a higher concentration of phenolic acids and the rhizome extracts a higher concentration of flavonoids and phenolic acids (13,55 ± 0,08 to 26,12 ± 0,04), respectively. Phenolic compound as Kaempferol, Luteolin and p-coumaric acids were abundant. Our findings suggest that MS have a good antioxidant, showing an EC50 for DPPH lower for the rhizome extract (12 µg/mL GAE) than leaves (20 µg/mL GAE) and compared to gallic acid (26, 32 µg/mL) and an ORAC value 63% more effective than the TROLOX control. The extracts are not cytotoxic on HDFa cells and have a good antioxidant capacity when the cells are pre-incubated for 24 hours with the extracts and subsequently are infected with S. epidermis, showing a 50 % decrease in ROS formation compared to the untreated cells. Furthermore, the rhizome extracts showed an 64 % of inhibition to COX-2 at a concentration of 3 µg/mL. Conclusion. Altogether, these results suggest the relevance to study the most important compounds of MS to establish their therapeutic potential and anti-inflammatory activity. Therefore, the continuation of this research can be supported by in silico studies of docking with COX-2 enzyme. Acknowledgements. FONDEF IT18I0015, Student grant ANID 21190657 and the Dirección de Investigación de la Vicerrectoría de Investigación y Estudios Avanzados, Pontificia Universidad Católica de Valparaíso, Chile (DIE 37.698-33).

Audience Take Away:

- To know about characterization of native and medicinal plants
- Potential therapeutic of compound presented in plants
- Study of properties of molecules in a cell model of damage
- New ideas about characterization of native plants, to collaborative with another researcher.
- Molecular docking
- Environmental monitoring and protection

Biography:

Leda Guzman, Ph.D in Biochemistry and Molecular Biology, associate professor of the Institute of Chemistry and Head of the Biomedicine and Biocatalysis Laboratory at the Universidad Católica de Valparaiso since 2007. In 1997 she finished her Ph. D in Biological Science at the Dr. Manuel Espinosa`s laboratory (Universidad Complutense de Madrid, Spain). 1998-2000 she worked as Postdoctoral researcher with the Dr. Dietmar Pieper at the National Centre of Biotechnology, Braunschweig (Germany) and Dr. Bernardo González in the Laboratory of Microbiology at the Pontifical Catholic University of Chile. She has been developing biomarkers for the detection of cancer and development of natural antimicrobial-antitumor therapeutic agents. Currently, she is lecturer of undergraduate students of Biochemistry, graduate students of PhD programs in Chemistry and Biotechnology (PUCV -Universidad Federico Santa María). Dr. Guzmán has been advisor of more than 30 undergraduate and graduate students; she has directed a number of research projects; her research (more than 31 research articles) has been published in important research journals.

Sunita Chandel* and Sumit Sidana

Department of Plant Pathology, Dr.Y.S.Parmar University of Horticulture and Forestry, Nauni, Solan (HP) – 17323

Bioresources, fungicides and SAR chemicals in integrated management of Alternaria branch rot of carnation

Alternaria branch rot or leaf spot of carnation was reported as a serious disease in carnation during 2016-17 in Himachal Pradesh-India causing maximum disease severity of 26.25% in Chail of Solan district. The symptoms on leaves initiated from the margin, tips as small purple lesions, turning grayish-brown as it matures and get blighted. Spreading later on to the stem, flower buds and even the immature flowers develops characteristic water soaked areas. Considering to the heavy losses annually and the adverse effect of the chemicals on environment, the present study was formulated with the objective to include alternative strategies in managing this devastating disease with the use of ecofriendly means. Various bioresources and SAR chemicals were exploited to manage the disease to keep the environment clean and soil fertile. Out of the bio-products, neemazal followed by cow urine were found superior by giving cent per cent and above 95.37% inhibition at higher concentrations of 30% compared to lower conc.10, 20% .Cloves extract of garlic yielded good results in suppressing the growth of the fungus upto the extend of 60.80% .The latex of agave and fruit rind of the soapnut gave 50.60 and 47.09 per cent inhibition in mycelia growth. Maximum inhibition (91.42%) in mycelia growth was obtained with neem oil and mint oil (88.52%).Whereas in fungicides score (difenoconazole) and contaf (hexaconazole) completely inhibited the growth at all concentrations amongst the systemic fungicides which was followed by fungicide, dithane M-45 (mancozeb) a non-systemic in nature under in vitro assessments. In field trail, the best treatments along with SAR (systemic acquired resistant) chemicals revealed the minimum extent of the disease severity with four applications of the sprays in score, which was followed by Contaf and combined treatments of BABA (β amino butyric acid)+ neemazal+garlic extract + neem oil and Chitosan+ neemazal+garlic extract + neem oil .The combined treatments also enhanced all the plant growth parameters in addition to lowering of the disease level to minimum threshold.

