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Agriculture & Organic farming

August 25-26, 2022 | Webinar

Keynote Speaker

SCIENTIFIC TRACKS & ABSTRACTS

Amritpal Kaur, Advances in Crop Science and Technology 2022, Volume 10

Amritpal Kaur
Guru Nanak Dev University, India

Preparation of ready-to-cook carrot halva from dried carrot shreds

Objective: Preparation of ready-to-cook carrot halwa from dried carrot shreds.

Methodoloy: Fresh orange carrots were purchased from local market, Amritsar. The carrots were washed, trimmed and peeled manually with knife and grated. Condensed milk, Milk Powder, Desi Ghee, Cardamom Powder were procured from local market, Cabinet Drier was used for the drying of carrot shreds. Ready to Cook or convenience food was developed by replacing fluid milk with milk powder and condensed milk. Dried carrot shreds were divided into two lots where blanching treatment was given before and after grating and then the product was prepared. Both of these treatments also varied cooking time and consumer acceptability. Milk powder and condensed milk were added individually and in combination and, then evaluated for consumer acceptability.

Results and Conclusion: Ready to cook Gajar ka Halwa was prepared from dehydrated carrots. Carrots grated prior to blanching gave bright orange colored products whereas carrots which were grated followed by blanching gave dark coloured product. Formulation having condensed milk and milk powder was accepted. Peroxidase test was negative after 2 minutes of blanching. Other quality tests were also performed.

Biography

Dr. Amritpal Kaur has done Graduation and Post-graduation in Food Technology and completed PhD Food Technology from Guru Nanak Dev University under the supervision of Prof. Dalbir Singh Sogi. Her area of research is biosynthesis, stability and application of bio-pigment from carrot. She is presently working as an Assistant Professor at the Department of Food Science and Technology, Khalsa College, Amritsar.

Received:June 21, 2022; **Accepted**: June 23, 2022, 2022; **Published**: August 26, 2022

George Kantor, Advances in Crop Science and Technology 2022, Volume 10

Artificial intelligence and robotics: current and future tools for organic agriculture

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Carnegie Mellon University Robotics Institute, USA

The past decade has seen dramatic advances in robotics and artificial intelligence technologies, resulting in emerging tools that have practical applications in agricultural production today. Additionally, an even larger number of potential tools are in development in university research labs and tech startups. This talk will provide an overview of some of these techniques, ranging from image processing to autonomous mobility solutions to robotics interventions that require intelligent tactile manipulation. After laying the foundation of where we are today, the presentation will move on to discuss potential future tools that could be developed for the specific needs of organic agriculture. are pursuing early disease detection in greenhouse tomato production, apple fruitlet growth rate monitoring, and robotic dormant season grapevine pruning. He is a part of the USDA/NIFA Artificial Intelligence Institute for Resilient Agriculture, which is combining AI, sensing, and robotics to create comprehensive digital twins of staple crops. Kantor holds B.S. in Electrical Engineering from Michigan State University, and M.S. and Ph.D. degrees in Electrical and Computer Engineering from the University of Maryland College Park.

Biography

George Kantor is a Research Professor at Carnegie Mellon University's Robotics Institute. He has over 20 years of experience research in developing and deploying robotic technologies for real-world applications such as agriculture, mining, and scientific exploration. In the agriculture domain, earlier research projects include the development distributed sensor-actuator networks for intelligent irrigation, the development vehicles for autonomous navigation in specialty crops environments, and the development of in-field robotic phenotyping technologies. Current projects are pursuing early disease detection in greenhouse tomato production, apple fruitlet growth rate monitoring, and robotic dormant season grapevine pruning. He is a part of the USDA/NIFA Artificial Intelligence Institute for Resilient Agriculture, which is combining AI, sensing, and robotics to create comprehensive digital twins of staple crops. Kantor holds B.S. in Electrical Engineering from Michigan State University, and M.S. and Ph.D. degrees in Electrical and Computer Engineering from the University of Maryland College Park.

Received:July 25, 2022; **Accepted**: July 27, 2022, 2022; **Published**: August 26, 2022

J. C. Tarafdar, Advances in Crop Science and Technology 2022, Volume 10

J. C. Tarafdar
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Microbial synthesized nanoparticles and its use in agriculture

Background: Different nanomaterial can be synthesized by microbial protein to enhance plant productivity, nutrient use efficiency, stress management, soil health management and environmental protection. Microbial synthesized nano-nutrients application in agriculture may serve as an opportunity to achieve sustainability towards global food production. Important benefits of nanonutrients over conventional chemical fertilizers rely on nutrient delivery system. For example, nutrient can be released over 40-50 days in a slow-release fashion rather than 4-10 days by the conventional fertilizers. The nutrient use efficiency also improved by 2-20 times, therefore, nutrient requirements is less as well as reduces the need for transportation and application costs. Moreover, by using small quantities soil does not get loaded with salts that usually are prone to over application using conventional fertilizer. Nanonutrients also can be used as nanobioformulations. The formulations containing one or more beneficial microorganisms after blending of required nanoparticles to enhance soil productivity.

