SCICON SERIES

3RD INTERNATIONAL CONFERENCE ON

# IN SYNC -WITH NEXT GENERATION BIOSCIENCES (INGB)-2019

www.scire.co.in | www.scire.tech | www.sciconseries.com
info@scire.co.in | conference@scire.co.in

Associated partners...

ISSN 978-81-934009-8-2
9 788193 400982
₹ 400/-

In Sync - With Next Generation Biosciences (INGB)-2019

SciCon INGB-2019

# BOOK OF ABSTRACTS

SCICON SERIES

3RD INTERNATIONAL CONFERENCE ON

# IN SYNC -WITH NEXT GENERATION BIOSCIENCES (INGB)-2019

November 06-08, 2019, Hotel Fidalgo, Goa, India

By

Scire Science

www.sciconseries.com

# SciCon Series on

# IN SYNC
# *–WITH NEXT GENERATION BIOSCIENCES (INGB)-2019*

# BOOK OF ABSTRACTS

**International Conference**
**November 06-08, 2019**
**Goa, India**

Published by Scire Science Publications, India

The abstracts in this book are synopsis of those presented during the 3rdInternational Conference of SciCon Series on In Sync-With Next Generation Biosciences (SciCon INGB-2019), at Goa, India, on November 06-08, 2019, organized by Scire Science.



Edition: November-2019

Compiled by,

Dr. Rajesh Chowdary
Dr. Jikku Jose
Dr.Manoj Kumar H.B.
Ms. Krishna T.B.
Ms. Sneha B

Price: INR. 400.00



Printed and bound in India by
Mango Media, India

# PREFACE

Transformative technologies in biosciences have introduced rapid changes in the field over the past few years.The phenomenal growth of life science to its advanced level has become the greatest boon to humankind. SciCon Series by Scire Science conducts conference and workshop series, to gather eminent researchers, scientists, academicians, industrialists and policymakers and pave their path towards the betterment of the society by providing an excellent platform for sharing their thoughts, views, and research contributions along with outstanding interaction opportunities. Research stands as the critical factor of efficient learning or the process of gaining optimal knowledge using limited resources.

International Conference on In Sync-with Next Generation Biosciences(INGB-2019) is a follow-up of a very successful SciCon series organized since 2014 and has been designed in such a way that all who are part of it get a platform to share their knowledge, thoughts and new trends in the field of bioscience. SciCon gatherings offer ample opportunities for the participants to interact with invited experts, session speakers and the participants on different topics of biosciences, considering the fact that an inspirational discussion can lead to productive futuristic development. One of the main highlights of SciCon Series is its highly interactive and enlightening panel discussion on a significant theme on the ongoing scenario. In this year, SciCon INGB 2019 has chosen a critical topic of the era “Anthropogenic effects and Climatic changes” to discuss during the conference.

We are also releasing the book of abstracts that is a compiled version of research works by researchers and scientistsof various domestic and international institutions in the field of bioscience. This multidisciplinary global conference focuses on several distinct and versatile research topics under themes such as Agricultural Bioscience, Animal Bioscience, Artificial Intelligence in Bioscience, Biochemistry & Biotechnology, Clinical &Biomedical Science, Computational Biology, Ecology and Environmental Science, Energy Bioscience, Food and Nutrition, Industrial Bioscience, Marine and Fisheries Bioscience, Microbial Science, Nano Bioscience, and Phytopharmacology Science. The vibrant and charming milieu ofGoa that has limitless elegance and most favoured destination in Indiais a perfect choice for the venue, which will surely add to the spirit of the gathering.

Scire Science has already outshined and reached the next step towards scientific excellence by creating science communication platforms such as SciCon series, R &D essentials, Summer school, Science project contests, Journal, Newsletter and Books. Scire recognizes and honours the proficient researchers and scientists considering their experience and expertise.

We are very grateful to the International/National advisory committee, keynote speakers, authors, session chairpersons and attendees, whose selfless contributions are inestimable and highly appreciate the efforts of participation and generosity in sharing their wisdom and experience. Scire Science expresses heartfelt gratitude to the patron, advisory board, and project team who has dedicated their time and energy to SciCon INGB 2019.

Dr. Jikku Jose

MD, Scire Science

## INDEX

### PLENARY LECTURES

SciCon INGB - 2019
November 06-08

**Abstracts**

# PLENARY LECTURES

*In sync with Next Generation Biosciences [INGB–2019], Goa, India*
*Scire Conference series, Book of Abstracts, ISBN 978-81-934009-8-2*
*www.scire.co.in*

# SciCon INGB - 2019

November 06-08

*In sync with Next Generation Biosciences [INGB–2019], Goa, India*
*Scire Conference series, Book of Abstracts, ISBN 978-81-934009-8-2*
*www.scire.co.in*

SciCon Series on
In sync with Next Generation Biosciences
INGB-2019
November 6-8

**PLENARY LECTURE-01**

# Biofuel from genetically modified algae

**Vikas Uddhav Kapase, Prachi Nawkarkar and Shashi Kumar**
Group Leader, Metabolic Engineering (Biofuels and Industrial Biotechnology), International Centre for Genetic Engineering and Biotechnology, Aruna Asaf Ali Marg, New Delhi-110 067, India.

*skrhode@icgeb.res.in*
*+91-9999950544*

Photoautotrophic microalgae are promising targets for the production of biofuel. However, the low lipid accumulation and availability of inorganic carbon is one of the main limitations for producing commercially viable algal biofuel. Hence, genetically modified (GM) algal strains are being investigated to make algal biofuel commercially competitive to fossil fuel. To enhance the neutral lipid for biodiesel, green alga *Chlorella sorokiniana-I* was genetically engineered with the heterogeneous diacylglycerol acyltransferase (DGAT2) of *Brassica napus*. The composition of FAME was altered in transformed alga. To enhance the CO2 fixation, we have genetically engineered a commercially important oleaginous marine alga *Parachlorella kessleri*-I by overexpressing two different bicarbonate transporters from *Chlamydomonas reinhardtii* to enhance the supply of carbon dioxide to RuBisCO. This has increased the $CO_2$ accumulation around the pyrenoid in transgenic cell lines of *P. kessleri*-I and has favored carboxylation reaction in RuBisCO over photorespiration (oxygenation reaction) thereby enhancing the biomass productivity in transgenic bulgy cell lines. The optimizing external supply and intracellular transport of inorganic carbon significantly improves the commercial viability of *P. kessleri*-I and potentially other microalgae for the production of biofuel if both the trait of lipid accumulation and CO2 fixation can be improved.

**PLENARY LECTURE-02**

# Sustainable food systems, research and interventions

**Dr. Pushpa S Murthy**

Principal Scientist, CSIR-Central Food Technological and Research institute
Cheluvamba Mansion, Mysuru-570020, Karnataka, India.

*pushpa@cftri.res.in*
*+91-9945273672*

Focus on the recent trends and discoveries in the area of functional foods, nutraceuticals, food safety, food security, sustainable agriculture, agro-food engineering, technology, and economists, are finding the food systems approach useful to do justice to the complexities and dynamics of the interrelated tasks in the food and agricultural domain. Sustainable food structures capture better the non-linearity, feedback loops and unintended concerns between elements of the food system, including how information and policies shape activities and outcomes. The sustainable development goals and targets can only be achieved if they are addressed in an integrated manner. Attention is given to the key drivers of food systems performance and how it interfaces between food consumption, value chains and food production can be empirically analyzed. Despite the achievements in the present food systems related to employment and income, worries about the present food system outcomes differ per discipline and are related to the increase of malnutrition, the ability to produce sufficient food for the growing population, inequity of distribution of food around the world, and the unacceptable environmental footprint. Most recent innovations, trends, and challenges in the field while presenting solutions for achieving food security along with a sustainable agricultural development is the need of the hour. Food Bioprocess with emphasis on waste and biomass valorisation, environmental science and pollution with global waste to energy, research and technology is essential.

**Social relevance of the study**

Sustainable Food systems are vital in achieving global nutritional security curtailing negative environmental impact and improving socio-economic welfare.

**PLENARY LECTURE-03**

# *De novo* organogenesis and ISSR assisted clonal fidelity study in *Acridocarpus orientalis* Juss, an endangered desert species

**Fayas Purayil, Sreeramanan Subramaniam, Sheikha AL Dhaheri, Khalid M.A. Amiri, Sonu Krishankumar and Shyam Kurup**

Associate Professor(Horticulture)& Coordinator for Ph.D. program
College of Food and Agriculture, UAE University, ALAin, UAE

*skurup@uaeu.ac.ae*
*+971 3 7134579*

The present study describes the first report on rapid *in vitro* organogenesis of *Acridocarpus orientalis* Juss, an endangered desert plant in the western Asia region using shoot-tip as explant. The research was carried out as part of the in vitro conservation of endangered species. Murashige and Skoog (MS) medium supplemented with different plant growth regulators viz., 6-benzyl aminopurine (BAP) and thidiazuron (TDZ) were tested for inducing organogenesis under different concentrations. BAP was found to be more effective for the maximum shoot induction through direct organogenesis compared to TDZ. A maximum of four shoots per explant developed under medium supplemented with 2 mg/L BAP. *In vitro* rooting studies were conducted by utilizing various concentrations of the auxin, α-Naphthalene acetic acid (NAA). NAA 0.5mg/L was found to be optimal for root induction. The hardening and acclimatization steps resulted in the formation of healthy plantlets with high survival rate. ISSR analysis was conducted to confirm the genetic uniformity of the developed clones, which resulted in monomorphic banding patterns in all the clones and parent tested. Thus, the present study provides an ideal step for the future conservation program in *A. orientalis*, an endangered plant to conserve biodiversity.

**PLENARY LECTURE-04**

# Advanced research in regenerative medicine – biofabrication of tissues

**Dr. Anil Kumar P R**

Scientist E and In-Charge

Sree Chitra Tirunal Institute for Medical Sciences and Technology
Division of Tissue Culture, Department of Applied Biology,
Biomedical Technology Wing, Poojappura, Thiruvananthapuram,
Kerala- 695 012, India.

*anilkumarpr@sctimst.ac.in*

*+91-9447340754*

Tissue engineering is an approach emerged around 30 decades ago where functional tissues and organ are aimed by developing biological substitute. A combination of biomaterial, cells and growth factors are provided to reconstitute lost or damaged tissues or regain lost tissue functions Recently a new area of research known as "biofabrication" has been gaining attention with the advent of latest technology known as 3D Biopnnting. 3D Bioprinting is an additive manufacturing technology where cells and its extracellular matrices are spatially incorporated and directed to maturation of artificial tissue in vitro_ This technology not only gives functional replacement tissues, but also provides lot of other opportunities 3D Bioprinting has potential to transform life science. Prechnical testing will be possible with bioprinted tissues to improve drug discovery and eliminate animal testing. Many studies are ongoing to develop artificial kidney, Liver, Muscle, Trachea, Blood vessel and Bone. The talk will review the advances and latest trends in the biofabrication of tissues.

**PLENARY LECTURE-05**

# Nanoparticle mediated LCS-1 delivery for the targeted therapy of BLM-defective colorectal cancer cells

**Rehan Khan, Anuradha Gupta, Anas Ahmad and Jayamurugan Govindasamy**

Scientist C

Institute of Nano Science and Technology, Phase-X, Sector-64, Mohali-160062, Punjab, India

*rehankhan@inst.ac.in*
*+91-7888558368*

Targeted cancer therapy using synthetic lethality approach is a promising strategy for specifically killing cancer cells by exploiting somatic mutations in cancer cells. Targeting colorectal cancer (CRCs) cells using LCS-1 (SOD1 inhibitor) by exploiting the reported synthetic lethal interaction between SOD1 and BLM. LCS-1 drug show very low water solubility due to hydrophobic in nature. The study aimed to develop a nanocarrier for LCS-1 delivery. We have synthesized and characterized magnetic nanoparticles (MNPs) which contains iron oxide core. MNPs were further grafted with three different polymers such as amino cellulose, dendron, and polyethylene glycol (PEG). VSM analysis exhibited that nanoparticles after layers of polymers still retains the super paramagnetic behavior. MTT assay exhibited minimal cytotoxic effects on normal cells which are mainly attributed due to grafted AC. Dendron layer due to branching having pockets for LCS-1 encapsulation while PEG prevents nanoparticles (NPs) aggregation and imparts hydrophilicity. Nanocarrier encapsulated with LCS-1 drug exhibited around 104 times more selective towards BLM-deficient as compared to BLM-proficient HCT116 cells. LCS-1 loaded nanocarrier induced persistent DNA damage as demonstrated by DNA double-strand break markers (γH2AX and 53BP1) and ultimately apoptotic cell death preferentially in BLM-deficient HCT116 cells. Customized polymeric-iron oxide-based nanocarrier for the effective delivery of LCS-1 was synthesized and characterized for selective targeting of CRC cells. Blank NPs were found to be cytocompatible and LCS-1-encapsulated NPs exhibited superior therapeutic efficacy as compared to free LCS-1 drug against BLM-defective colorectal cancer cells.

**Social relevance of the study**

Precision cancer nanomedicine may lead to minimal adverse effects by targeting patients having BLM defects.

**PLENARY LECTURE-06**

# Towards dengue antivirals; *in vivo* approaches

**Dr. Sreekanth Gopinathan Pillai**

Siriraj Center of Research Excellence for Molecular Medicine, Department of Research and Development, SiMR 4th Floor, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok Noi-10700, Bangkok, Thailand.

*sreekanthsreebhavan@gmail.com*
*+66-814878360, +91-9995238759*

Dengue virus **(**DENV**)** infection is one of the most widespread arboviral infections, causing self-limiting febrile illness to life-threatening severe forms, including dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS)**.** Clinical signs of liver injury were evident in DENV-infected patients and were reported to be one of the major disease criteria for the severe forms of DENV infection by the World Health Organization (WHO). In an immunocompetent mouse model of DENV infection exhibiting liver injury, inhibitors of mitogen-activated protein kinases (MAPKs) limited hepatic cell apoptosis and reduced liver injury in DENV-infected mice; however, these inhibitors were unable restrict virus replication in the liver. In DENV-infected HepG2 cells, we screened a group of selected drugs from the FDA drug library and repurposed for their antiviral effects. We preliminarily identified minocycline for its potential antiviral effects in DENV-infected HepG2 cells and this drug was found to obstruct the ERK phosphorylation. Recently, we found that N-acetyl cysteine (NAC), the drug used to treat acetaminophen-induced liver toxicity, showed potential to reduce both virus titter and host responses in DENV-infected cell lines as well as mice via modulating the type 1 interferon responses. Our findings explain different therapeutic strategies to DENV-induced liver injury in animal models, that needs evaluation in randomized clinical trials.