Audience Take Away:

- Audience will receive an overview of the disease problem of carnation crop in India
- Eco-friendly methods of the foliar disease management will be addressed which can be used by others students/ researchers /entrepreneurs for practical application under protective cultivation of flower crops
- Accurate designs for data analysis are adopted for result accuracy and problem assessing

Biography:

Dr. Sunita Chandel attained degree in BSc. Agriculture from Himachal Pradesh Krishi Vishvidhalaya, Palampur, India and her post graduate degrees in MSc and Ph.D in Mycology & Plant Pathology in years 1987 & 1991from 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

Sahir-Halouane F*, Bennacer A, Benmessaoud T and Hamdene A

Université M'hamedbougara De Boumerdes Laboratoire Valorisation Et Conservation Des Ressources Biologiques

Evaluation of the antifungal activity of olive leaf extracts against filamentous fungi of stored soft wheat

Olive tree leaves (*Oleaeuropeae*.) were suited in order to valorize the one of the medicinal plants from the Algerian flora, growing spontaneously in the Blida region, Algeria.This study aims mainly to assess the antifungal potential of the aqueous and tannic extract. the antifungal properties of the obtained extracts were evaluated by the agar diffusion method and four fungal species isolated from stored soft wheat (*Aspergillusflavus, Aspergillusniger, Aspergillusfumigatus, Aspergillusterreus* and *Mucor spp.*) were assessed. Regarding the fungicidal potential of the tannic extract, the highest inhibition zone was obtained for the *A.niger* (25.33 ± 0.44 mm) strain, followed by *A.flavus* (19.33 ±0.88 mm), *Mucor spp*. (17.00 ± 0,33 mm) and *A. fumigatus* (16.66 ± 0.44 mm), mm) however the aqueous extract performed the highest effect on A.fumigatuswith inhibition zone diameterof (23,00± 0,33 mm), *Mucor spp*.(19.00 ± 0,33 mm), *A niger and* A. flavus recorded the same inhibition zonewith (19.33 ±0.88 mm). The results of the IMC show that the aqueous and the tannic extracts of the leaves of Oleaeuropaeaused at low concentration could have significant potential for the biological control of fungal strains contaminating stored soft wheat..

Key words: Olea europeae, aqueous and tannic extracts, soft wheat, antifungal potential.

Hamma.Faradji Samia*, Bendjeddou K, Ait Meddour A
Universite M'hamedbougara De Boumerdes Laboratoire Valorisation Et Conservation Des Ressources Biologiques

Use of artichoke waste as a source of coagulant enzymatic extracts as an alternative to animal rennet in the development of cheeses

The gradual decline in availability of rennet excretion of calf rennet destined for the cheese industry, and the increase in protein requirements in the diet have led to a strong demand for cheese products (ROTONEL et, EQUI, l972). . This situation has led many researchers to take an interest in new sources of coagulating enzymes, in particular plant enzymes (BARBOSA et al., 1976). In this study, the coagulant activity of the enzymatic extract of the artichoke, a rennet substitute, was highlighted by the development of a traditional cheese.

Enzymatic extraction by maceration (NOUANI et al., 2009) from artichoke waste (hay and stems) was performed. In order to study the coagulating activity of artichoke stems and hays, several concentrations of Enzymatic extracts were tested taking into consideration the clotting time. The effect of temperature (0 ° C., 50 °, 60 ° C. and 100 ° C.) as well as the drying mode on the coagulant power was studied for the active enzymatic fraction. The latter has been used for the development of a traditional cheese. The yield of the latter has been measured. A follow-up of the physicochemical and microbiological quality was carried out during storage at 6 ° C. for 20 days. At the end of the preservation, a sensory analysis was carried out.

Analysis of milk for cheese production showed good hygienic quality with absence of staphylococci. During the transformation of raw milk into cheese by enzymatic coagulation under the action of the enzymatic extract of the artichoke, a homogeneous, firm, thick gel characterized by greater flexibility, elasticity, firmness and friability. accentuated than those of rennet gel was obtained. A higher yield (150g / liter of milk) was obtained using the enzyme extract of artichoke, a reduction of the coagulant power was observed after freezing and after a natural drying at room temperature. Indeed, a yield less important is obtained. However, a heat treatment of 15 min at 60 ° C. has no effect on the coagulating power of the enzymatic extract of the artichoke.

Microbiologically, artisanal cheese has a high lactic flora load (108 CFU / ml) with no staphylococci, faecal coliforms and salmonella.