Nanobioformulations can be helpful to enhance the stability of biofertilizers with respect to desiccation, heat and UV inactivation. It can also solve some limitations of biofertilizers such as ease to handling, enhanced stability, protection against oxidation, retention of volatile ingredients, taste making, consecutive delivery of multiple active ingredients etc. In general, microbial synthesized nanomaterial mobilizes 30% more native nutrient than conventional fertilizer application. The average improvement of yield, irrespective of crops and soil types, varies between 24-32% as compared to 12-18% under chemical fertilizers. Nanomaterial, with a particle size less than 100 nm, influences key life events of the plants that include seed germination, seedling vigor, root initiation, stress management, growth and photosynthesis to flowering. Additionally, nanomaterial have been implicated in the protection of plants against oxidative stress as they mimic the role of antioxidative enzymes such as superoxide dismutase (SOD), catalase (CAT) and peroxidase (POX). But in spite of all these, nanomaterial and nanobioformulations should be applied as recommended doses; because at higher rate of application have been proved to be phytotoxicity as they enhance the generation of reactive oxygen species (ROS). The elevated level of ROS may damage the cellular membranes, proteins and nucleic acids.

The uptake rate of nanonutrients by plants also depends on their shape and sizes. In general, small sizes of nanoparticles can be penetrating through the cuticle while larger nanoparticles can penetrate through cuticle-free areas such as hydathodes, the stigma of flowers and stomata. Nanonutrients may be applied both on soils and on leaves as foliar. This can also be applied through drip, hydroponic, aqua and aeroponic. With recommended doses of application, it can be envisaged to become major economic driving force and benefit consumer and farmers with no detrimental effect on the ecosystem.

Biography

Dr. J. C. Tarafdar did his M. Sc. and Ph. D. degrees in Soil Science and Agricultural Chemistry from Indian Agricultural Research Institute, New Delhi and Post Doctorate from Institute of Agricultural Chemistry, Goettingen, Germany. He got merit scholarship throughout his academic periods. Dr. Tarafdar has made original and well recognized contribution on mobilization of native phosphorus. He has developed an in-vivo filter paper technique for phosphatase estimation. His developed biological phosphorus (Bio-phos) fertilizer is now promoting by State Government of Rajasthan. He is the first in the world successfully developed biosynthesized nano nutrients and nano induced polysaccharide powder for agricultural use. He also developed a sequential P fractionation scheme and a rapid method for assessment of plant residue quality.

Received:July 25, 2022; **Accepted**: July 27, 2022, 2022; **Published**: August 26, 2022

Magdalena Szymura, Advances in Crop Science and Technology 2022, Volume 10

Environment-friendly restoration of land degraded by invasive plants

Magdalena Szymura
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Semi-natural grasslands provide a wide range of ecosystem services—from forage production and carbon sequestration to water retention and purification. Unfortunately, recently in Europe most semi-natural grasslands are threatened by invasive alien plants, which have also overgrown abandoned fields. The aim of the study was to test different methods of eliminating invasive species and adding seed to restore valuable species-rich grassland. Three eradication treatments (herbicide spraying; rototilling; turf stripping) and two seed addition methods (direct sowing of a grass species mixture; spreading of fresh hay) were examined alongside control treatments. The experimental plots were mowed twice a year, and the vegetation composition, biomass production, hay chemical composition, and fodder quality were assessed. Significant differences were observed in the invaders' cover between the removal treatments and between the seed addition methods early in the study, the differences lessened over time, especially for the removal treatments. By the end of the six year study period, the invasive species cover was reduced to 25% of the initial complete coverage. Spreading fresh hay greatly reduced invasive species biomass and yielded the highest characteristic species cover. Herbicide treatment was not more efficient than the more environmentally friendly methods over the study period. The results suggest that fresh hay is good method of seed addition for restoring old fields overgrown by invasive plant species. With mowing of the restored area twice a year for several years, invasive species removal by turf striping (scalping) followed by the spreading of fresh hay is recommended for grassland restoration given its environmental impact, cost, and hay quality.

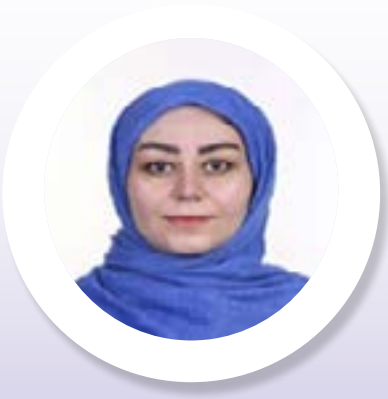
Biography

Dr hab. Magdalena Szymura is a biologist with specialization in environmental biology, more specifically botany. She is working currently in the area of agriculture and horticulture sciences. She prefers field works, connected with vegetation analyses. Her research focuses on invasive species, particularly plants. She analyzes their environmental impact, methods of elimination, and possibilities of habitat restoration, particularly in case of grassland habitats. She also studies methods for preserving the biodiversity of meadows and pastures. She cooperates with farmers, as well as conduct her projects on protected areas: Karkonosze National Park and Stolowe Mountains National Park. Recently her research is connected with city greenery, and possibilities of enriching the ecosystem services served by city grasslands due to biodiversity maintenance and human well-being. .