**PLENARY LECTURE-07**

# Characterization and assessment of silicon on critical signalling pathways and homeostatic maintenance in horticultural crops under abiotic stress employing proteomic and genomic approaches

**Dr. Sowbiya Muneer**

Assistant Professor (Sr.)
Horticulture and Molecular Physiology Lab
School of Agricultural Innovations and Advanced Learning
Vellore Institute of Technology, Vellore-632014, Tamil Nadu, India.
*sowbiya.muneer@vit.ac.in*
*+91 9597559708*

Silicon (Si) is the second most abundant element in the soil after oxygen and due to its abundance all plant roots contain some amount of Si. Silicon is transported in plants in the form of silicic acid [$Si(OH)_4$] (below pH 9) which is an uncharged molecule. Whereas, plants significantly vary in their ability for Si uptake and transport because other than monocots most dicots are unable to accumulate Si in their shoots and are thus included in the Si-excluder category. Nevertheless, the Si-excluder plants have also shown their ability to accumulate Si in their shoots. Moreover, to many life forms such as diatoms silicon is essential element required for the production of structural material. While it is considered as a non-essential element in higher plants, but this element is routinely supplied to several crops like rice and sugarcane to obtain high and sustainable crop yield. Besides, in majority of the plants silicon uptake has been found beneficial to plants to improve the tolerance to variety of biotic and abiotic stresses such as pest and pathogens, metal toxicity, drought stress, mineral deficiency, and salt stress. The positive effects of Si has been largely observed in several crop plants such as wheat, barley, rice, cucumber, tomato, and soybean but the beneficial role of Si in horticultural crops particularly the edible parts is very limited. As we know 80% of the human food is composed of horticultural crops, which is dominated by vegetables and fruits. On the other hand, horticultural production is seriously hampered by abiotic stresses such as drought, climate changes, salinity, and nutritional deficiencies. Therefore, to ensure the security of global food production, it is essential to produce sustainable crop varieties that can adapt to climate variability, and to develop a broad spectrum of abiotic stress tolerant crops. This has driven much research into the study of crop responses to abiotic stresses. To meet this challenge, several researchers incorporated proteomic techniques into their studies in addition to genomics, transcriptomics, and classical genetics methods in model plants. Until now a large scale proteome and genome data base has been reported on model plants and important crops species such as rice, wheat, and tomato but a little information is reported about horticultural plants. We studied genomic and proteomic response in a large number of horticultural plants to different abiotic stresses under exogenous Si supply. The species used in the study were *solanum lycopersicum, Capsicum annum, Glycine max, Dianthus caryophyllus, Fragaria × ananassa, Dendranthema grandiflorum*, and *Rosa hybrida*. The observed genomic and proteomic responses in horticultural plants indicated that the Si has a substantial role in limiting or maintaining the abiotic stresses

**PLENARY LECTURE-08**

## Paddy husk based formulations of plant growth-promoting rhizobacteria for plant growth

**A. B. Gunjal and B. P. Kapadnis**

Assistant Professor,
Dr. D.Y. Patil Arts, Commerce and Science College, Pimpri, Pune-411018, Maharashtra, India
Savitribai Phule Pune University, Pune-411018, Maharashtra, India

*aparnavsi@yahoo.com*
*+91-9011491889*

The use of chemical fertilizers in agriculture is a serious problem which needs to be tackled. The agroindustry by-products viz., peanut shell, corn cob, sawdust, paddy husk, pressmud, etc. are generated in huge amount. These agroindustry by-products are either incinerated or disposed of to the landfills. The agroindustry by-products can be converted to value-added products viz; proteins; antibiotics; mushroom production; compost; plant growth-promoting substances; etc. The agroindustry by-products can be used as carriers for the plant growth-promoting rhizobacteria. The work focuses here on use of paddy husk based formulations of *Bacillus circulans* and *Bacillus subtilis* for the plant growth viz., maize, wheat, jowar and bajra which was studied by the pot experiment. The paddy husk based formulations of plant growth-promoting rhizobacteria showed an increase in the germination and vigor index of maize, wheat, jowar, and bajra. There was also a significant increase in the plant growth viz., root length, shoot length and dry weight with paddy husk based formulations of *B. circulans* and *B. subtilis*. The use of paddy husk based formulations of *B. circulans* and *B. subtilis* for plant growth promotion will be eco-friendly and also minimize the use of chemical fertilizers.

**Social relevance of the study**

The social impact of the study is the biofertilizer product developed will be beneficial to the farmers and other agriculture people in their field and also it will be economical.

**PLENARY LECTURE-09**

# Soilless culture of vegetables

**D. Kalaivanan, G. Selvakumar, A.N. Ganeshamurhty, and S. Shankara Hebbar**

Scientist, ICAR-Indian Institute of Horticultural Research
Hesaraghatta Lake Post, Bengaluru-560 089,
Karnataka, India.

*kalainith2003@gmail.com*
*+91-9986637407*

Soil is usually the most available growing medium for all kind of plants. Almost all of the vegetables we find on grocery store shelves are produced either directly or indirectly in open field soils. A well-drained, pathogen free field soil of uniform texture is the least-expensive medium for plant growth, but soil doesn't always occur in this perfect package. Existing levels of abiotic and biotic stresses in soil severely affects the agricultural and horticultural production. Some soils are poorly textured or shallow, and provide an unsatisfactory root environment because of limited aeration and slow drainage. Pathogenic organisms are a common problem in field soils. On the other side, the shrinking of agricultural land due to continuous urbanization and industrialization also affects the total agriculture and horticulture production. Under this pressure, it is our obligation to increase the productivity with the minimum available agricultural lands in our country to meet the future demands. In this critical condition, we have to identify some alternatives to produce the crops without using soil medium. Presently, many countries are focusing special attention towards soilless cultivation *i.e.,* hydroponics, aeroponics and other substrates medium like cocopeat, compost etc. Subtropical country like India aeroponics or substrate based cultivation is ideal as water is precise input for us. The recent scientific invention proved that it is also possible to produce the crop plants without soil *i.e., Soilless culture.* With this background information, a project on development and standardization of soilless cultivation of vegetables under open and protected conditions has been formulated to study the effect of fertigation scheduling using different concentrations of nutrient solution at critical growth stages on growth, yield and quality of different vegetable crops. Under this project, the production technology for soilless cultivation of most commonly consumed vegetables in India using arka fermented cocopeat as substrate has been standardized at ICAR-Indian Institute of Horticultural Research. The results of most of the experiments conducted with different vegetable crops under open-field and polyhouse soilless culture indicated that the plants grown in soilless culture recorded higher yield and better quality particularly in mineral nutrient content compared to soil grown plants.

**Social relevance of the study**

The application of a soilless culture system in vegetable production would result in efficient and effective use of space, water and fertilizers and minimize the use of chemicals for pest and disease control. This technology would be useful in cultivation of vegetables under adverse soil conditions where reclamation is impractical and highly suited for urban and peri-urban vegetable cultivation.

SciCon INGB - 2019
November 06-08

Abstracts

# ORAL PRESENTATIONS

*In sync with Next Generation Biosciences [INGB–2019], Goa, India*
*Scire Conference series, Book of Abstracts, ISBN 978-81-934009-8-2*
*www.scire.co.in*

# SciCon INGB - 2019

November 06-08

*In sync with Next Generation Biosciences [INGB–2019], Goa, India*
*Scire Conference series, Book of Abstracts, ISBN 978-81-934009-8-2*
*www.scire.co.in*

**AGE-01**

# Benefit- cost analysis of organic paddy straw mushroom production in Bhubaneswar, Odisha

**Suvangi Rath, R. K Mishra, K. K. Sarangi and Dwity Sundar Rout**

College of Agriculture, OUAT, Bhubaneswar- 23
Madhusudan Nagar, Unit-4, Bhubaneswar, Odisha-751001, India

*suvangi.rath@gmail.com*
*+91-9658328944, +91- 9437183762*

Since ancient times, mushroom has been considered as one of the important food items for its exceptional taste and high nutritional value. The edible mushrooms are a good source of vitamins, proteins and minerals. They have been regarded as a means of supplementing nutrition to the human beings. In this study, the benefit-cost and constraint analysis of Paddy straw mushroom (*Volvareilla volvaceae*) has been carried out using various analytical tools viz. Cost concept, SWOT analysis and Garrette's ranking. Data of mushroom demand and supply, constraints in production and marketing in Bhubaneswar city were collected from Traders, Mushroom growers and Hotels and restaurants through a well-structured questionnaire. The study reveals that Odisha being the largest producer of Paddy straw mushroom has proved to be the perfect hub, providing the appropriate climatic conditions for large scale cultivation of paddy straw mushroom. However, few limitations have been found out in its production and marketing, putting a big question whether it is a really remunerative enterprise or not. In Bhubaneswar, a considerable amount of gap was found between the demand and supply of straw mushrooms. Extreme climatic conditions of Odisha were found to be the major threat to the mushroom producers. While easy availability of inputs was one of the core strengths of paddy straw mushroom production, however the increasing cost of straw proved to be an important constraint that hindered the profit maximisation by the farmers.

**Social relevance of the study**

Paddy straw mushroom is considered as an enterprise for empowering the underprivileged. This study aims to find the gap that holds it back from turning out to be the poor man's gold.

SciCon Series on
In sync with Next Generation Biosciences
INGB-2019
November 6-8

**AGE-02**

# Relationship between adoption and socio-economic characters of IFS farmers

**Channamallikarjuna D., and Anasuya T. Patil**

University of Agricultural Sciences, Dharwad-580 005, Karnataka, India.

*channa.agri@gmail.com*
*+91-9480107631*

The present study was conducted in Belagavi, Dharwad, Haveri and Uttar Kannada districts of northern Karnataka. The total sample size for the study was 160 Integrated Farming System (IFS) farmers. The *Ex-post-facto* research design was adopted for study. Findings of the study revealed that that nearly half of the IFS farmers belonged to middle age group, studied up to high school, IFS farmers belonged to low land holding, low income group. Majority of them belongs to medium experience category, material possession of the farmers was found to be medium with high economic motivation. Majority of the IFS farmers belonged to medium innovative proneness, risk orientation, mass media utilization, extension contact and training received was belongs to low level. Majority of the farmers visited the nearest town once in fortnight. Among thirteen independent variables studied five variables namely mass media utilization, risk orientation, economic motivation, extension contact and cosmopoliteness showed positive and significant association at 0.01 level of possibility with adoption of practices of IFS. Remaining variables *viz*, land holding, family income, education, material possession, farming experience, and innovative proneness exhibited positive and significant at 0.05 level of probability with their adoption of recommended practices of IFS. While, age and training received didn't show significant relationship with adoption of recommended IFS practices.

**AGS-01**

# Efficacy of tricyclazole against neck and finger blast diseases of finger millet

**Raveendra H. R., Mallikarjuna N., Jadesha G., P. Venkatesha Murthy and N. Umashankar**

University of Agriculture Sciences, Bengaluru
ICAR-AICRP on Small millets, Zonal Agricultural Research Station,
VC Farm, Mandya-571 405, Karnataka, India

*ravi.hr.agri@gmail.com*
*+91-8884403899*

Field efficacy of five different fungicides and spraying schedules were evaluated at ICAR-AICRP on Small millets, Zonal Agricultural Research Station, V.C Fram, Mandya against finger millet blast. Of all the fungicides, two sprays of Tricyclazole 75WP 0.6 g $l^{-1}$ of water at 50 percent flowering followed by 10 days after the first spray was found most effective compare to other fungicides which accounted the minimum incidence of the neck (4.63%) and finger blast (4.21%). Further the existing recommended fungicide Carbendazim 50WP 1g $l^{-1}$ water has recorded the incidence of 7.66 and 3.14 percent neck and finger blast disease respectively. However, the untreated check recorded the maximum incidence of Neck (31.57%) and Finger blast (25.72%). Additionally Tricyclazole 75WP 0.6 g $l^{-1}$ enhances grain and fodder yield up to 48.22 and 71.83 percent when compared to Carbendazim 50WP1g $l^{-1}$ water and untreated check respectively and the study revealed that two sprays of Tricyclazole 75WP 0.6 g $l^{-1}$ water at 50 percent flowering followed by 10 days later found effective to manage the neck and finger blast disease and enhances yield with good B:C ratio.

**Social relevance of the study**

Evaluation of different fungicides for the management of neck and finger blast showed Tricyclazole was the best fungicide because existing chemicals are not effective, therefore Tricyclazole is the best alternative chemical for the farmers to manage the disease.

**AGS-02**

# Rhizosphere bacterial diversity of wild and cultivated varieties of black pepper

**D. Girija, Mahesh Mohan and Panchami P. S.**

College of Horticulture, Kerala Agricultural University,
Vellanikkara, KAU- 680 656, Thrissur, India.

*maheshmohan026@gmail.com*
*+91-9400724398*

Black pepper (*Piper nigrum*) being a spice crop of utmost importance is considered to be an inevitable commodity in the culture and commerce in an Indian aspect. The cultivation of black pepper is majorly concentrated in the Western Ghats, because of the favourable climatic factors. Various strategies for the improvement of cultivation are being formulated to increase the production of good quality black pepper. Improvement of rhizosphere microflora for enhancing carbon cycling and nutrient availability has been proved to be efficient for improving plant as well as soil health. For this purpose, an exploration of rhizosphere bacterial diversity in cultivated and wild black pepper varieties were done to obtain an insight into the major bacterial phylotypes using metagenomic tools. Cultivated and wild varieties of pepper were collected from various locations of Wayanad and subjected to bacterial diversity analysis to obtain the culturable and unculturable bacterial diversity. Even though 28 percent increase in the total bacterial population was observed in the wild pepper rhizosphere, phyla Bacteroidetes and Firmicutes were found to be higher in cultivated pepper rhizosphere. Major bacterial phyla *viz.,* Proteobacteria, Actinobacteria, Acidobacteria, and Verrucomicrobia were observed to be dominant in wild pepper rhizosphere possibly due to the increased organic content and organic richness of forest soils. Genus level study was also conducted to obtain the scenario of major agriculturally important microorganisms present in the rhizosphere. The current study enabled us to obtain an insight into the rhizosphere of black pepper in Wayanad and the data could be used to develop improved cultivation methods using the application of effective microbial strains for the black pepper ecosystem.

**Social relevance of the study**

The study indicated the relevance of the rhizosphere microbiome in mediating plant health as well as the requirement for application of organic carbon amendments for efficient microbe mediated nutrient cycling. The information obtained from the current study could be further used for developing microbial consortium for black pepper cultivation.

