CONFERENCE PROCEEDINGS
Vol 03, Issue 01, 2022
ISBN: 978-81-956247-0-6

AGRI Vision 2022

International Conference on

Agriculture for Sustainable Future

March 06-08, 2022 | Ravenshaw University, Cuttack, Odisha, India

(In Association with Department of Botany, Ravenshaw University)

Evation

आज़ादी का अमृत महोत्सव

https://agrivision.in


odishatourism.gov.in
Odishaaah!
Gundichaghagi Waterfall, Keonjhar

Conference Proceedings of

International Conference on

Agriculture for Sustainable Future

March 06-08, 2022 | Ravenshaw University, Cuttack, Odisha, India

Vol 03, Issue 01, 2022

Editor's Name:
Rajesh Kumar Guru and Dibyanshu Prasad Das

Published By:
Evation Business Solutions (P) Ltd.
Das Villa, Jobra Majhi Sahi, College Square
Cuttack– 753003, Odisha, India

Copyright © 2022 *by Evation & Agri Vision-2022*
https://agrivision.in and https://evationbusiness.com

All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means, electronics, mechanical, recording, or otherwise stored in a data base or retrieval system, without the prior written permission of the publisher. The program listing (if any) may entered, stored, and executed in a computer system, but they may not be reproduced for publication.

ISBN: 978-81-956247-0-6

Printed at:
AB Imaging & Prints Pvt. Ltd.
62 & 63, Ganga Nagar, Unit-6,
Bhubaneswar-751001, Odisha, India

ISBN: 978-81-956247-0-6
9 788195 624706

Cover (illustration) by:
Rajesh Kumar Guru

Information contained in this book has been obtained by Evation & Agri Vision-2022 from sources believed to be reliable. However, neither Evation/ Agri Vision nor its Editors guarantee the accuracy or completeness of any information published herein, and neither Evation/ Agri Vision nor its Editors shall be responsible for any errors, omissions, or damages arising out of using this information. Authors of the respective articles will be responsible for any factual information, legal aspects of the information and or the above stated. This work is published with the understanding that Evation/Agri Vision/Editors are supplying information but are not attempting to render professional services. If such services are required, the assistance of an appropriate professional should be sought. This publication is designed to provide accurate and authoritative information for Business Owners. It is freely available under the express understanding that any decisions or actions you take as a result of reading this book must be based on your commercial judgement and will be at your sole risk. The authors, editors or publishers will not be held responsible for the consequences of any actions and/or decisions taken as a result of any information given or recommendations made.


india celebrates
75
आज़ादी का
अमृत महोत्सव


150
YEARS OF
CELEBRATING
THE MAHATMA


स्वच्छ
भारत
एक कदम स्वच्छता की ओर

Acknowledgement

The financial assistance received from Research & Development fund of **National Bank For Agriculture & Rural Development (NABARD)** towards publication of Book of Abstract is gratefully acknowledged.

NABARD

Sponsors & Supporters

LARSEN & TOUBRO

सेन्ट्रल बैंक ऑफ़ इंडिया
Central Bank of India
1911 से आपके लिए "केंद्रित"
"CENTRAL" TO YOU SINCE 1911

ODISHA
INDIA'S BEST KEPT SECRET.

Bank of India
Relationship beyond banking

एपीडा
APEDA

NABARD

टी बोर्ड ★ भारत ★
TEA BOARD ★ INDIA

NATIONAL MEDICINAL PLANTS BOARD
Plants For Health & Prosperity

जैवप्रौद्योगिकी विभाग
DEPARTMENT OF BIOTECHNOLOGY
सत्यमेव जयते

नालको NALCO

ट्राईफेड
TRIFED
tRIBES India
ट्राइब्स इंडिया

के क फ अ सं
CTCRI

कयर बोर्ड, भारत सरकार
COIR BOARD, GOVERNMENT OF INDIA

भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

भा कृ अनु प
के कृ म सं
ICAR
CIWA

CIBA

CIFA

भा.कृ.अनु.प.-भा.बा.अनु.सं.
ICAR-IIHR

Sponsors & Supporters

Empowering India
कोल इण्डिया
Coal India
Nurturing Nature · Enabling Life

MCL

केनरा बैंक Canara Bank
भारत सरकार का उपक्रम
A Government of India Undertaking
सिंडिकेट Syndicate

कॉफी बोर्ड
COFFEE BOARD

ICARDA
Science for resilient livelihoods in dry areas

सी एम एफ आर आइ
CMFRI

नारियल विकास बोर्ड भारत • COCONUT DEVELOPMENT BOARD INDIA •

राष्ट्रीय चावल अनुसंधान संस्थान
NRRI
Estd.1946

Bharat Petroleum

रा पा आ सं ब्यूरो
NBPGR

एन एस सी
NSC

KRIBHCO
Cooperative and beyond...