Received: April 19, 2022; **Accepted**: April 22, 2022; **Published**: August 26, 2022

Maria Beihaghi, Advances in Crop Science and Technology 2022, Volume 10

In silico analysis and in planta production of recombinant ccl21/IL1β protein and characterization of its in vitro anti-tumor and immunogenic activity



Maria Beihaghi
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Background: CCL21 has an essential role in anti-tumor immune activity. Epitopes of IL1β have adjuvant activity without causing inflammatory responses. CCR7 and its ligands play a vital role in the immune balance; specifically, in transport of T lymphocytes and antigen-presenting cells such as dendritic cells to the lymph nodes. This study aimed to produce epitopes of CCL21 and IL1β as a recombinant protein and characterize it's in vitro anti-tumor and immunogenic activity. A codon-optimized ccl21/IL1β gene was designed and synthesized from human genes. Stability and binding affinity of CCL21/IL1β protein and CCR7 receptor were examined through in silico analyses. The construct was introduced into N. tabacum to produce this recombinant protein and the structure and function of CCL21/IL1β were examined. Purified protein from transgenic leaves generated a strong signal in SDS PAGE and western blotting assays. FTIR measurement and MALDI-TOF/TOF mass spectrography showed that ccl21/IL-1β was correctly expressed in tobacco plants. Potential activity of purified CCL21/IL1β in stimulating the proliferation and migration of MCF7 cancer cell line was investigated using the wound healing method. The results demonstrated a decrease in survival rate and metastasization of cancer cells in the presence of CCL21/IL1β, and IC50 of CCL21 on MCF7 cells was less than that of non-recombinant protein. Agarose assay on PBMCsCCR7+ showed that CCL21/IL1β has biological activity and there is a distinguishable difference between chemokinetic (CCL21) and chemotactic (FBS) movements. Overall, the results suggest that CCL21/IL1β could be considered an effective adjuvant in future in vivo and clinical tests. is recommended for grassland restoration given its environmental impact, cost, and hay quality.

Keywords: CCL21/IL1β, Coronavirus disease, molecular dynamics simulation, FTIR, Scratch assay, Chemotaxis assay.

Biography

Maria Beihaghi is an Assistant Professor, Department of Biology, Kavian Institute of Higher education, Mashhad, Mashhad, Iran. Invited lecturer of School of Science and Technology, The University of Georgia, Tbilisi, Georgia, Research adviser, Department of Biology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran. She did her M. Sc. and Ph. D. degrees in Plant Biotechnology from the Ferdowsi University of Mashhad, Iran, and Postdoctoral Research Associate in drug design, Ferdowsi University of Mashhad, Iran. She is an inventor member of IFIA 2022 and She has gotten a Gold medal in the second international invention and innovation competition for IFIA inventor members. She is working currently in the area of genetic engineering science like the production of recombinant proteins she invented several recombinant proteins, that have been patented. Her research focuses on cancer,s biomarkers, and exosome medicinal production.

Received: July 22, 2022; **Accepted**: July 26, 2022; **Published**: August 26, 2022

Shuisen Chen, Advances in Crop Science and Technology 2022, Volume 10

Remote sensing monitoring methods for agricultural typhoon disasters: A case study of South China

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Background: With a foreseen increase in the number of agrometeorological disasters due to climate change, especially in the field of crop lodging, lodging has been a major yield-limiting factor in agricultural production. Accurate assessment of crop lodging is essential for yield damage estimation, agricultural insurance claims settlement and subsequent management decisions. Meanwhile, the advent of remote sensing data of Sentinel 1 presents an opportunity for this kind of disaster monitoring. This report presented innovative monitoring techniques to explore the application potential of muti-source remote sensing data on crop disaster conditions.

Based on the sugarcane planting area extracted from sentinel-1 time-series data and combination of Landsat-8 and sentinel-2 MSI images before and after Super Typhoon Hato, a vegetation index distance leveling method was come out and then was applied to assess the sugarcane lodging in Nansha district of Guangzhou, south China.

An extraction method of lodging rice distribution using multi-source remote sensing data was also proposed for exploring the effect of lodging on backscatter/coherence and spectral reflectance derived from Sentinel-1 and Sentinel-2 data.

Biography

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Received:June 08, 2022; **Accepted**: June 10, 2022; **Published**: August 26, 2022