**AGS-03**

# Effect of marigold flower exudates for sustainable agriculture

**N. Umashankar, G.G. Kadalli, R. Jayaramaiah and P. Venkatesha Murthy**

College of Agriculture, University of Agricultural Sciences, GKVK, Bangalore-560 065, Karnataka, India

*umashankarn@rediffmail.com*
*+91-9845637672*

Marigold flower is processed for the extraction of oleoresin content used as a colouring agent, nutraceutical and in the pharmaceutical industry. The flower exudes water and debris during processing which is called Marigold Flower Exudates (MFE). This MFE was tested in the field with maize as a test crop. Farm trial was conducted in farmers field at Muthathi village of Hassan district, Karnataka state, India, with two treatments, one with Borewell Water: MFE @ 50: 50 and another control 100:0. The size of the plot was 500 $m^2$ each. The treatments were imposed 15 days before sowing, taking into consideration of water holding the capacity of the field. MFE: borewell water was mixed and imposed in the ratio of 10750: 10750 L and in control, it was 21500:0 L. The results revealed that treatment with MFE and borewell water in the ratio of 50: 50 was superior to control with respect to growth and yield parameters. The maize yield was recorded maximum in 50:50 treatment (97.85 Q $ha^{-1}$) compared to control (85.27 Q $ha^{-1}$), it is approximately 12% increase in yield. The total microbial population was found to be higher in soils with the application of MFE and borewell water. The soil fertility with respective to macro and micronutrients content was also enhanced with the application of MFE. Hence, the MFE water can be used safely for crop production as a one-time application to soil 15 days before sowing mixing with borewell water in the ratio of 50:50.

**Social relevance of the study**

This study helps for exploring alternative irrigation sources like Industrial wastewater which is believed to be vital to ensure food safety and to preserve natural water bodies.

**AGS-04**

# Management of finger millet blast disease – an integrated approach

**Raveendra H. R., Deepak C. A., and Shubhashree K. S.**

University of Agriculture Sciences, Bengaluru
ICAR-AICRP on Small millets, Zonal Agricultural Research Station, VC Farm, Mandya-571 405, Karnataka, India

*ravi.hr.agri@gmail.com*
+91-*8884403899*

A field experiment was conducted to evaluate different integrated disease management (IDM) approaches on Finger millet blast at ICAR-AICRP on Small Millets, Zonal Agricultural Research Station, V.C Farm, Mandya during *Kharif*-2018. Among the different IDM strategies evaluated against blast disease, seed treatment with Chitosan @ 3.75g $kg^{-1}$ of seed recorded lesser incidence of neck blast (4.17) and finger blast (6.42) followed by the seed treatment with Chitosan @ 2g $kg^{-1}$ of seed plus two foliar sprays with *Pseudomonas fluorescens* at the rate of 10g $l^{-1}$ of water at panicle initiation and grain filling stage which accounts 5.89 of neck blast and 8.35 per cent of finger blast disease. Surprisingly, the higher grain (3355 kg $ha^{-1}$) and fodder (5872 kg $ha^{-1}$) yield was recorded in the Chitosan seed treatment in combination with bio-agent compared to other treatments and untreated check recorded maximum incidence of NB (37.77%), FB (18.69%) and also least yield of 1581 kg of grain yield and 2767 kg of fodder yield $ha^{-1}$. Further, the seed treatment with chitosan followed by spraying of bio-agent gave better BC ratio of Rs. 2.69 for the benefit of farmers.

**Social relevance of the study**

The management of blast disease through integrated strategy is helpful for the farming community because management of this disease by ecofriendly concept can reduces the cost of cultivation and enhances the crop yield.

**AGS-05**

# Effect of organic mixtures on stone germination and seedling growth of mango (*Mangifera indica* L.) cv. Totapuri under net house and polyhouse conditions

**Vandana S. and Venkatesha Murthy P.***

University of Agricultural Sciences, GKVK, Bengaluru - 560065, Karnataka, India.

*pvenkateshamurthy@gmail.com*
☎ *+91- 94486 57775*

A study was conducted to find out the effect of organic mixtures on stone germination and seedling growth of mango (*Mangifera indica* L.) cv. Totapuri under net house and poly house in the Department of Horticulture, UAS, GKVK, Bengaluru. To improve the germination and seedling quality, a nursery study was conducted to notice better combination of organic mixtures. The seedlings were kept to study the growth under net house and poly house for 180 days. Under poly house, the treatment ($T_{10}$) consists of Soil : Sand : FYM : Vermicompost : Cocopeat : PGPR [2:1:1:1:1:1] ratio recorded maximum germination percentage (80.00 %) and better growth parameters, *viz.* higher plant height (55.07 cm), more number of leaves (19.45), highest stem diameter (1.07 cm), higher vigour index of fresh and dry weight (3822.00 and 2854.60 respectively) and higher root length (41.54 cm) at 180 days after sowing (DAS). Similarly, under nethouse the treatment ($T_{10}$) noted maximum germination percentage (70.00 %) and better growth parameters, v*iz.* higher plant height (44.81 cm), more number of leaves (14.00), highest stem diameter (0.92 cm), higher vigour index of fresh and dry weight (3051.60 and 2286.43 respectively) and higher root length (34.74 cm)at 180 DAS. Thus, it can be concluded that, the combination of organic mixtures have positively influenced the germination, growth and vigour of mango cv. Totapuri seedlings under poly house compared to net house. The study suggested that, the inclusion of combination of organic mixtures for increased germination and further growth of seedlings was beneficial.

**Social relevance of the study**

Germination of mango stone and its further satisfactory growth has been popular and this variety considered as better root stock for its vegetative propagation. Hence, the study is of commercial importance.

**AGS-06**

# Influence of nutrients and shoot retention on productive characters and yield in rejuvenated guava (*Psdium guajava L.*) cv. Sardar.

**Archana S., Nagesh Naik*, Nataraja K. H., Kantharaju V., Sayeed Almas Mulla, and Vandana V.**

Kittur Rani Channamma College of Horticulture, Arabhavi, Gokak-591 218, Belagavi District, Karnataka, India.

*nageshnaikkagal@gmail.com*
*+91-9481464149*

A study on the influence of nutrients and shoot retention on growth and yield in rejuvenated guava was conducted during 2018-2019 in the Department of Fruit Science, Kittur Rani Channamma College of Horticulture, Arabhavi (UHS, Bagalkot), Karnataka. Among shoot thinning, number of days for initiation of flowering (71.36), 50% flowering (81.17), completion of flowering (87.61) was least in 3 shoots per branch ($S_1$), number of flowers per shoot and flowers per plant (25.18 and 75.85) were more in 4 shoots per branch ($S_2$). Days for initiation of fruiting (86.33), 50% fruiting (97.96) and completion of fruiting (120.22) were least in $S_1$. Number of fruits per plant (69.28) and yield (10.25 kg/plant) was highest in $S_2$. Nutrient had significant effect on flowering and fruiting parameters in rejuvenated guava. Plants supplemented with 100 % RDF (200: 80: 150 NPK g/plant) + (Zn+B+Mg) 0.3 % each ($F_6$) has early initiation of flowering (71.72), 50% flowering (81.56), completion of flowering (87.56), higher number of flowers per shoot and flowers per plant (24.67 and 75.93), least days for initiation of fruiting (87.56), 50% fruiting (98.00) completion of fruiting (118.78), maximum number of fruits per plant (69.14) and yield (10.90 kg/plant). Interaction effect has got nonsignificant results for all the parameters. However, the treatment $S_1F_6$ flowers and fruit early but $S_2F_6$ has a higher number of flowers per shoot and plant, maximum fruits per plant and yield.

**Social relevance of the study**

- Technolgy outcome promote for attracting farmers to adopt in large ways
- Increase the economic status of the farming community
- Increase nutritional security
- Increase the living standards of the people
- Control the environmental pollution hazards

**AGS-07**

# Improvement of ornamental crops for fragrance: recent advances and future challenges

**[1]Shephalika Amrapali, [2]Krishna Prakash, [3]Aparna Veluru, and [4]Sunil Archak**

[1]ICAR-Directorate of Floricultural Research,
Pune-411005, Maharashtra, India.
[2]ICAR-Central Plantation Crops Research Institute
Kasaragod-671124, Kerala, India.
[3]ICAR-Indian Agricultural Research Institute
New Delhi-110012, India.
[4]ICAR-National Bureau of Plant Genetic Resources
New Delhi 110012, India.
*shephalikaamrapali@gmail.com*
*+91-9096875529*

Flowers have been known for their fragrance since olden days. But we hardly find fragrant flowers in our floral bouquet. Breeding for fragrance has been a challenging task for flower breeders owing to its complex nature. However, discoveries of novel scent genes and advances in the knowledge of floral volatile biosynthetic pathways have the potential of improving fragrance in the flower crops. Genetic and metabolite engineering provide opportunities to manipulate the amount of specific volatile and thus change the fragrance profile of a flower. The challenges breeders have been facing in breeding for fragrance have been overcome to some extent by successfully introducing new genes, or by modifying existing biosynthetic pathways or by blocking the competing pathways. Current understanding of fragrance gene circuitry is limited to the genes encoding for enzymes or a few transcription factors. A better understanding of the regulating factors, as well as, the master regulator involved in the production and orchestrated emission of volatiles is required to increase the efficiency of fragrance breeding. Recent advances in the genomics and increased number of the completed genome sequence of flower crops shall provide more opportunity to manipulate and/or modify the fragrance profile of flowers. The availability of targeted genome editing tools viz CRISPER/Cas shall further increase the success of fragrance engineering.

**Social relevance of the study**

Flowers are an integral part of human life and have been used in social and religious rituals since antiquity. It also found application in many consumer-based products ranging from food and beverages to perfumes, detergents and cleaning products to cosmetics and aromatherapy items, which are mainly responsible for its commercial value. The essential oils obtained from fragrant flowers are considered an item of luxury. Restoring fragrance can help flower growers in getting more income from their produce, especially in peri-urban areas and at the same time buyers will enjoy the sweet enchanting aroma of fragrance which induces positive emotion.

**AGS-08**

# Increase in growth and biomass production of mung bean (*Vigna radiata)* using panchagavya and E.M.

**Priyanka Prakash Parab**

Don Bosco College of Agriculture, Sulcorna Quepem,
H. No. 484, Dessai waddo, Pirna Bardez, North Goa,
Goa-403513, India.

*priyankaparab21p3@gmail.com*
*+91-9359420600*

Mungbean (*Vigna radiata*) is a pulse crop grown as both, vegetable and grain. The leaves and green pods are cooked and consumed as a vegetable. The grain is used whole or as split-pulses or *dal*. To study the influence of Panchagavya and Effective Micro-organisms (E.M), singly or in combination, on the plant biomass and plant height of Mungbean, an experiment was conducted in the polyhouse at Don Bosco College of Agriculture, Sulcorna-Goa. The seeds of the mungbean were soaked for 15 minutes under four treatments which were 1.Control (water) 2.Panchagavya 3.E.M. (Effective Micro-organisms) 4. Panchagavya+ E.M. It was observed that the combined treatment of Panchagavya + E.M. enhanced the plant height and biomass production significantly over control, E.M. and Panchagavya alone.

**Social relevance of the study**

Organic production needs ways and means to substitute the role of synthetic fertilizers in crop production. Such action also reduces the dependence on petroleum products and the entry of carcinogens in the food chain.

**AGS-09**

# Influence of Panchagavya and E.M on nodule formation in m.ungbean (*Vigna radiata* ) for better nitrogen fixation in the plant

**Vassudev alias Vandit R. Naik and Priyanka Prakash Parab**

Don Bosco College of Agriculture, Sulcorna Quepem, Goa

H. No. 98, Malbhat Goa-Velha, Tiswadi Goa – 403108, India

*vanditnaik.249@gmail.com*
*+91-8459198265*

Mungbean (*Vigna radiata*) is capable of fixing nitrogen through symbiotic association with *Rhizobium japonicum* bacteria living in its root nodules. Effect of other micro-organisms has not been extensively studied. The experiment was conducted at Don Bosco College of Agriculture, Sulcorna- Quepem, Goa–India under the polyhouse condition, to study the effect of Panchagavya and Effective Micro-organisms (E.M.) on the number of nodules formed in mungbean. The Mungbean seeds were first treated with EM, Panchagavya as well as a combination of EM and Panchagavya. The seeds were soaked with a respective solution of treatment for 15 minutes and one was kept as control, i.e in plain water, to compare the results. The experimental results have shown that the seeds with the treatment of EM have more root nodules and, hence, likely to have better nitrogen fixation ability.

**Social relevance of the study**

Mungbean is an important source of dietary protein for vegetarians. Enhanced ability for symbiotically fixing atmospheric nitrogen reduces the expenditure on urea that also contains carcinogenic thiourea.

**AGS-10**

# Banana red rust thrips, *Chaetanophothrips signipennis* (Bagnall): an emerging pre and post-harvest malady to banana cultivation in Kerala

**Gavas Ragesh, K. D. Bisane, B. Padmanaban, P. B. Pushpalatha and Prakash Patil**

Banana Research Station, ICAR-AICRP on Fruits, Kerala Agricultural University, Thrissur-680652, Kerala
Fruit Research Station, ICAR-AICRP on Fruits, Navsari Agricultural University, Gandevi-396360, Gujarat
ICAR- National Research Centre for Banana, Tiruchirapalli-620102, Tamil Nadu
ICAR-AICRP on Fruits, ICAR-IIHR, Bengaluru-560089 (Karnataka)

*gavas.ragesh@kau.in*
*+91-9495756549*

India is the leading banana producing country in the world. It is one of the cheapest staple foods for millions and has a vital role in supplying the nutritional requirements in the human diet. Nendran is the most preferred banana in Kerala state and parts of Karnataka and Tamil Nadu. A major factor limiting banana cultivation in the state is pest and disease attack and subsequent yield reduction. It is not uncommon that new pests emerge under different agro-climatic conditions resulting in various intensities of loss. Hence it is essential to undertake surveys at different agro-ecological regions to identify pest situations.As part of ICAR-AICRP (Fruits), roving /exploratory surveys and fixed plot surveys were conducted to catalogue the insect and non-insect pests affecting banana cultivation within the state. Among 21 different species of pests recorded during the survey period of 2014-2018, red rust thrips, *Chaetanophothrips signipennis* (Bagnall) (Thripidae: Thysanoptera), was recorded as a minor pest due to its very low occurrence. However, during the last two years, an increasing trend in the infestation of red rust thrips on fruits in the banana fields was observed. Market surveys coupled with visits to farmers' plots revealed the extent of damage ranging from 5-65% of affected bunches. Both the adult and nymphs of thrips feed by rasping the fruit's surface and sucking the oozing sap. This leads to the formation of reddish-brown oval stains or red spots and raised structures on the finger, which can extend over the entire length of the fruit. Sometimes, during a severe infestation, peel cracking is also observed, which may lead to a secondary infestation of fruit flies. The damage symptoms appeared only at crop maturity or full bunch emergence, thus escaping from the attention of farmers at early stages. When the fruits are severely infested with rust thrips the market value is reduced although the quality of fruits is not affected and the fruits remain edible. As the pest affects the cosmetic value of the fruits, it fetches low sale price at the wholesale and retail market. Commercial cultivars such as Poovan, Monthan, Palayamkodan, Grand Nain, Rasthali and Nendran were found susceptible. An infestation of these pests on Nendran variety (5-20%) was recorded during 2018-19. Bunch covering along with insecticide spraying or bud injection of imidacloprid (0.3 ml/500 ml water) @ 1 ml/bud were found to be effective in managing this new and emerging pest of banana. The outbreak of rust thrips on a banana is discussed in relation to weather factors.