पी. सी. आर. ए.
PCRA

OfM
RUCHI™
FOODLINE
Since 1976
Karlo Dosti Sehat Se.

omfed™

PPL
Paradeep Phosphates Limited

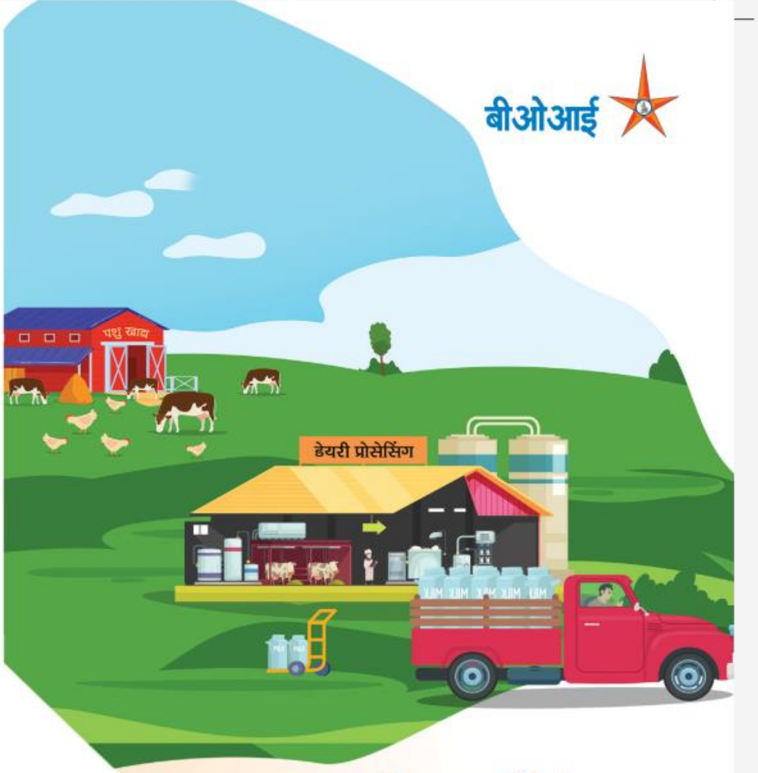
यूनियन बैंक ऑफ इंडिया
Union Bank of India
भारत सरकार का उपक्रम
A Government of India Undertaking
आन्ध्रा Andhra
कार्पोरेशन Corporation

ORMAS
(Odisha Rural Development and Marketing Society)
Panchayati Raj Department, Govt of odisha

Odia Language Literature & Culture Department
Government of Odisha

बीओआई

स्टार सूक्ष्म खाद्य प्रसंस्करण उद्यम योजना (एसएफएमई)



स्टार एनिमल हसबैंड्री इंफ्रा (एसएएचआई)

75 आज़ादी का अमृत महोत्सव

समृद्ध और खुशहाल किसान, हैं मजबूत देश की पहचान.

स्टार ब्लू रेवल्यूशन स्कीम (एसबीआरएस)

स्टार एग्री इंफ्रा (एसएआई)

बैंक ऑफ़ इंडिया

रिश्तों की जमापूँजी

टोल फ्री नं.: **1800 220 229 / 1800 103 1906** | देखें: **www.bankofindia.co.in** | हमें फॉलो करें:

Evation
AGRI Vision 2022

MESSAGES

परशोत्तम रूपाला
PARSHOTTAM RUPALA

सत्यमेव जयते

आज़ादी का
अमृत महोत्सव

मंत्री
मत्स्यपालन, पशुपालन एवं डेयरी
भारत सरकार
MINISTER
FISHERIES, ANIMAL HUSBANDRY & DAIRYING
GOVERNMENT OF INDIA

D.O. No. 524 MIN(FAH&D)/2021-22

MESSAGE

22 DEC 2021

I am glad to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference **on the theme "Strategies for Doubling Farmers' Income through a Sustainable Agri System" - Agri Vision 2022** at Ravenshaw University, Cuttack, Odisha from 06th February, 2022 to 08th February, 2022.

In order to realise the Hon'ble Prime Minister's vision of doubling farmer's income, it is imperative that farming fraternity should adopt modern and sustainable agricultural practices in farming in addition to the traditional practices. I am sure that the Agri Vision-2022 will address the challenges of the four quadrants of Agriculture Sector i.e Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers.

I convey my best wishes for a successful conduction of the Conference.

(Parshottam Rupala)

Delhi Office: Room No. 234, 'B' Wing, Krishi Bhawan, Dr. Rajendra Prasad Road, New Delhi-110 001
Tele.: +91-11-23380780, **Fax:** +91-11-23380783, **E-mail:** rupalaoffice@gmail.com
Gujarat State Camp Office: Plot No. 219, Sector-20, Gandhinagar-382 020, **Tele.:** 079-23260013

विश्वेश्वर टुडु
BISHWESWAR TUDU

सत्यमेव जयते

आज़ादी का
अमृत महोत्सव

जल शक्ति एवं
जनजातीय कार्य राज्य मंत्री
भारत सरकार
नई दिल्ली-110001
MINISTER OF STATE FOR
JAL SHAKTI & TRIBAL AFFAIRS
GOVERNMENT OF INDIA
NEW DELHI - 110001

MESSAGE

I am happy to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference on "Agriculture for Sustainable Future" (**AGRI VISION 2022)** at Ravenshaw University, Cuttack, Odisha from Feb 06-08, 2022 on the theme "Integrated Strategies for doubling farmer's income".

It is good to know that the Agri Vision-2022 at Odisha is addressing the challenges of the four quadrants of Agriculture sector i.e. Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

It is the time to shift from the traditional Agriculture to the modern and sustainable way of Agriculture to meet the future needs of India. We believe that the vision of doubling farmer's income can be achieved easily in coming five years through the modern ways of farming.