Regarding the results of the physicochemical analysis, they testify to the good nutritional quality of the cheese. The hedonic analysis shows that the cheese produced is of the same quality as the industrial cheese with rennet technology.

Key words: recovery of artichoke waste, enzymatic artichoke extracts, coagulant power, artisanal cheese, physicochemical and microbiological quality, sensory analysis.

Joseph Nana Annan
Department of Biology Education, University of Education, Winneba, Ghana

Effects of Biozyme T. F., A Plant Hormone on Growth and Yield in Glycine max

The effect of a new plant regulator, Biozyme T.F. (Giz) was evaluated on soybean (*Glycine max* var. TGX 336 02D). Pot-grown soybeans were treated with foliar sprays of 0.5 PPT and 1.0 PPT concentrations of the growth regulator at flower initiation stage with the control being sprayed with only water as 0.0 PPT. Results indicate that Giz significantly increased fresh weight and dry matter accumulation in both shoots and roots of soybean. It also increased stem height significantly ($p < 0.05$). Both 0.5 PPT and 1.0 PPT Giz increased the leaf relative water content from the seventh day of application to the 21st day. The pattern after this day however, was not altered and the difference over the control was not significant. Giz also increased the levels of photosynthetic pigments and soluble carbohydrates in soybean with 0.5 PPT maintaining significant higher level. Giz also induced early flowering and significantly increased yield with 0.5 PPT performing better than 1.0 PPT.

Audience Take Away:

- It will provide information on the possibility of increasing yield in soybean
- An opportunity to consider the molecular basis of the effect of Giz

Biography:

Joseph Nana Annan graduated in 2008 with PhD degree in Plant Sciences from Oklahoma State University, Stillwater, Oklahoma, U.S.A. He received his MPhil in Botany in 1999 and B.Sc. in Botany and Zoology in 1992, both from the University of Cape Coast in Ghana. Dr. Annan is currently a Senior Lecturer in Plant Science in the Department of Biology Education, University of Education, Winneba. Ghana.

magnus Group

E-POSTERS

DAY 2

GLOBAL CONGRESS ON

PLANT BIOLOGY AND BIOTECHNOLOGY

MARCH 22-23, 2021

GPB 2021

Iakovleva Maria Timofeevna
Russian Academy Of Agriculture Sciences, Siberian Branch, Yakut Scientific Research Institute of Agriculture, Yakutsk, Republic of Sakha (Yakutia), Russia

The use of biological preparations based on strains of nodule bacteria on the productivity of alfalfa in Central Yakutia

The influence of strains of nodule bacteria, associative rhizobacteria and isolated active strains that increase the yield of alfalfa and improve the quality of the stern have been studied under the condition of Central Yakutia.

In the conditions of biologization of agriculture, special attention is paid to legumes that are able to create biological nitrogen through their symbiotic apparatus. Alfalfa is a perennial, legume, fodder crop. According to A.A. Soromotina (1993), yakutian yellow alfalfa has been accumulating up to 220 kg per hectare of biological nitrogen on permafrost-taiga soils for 9 years.

I have studied the inoculation of alfalfa seeds with strains of nodule bacteria: 425a, 5562, 415b, 412b and associative rhizobacteria mizorin, agrophil, serracil, pseudomonos. Under the conditions of permafrost soils, the selection and introduction of microorganisms, especially in the early stages of plant development, acquires priority importance. For the first time in the frozen soils of Central Yakutia in 1999, I isolated local strains of nodule bacteria Yakutian No. 1 and Yakutian No. 2.Thus, patent for invention No. 2299188 "A way to increase the yield of green mass of alfalfa" were registered in the State Register of Inventions of the Russian Federation on May 20, 2007. After further research, she received a second patent No. 2537901 "A method of increasing the humus content in soil using the Yakutian No. 2 alfalfa bacteria strain", registered on November 13, 2014.

The research shows that the pre-sowing inoculation with nodule bacteria of the reconnaissance experience of yakutian yellow alfalfa has a positive effect on the main indicators:

- the prolificness of alfalfa is increased up to 33%;

- the quality of alfalfa is improved up to 19%;

- humus content in permafrost-taiga-pale soil using 425a is 6% higher.

When cultivating alfalfa, on average, using nitrogen-fixing rhizobacteria, the profitability is 48%, the net income is 31000 rubles per hectare.

Audience Take Away:

The use of biological preparations (microorganisms) is able to perform a number of functions:

- improve the mineral nutrition of plants,
- fix atmospheric nitrogen,
- stimulate plant growth,
- suppress phytopathogenic microflora,
- increase plant resistance to stress.