## Social relevance of the study

Nendran is the most preferred banana in peninsular India especially in the state of Kerala. Banana red rust thrips has now emerged as a detrimental factor in the reduction of marketability and the aesthetic value of bunches. The infestation and the subsequent reduction in marketability often force the farmers to go for distress sale. The paper elucidates the need to identify, assess and manage the banana red rust thrips infestation in a banana for bounty full crop in relation to weather factors.

**AGS-11**

# Development of mapping populations for identification of QTLs resistance to root rot disease in mulberry

**Arunakumar G. S., Gnanesh B. N., Supriya M., Harshitha M. M., Manoj Kumar H. B., Pratheesh Kumar P. M., and Pankaj Tewary**

Central Sericultural Research and Training Institute
Srirampura, Manandavadi Road, Mysuru – 570008, Karnataka, India.

*arunarvind22@gmail.com*
☎ *+91-9164148616*

India is the second largest country in the world under mulberry cultivation and it is being cultivated extensively as food for the silk worm. Root rot disease is major soil borne diseases of mulberry caused by *Fusarium solani* (Mart.) *F. oxysporum* Schlecht., *Lasiodiplodia theobromae* Pat. and *Macrophomina phaseolina*. Presently, no cultivated variety is known to be resistant to root rot disease and majority of the commercially grown varieties are found to be susceptible. Resistance to root rot is an important and long term strategy to combat the dreaded disease. The genes conferring resistance needs to be mined from the natural gene pool. Development of improved variety having resistance to root rot pathogens through breeding programmes is effective approach to avoid crop loss. Due to high heterozygosity of the mulberry, linkage analysis of segregating $F_1$ progeny generated by pseudo-test cross is being utilized for mining QTLs. Three different mapping populations (*M. multicaulis* (ME-0168) × Thailand Male, *M. multicaulis* (ME-0006) × Thailand Male and Punjab local × Cathyana Hybrid were developed and established under field conditions. The mapping populations will be extensively phenotyped against root rot causing fungal pathogens under glass house conditions. SSR and SNP markers will be used for chromosomal mapping and QTL analysis of root rot resistance. The major QTLs conferring resistance for root rot diseases of mulberry will be introgressed into a popular cultivated mulberry through marker assisted breeding (MAB). Root rot resistance breeding is eco-friendly method and it will have long-term impact on the productivity and sustainability of mulberry cultivation in India.

**Social relevance of the study**

Identification of simple and accurately scored molecular markers for genes that contribute to root rot resistance of mulberry could greatly benefit future efforts to prevent disease losses.

**AGS-12**

# Development and evaluation of cost effective substitutes for preparation of semi-synthetic diet of *Galleria mellonella* - an universal bioagent host

**Harisankar K. R., Gavas Ragesh, and Pushpalatha P. B.**

Department of Food Science, St. George's College, Aruvithura, Kottayam-686122, Kerala.
Agricultural Entomology, ICAR-AICRP on Fruits, Banana Research Station, Kerala Agricultural University, Thrissur-680652, Kerala.
Banana Research Station, Kerala Agricultural University, Thrissur-680652, Kerala.
*harishankar99kr@gmail.com*
*+91-8075547123*

*Galleria mellonella*, the Greater wax moth or honeycomb moth (Family: Pyralidae; Order: Lepidoptera) is found throughout the world. It is one of the two species of wax moths, with the other being the lesser wax moth. *G. mellonella* eggs are laid in the honeycombs, and they have four life stages (egg, larvae, pupa, and adult). Males can generate ultrasonic sound pulses, which, along with pheromones, are used in mating. The larvae of *G. mellonella* are often used as a model organism in research. In addition, they are also used as the universal bio-agent host for mass multiplication of parasites and parasitoids, especially Entomopathogenic nematodes (EPNs), the safest biocontrol agent in the world. In the lab conditions, they are grown in a semi-synthetic diet with honey as one of the major ingredients. The cost of natural honey these days has increased, thus making the preparation of a semi-synthetic diet less lucrative. So a project was envisaged to develop and evaluate alternate honey sources for making cost-effective diet constituents of *G. mellonella.* Substitute honey was prepared from various sources like fruits, vegetables, coconut water etc. to compare their nutritive value for the mass multiplication of *G. mellonella*, the universal host of biocontrol agents. Growth of *G. mellonella* larvae was best when honey prepared from coconut water and banana juice were used for the weight gain studies conducted on various instar stages. Cost analysis was done by comparing the market value of honey procured from shops to the cost of 1kg each of prepared honey samples. It was found that coconut water honey and banana honey are 2.6-3.5 times cheaper in comparison to natural honey without compromising its effect on enhancing the weight gained by the larvae that were fed on these diets.

**Social relevance of the study**

Development of cost effective and cheaper alternatives for ingredients required for the mass multiplication of universal host for bio control agent production will enhance acceptability and wider adoption of safe to eat pest production technique.

**AGS-13**

# Transgrafting; A new paradigm to expand the use of genetic engineering for horticultural crops

**Shwetha A., and Basavaraja N.**

University of Horticultural Sciences, Bagalkot
Udyanagiri, Near Semekeri Cross, Hubli Bypass Road,
Navanagar, Bagalkot- 587104, Karnataka, India.

*shwethahort@gmail.com*
*+91-9482462818*

Grafting is one of the established plant propagation practices and crop improvement techniques. It is most commonly used for the commercial production of fruit trees and solanaceous and cucurbitaceous vegetable crops to overcome soil-borne diseases. Transgrafting is a technique, which combines the traditional grafting practices with the genetic modification of crop plants. Grafting a non-genetically modified scion on a genetically modified (GM) rootstock results in a chimeric plant. Unlike the GM crops, neither the scion nor the products of transgrafted plants contain foreign DNA, hence considered safer. Transgrafted plants address the concerns about transgene flow and exogenous transgene products. Therefore, it has implications for the commercialization of transgenic plants as rootstocks. Transgrafting has the potential to expand the value of grafting strategy by enabling the utilization of transgenes, whose products serve as a novel source for abiotic and biotic stresses, quality improvement, etc. The food products derived from the non-transgenic parts of the transgrafted plants are considered as non-GM because the immobile transgene products are not present in the non-transgenic part and mobile transgene products are equivalent to endogenous plant products. It also offers an advantage for the environment, where the pollen flow concern would be minimized because the non-engineered scion would be the only source of pollen. Hence, transgrafting is a way to expand the use of genetic engineering for horticultural crops.

**Social relevance of the study**

Transgrafting can genetically improve rootstocks regarding soil-borne diseases and also prevent treatment with chemical soil disinfectants or steaming of soil that would require a lot of energy. It would be beneficial for the growers to harvest non-GM food products.

**AGS-14**

# Genetic evaluation of carrot (*Daucus carota* L.) genotypes for yield traits under northern dry zone of Karnataka

**Meghashree J. R., C. N. Hanchinamani and N. Basavaraja**

University of Horticultural Sciences, Bagalkot
Udyanagiri, Navanagar-587 104, Karnataka, India.

*meghanajr17@gmail.com*
*+91-9480967927*

Carrot (*Daucus carota* L.) is an important root crop with many nutritional compounds like β-carotene, fiber, and other dietary nutrients. It occupies the pride place due to its delicious taste, flavor, soft texture and nutritive value. The lack of superior genotypes or improved cultivars is the limiting factor for low productivity. Hence, there is a need for the development of new varieties and hybrids with high productivity. Germplasm maintenance, evaluation, and characterization for economically important traits are prerequisite for genetic improvement of the crop. Hence, the investigation was conducted using twenty-five genotypes procured from different sources in randomized block design with two replications during *rabi* 2017. The analysis of variance indicates highly significant differences among all the traits studied, thus indicating the existence of variation among the genotypes and there was a scope for crop improvement. Among the genotypes, maximum root weight was recorded in VRCAR-197 whereas, HUB-11 produced thickest roots with more core diameter and HUB-5 produced the longest roots. Total yield/plot and total yield/ha were found best in the genotype VRCAR-197. Based on the mean performance, the genotypes such as VRCAR-197 and HUB-5 were performed well for other parameters also along with yield. These identified genotypes can be used for the further crop improvement programme.

**Social relevance of the study**

The genetic information obtained from the study helps for the development of high yielding carrot varieties suitable for the Northern dry zone of Karnataka to help the farming community.

**AGS-15**

# Effect of different potato micronutrient formulations on performance of potato

**Vishnuvardhana, Manjunath R. P., and Anilkumar S.**

University of Horticultural Sciences, Bagalkot-587104, Karnataka, India.
RHREC, UHS Campus, GKVK, Bengaluru-560065, Karnataka, India.

*vishnutiptur@yahoo.com*
*+91-9483560272*

A field experiment was conducted at Horticulture Research and Extension Centre (HREC), Somanahallikaval, Hassan during 2016 to study the effect different potato micronutrient formulation on the performance of potato (Solanum tuberosum L.) Cv Kufri Jyoti. The experiment was conducted with a Randomized Complete Block Design with twelve treatments and three replications. In each formulation, different concentrations of micronutrients were used. The micronutrients and their formulation were sprayed at 30, 45 and 60 days after sprouting of tubers. Among the different formulations, foliar spray of UHSB-3 micronutrient formulation along with RDF recorded significantly highest A grade (> 75g) tuber yield per plant (532.15 g), total yield per plant (687.87 g), A-grade tuber yield per hectare (16.65 t/ha), total tuber yield per ha (25.18 t/ha), dry matter content (19.76%) and total sugar (0.43%). The major and micronutrient uptake in the plant as well as tubers were also recorded significantly higher values in the treatment which was sprayed with UHSB-3 micronutrient formulation.

**Social relevance of the study**

The research is focused on developing crop-specific nutrient formulation. In this study potato micronutrient special has been developed and tested to get higher yield and quality. Foliar spraying of micronutrients increases the yield and reduces the fixation in soil and helps in higher nutrient uptake

AGS-16

# Adoptability of the improved hollow cone nozzle on beans and tomato under farmer field conditions

**D.S. Premasiri[1] and K.A.N.P. Bandara[2]**

[1]Seed Certification and Plant Protection Centre, Gannoruwa-20400, Peradeniya, Sri Lanka
[2]Horticultural Crops Research and Development Institute, Gannoruwa-20400, Sri Lanka

*dhammika.scppc@gmail.com*
*+94-712656976*

Earlier investigations indicated that higher volumes of pesticides than the recommended volumes are been used in vegetable cultivations in Sri Lanka mainly due to the use of errant nozzles under low pressure. The same study further indicated that the use of an improved hollow cone nozzle under standard pressure managed to reduce around one-third of the volume used in cabbage cultivation. Further evaluation of this improved hollow cone nozzle on other types of foliage under farmers' cultivation conditions is required recommending this new nozzle replacing the conventional nozzle in foliar applications of insecticides on vegetables. The present study was carried out to confirm the effectiveness of this improved hollow cone nozzle on vegetables with other types of foliage under farmers' cultivation conditions. The pest control efficacy of the improved hollow cone nozzle was compared with the conventional nozzle on tomato and bean in farmers' field at Bandarapola, Matale. Spraying of insecticides using both types of nozzles reduced the number of pests and increased marketable yield and there was no significant difference in the efficiency between them. However, the Improved nozzle consumed 20% to 29% lower spray volume when compared with the conventional nozzle. Therefore the recommendation of improved hollow cone nozzle replacing the conventional nozzle will provide an acceptable solution for the overuse of insecticides in vegetable cultivations.

**Social relevance of the study**

Sri Lanka is approaching to a middle-income nation and the living standards of the people are improving and their food habits are changing. As a result, the consumer awareness on adverse effects of pesticide is increasing and most of the consumers prefer to buy vegetables which have been produced with less or no pesticides. A number of studies on pesticide usage in upcountry vegetables indicated that the majority of farmers are using higher rates of pesticides than the recommended rates. The same situation existing low country leafy vegetables. Majority of farmers use hand-operated knapsack sprayer with single or double hollow cone nozzles for delivering insecticides to the target, however, they were not concerned on the flow rate and the pressure. Recent studies indicated that this over usage of pesticides was mainly due to the use of errant application appliances and the use of improved hollow cone nozzle (IHCN) under recommended pressure on cabbage crop managed to reduce the spray volume by 33% when compared with the conventional hollow cone nozzle (CHCN) without affecting their efficiency (Bandara et al., 2011).

**AGS-17**

# Evaluation of biopesticide extracted from *Tagetes erecta and Tagetes patula* on common crop pests

**Sasmita Sabat, Pavithra R., Keerthana Kannan and Keerthy B N.**

PES University, 100 Feet Ring Road, Banashankari III Stage, Bangalore 560085, Karnataka, India.

*sasmitasabat@pes.edu*

*+91-9845103846*

*Tagetes* sp. contains thiophene compounds, which have a wide range of biocidal properties. In this study, the crude extracts of different parts of *Tagetes erecta* and *Tagetes patula* were obtained by Solvent extraction method using a Soxhlet apparatus. Especially, the leaf extract was subjected to GC-MS for identification of the components and confirm the presence of thiophenes. The samples were then tested for their larvicidal properties on two major disastrous crop pests viz., *Spodoptera litura* and *Corcyra cephalonica*, by direct and indirect methods. In the indirect method, the *S.litura* larvae were allowed to feed on castor leaves sprayed with different concentrations of the methanolic sample extracts. In the direct method, the *S.litura* and *C.cephalonica* larvae were sprayed with low to high concentrations of crude sample extracts of both *T. patula* and *T. erecta*. Significant decrease in the larval activity and survival rate within 24 hours to 48 hours were observed and recorded. To check the larvicidal effect trials were performed from a lower concentration of 10uL to a higher concentration 1000uL. It was 100% lethal for larvae with 25uL roots and stem extracts of *T. erecta* within 24 hours. *T. patula* flowers, roots and stem extract would effectively kill only 50% of the larvae in 48 hours at a concentration of 50uL. Mini nursery was set-up for evaluation by direct method on larvae growing on jowar saplings, which displayed 100% mortality of larvae within 24 hours for 25uL of *T. erecta* leaf and flower extracts and *T. patula* only with flower extract. From these trials, it was concluded that the extracts of *T. patula* and *T. erecta* were effective, eco-friendly, non-hazardous and non-toxic larvicides of *S. litura* and *C. cephalonica.*

**Social relevance of the study**

Chemical pesticides have been found highly disastrous for the crop and also to the animals to human beings. To avoid the use of these harmful chemical substances and enhance the application of eco-friendly, non-toxic but very effective plant extract called as biopesticides for good and safe health of the society, this project was undertaken and proven as worth for its application.