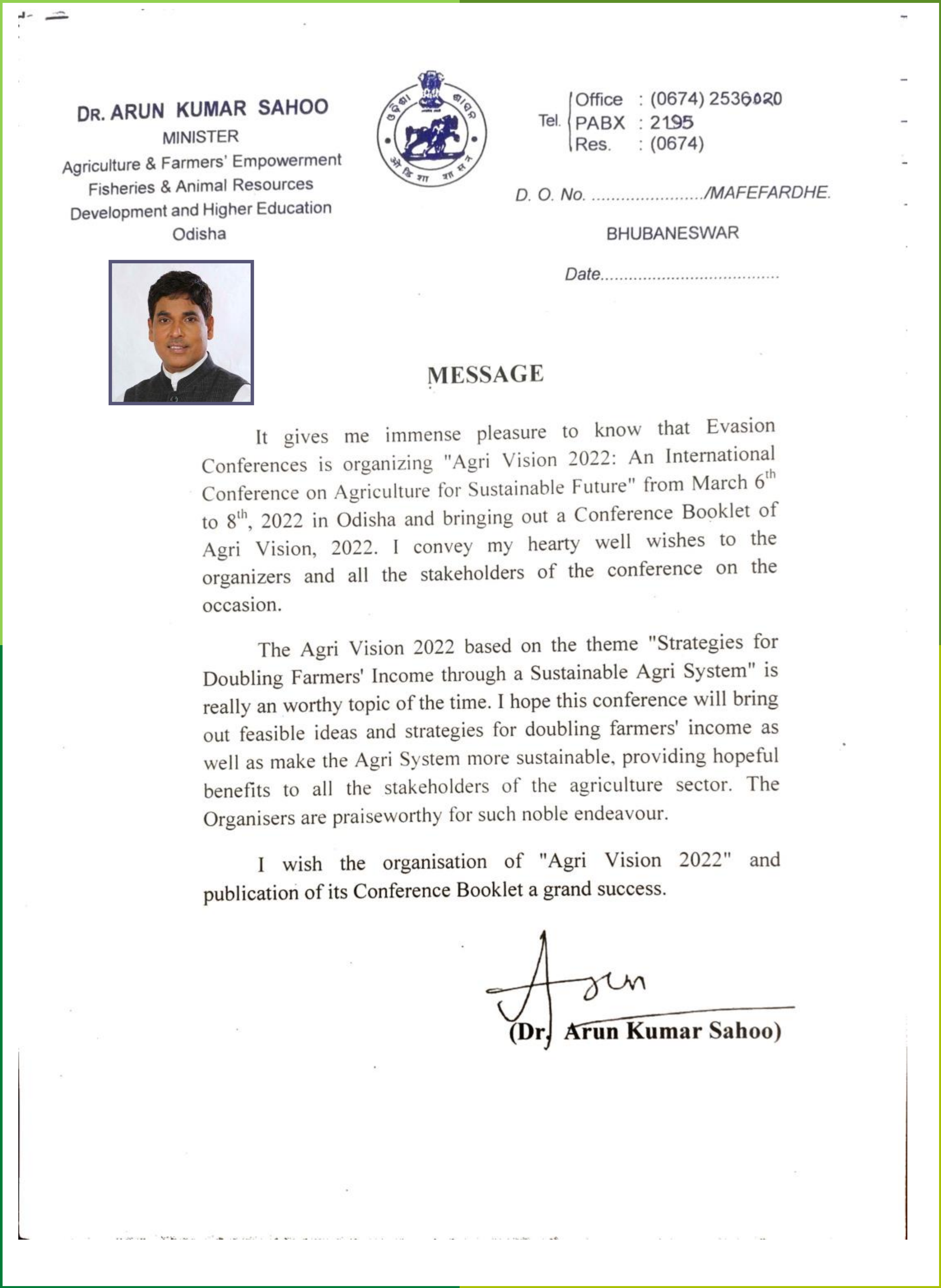
I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers. This platform will address the challenges of the current agri-system is facing and will pave a way for the future sustainable agriculture. This platform will support the farmers in strengthening their economical status and growth of the society.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

8/1/2022

(BishweswarTudu)

215, श्रम शक्ति भवन, रफी मार्ग, नई दिल्ली -110 001, 215, Shram Shakti Bhawan, Rafi Marg, New Delhi-110 001
दूरभाष : (011) 23708419, 23718759, **फैक्स :** 011-23354496, Tel. : (011) 23708419, 23718759, Fax : 011-23354496
415, 'बी' विंग, शास्त्री भवन, नई दिल्ली -110 001, 415,'B' Wing, Shastri Bhawan, New Delhi-110 001
दूरभाष : (011) 23070580, 23070669, Tel. : (011) 23070580, 23070669, E-mail : mos-tribalaffairs.gov.in



DR. ARUN KUMAR SAHOO
MINISTER
Agriculture & Farmers' Empowerment
Fisheries & Animal Resources
Development and Higher Education
Odisha

Tel. Office : (0674) 2536020
PABX : 2195
Res. : (0674)

D. O. No. ..../MAFEFARDHE.

BHUBANESWAR

Date......................................