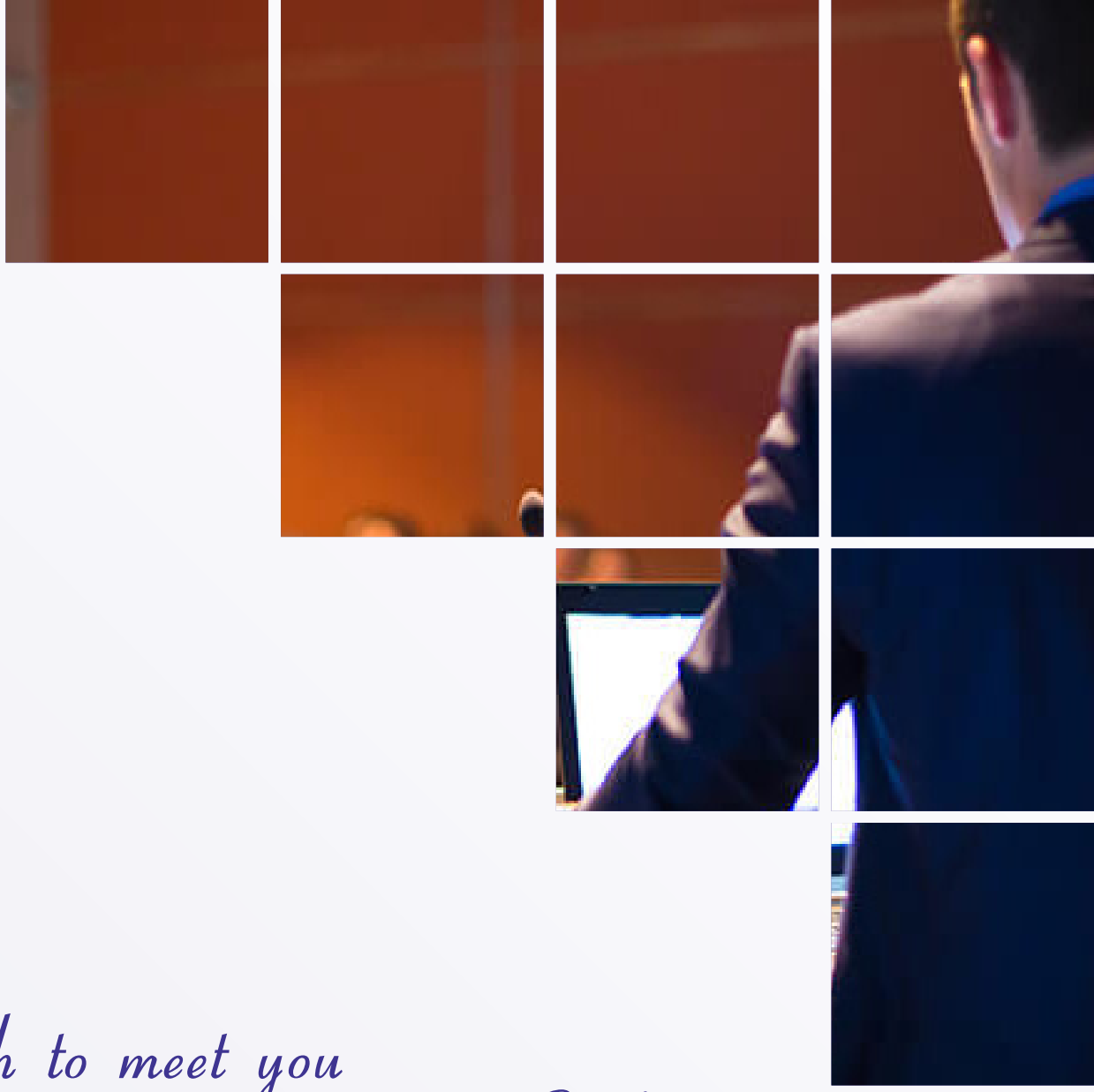
The use of environmentally friendly and cost effective biological products will help you improve the productivity of agricultural crops.

Biography:

Dr. Iakovleva M.T. graduated from the Omsk Agricultural Institute in 1985. She received her PhD degree in 2007 at the Yakut Research Institute of Agriculture in the Laboratory of Selection and Seed-Growing of Perennial Grasses. Now she is the senior lecturer on general agriculture and plant growing. She has published more than 60 research articles in scientific journals, a monograph and 5 methodical recommendations.

PARTICIPANTS LIST

PARTICIPANTS LIST



We wish to meet you again at our upcoming Conference:

7TH EDITION OF GLOBAL CONGRESS ON

PLANT BIOLOGY AND BIOTECHNOLOGY

MARCH 24-26, 2022 | SINGAPORE

https://plantbiologyconference.com/

Questions? Contact

+1 (702) 988-2320 or Inquires:

contact@plantbiologyconference.com

For Registration:

https://plantbiologyconference.com/register