**AGS-18**

# Bunch care technologies to maximize yield in banana

**H M Santhosha*[1], M. J. Manju[2], and Ashoka P [3]**

[1,3] ICAR- Krishi Vigyan Kendra, Hanumanamatti, Haveri-581115, Karnataka, India.
[2] ICAR- Krishi Vigyan Kendra, Sirsi-581401, Uttara Kannada, Karnataka, India.

*san3070@gmail.com*

☎ *+91-9964572247*

Frontline demonstration was carried out by ICAR-Krishi Vigyan Kendra, Sirsi, Uttara Kannada during 2018-19 to study the effect of various bunch caring technologies on yield of banana cultivar elakki mitli. Application of Arka banana special @ 5 gram/liter, during 5th month after planting, 4 sprays at monthly interval, denavelling – removal of male bud after appearance of last hand in bunch, bunch feeding through the distal end of the bunch peduncle after denavelling and bagging of bunch with polypropelene covers after emergence of last hand was carried out in ten farmers field at kayagudde village of Uttara Kannada district**.** The results revealed that the highest yield, yield related components and B:C ratio were recorded by following bunch caring technologies under demonstration field compared to farmer practice.

AGS-19

# New- generation Water-based and dust fungicide formulations in management of Corynespora Leaf Fall (CLF) disease of rubber

**M.J. Manju, H.M. Santhosha, and L. Annapurna Neeralgi**

University of Agricultural Sciences, Dharwad,
ICAR-Krishi Vigyana Kendra, Uttara Kannada, Sirsi -581401,
Karnataka, India.

*manjumjm@yahoo.co.uk*

*+91-9448495345*

Corynespora leaf fall disease (CLF) incited by *Corynespora cassiicola* is one of the major leaf diseases of *Hevea brasiliensis* in major rubber producing countries in South and South East Asia. Incidence of CLF disease is confined only to dryer months after the annual leaf fall and causes repeated leaf fall during the refoliation period. Use of effective and economical fungicides in rubber plantation is very important task for efficient disease management. Evaluated new-generation systemic and contact water-based and dust fungicides for CLF disease management. Among the water based fungicides SAAF, a combination fungicide containing mancozeb and carbendazim, at 2g/l was found to be more effective in CLF disease management as compared to the currently recommended fungicides such as mancozeb and carbendazim. Systemic dust fungicide hexaconazole 2 percent dust at 9kg/ha. was found superior as compared to 1 percent dust formulation. The advantages of the use of systemic fungicides in rubber plantation during the refoliation period are discussed.

**AIB-01**

# Classification and quantification of Odonata biodiversity in Kuttanad using machine learning methods

**Geetha Paul, Robin Jacob Roy, Gigi K Joseph, and Ninan Sajeeth Philip**

S.B College, Changanacherry-686101, Kerala, India.
airis4D, Thelliyoor-689644, Kerala, India.
Nirmala College, Muvattupuzha-686661, Kerala, India.

*geethapaulchitchat@gmail.com*
*+91-9495379661*

Using state of the art Machine Learning tools and data collected by periodic monitoring starting from March 2019, we report a sharp decline in the odonata (dragonfly and damselfly) biodiversity in North, Lower and Upper Kuttanad. The study period covers the seasons when odonata population is expected to be high in the region. However, in contrast, we find that several species mentioned in an earlier study in 2007 are missing and that none of the odonates seen in freshwater could be found in the entire duration of the study. Since it is known that odonate population is highly sensitive to the water quality and climate change, we argue that the human-induced factors like littering of food and poultry waste, spilling of petroleum compounds from houseboats and other water transport systems along with excessive use of pesticides, waste from duck farms, etc in addition to the global warming and climate alterations are the causes for the decline in observed odonata diversity.

**Social relevance of the study**

Since odonates are also natural predators of various disease-causing insects including mosquitoes, the study points to the possibility for the unexpected spread of epidemics in those regions unless appropriate on time remedial actions are taken.

**AIB-02**

# Using text mining for sifting oceans of data for business intelligence

**Abdelaziz Saleh Mohammad, Mohammad Al Kadri, and Muhammad Ameer Zanabi**

Jamia Milia Islamia, New Delhi-110025, India

*abedalazizfhied@gmail.com*

☎ *+91-9821353118*

The amount of data our systems produce every day is mind-blowing. Businesses seek ways to invest in the treasure of data available online like posts on Reddit, Tweets on Twitter, Posts, and comments on Facebook, Pinterest, and Amazon. However, most of the data found in such platforms present a real dilemma due to its nature of being mostly text-based and unstructured. We will try to understand how we can analyze reviews submitted by users on the Amazon website and enable businesses to make the most of this asset. We will employ Artificial Intelligence application by using C# application that reads JSON file and converts it into a JSON object and stores it to a database server then exports the data we needed to a CSV file. After that, we will apply traditional Text-mining methods. To prepare, analyze and produce visualized results**.** In our research, we performed the following steps to prepare the data for analysis: 1-Downloading the text customers review From Amazon.com size (~55GB). 2- Create a Croups. 3-Applying Pre- Processing, Data Clean. 4-Applying Artificial Intelligence and Text Mining. 5-Testing and Evaluation. 6- Business Intelligence Visualization. 7-Knowledge Discovery.

**Results**

Create Frequency Term Matrix, Create Topmost 100 frequent terms, Create Correlation for the terms, Results Visualization: word cloud, Bar Charts, Circular plots.

**Social relevance of the study**

From this work we analyze more than 55GB of customer reviews of amazon.com, by using artificial intelligence processes of Text Data Mining. We can use this methodology in many areas like bioscience, physiotherapy patients review, hotels, social networks reviews.

**BB-01**

# Deciphering the role of p21 (Cip1/Waf1) in regulation of autophagy

**Mayank Maheshwari, Mohammad Hasanain, Praveen Pandey, Kuldeep Choyal, and Jayanta Sarkar**

CSIR-Central Drug Research Institute, Sector-10, Jankipuram Extension, Lucknow, 226 031, Uttar Pradesh, India.

Academy of Scientific and Innovative Research, Chennai, 600113, Tamilnadu, India

*mmaheshwari24@gmail.com*

*+91-8840127141*

Autophagy is an evolutionarily conserved, catabolic cellular process which serves as a temporary survival mechanism during cellular stress related to nutrient depletion, infection or apoptosis. Autophagy occurs at a low basal level to maintain cellular homeostasis by degrading intracellular damaged proteins and organelles. In the present study, we observed the enhanced level of autophagy upon p21 depletion which was evident as decreased p62/SQSTM1 expression, up-regulation of LC3 lipidation, redistribution of GFP-LC3 as cytoplasmic puncta and fusion of autophagosomes and autolysosomes. Our results also showed an additionally enhanced turnover of LC3-II and accumulation of LC3 specific puncta when p21 depleted cells were exposed to autophagolysosome inhibitors (such as CQ, Baf) indicating augmented autophagic flux. We validated the significance of p21 in the autophagic process by RNAi mediated gene silencing of a key autophagy regulatory protein ATG7 wherein suppression of ATG7 was associated with overt loss of autophagy. Further, we explored that autophagy inhibitory effect of p21 is independent of p53 activity which is the primary transcription factor for p21 expression. *In vitro*, clonogenic assay revealed that the absence of p21 significantly inhibited cellular proliferation and was evident as reduced tumor sphere-forming capacity of p21 deficient HCT116 cells. Similar findings were observed in *in - vivo* studies where the size of xenograft bearing p21 proficient HCT 116 cells was much larger than p21 deficient cells and this reduction in tumor volume was associated with an enhanced level of autophagy suggesting a likely role ofp21 ablation in the suppression of tumor formation.

**Social relevance of the study**

Our data suggest a regulatory role of p21 in the autophagic process and its association with cancer progression which could provide a clue to explore p21 for potential therapeutic applications.

**BB-02**

# Statistical optimization of bio surfactant production from isolated microbial strain

**Deepak A. Yaraguppi, Zabin K. Bagewadi and Uday M. Muddapur**

KLE Technological University, Hubballi-580031, Karnataka, India

*zabinb@gmail.com*
*+91- 9845225921*

Bio surfactants are amphiphilic molecules that reduce the surface interfacial tension between immiscible fluids. In the present study, bio surfactant producing strain was isolated and screened for its potentiality. The potential strain was characterized by 16S rDNA gene sequencing. The production of bio surfactant was optimized by one factor at a time approach during initial screening. The growth and product kinetics were determined. The bio surfactant production was statistically optimized through Plackett-Burman design and response surface methodology. Analysis of variance revealed significant effects and interaction effects of the factors. The obtained model was validated with triplicate trials. After optimization, the bio surfactant yield was improved to several folds. The produced bio surfactant was assessed for its stability at an array of pH, temperature and NaCl concentration. The bio surfactant showed good stability under these tested conditions. The biological properties such as antimicrobial and cytotoxicity activities were evaluated. The bio surfactant showed significant inhibitory effect against selected pathogens and also showed cytotoxicity activity on human breast cancer MCF-7 cell lines through MTT assay. The bio surfactant was analytically characterized by Fourier Transform Infrared Spectroscopy and Scanning electron microscopy (SEM) with energy dispersive X-ray (EDX) analysis.

**Social relevance of the study**

The bio surfactant can be employed for the recovery of crude oil from contaminated sites and can be a promising candidate for application in bioremediation.

**BB-03**

# Isolation, characterization and application of bio surfactants produced from bacterial sp.

**Priya Katiyar, Sudeeksha Tyagi, Suraj Sajeev, Vidya Naik, and Manjusha Dake**

Dr. D. Y. Patil Biotechnology and Bioinformatics Institute
Sr. No. 87-88 Mumbai Bangalore Highway Tathawade-411033,
Pune, Maharashtra, India.

*manjusha.dake@dpu.edu.in*
*+91- 9960900053*

Surfactants are surface active compound that reduce the interfacial tension and contain both hydrophobic and hydrophilic moieties. They are synthesized by microbes like bacteria, fungi and yeast. Biosurfactants exhibit properties of dropping surface tension, stabilizing emulsions, promoting foaming and are usually non-toxic and biodegradable. Biosurfactants producing bacterial strains were isolated and screened for the production of biosurfactant using MSM medium containing vegetable oil and petroleum oil as a carbon source. Blood hemolysis test, emulsification activity as well as drop collapse tests was performed for screening of the biosurfactant producing bacteria. Four bacterial isolates 1, 2, 3, and 4 were found to produce biosurfactants. Production of biosurfactant was confirmed by performing Drop Collapse test and emulsification index. Bacterial isolates (2 and 4) showed significant positive results for Drop Collapse test. These isolates also exhibited high emulsifying activity with emulsification index of 49 % and 53 % respectively. Foaming stability was higher for bacterial isolate 2. All four bacterial isolates (1, 2, 3 and 4) were found to produce glycolipid or oligosaccharide type of biosurfactant at pH 7.0 and a temperature of 37°C with an incubation period of 5 days. Production of lipopolysaccharide type biosurfactant was analyzed by measuring the carbohydrate content of biosurfactant by phenol $H_2SO_4$ method. Isolate 4 gave maximal production of lipopolysaccharide type biosurfactant. The oil displacement test also confirmed the higher yield of biosurfactant by isolate 2 and 4.

**Social relevance of the study**

Biosurfactants have potential applications in cosmetics, pharmaceuticals, humectants, food preservatives and detergents due to their biodegradability, ecological acceptability.

**BB-04**

# Extraction, purification and characterization of protease inhibitors from *Allium fistulosum.*

**Vedangi Dhavalikar, Shweta, Vidya Naik, and Manjusha Dake**

Dr. D. Y. Patil Biotechnology and Bioinformatics Institute
Sr. No. 87-88 Mumbai Bangalore Highway Tathawade-411033,
Pune, Maharashtra, India.

*manjusha.dake@dpu.edu.in*
+91-*9960900053*

The proteases produced by all living organisms have an essential role in metabolic and regulatory functions in various biological processes. But uncontrolled proteolytic pathways lead to several diseases including metabolic disorders. Plant protease inhibitors are small proteins mainly found in tubers, seeds and aerial parts of plants. One of the important defense strategies that are found in plants to prevent predators involves protease inhibitors which are in particular effective against phytophagous insects and pathogenic microorganisms. In view of this present work has been carried out on the isolation of protease inhibitor from the leaves of *Allium fistulosum.* Protease inhibitor was further evaluated for inhibition studies using standard proteolytic enzyme Trypsin. The protease inhibitor was subjected to purification by ammonium sulfate fractionation where (30%, 60%, and 90%); the active inhibitor fraction was isolated during 60% saturation. Biochemical characterization of purified inhibitor displayed the stability of protease inhibitor between pH 4-7. The protease inhibitor showed thermal stability up to 60°C. Inhibitor showed maximum stability in the presence of PEG 4000 and BSA at 50°C. Protease inhibitor was highly stable with Tween 80 with maximum activity. Inhibitor remained significantly stable and active in the presence of 1% $H_2O_2$ as an oxidizing agent and 0.5% DTT as a reducing agent. An increase in inhibition activity was displayed as the concentration of Succinic anhydride and PMSF increased. Antibacterial activity was observed for the crude inhibitor extract *E.coli.*

**Social relevance of the study**

Protease inhibitors are also important in food processing, preservation and as therapeutic agents. May or may not display anticancer potential.

**BB-05**

# Formulation and biochemical assessment of minimal sugar arishta during fermentative maturation

**Gargi Panicker and Minal Wani**

Dr. D. Y. Patil Biotechnology and Bioinformatics Institute,
Sr. No. 87-88 Mumbai Banglore Highway, Tathawade, Pune-411033,
Maharashtra, India.

*minal.wani@dpu.edu.in*
*+91- 9373332012*

Ayurveda, the traditional Indian medicinal system remains the most ancient yet living traditions with sound philosophical and experimental basis. It is a science of life with a holistic approach to health and personalized medicine. Arishtas are naturally fermented herbal decoction used in Ayurveda as a medicine, for the treatment of various diseases. Pharmacology and pharmacokinetics of many important ayurvedic drugs are still not fully explored. There is a need to validate basic principles as well as drugs used in the ayurvedic system of medicine with the help of advanced research methodology using Biotechnology. Arishta is prepared by soaking the herbal decoction in a solution of sugar or jaggery for a specific period for the extraction of active ingredients contained in the herbs. Alcohol in arishtas acts as the medium for active ingredients of the herbs to dissolve in it. Arishtas consists of high sugar percent, when prescribed for diabetic patients for some ailments, may elevate their blood sugar level. The present study is carried out for the preparation of minimal sugar dashamulatishta, which will be diabetic friendly and to assess the comparative composition through phytochemical and physiochemical analysis and an antioxidant assay of the formulations and marketed arishtas.