MESSAGE

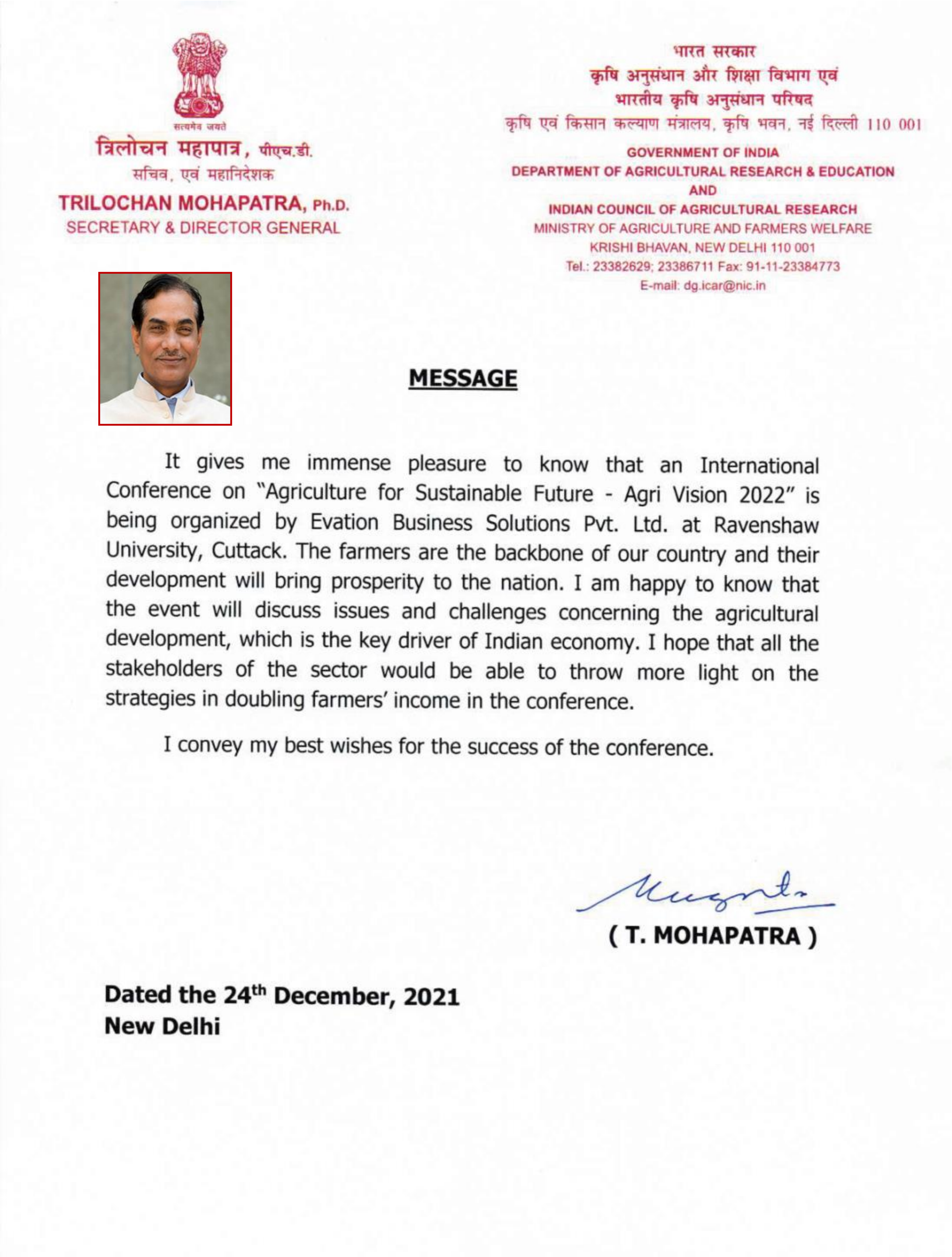
It gives me immense pleasure to know that Evasion Conferences is organizing "Agri Vision 2022: An International Conference on Agriculture for Sustainable Future" from March 6th to 8th, 2022 in Odisha and bringing out a Conference Booklet of Agri Vision, 2022. I convey my hearty well wishes to the organizers and all the stakeholders of the conference on the occasion.

The Agri Vision 2022 based on the theme "Strategies for Doubling Farmers' Income through a Sustainable Agri System" is really an worthy topic of the time. I hope this conference will bring out feasible ideas and strategies for doubling farmers' income as well as make the Agri System more sustainable, providing hopeful benefits to all the stakeholders of the agriculture sector. The Organisers are praiseworthy for such noble endeavour.

I wish the organisation of "Agri Vision 2022" and publication of its Conference Booklet a grand success.

Arun

(Dr. Arun Kumar Sahoo)



सत्यमेव जयते
त्रिलोचन महापात्र, पीएच.डी.
सचिव, एवं महानिदेशक
TRILOCHAN MOHAPATRA, Ph.D.
SECRETARY & DIRECTOR GENERAL

भारत सरकार
कृषि अनुसंधान और शिक्षा विभाग एवं
भारतीय कृषि अनुसंधान परिषद
कृषि एवं किसान कल्याण मंत्रालय, कृषि भवन, नई दिल्ली 110 001
GOVERNMENT OF INDIA
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION
AND
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
KRISHI BHAVAN, NEW DELHI 110 001
Tel.: 23382629; 23386711 Fax: 91-11-23384773
E-mail: dg.icar@nic.in

MESSAGE

It gives me immense pleasure to know that an International Conference on "Agriculture for Sustainable Future - Agri Vision 2022" is being organized by Evation Business Solutions Pvt. Ltd. at Ravenshaw University, Cuttack. The farmers are the backbone of our country and their development will bring prosperity to the nation. I am happy to know that the event will discuss issues and challenges concerning the agricultural development, which is the key driver of Indian economy. I hope that all the stakeholders of the sector would be able to throw more light on the strategies in doubling farmers' income in the conference.

I convey my best wishes for the success of the conference.

(T. MOHAPATRA)

Dated the 24th December, 2021
New Delhi

डॉ. मृत्युंजय महापात्र
मौसम विज्ञान विभाग के महानिदेशक,
विश्व मौसम विज्ञान संगठन में भारत के स्थाई प्रतिनिधि
एवं कार्यकारी परिषद के सदस्य

Dr. Mrutyunjay Mohapatra
Director General of Meteorology,
Permanent Representative of India with WMO,
Member of Executive Council, WMO

भारत सरकार
पृथ्वी विज्ञान मंत्रालय
भारत मौसम विज्ञान विभाग
मौसम भवन, लोदी रोड़
नई दिल्ली–110003
Government of India
Ministry of Earth Sciences
India Meteorological Department
Mausam Bhawan, Lodi Road
New Delhi - 110003

Message

I am pleased to note that Evation Conferences (a subsidiary of Evation Business Solutions Pvt. Ltd.) is organizing "Agri Vision 2022: An International Conference on Agriculture for Sustainable Future" during 6-8 March, 2022 in Odisha on the theme, "Strategies for doubling farmers' income through a sustainable Agri system".

Hon'ble Prime Minister has laid emphasis on zero budget natural farming, which is a promising tool to minimise the dependence of farmers on purchased inputs and reducing the cost of agriculture by relying on traditional field based technologies thereby leading to improve the soil health, enhanced productivity and increased income.

In the changing environment, with the evolution of new researches and techniques, scientific community can develop new methods of farming and introduce innovative ways to ensure minimum loss to the crops due to natural calamities & generate maximum yield. This will act as a boost in enhancing income of our farming community.

I personally feel that this Conference will provide a common platform to the academicians, researchers, young scholars and policy planners to deliberate on this important issue and help them in deriving decisive recommendations on the issue of developing technologies which may help to make agriculture a dependable option and help in doubling farmers' income through a sustainable agri system.

I wish all the best for successful organization of this Conference.

(Mrutyunjay Mohapatra)

Phone : 91-11-24611842, Fax : 91-11-24611792, Res.: 91-11-47100152
E-mail : directorgeneral.imd@imd.gov.in / dgmmet@gmail.com / m.mohapatra@imd.gov.in

भाकृअनुप
ICAR

डॉ. जे.के. जेना
उप महानिदेशक (मत्स्य विज्ञान)
Dr. J.K. Jena
Deputy Director General (Fisheries Science)

भारतीय कृषि अनुसंधान परिषद
कृषि अनुसंधान भवन-II, नई दिल्ली-110 012
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
KRISHI ANUSANDHAN BHAVAN-II, PUSA, NEW DELHI-110012

Ph.: 91-11-25846738 (O), Fax: 91-11-25841955
Email : ddgfs.icar@gov.in

MESSAGE

I am glad to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference on “Agriculture for Sustainable Future” (AGRI VISION 2022) at Ravenshaw University, Cuttack, Odisha during 6-8 March 2022.

India, during the last 75 years after independence, has witnessed unparallel growth in all fronts of agriculture. With the dream of achieving self-sufficiency in the production of most of the agricultural commodities becoming reality, the country at present is envisioning to double the farmers’ income besides keeping the growth pace in production and productivity. Sustainable intensification is envisaged with the adoption of modern farming practices. At this time when the country is developing a roadmap for overall development including in the agricultural sector i.e. Vision@2047, I sincerely believe that the platform given in Agri-Vision 2022 at Odisha will discuss important issues associated with the Agriculturural sector and provide certain pragmatic strategies. I am sure that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers of different sessions viz., Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri-Business & Policies.

I convey my best wishes to the organizers, delegates, exhibitors, and all stakeholders for the success of the programme.

(J.K. Jena)

ପ୍ରତାପ ଚନ୍ଦ୍ର ଷଡ଼ଙ୍ଗୀ
प्रताप चंद्र षडङ्गी
Pratap Chandra Sarangi
Member of Parliament
(Lok Sabha)

pratap.sarangi@sansad.nic.in
pratapchandrasarangi@gmail.com

MESSAGE

I am happy to know that "Evation Business Solutions" in association with Department of Botany, Ravenshaw University is hosting the AGRI VISION 2022 an International Conference on Agriculture for Sustainable Future, on the theme "Integrated Strategies for doubling farmer's income" during February 06-08, 2022 at Ravenshaw University, Cuttack, Odisha.