**Social relevance of the study**

8.5% population of the world is suffering from diabetes (according to WHO in 2014) and 80% or more of the world relays on herbal medications for primary health care. The production of a different line of diabetic-friendly arishtas is possible. Commercially for the ayurvedic pharmaceutical companies, this would be a profitable investment without any extra expenditure. Moreover, this is also beneficial for the diabetic population who prefer ayurvedic treatment for their other ailments.

**BB-06**

# Assessment of genetic diversity in Morus germplasm collection using novel SSR markers

**B. N. Gnanesh, G. S. ArunaKumar, H. B. Manoj Kumar, B. V. Sharada, M. M. Harshitha and M. Supriya**

Central Sericultural Research and Training Institute
Srirampura, Manandavadi Road, Mysuru – 570008,
Karnataka, India.

*manojmandya.17@gmail.com*
*+91- 9964663850*

Mulberry (*Morus* L.) is essential for sericulture as primary source of food for silkworm *Bombyx mori* L. Many of its indigenous and exotic cultivars are generally being used for cultivation. Divergences among the mulberry germplasm accessions necessitate their genetic exploration. Simple Sequence Repeat (SSR) profiling was employed to assess genetic relatedness among 96 mulberry genotypes maintained in the Panel of diverse germplasm (PDG) maintained at Central Sericultural Research and Training Institute, Mysuru. Thirty three SSR primer sets were screened for detection of polymorphism in 96 genotypes and documented the expected product size of successfully amplified SSR primer sets based on their amplification pattern. Of the thirty three SSR markers MUL2SSR17, MUL2SSR20, MUL2SSR49, MUL2SSR150, MUL2SSR170, MUL2SSR172, MUL2SSR174 and MUL2SSR193 were failed to produce PCR bands. Remaining primers yielded a total number of 32 alleles with an average of 1.28 alleles per primer from 25 markers. An average of 2.5 alleles was produced by polymorphic primers MUL3SSR73, MUL3SSR118, MUL3SSR124 and MUL3SSR192. The highest similarity value was observed between AR-12 and Mysore local followed by RFS135 tetraploid and S36 tetraploid with 0.99 similarities while the lowest similarity coefficient (0.15) was between BR-8 and Monlal. The mulberry accessions were divided into two distinct major groups through cluster analysis. There were no sub clusters in Group I while two sub clusters have been formed from the Group II. The result indicates distinctness of exotic and indigenous genotypes at molecular level which could be useful for selection of diverse parents for mulberry breeding. Further, specific DNA fingerprints can be developed for different mulberry germplasm from these identified markers.

**Social relevance of the study**

Result revealed the genetic relationship of selected mulberry genotypes.

**EES-01**

# Bibliometric analysis of water pollution research between 2007 and 2016- a decade study

**Shankarappa T. H., Shankar Reddy Kolle, Satish M. V., and Shivanna M.**

Regional Horticultural Research and Extension Centre, UHS Campus- 560 065, Bengaluru, Karnataka, India.
Indira Gandhi National Tribal University, Amarkantak Lalpur-484 887, Madhya Pradesh, India.
Government Engineering College, Hassan-573 202, Karnataka, India.

*shankarappath@gmail.com*
*+91-98456 95662*

A bibliometric analysis of research articles between 2007 and 2016 was undertaken to reveal the current trends in water pollution research. The data was collected from the SCEI and SSCI of Web of Science. 10,055 articles in total were retrieved and analyzed to reveal publication trends in water pollution. The analysis indicated that the literature on water pollution had grown exponentially during the assessed period, where the majority of the articles were published in the *Journal of Hazardous Material.* It was also observed that the most productive country was China followed by the USA and the word "removal" had appeared maximum times in the title of the articles followed by the words china, river, aqueous solution, contaminated water, and adsorption. This is a specific study, reporting for the first time about the literature published on water pollution for the period 2007-2016 and would be useful to the researchers to know the latest trends happening in water pollution research, various institutes and scientists working in the area of water pollution and to formulate research.

**Social relevance of the study**

The study explains the present status of research on water pollution in particular and the leading institutions, countries, technologies developed and the scientists involved in water pollution research in general.

**EES-02**

# Production of Microbial Photovoltaic Cells utilizing *Chlorella vulgaris*

Arathy G Nair, Devika S Kumar, Sneha B., and Jikku Jose*

Scire Science R&D Laboratory Kochi-682035, India
Hershey High School Hershey, Pennsylvania, USA

*jikkujose1@gmail.com*

☎ *+91-7907258764*

As the population increases, the necessity for energy across the globe rises. Currently used energy sources have their disadvantages such as global warming, geographical limitations and pollutant emissions. Hence both energy demand and ecological consequences require an alternative energy source, which is sustainable, cheap, and readily available. Electricity production by harnessing solar energy is an effective solution for the present energy crisis. Since the energy produced from the sun is renewable and sustainable and clean. The Microbial Photovoltaic Cell (MPV) is an emerging technology, that harnesses Photosynthetic Active Radiation (PAR) from sunlight through autotrophic organisms to produce electricity. In the present study, the photovoltaic efficiency of microalgae was investigated. A rapid-growing microalgae species was selected for the current study and was identified as *Chlorella vulgaris* using genomic sequencing. The growth parameters were standardized by monitoring and evaluating the changes in the optical density, cell density, and the chlorophyll contents. A biofilm-based prototype MPV was constructed to evaluate the photovoltaic efficiency. There was an increase in surface area coverage percentage from 35.53% to 98.38%,as the incubation day of photoelectrode proceeded from day 3 to day 15. When the voltage across the circuit was measured by applying 1k Ω external resistance in the constructed completed circuit, there was an increase in power density from $0.078\times10^{-2}W/m^2$ to $18.4\times10^{-2}W/m^2$, when the biofilm having SAC% 35.53% to 98.38% was used. The present study showed that *Chlorella vulgaris* has the ability to produce biofilm on ITO glass slide and current output, which indicates that this study can lead to promising technology development for sustainable energy production.

**Social relevance of the study**

The study can facilitate the development of the cost-effective, sustainable electricity-producing system by using Microalgae. This 'Go-Green' method shall, in turn, support the economic growth of the country.

**FNS-01**

# Bioaccessibility of iron from high and low phytic acid lines of finger millet [*Eleusine Coracana* (L.) Gaertn.]

**Netravati Hiremath, Geetha K., Nanja Reddy Y.A., and Sheshshayee M. S.**

University of Agricultural Sciences, GKVK, Bengaluru-560 065, Karnataka, India.

*netravatih@rediffmail.com*

*+91-7829610347*

Iron Deficiency Anaemia (IDA) remains a major public health problem affecting nearly 75 percent of the Indian population. One of the considerable causative factors for IDA is not only the low iron intake but is also due to the consumption of non-haem, cereal-based diet with low absorbable iron. The limited bioavailability of minerals from cereals is mainly due to the presence of antinutritional factors. Based on the measurement of grain iron and phytic acid in 100 accessions of finger millet, contrasting lines were selected (n=8) and assessed for their *in vitro* iron bioaccessibility. It was evident that bioaccessible iron was high in 'high iron and low phytic acid' lines *viz.,* GE-4597 and GE-4976 with the value of 17.34 and 16.69 percent respectively. Iron bioaccessibility was low in 'high iron and high phytic acid' lines *viz.,* GE-91 (12.99 %) and GE-1004 (11.25%). A highly significant negative correlation existed between the molar ratio of 'phytic acid to iron' and iron bioaccessibility (r = -0.830**). Hence the present findings revealed that iron bio-accessibility is primarily dependent on phytic acid to iron molar ratio implying the inhibitory effect of phytic acid on bioaccessible iron.

**Social relevance of the study**

Bioaccessible iron was comparatively high among the 'high iron and low phytic acid' lines suggesting the usage of such lines in crop improvement enhance the iron absorption.

**FNS-02**

# Efficacy of Millet-based low glycemic food mix for management of diabetes

**Geetha K., Geetha M. Yankanchi, Netravati Hiremath, and Savitha Hulamani**

University of Agricultural Sciences, GKVK, Bengaluru-560065, Karnataka, India.

*geethanutrition@gmail.com*

*+91-9448335077*

A study was conducted to assess the glycemic index of millet-based food mix and its efficacy on pre-diabetics. Millet based food mix was developed using region-specific low glycemic foods. Locally consumed regional foods namely *roti, mudde, dosa* were prepared from the developed mix and glycemic index was assessed on 10 normoglycemic subjects aged 18-30 years. Food-based intervention was carried out on 16 pre-diabetic subjects with Fasting Blood Sugar (FBS) ≥100 and Glycosylated hemoglobin (HbA1C ) 5.7 to 6.4 to assess the efficacy of the mix in managing blood sugar level for 120 days. The experimental subjects were provided 110gm of food mix to be used in the form of *roti, dosa, mudde* as one of the meal. After completion of the intervention, the subjects were reassessed for the FBS, HbA1c along with lipid profile and anthropometric measurements. The glycemic index of *dosa, roti,* and *mudde* were found to be 37, 53 and 48 respectively. The paired 't' test indicated a statistically significant reduction in FBS and HbA1C in the experimental group compared to control. Though not significant there was also a reduction in weight in the experimental group. The results suggested that replacing rice-based breakfast/lunch with millet-based food lowers the blood sugar level among pre-diabetics. Millets along with other low glycemic locally available foods may have a protective role in the management of diabetes.

**Social relevance of the study**

The developed millet-based food mix lowers the postprandial blood glucose levels indicating the protective role of millets and other hypoglycemic food components in the management of hyperglycemia.

**FNS-03**

# Enhanced stability and Characterization of 6-gingerol, encapsulated by γ-cyclodextrin metal-organic frameworks

**Vedashree M., Nanishankar V. H., and Madhava Naidu M.**

Academy of Scientific and Innovative Research (AcSIR)
CSIR- Central Food Technological Research Institute (CFTRI)
Mysore-570020, Karnataka, India.

*vedashreemsharma@gmail.com*
*+91-918748857519*

Ginger, is a widely consumed spice across the globe. Specifically, in Asian countries routinely employed in various capacities in culinary preparations. Ginger possesses many distinct bioactive molecules, among them, pungent gingerols stand out. Gingerols are a pungent component, among these, 6-gingerol, has been shown a number of pharmacological activities and marked for its therapeutic benefits, however, due to poor water solubility it limits its application. Also, due to the presence of the adjacent hydroxy group, they suffer from stability issues and the conversion of gingerol to shogoal takes place upon dehydration. Hence the current work focuses on the improvement of aqueous solubility of 6-gingerol and also to prevent the thermal conversion of 6-gingerol to 6-shogol.To achieve these goals we have chosen MOF derived γ-CD as a platform for encapsulation. These CDMOF materials are biocompatible as they are derived from GRAS status materials consists of γ-CD, potassium hydroxide, and ethanol. Later the newly derived compound was characterized by NMR, IR-MS, XRD, SEM, DSC, and Chromatography and analyzed for its stability and solubility.

**The social relevance of the study**

The ginger consumption has enhanced to a large extent recently because of its low toxicity and its broad spectrum of biological and pharmacological applications. The objective of the present work is the improvement of aqueous solubility of 6-gingerol, which helps for the greater absorption in the body. This 6-Gingerol@CDMOF may be very effective in the suppression of transformation, hyperproliferation, and inflammatory processes that initiate and promote carcinogenesis, as well as the later steps of carcinogenesis, angiogenesis, and metastasis.

**FNS-04**

# Curcumin – A wonder dietary compound for Human health: A review

**Savitha V Jammanakatti and Prashanth S J**

Karnataka State Akkamahadevi Women's University
Toravi , Vijayapura-586108, Karnataka, India.

*Savitha.vj94@gmail.com*

*+91-9036651098*

Turmeric is a spice commonly used in Indian cuisine as a flavoring and coloring agent. It is traditionally used as a folk medicine and has multitudinous health benefits. The bioactive compound and major constituent present in the turmeric is known to be Curcumin and it is nonmutagenic and nongenotoxic which is being recognized and used worldwide for its potential benefits like hepato-protective, anti-inflammatory, anti-microbial, antioxidant, anti-carcinogenic and as a remedial agent in healing wound, body ache, arthritis, infections, urinary discharges, leukoderma etc. It also helps in the management of exercise-induced inflammation and muscle soreness, thus it also enhances the recovery and performance in active people. Uptake of Curcumin alone does not lead to health benefits due to its poor bio-availability. In order to increase bio-availability, Curcumin has to be consumed along with the other dietary compounds like Amla tannins or Piperine which will enhance the absorption of these compounds. Thus it can be considered as a wonder dietary compound that would be helpful for mankind by providing multiple health benefits and also in maintaining overall wellness.

**Social relevance of the study**

The historical use of turmeric as a therapeutic medicinal herb product and has good economic value dates back to ages, but the recent advances regarding the bioactive compound- Curcumin have extended the possibilities of its use as therapy.

**FNS-05**

# Nutritional status of children and adolescents in the rural urban interface of Bengaluru

**Geetha K., Vijayalakshmi D., and Shilpa Yatnatti**

University of Agricultural Sciences, GKVK,
Bengaluru-560065, Karnataka, INDIA.

*shilpayatnatti@gmail.com*

*+91-7829416650*

Children and adolescents are the most vulnerable group for malnutrition and they are significantly influenced by urbanization leading to food transitions which are characterized by a shift from indigenous traditional food to diversified global foods. The present study investigated the nutritional status of children among selected households across the rural-urban interface in southern and northern transects of Indian megacity Bengaluru. From the geocoded localities 300 middle-income households comprising of rural, transition and urban areas were selected by purposive random sampling technique and children belonging to these households constituted a total sample size of n=275. Anthropometric measurements were taken for all the children and Body Mass Index (BMI) was calculated compare with standards to derive inferences from the research findings. Anthropometric measurements of children revealed 81.1 and 75.5 percent of rural girls were below standards for body weight and MUAC respectively. Classification based on body mass index indicated underweight girls were more in rural (17.0%) and contradictory to this overweight in urban (12.8%). It is interesting to note that 31.6 percent of boys in rural were underweight and 16.2 percent in urban boys were overweight. A statistically significant difference was observed between anthropometric measurements of boys and girls and the classification of boys based on BMI ($\chi^2$=20.65*) across a rural-urban gradient. These findings indicated the magnitude of prevalence of malnutrition among children across the rural-urban interface. Urbanization leading to a corresponding increase in food transitions attributed to more overweight children (both boys and girls) in urban, compared to transition and rural areas.

**Social relevance of the study**

The present study reveals urbanization influence on children and adolescents nutritional status across rural-urban gradient which corresponds to widespread public health significance and aids in government policies.

**FNS-06**

# Nutritional value and sensory evaluation of herbal tea formulation from *Moringa oliefera* and *Spirulina platensis*

**Jasna A R[1], Krishna T.B, Sneha B., and Jikku Jose***

[1]Vimala College (Autonomous), Cheroor-680009, Kerala, India

Scire Science R & D Laboratory, Kochi-683503, Kerala, India

*jikkujose1@gmail.com*

☎ *+91-7907258764*

Tea is the most consumed beverage in the world after water. About 80% of the total world populations prefer using herbal-based products. Thus, it would be of great significance if the tea is made from herbal content which is essentially prepared from leaves, seeds, and or roots of various plants. Technological advancement, pollutions, long work hours stress increases the need for a healthy beverage. When herbal tea consumed with a balanced diet, it helps to improve antioxidant status and minimize oxidative stress in humans and hence enhances overall health status. There are various commercial tea formulations available in the market, each of which is designed to have a specific therapeutic or medicinal benefit. However, there is still a gap for more versions of the tea formulations, which can support a healthy lifestyle. Utilizations of plants to extract the raw materials for any preparations may need the sacrifice of the plant. In this study, we used microalgae as one of the components for the formulation. This present work aimed to formulate herbal tea from *Spirulina platensis* and *Moringa oleifera*. Phytochemical analyses were done to detect the presence of active chemical constituents, and the acceptance of this herbal tea was checked by sensory evaluation. The sensory evaluation shows that the blend of Spirulina and Tea leaves was most preferred in terms of flavour, texture, appearance, taste and general acceptability. The study showed that this herbal tea using *Spirulina platensis* could enhance antioxidant activity, which plays a vital role in the protection of our health.

**Social relevance of the study**

The study reveals that a cost-effective and healthy nutrition rich herbal tea that would be readily available in the market can be prepared without sacrificing plant lives and at the meantime by using microalgae which has a significant role in reducing carbon footprint.

**FNS-07**

# Studies on potential of *Chlorella vulgaris* for formulation of nutraceutical products

**Neha E. S[1]., Krishna T. B., Sneha B., Sareen Sarah John, and Jikku Jose**

[1]Vimala college (Autonomous), Cheroor-680009, Kerala, India.
Scire Science R&D Laboratory, Kochi-683503, Kerala, India.

*jikkujose1@gmail.com*

*+91-7907258764*

World population is increasing steadily and approximately 1 billion people are undernourished as per the current status. Combating malnutrition is one of the significant global health challenges as the affected population is varied in the gender, age, and economic status. Malnutrition is mainly affecting economically weaker section of the society. It increases health care costs, reduces productivity, which can perpetuate a cycle of poverty and ill health. Plant-based nutraceutical product development and its manufacturing are time-consuming and labour-intensive. In this scenario, microalgae nutraceuticals are playing a promising role due to its fast growth and cost-effectiveness. Microalgae are valuable natural sources of various bioactive compounds, such as vitamins, essential amino acids, polyunsaturated fatty acids, minerals, carotenoids, enzymes, and fibre hence are the most promising and innovative sources of new food and functional products. Chlorella is the most nutritious microalgae, which is composed of 55-67% protein, 1-4% chlorophyll, 9-18% dietary fibre and numerous minerals and vitamins. In this study, we were trying to optimize culture media and study the antioxidant and antibacterial property of *C. vulgaris* as a primary assessment of the development of a nutraceutical product. Maximum absorbance for the species was found to be at 686 nm. We observed that BG11 media provided a better culture growth with higher optical density in comparison with the other four media. The cells multiplied and entered into exponential phase after 6 days of inoculation and persisted in exponential phase until 24$^{th}$ day of inoculation. From 27$^{th}$ day there was no increase in microalgal cells indicating that the culture entered into a stationary phase and then into death phase. *Chlorella vulgaris* was found to have better antioxidant activity in chloroform extract with the presence of flavonoids, glycosides, and alkaloids. Antibacterial activity of *Chlorella vulgaris* also found to be emphasizing the potential to use as a nutritive additive for nutraceutical products.

**Social relevance of the study**

The study shows that *Chlorella vulgaris* can potentially be used for the formulation of affordable nutraceutical products, which can alleviate the malnutrition by improving the well-being and quality of life, and curtailing ailment risks.

**MBS-01**

# *Pseudomonas fluorescens* improves root growth in finger millet and groundnut

**Srinivasamurthy G.T., Harinikumar K. M., Bhavani P., N. Umashankar, and Chinmayi M. G.**

University of Agricultural Sciences, GKVK Campus, Bangalore-560065, Karnataka, India.

*harinikumarkm@gmail.com*
*+91-9448832077*

Fluorescent *Pseudomonads* belong to Plant Growth Promoting Rhizobacteria (PGPR), the important group of bacteria that play a major role in the plant growth, induced systemic resistance, biological control of pathogens, etc. The current investigation was carried out to study the molecular and physiological characterization of *Pseudomonas* species isolated from different plant rhizosphere soil of Tumakuru and Bangalore Rural district. Its effects on the root growth of Groundnut and Finger millet. *Pseudomonas* strains from different locations were isolated, identified and confirmed as isolates of *Pseudomonas fluorescens* using standard synoptic keys. Molecular diversity of the isolates were characterized by 16S rDNA universal primers analysis. Out of twelve isolates studied best performing six isolates for root growth were sequenced and the sequence obtained was compared against NCBI-Gene Bank database. Analysis of the sequences by NCBI-BLAST tool indicated that 97% similarity of three isolates with *Pseudomonas fluorescens*. Simultaneously, plant growth response studies using groundnut and finger millet as host were conducted. In plants inoculated with *P. fluorescens* isolates, the root length, fresh and dry weight of roots was found to be higher than the uninoculated plants. In the experiment conducted, isolates of rhizospheric soil selected from groundnut (PS-GN), tomato (PS-T) and finger millet (PS-FM) performed well compared to other isolates.

**Social relevance of the study**

It provides important services to the agroecosystems as they promote plant growth and health by suppressing soil borne diseases, by stimulating plant immune defenses, and by improving nutrient availability in soil**.**

**MBS-02**

# Screening for antimicrobial producing microbes in paddy field soil

**Sareen Sarah John[1] and Agnes Jerome[2]**

[1] Union Christian College, Aluva- 683102, Kerala, India.
[2]Cochin University of Science & Technology, Kalamassery, Kochi-682022, Kerala, India.

*sareensj@gmail.com*

☎ *+919447502758*

Antibiotic is one of the most important commercially exploited secondary metabolites produced by bacteria, fungi and *Streptomyces* and employed in a wide range. Most of the antibiotics used today are from the microbes. Bacteria are easy to isolate, culture, maintain and to improve their strain. *Bacillus* species being the predominant soil bacteria because of their resistant endospore formation and production of vital antibiotic like polymyxin, bacitracin etc. are always found inhibiting the growth of the other organisms. Production of antibiotic by microorganisms from soil is affected by many factors including nitrogen and carbon source. Therefore there is a great need to optimize with different substrates that provides maximum production of antimicrobial substance. In the present research study, screening of bacteria, fungi and *Streptomyces* with potential antibiotic activity was carried out. Ten isolates have produced activity against the tested microorganisms. Among the microbes isolated and identified, *Bacillus subtilis,* and *Streptomyces* sp. were selected on the basis of their anti-bacterial activity. The inhibitory activities of the isolated microorganisms were checked against *Staphylococcus sp.* (UCCB146), *Pseudomonas aeruginosa* (UCCB101), *Escherichia coli* (UCCB128) and *Klebsiella pneumonia* (UCCB133). All the microbes isolated from the soil showed good zone of inhibition against against both gram positive as well as gram negative bacteria. Using ethyl acetate extraction method the culture supernatants of the isolates were tested by diffusion method against indicator microorganisms. These results indicate that *Bacillus subtilis* and *Streptomyces* isolated from paddy fields of Kerala region could be sources of antimicrobial bioactive substances.

**Social relevance of the study**

Bacteria have so far been the most promising resource for antibiotics in the past decades and will undoubtedly remain an important resource of innovative bioactive natural products in the future.

**MFB-01**

# Isolation, screening, characterization and identification of amylase and catalase producing microorganisms from marine environment

**Priya Senan V., Mahima P., and Amridha R.**

Sahodharan Ayyappan Smaraka SNDP Yogam College,
Konni-689 691, Kerala, India.

*priyasenanv@gmail.com*
*+91-9605341435*

Amylases and catalases are among the most important enzymes and are of great significance in the present day industries such as food, fermentation, textile and paper. The aim of the present study was the isolation, screening and identification of the marine bacterial strains from marine sediments, which produce industrially important enzymes such as amylase and Catalase. Marine sediment samples were collected from Puthenthura (Chavara), located in Kollam district, Kerala. The collected samples were cultured on Zobell Marine Agar medium. After 48 hrs of incubation bacterial strains were isolated from the culture. The isolates showing amylase and catalase activity were screened and the strain AM01 has the highest amylase activity and the strains (Ca07) were selected for catalase activity. Hence the two strains were selected for gene sequencing and further identification. Morphological and biochemical characteristics and pH stability were studied. Phylogenic taxonomy as well as molecular phylogeny of AM01 and Ca07 were studied. The phenotypic characterization and 16S rRNA of AM01 indicated that bacterial cultures belong to genera *Klebsiella* and the species is *K. Pneumoniae* and that of Ca07 indicated that bacterial cultures belong to genera *Klebsiella* and the species is *K. quasipneumoniae*.

**Social relevance of the study**

The present study disclosed that this amylase and catalase producing strain could also be helpful for industrial application particularly in food industry, beverages, animal feed, brewing, textiles, detergent and health care. Isolation of bacterial strains from marine sediment samples would also provide extensive scope to assess their biotechnological potential.

**NBS-01**

# A green nano-fabrication with the help of *Trichoderma viride* for suppression of pathogen

**Aradhana Mishra**

CSIR-National Botanical Research Institute,
Rana Pratap Marg, Lucknow- 226001, Uttar Pradesh, India.

*mishra.a@nbri.res.in*
*+91-7052440871*

In the era of nanotechnology, silver nanoparticles are leading towards obtaining the status of wonder drug, combating the problem of multiple drug resistance (MDR) acquired by several pathogenic microbes. Spherical, rectangular, penta, and hexagonal silver nanoparticles of different dimensions were biosynthesized in an eco-friendly manner by biocontrol agent, *Trichoderma viride* by manipulating physical parameters, pH, temperature, and reaction time. The particles were characterized by UV-vis spectroscopy; Dynamic Light Scattering, Transmission Electron Microscopy and Fourier Transform Infra-red Spectroscopy. Maximum inhibition was found with spherical nanoparticles (2-5 nm) showing 40, 51, 43, 53.9 and 55.8% against *Shigella sonnei*, *Escherichia coli, Serratia marcescens*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* respectively, whereas pentagonal and hexagonal nanoparticles (50-100nm) demonstrated 32, 41, 31, 42.84 and 42.80% of inhibition as compared to control. An excellent antimicrobial efficacy was obtained with spherical nanoparticles of 2-5 nm with ampicillin and penicillin. Furthermore, a comparative study of antimicrobial activity between biogenic silver nano-architecture (10-20 nm) and citrate stabilized silver nanoparticles reveals that *T. viride* synthesized nanoparticles were more potent than their chemical synthesized nanoparticles in killing of pathogens because of the surface coating of secondary metabolites of *T. viride*. Complete cell death was observed due to more internalization of biosynthesized nanoparticles inside the bacterial cell leads to higher production of reactive oxygen species increasing oxidative stress and membrane disruption. Thus, the study reveals that biologically synthesized silver nanoarchitecture coated with antimicrobial metabolites of *T. viride* was more potent than their chemical counterpart in the killing of pathogenic bacteria.

**Social relevance of the study**

Synergistic effects of green biosynthesized silver nanoparticles stabilized with the antimicrobial metabolites of *T. viride* certainly opens up new opportunities for pharmaceuticals and agriculture pharmaceuticals industries in an eco-friendly manner

SciCon INGB - 2019
November 06-08

**Abstracts**

# POSTER PRESENTATIONS

*In sync with Next Generation Biosciences [INGB–2019], Goa, India*
*Scire Conference series, Book of Abstracts, ISBN 978-81-934009-8-2*
*www.scire.co.in*

# SciCon INGB - 2019

November 06-08

*In sync with Next Generation Biosciences [INGB–2019], Goa, India*
*Scire Conference series, Book of Abstracts, ISBN 978-81-934009-8-2*
*www.scire.co.in*

**PP-01**

# Hsp60 knockdown prevents tumor progression by inducing oxidative stress and autophagy

**Kuldeep Choyal, Mohammad Hasanain, Mayank Maheshwari, Praveen Pandey, Deepa Gandhi, and Jayanta Sarkar**

CSIR-Central Drug Research Institute, Sector-10, Jankipuram Extension, Lucknow, 226 031, Uttar Pradesh, India.

*choyalkuldeep@gmail.com*
*+91-7734804065*

Hsp60 is a highly conserved protein involved inappropriate folding of nascent polypeptides. Elevated expression of Hsp60, which play both cytoprotective as well as pro-death activity in a context-dependent manner, has been shown in a number of human tumors. Even though several studies have demonstrated the role of Hsp60 in cancer cell survival and apoptosis, detail biochemical analyses on the underlying molecular mechanism of regulation of cancer cell death by Hsp60 are limited. In the present study, we show that *in vitro* RNAi mediated suppression of Hsp60 leads to autophagic induction which has been demonstrated by showing enhanced LC3-II and p62 downregulation by immunoblotting and accumulation of LC3 puncta by confocal microscopy. Measurement of autophagic flux by immunobloting in Hsp60 proficient and deficient cells, with and without autophagy inhibitor chloroquine or bafilomycinA1, revealed additional turnover of LC3-II and induction of p62. Autophagic flux was further confirmed by confocal microscopy in cells with stable expression of GFP-LC3-RFP-LC3ΔG. Hsp60 knockdown also resulted in upregulation of ROS level and activation of Akt through phosphorylation at Ser 473. The observed effect was probably due to inactivation of Foxo3a transcription factor which in turn leads to downregulation of antioxidants. Tumor progression studies in nude mice tumor xenograft model, derived from Hsp60 proficient and deficient cell lines, revealed a relatively reduced rate of tumor progression upon Hsp60 depletion. Collectively our data indicate the inhibitory role of the Hsp60 in the autophagic process and tumor regression in Hsp60 deficient condition.

**Social relevance of the study**

Our data will further strengthen HSP60 as a potential drug target for anticancer therapy as well as its usefulness as a biomarker for cancer diagnosis and disease progression.

**PP-02**

# *Moringa oleifera* as a Source of Antimicrobial Compounds

**Sreekala S. and Usha D. Muraleedharan**

Goa University, Goa – 403 206, India.