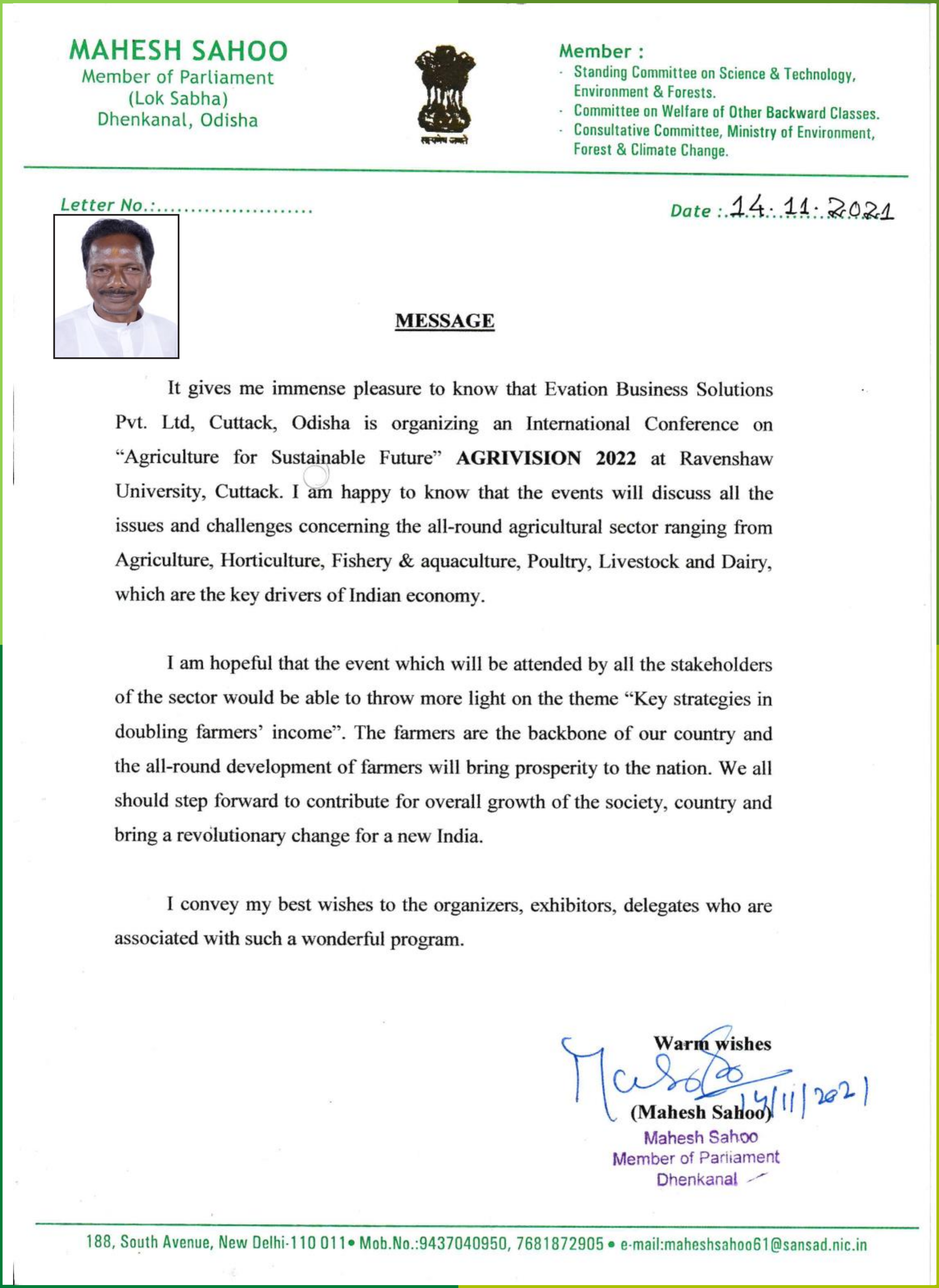
Agricultural productivity assumes critical importance in augmenting farmer's income. The role of genomics in this direction is well acknowledged. I am sure, the agricultural scientists attending the conference will reflect on varied facets of plant genomics to find credible solutions facing the agricultural sector.

I wish the AGRIVISION 2022 Conference all success.

13.12.21

(Pratap Chandra Sarangi)

Residence: 10, Pandit Pant Marg, New Delhi-110001, Phone: 011-23317017 Fax: 011-23317016



MAHESH SAHOO
Member of Parliament
(Lok Sabha)
Dhenkanal, Odisha

Member :
- Standing Committee on Science & Technology, Environment & Forests.
- Committee on Welfare of Other Backward Classes.
- Consultative Committee, Ministry of Environment, Forest & Climate Change.

Letter No.:......................

Date : 14. 11. 2021

MESSAGE

It gives me immense pleasure to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference on "Agriculture for Sustainable Future" **AGRIVISION 2022** at Ravenshaw University, Cuttack. I am happy to know that the events will discuss all the issues and challenges concerning the all-round agricultural sector ranging from Agriculture, Horticulture, Fishery & aquaculture, Poultry, Livestock and Dairy, which are the key drivers of Indian economy.

I am hopeful that the event which will be attended by all the stakeholders of the sector would be able to throw more light on the theme "Key strategies in doubling farmers' income". The farmers are the backbone of our country and the all-round development of farmers will bring prosperity to the nation. We all should step forward to contribute for overall growth of the society, country and bring a revolutionary change for a new India.

I convey my best wishes to the organizers, exhibitors, delegates who are associated with such a wonderful program.