*sreekalasarala@gmail.com*
*+91-9605533626*

Antimicrobial cationic peptides are innate host defense molecules found across diverse species. Broad-spectrum bioactivities of these small basic peptides could be employed effectively against the emerging number of drug-resistant microbes. High stability of antimicrobial peptides from plant sources makes them a promising template for the design of novel antibiotics. *Moringa oleifera* is a widely cultivated species of the Moringaceae family with high nutritional value. Different parts of this plant possess a plethora of bioactivities such as antibacterial, antifungal, anti-inflammatory, antispasmodic, antitumor, antioxidant and antidiabetic, projecting a noticeable role in indigenous systems of medicine. Although many bioactive compounds from *M. oleifera* have been described, identities of some potentially active compounds are still unknown. The present study was directed towards isolation and characterization of antimicrobial cationic peptides from *M. oleifera.* Peptidic components from the acid extract of *M. oleifera* seeds were separated by ammonium sulfate precipitation and column chromatography. A small peptide of molecular size <10 kDa exhibited high antimicrobial activity against *Candida albicans*, *Salmonella typhimurium*, and *Staphylococcus aureus*. The isolated peptide was characterized in terms of basicity, MIC and thermal as well as proteolytic stability. The results of this study indicated the presence of a highly stable low molecular weight cationic peptide which would contribute significantly to the antimicrobial properties of *M. oleifera*.

**Social relevance of the study**

Identification of peptide-based antimicrobial agents from plant sources is a promising strategy for the development of novel therapeutic drugs to fight against rapidly growing antibiotic resistance.

SciCon Series on
In sync with Next Generation Biosciences
INGB-2019
November 6-8

**PP-03**

# Effect of different doses and splits of potassium on growth, yield, quality and storage of onion

**Deepa Adiveppa Holer**

Dr. Panjabrao Deshmukh Krishi Vidyapeeth
Krishi Nagar, Akola-444104, Maharashtra, India.

*Deeparh22@gmail.com*
*+91-8095412449*

A field experiment entitled "Effect of different doses and splits of potassium on growth, yield, quality and storage of onion" was carried out at Main Garden, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during 2015-16. The experiment was laid out in Factorial Randomized Block Design with three replications and two factors i.e. factor 'A' viz., $K_1$ - 40 kg, $K_2$ - 50 kg , $K_3$ - 60 kg and $K_4$ - 70 kg of K $ha^{-1}$ and factor 'B' $S_1$, - 100 % at the time of transplanting , $S_2$ - 50 % at the time of transplanting + 50 % at 30 DAT and $S_3$ - 33.33 % at the time of transplanting + 33.33 % at 30 DAT + 33.33 % at 60 DAT with 12 treatment combination. The potassium level $K_3$ was found significantly superior in respect of plant height (36.67, 56.71, 52.01cm), leaf area (77.37, 232.13 and 158.86 $cm^{2)}$ at 30, 60 and 90 DAT respectively, days for harvesting (123.81), diameter of bulb (5.50 cm), total yield per plot, total yield $ha^{-1}$, TSS of bulbs. In storage study, treatment $K_3$ recorded minimum physiological loss in weight. The split application method $S_3$ was found significantly superior in respect of plant height and leaf area at 30, 60 and 90 DAT respectively, days for harvesting, a diameter of the bulb, total yield per plot, total yield ha-1, TSS of bulbs with $S_2$. In storage study, significantly minimum physiological loss in weight was recorded with treatment $S_3$. Interaction between different potassium levels and its split application was found to be significant for among all treatment combinations i.e. $K_3S_3$ in respect of the diameter of the bulb, yield per plot. Among storage parameters, physiological loss in weight was recorded better results from treatment $K_3S_3$.

**Social relevance of the study**

The application of an appropriate quantity and source of potassium to onion at critical growth stages is thus essential for maintenance of growth and quality as this crop is gaining the importance due to its high-value consumptions and their pungency contain, it is necessary to study the demand of potassium to produce good quality onion

**PP-04**

# Hyperlipidemia induces cognitive impairment in rats: assessment of restorative potential of EPA+DHA and zerum bone

**Vinayak Uppin, Bettadaiah and Ramaprasad Ravichandra Talahalli**

ICAR-CFTRI, Mysore- 570020, Karnataka, India

*vinayakuppin910@gmail.com*
*+91-8970805092*

Loss of metabolic function often associates with a cognitive abnormality, and the impact of dyslipidemia on cognitive functions needs to be elucidated. Dyslipidemia being one of the metabolic abnormalities can be causative factor for the activation of many molecular inflammatory cascades in cells. Moreover, the brain oxidative stress is reported to be closely associated with astrocytes and microglia activation, alteration of blood-brain barrier tight junction assembly, increase in pro-inflammatory cytokines, thus affecting the synaptic plasticity and exuberance of neurons which are potential for regulating cognitive functions. The implications of dyslipidemia on the cognitive functions and dietary effects of bioactive molecules like n-3 fatty acids and zerumbone under dyslipidemic conditions are yet to be elucidated. In our study, we assessed the effect of Zerumbone (200mg/kg BW) on behavioral parameters in dyslipidemia induced male Wistar rats (n=5). Cognitive parameters such as memory, motor co-ordination strength were investigated by maze tests such as Morris water maze, elevated plus maze (Transfer latency), T-maze (spontaneous alteration), open field test and Rotarod test. The animal behavior was recorded by ALL MAZE video tracking software, and data is analyzed by Graph-Pad Prism, and values are considered significant if P value is <0.05 by ANOVA. HF+F, HF+Z, and HF+F+Z group rats had shown significantly ($p<0.05$) vs. HF;1) increased retention memory performance in Morris water maze test over HF and control group, whereas the additive effect is seen in case of HF+F+Z fed group over HF+F group. 2) Consistent results are observed in case of spontaneous T-maze alteration and elevated maze-Transfer latency studies for the memory. 3) Significant difference between the experimental (HF+F, HF+Z, HF+F+Z) vs HF group was observed for locomotory behavior in the rotarod test and open field test study. In conclusion, administration of long chain n-3 fatty acids and zerumbone, significantly modulated dyslipidemia induced cognitive impairment in experimental rats.

**Social relevance of the study**

Since there is ambiguity exist among the researches for the high fat diet induced brain damage and cognitive impairment, there is need to further identify food bioactive molecule that can restore the changes. Ginger is extensively used spice in the country like India, and its anti-inflammatory effects are proved in the cell culture studies but there is need further evaluate nootropic and anti-dyspraxia effect. Evaluating the synergistic effect of LC-PUFA and zerumbone could be cost effective therapy to treat the brain insults and identifying the pathway can be a become therapeutic target for many pharmacological drugs.

**PP-05**

# Toxicity and bioavailability of lutein loaded chitosan-sodium alginate-oleic acid hybrid nanocarrier system using *in vitro* and *in vivo* model.

**Veeresh B Toragall and Baskaran V.**

CSIR-CFTRI, Mysore-570020, Karnataka, India

*baskaranv@cftri.res.in*
*+91-8792479614*

Lutein is an important antioxidant having numerous biological properties, prevent diabetic retinopathy by decreasing oxidative stress of the macula, VEGF and ARMD. However, stability and bioavailability of lutein are poor, due to hydrophobicity and sensitivity to heat, light, pH and oxygen tension. Hence, an attempt was made to increase the stability, solubility, and bioavailability of lutein by a nanocarrier approach using natural polymers chitosan (CS) and sodium alginate (SA) with oleic acid (OA). Further, the toxicity and bioavailability of LNCs in $CaCo_2$ cell line and rat model were investigated. The LNCs prepared were of the size range of 60-140 nm with a smooth spherical shape. Lutein uptake from LNCs by $CaCo_2$ cell line was significantly ($p \leq 0.05$) increased (32.6 %) as compared with mixed micelles. Acute toxicity study was carried out in rats with a single dose of LNCs (0.1, 1, 10 and 100 mg/kg body weight) and $LD_{50}$ of LNCs was more than 100 mg/kg body weight. In sub-acute toxicity study with either 1 or 10 mg/kg body weight of LNCs was gavaged to rats for 28 days. In both the acute and sub-acute toxicity studies, no mortality, morphological and clinical changes were recorded. Further, histopathology, hematology, and biochemical analyses of urine and plasma confirmed no toxicity of LNCs when compared to control. Lutein level in the plasma and tissues including eyes was higher on feeding LNCs. To conclude, increased bioavailability of lutein with no adverse effect demonstrates that LNCs as a safe delivery system for lutein and can be used in food and pharma applications.

**Social relevance of the study**

Chitosan-sodium alginate-based nanocarrier system for targeted delivery of lipophilic eye-protective lutein with no toxic effects *in vivo* and *in vitro* could make a major impact on food and pharmaceutical application to overcome retinopathy and macular degeneration complications.

**PP-06**

# Evaluation of physiological and biochemical responses of *Ricinus communis* seedlings to different temperatures

**Mithila Pise, Sudeeksha Tyagi, Priya Katiyar and Minal Wani**

Dr. D.Y. Patil Biotechnology & Bioinformatics Institute, Dr. D. Y. Patil Vidyapeeth, Tathawade, Pune -411033, Maharashtra, India.

*minal.wani@dpu.edu.in*
*+91- 9373332012*

*Ricinus communis,* the castor bean plant belongs to the family Euphorbiaceae. It is widespread throughout the tropical regions and has been used since ancient times for its medicinal properties. Temperature is a critical environmental factor that influences the seedling establishment and a change in a few degrees may alter the growth and survival rate. Metabolite profiling of plants under different environmental conditions provides information about biochemical and molecular changes related to temperature adaptation. The present studies were carried out on Ricinus communis to study the physiological and biochemical responses of seedlings to different temperatures and their protein profiling. Seeds were collected and seed coats removed and allowed to germinate using paper rolls as substrate at 25ºC in the dark. After 44-50 hours, germinated seeds were transferred to moist vermiculite and were allowed to grow at different temperatures (240C, 300C, 350C) in continuous light for 10 days and sampled for further studies. Fresh and dry weight of leaves, stem and roots of the 14 days old seedlings and stem height were measured. Biochemical assays were performed to quantify the total proteins, carbohydrates, amino acid, proline, flavonoids and IAA oxidase content when plants grew over 13 days under different temperatures. Maximum protein concentration was observed in the samples of plants grown at 30oC than that at 24oC and 35oC. SDS-PAGE of nine different samples from castor under study produced staining protein patterns containing up to 7 distinct bands. Carbohydrate and amino acid metabolism appear to be part of the mechanisms for plants adaptation to different environmental conditions.

**Social relevance of the study**

The biochemical changes observed in response to the increasing temperature provide leads into understanding plant adaptation to environmental conditions like water scarcity and desiccation.

**PP-07**

# High throughput genotyping using Kompetitive Allele Specific PCR (KASP)

**B. N. Gnanesh, G. S. Arunakumar, H. B. Manoj Kumar, M. R. Bhavya, P. Sowbhagya, M. Supriya, M. M. Harshitha, M. Y. Jagadamba, T. Vinaya, and S. Bharatesha**

Central Sericultural Research and Training Institute
Srirampura, Manandavadi Road, Mysuru – 570008, Karnataka, India.

*gnaneshbn@gmail.com*
*+91-7893900859*

Genetic improvements for enhancing biotic and abiotic stresses are intricately linked with "Trait based" breeding approaches. Improvement of these traits through conventional breeding is a formidable task. The development of high throughput genotyping and next generation sequencing technologies has led to the identification of a large number of single nucleotide polymorphisms. These breeder friendly SNP markers have emerged as the most powerful markers owing to this abundance in coding and non-coding part of the genome. SNP markers can be effectively used for trait association among diverse germplasm accessions and will be most appropriate for the computation of LD decay along the genome and for discovering robust QTL or genomic regions governing target traits by association mapping. Prior to any SNP applications, the discovered SNPs must be validated to identify the true SNPs. The continuous progress in high through put genotyping technologies have resulted in various genotyping platforms. Among them KASP genotyping technology offer cost effective compared to other genotyping assays and more robust. Till today KASP assay has been very popular and has been extensively used to validate the SNP in almost all the crops.

**Social relevance of the study**

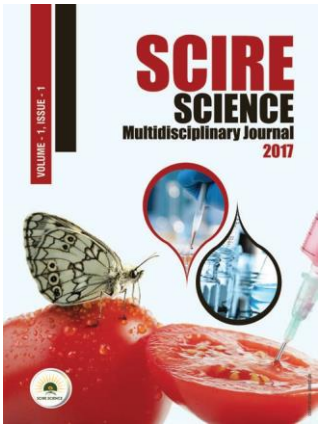
This technology helps in high throughput SNPs genotyping, GWAS, quantitative trait locus (QTL) mapping, marker-assisted selection (MAS) and allele mining.

# Scire Science Publications

*Our publications include academic and science Journal, Newsletter and Books.*

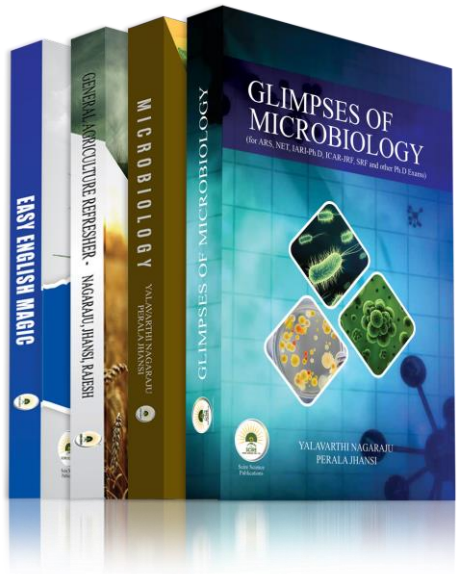
## • Scire Science Multidisciplinary Journal (SSMJ)

*Scire Science Journal (e ISSN 2457-0575) is an international multidisciplinary, open access, peer reviewed quarterly journal, which invites and publishes conscientious research of social relevance. We are member of Crossref which is an official Digital Object Identifier Registration Agency of the International DOI Foundation. All our articles are with DOI number and is licensed under a Creative Commons Attribution 4.0 International License.*




## • Scire Science Newsletter


*Scire Science Newsletter (e ISSN 2581-4583) is an international open access, quarterly newsletter, which invites and delivers updated scientific information / thought which is relevant to the current scenario or related to research and development. We are member of Crossref which is an official Digital Object Identifier Registration Agency of the International DOI Foundation. All our articles are with DOI number and is licensed under a Creative Commons Attribution 4.0 International License*




## • *Books Publication*

*Scire Science Pvt. Ltd. is in the business of providing quality educational books targeting a wide range of students as well as academicians. We are giving support to the authors for fulfilling their dream of completion of their book by supporting in editing to marketing with 50% royalty from the very start. The books are sold through retail outlets as well as online shops. We adhere to superior quality and service.*

## Notes

## Notes

## Notes

## Notes

## Notes