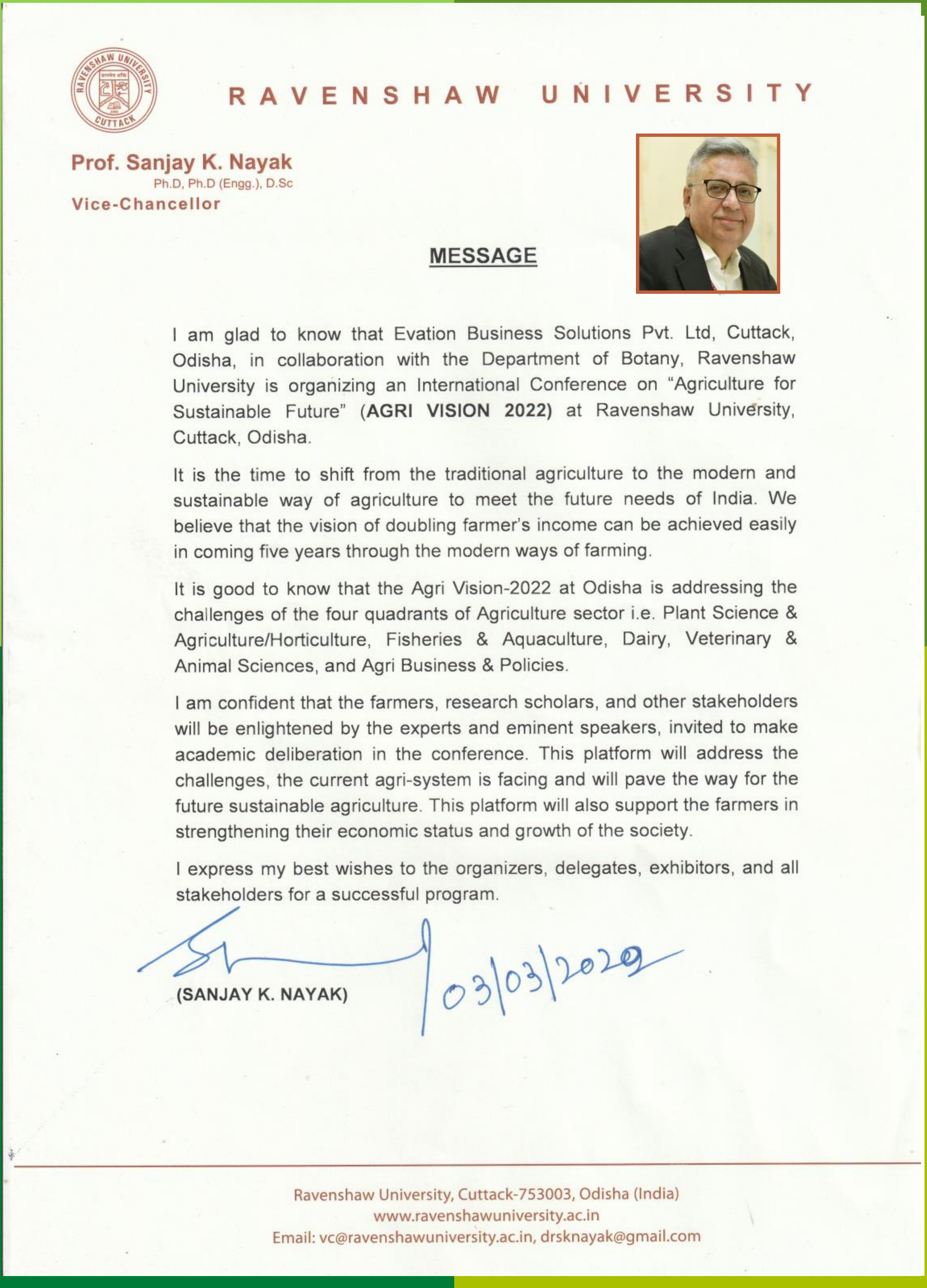
Warm wishes

14/11/2021

(Mahesh Sahoo)

Mahesh Sahoo
Member of Parliament
Dhenkanal

188, South Avenue, New Delhi-110 011• Mob.No.:9437040950, 7681872905 • e-mail:maheshsahoo61@sansad.nic.in



RAVENSHAW UNIVERSITY

Prof. Sanjay K. Nayak
Ph.D, Ph.D (Engg.), D.Sc
Vice-Chancellor

MESSAGE

I am glad to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha, in collaboration with the Department of Botany, Ravenshaw University is organizing an International Conference on "Agriculture for Sustainable Future" (**AGRI VISION 2022)** at Ravenshaw University, Cuttack, Odisha.

It is the time to shift from the traditional agriculture to the modern and sustainable way of agriculture to meet the future needs of India. We believe that the vision of doubling farmer's income can be achieved easily in coming five years through the modern ways of farming.

It is good to know that the Agri Vision-2022 at Odisha is addressing the challenges of the four quadrants of Agriculture sector i.e. Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers, invited to make academic deliberation in the conference. This platform will address the challenges, the current agri-system is facing and will pave the way for the future sustainable agriculture. This platform will also support the farmers in strengthening their economic status and growth of the society.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

03/03/2022

(SANJAY K. NAYAK)

Ravenshaw University, Cuttack-753003, Odisha (India)
www.ravenshawuniversity.ac.in
Email: vc@ravenshawuniversity.ac.in, drsknayak@gmail.com

Dr. P. K. Agrawal
VICE CHANCELLOR

ODISHA UNIVERSITY OF AGRICULTURE & TECHNOLOGY
BHUBANESWAR-751003, ODISHA

Dated the 04 **March, 2022**

MESSAGE

Sustainable production in agriculture can be achieved through adoption of new technologies.Sustainable production neeeds to take care of productivity, production, health of natural resources like soil & water and other environmental factors. It should also take care of judicious use of inputs like fertilizer and pesticides by use of morden methods like precision agriculture, while taking care of inputs cost and profitability.

It gives me immense pleasure to know that Evation Business Solutions Pvt. Ltd, Cuttack is organizing an International Conference on "Agriculture for Sustainable Future" (**AGRI VISION 2022**) in collaboration with Ravenshaw University, Cuttack. I am hopeful that the farmers, research scholars and other stakeholders will be benefitted from the deliberations made in the conference. This platform is expected to address the challenges faced by the current day agri-system.

I wish the endeovour all success.

4.3.22
(P. K. Agrawal)

Tel : (0674)2397700 (O), 2561606 (R) FAX : 0674-2397780 Email: vcouat@gmail.com, vc@ouat.nic.in

ISO Certified 9001:2015

भाकृअनुप-राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान
ICAR-NATIONAL INSTITUTE OF ABIOTIC STRESS MANAGEMENT
समतुल्य विश्वविद्यालय/Deemed to be University
भारतीय कृषि अनुसंधान परिषद, कृषि अनुसंधान एवं शिक्षा विभाग
Indian Council of Agricultural Research, Department of Agricultural Research & Education
कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार
MINISTRY OF AGRICULTURE & FARMERS WELFARE, GOVERNMENT OF INDIA
मालेगाँव, बारामती, पुणे, महाराष्ट्र ४१३ ११५, भारत
Malegaon, Baramati, Pune, Maharashtra 413 115, India

भाकृअनुप
ICAR

राअस्ट्रैप्रसं
NIASM

Dr. H. Pathak
Director

MESSAGE

I am happy to know that Evation Business Solutions Pvt. Ltd., Cuttack, Odisha is organizing an International Conference on "Agriculture for Sustainable Future" (**AGRI VISION 2022)** at Ravenshaw University, Cuttack, Odisha from February 06-08, 2022 on the theme "Integrated Strategies for Doubling Farmers' Income".

Agri Vision 2022 is addressing the challenges of the four quadrants of agriculture sector i.e., Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

It is the time to shift from the traditional agriculture to the modern and sustainable way of agriculture to meet the future needs of India. We believe that the vision of doubling farmers' income can be achieved only through the science-backed ways of farming.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers. This platform will address the challenges of the current agri-system is facing and will pave a way for the future sustainable agriculture.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

(H Pathak)

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद
Agrisearch with a human touch

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Phone : 02112-254055
Fax : 02112-254056
Website : www.niam.res.in,
Email : director.niasm@icar.gov.in

भाकृअनुप- केन्द्रीय मीठाजल जीवपालन अनुसंधान संस्थान
(आईएसओ 9001:2015 प्रमाणित संस्थान)
कौशल्यागंग, भुवनेश्वर-751002, (ओडीसा), भारत
ICAR- Central Institute of Freshwater Aquaculture
(An ISO 9001:2015 Certified Institute)
Kausalyaganga, Bhubaneswar-751002, (Odisha), India

डॉ सरोज कुमार स्वाइँ
निदेशक
Dr Saroj Kumar Swain
Director

MESSAGE

I am glad to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference on “Agriculture for Sustainable Future” (**AGRI VISION 2022)** at Ravenshaw University, Cuttack, Odisha.

It is the time to shift from the traditional Agriculture to the modern and sustainable way of Agriculture to meet the future needs of India. We believe that the vision of doubling farmer’s income can be achieved easily in coming five years through the modern ways of farming.

It is good to know that the Agri Vision-2022 at Odisha is addressing the challenges of the four quadrants of Agriculture sector i.e Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers. This platform will address the challenges of the current agri-system is facing and will pave a way for the future sustainable agriculture. This platform will support the farmers in strengthening their economical status and growth of the society.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

(Saroj Kumar Swain)

Phone: 0674-2465421, 2465446, 2465502 (O), **Fax:** 0674-2465407
Email: director.cifa@icar.gov.in/Saroj.Swain@icar.gov.in, **Website:** www.cifa.nic.in
- Grow Fish * Grow with Fish -

आज़ादी का
अमृत महोत्सव

भा.कृ.अनु.प.-राष्ट्रीय पादप आनुवंशिक संसाधन ब्यूरो
ICAR - National Bureau of Plant Genetic Resources
पूसा कैम्पस, नई दिल्ली - 110 012 / Pusa Campus, New Delhi - 110 012
☎ +91-11-25843697, 25802781 (O) +91-9868115373 (M)
✉ director.nbpgr@icar.gov.in; ashok.kumar28@icar.gov.in www.nbpgr.ernet.in

Dr. Ashok Kumar
Director (Acting)

MESSAGE

I am glad to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference on "Agriculture for Sustainable Future" (**AGRI VISION 2022)** in collaboration with Department of Botany, Ravenshaw University at Ravenshaw University, Cuttack, Odisha.

It is the time to go for sustainable agriculture utilizing natural resources in balanced manner to meet the future needs of Indian agriculture and environmental challenges. We believe that the vision of food and nutritional security can be achieved by making traditional agriculture more profitable using the modern ways of farming.

It is good to know that the Agri Vision-2022 at Odisha is addressing the challenges of the four quadrants of Agriculture sector i.e Agriculture and Horticulture; Fisheries and Aquaculture; Dairy, Veterinary and Animal Sciences; and Agri-Business and Policies.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers. This platform will address the challenges of the current agri-system is facing and will pave a way for the future sustainable agriculture. This platform will support the farmers in strengthening their economic status and growth of the society.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

(Ashok Kumar)

Celebrating 25 years of action for biodiversity : Conserve agrobiodiversity to mitigate impact of climate change and reduce hunger

जीव विज्ञान संस्थान
INSTITUTE OF LIFE SCIENCES
(An Autonomous Institute of the Department of Biotechnology, Govt. of India)

डा. अजय परिड़ा, एफएनएएससी,एफएनएएएस
निदेशक
Dr. Ajay Parida, FNASc, FNAAS
Director

MESSAGE

I am glad to know that Evation Business Solutions Pvt. Ltd, Cuttack, Odisha is organizing an International Conference on "Agriculture for Sustainable Future" (**AGRI VISION 2022)** at Ravenshaw University, Cuttack, Odisha.

It is the time to shift from the traditional Agriculture to the modern and sustainable way of Agriculture to meet the future needs of India. We believe that the vision of doubling farmer's income can be achieved easily in coming five years through the modern ways of farming.

It is good to know that the Agri Vision-2022 at Odisha is addressing the challenges of the four quadrants of Agriculture sector i.e Plant Science & Agriculture/Horticulture, Fisheries & Aquaculture, Dairy, Veterinary & Animal Sciences, and Agri Business & Policies.

I am confident that the farmers, research scholars, and other stakeholders will be enlightened by the experts and eminent speakers. This platform will address the challenges of the current agri-system is facing and will pave a way for the future sustainable agriculture. This platform will support the farmers in strengthening their economical status and growth of the society.

I express my best wishes to the organizers, delegates, exhibitors, and all stakeholders for a successful program.

(Dr. Ajay Parida)

Nalco Square, Bhubaneswar - 751 023, Odisha, India
Ph. +91-674-2301900 (D), Fax : 2300728
EPABX : 2300137, 2301460, 2301476, 2301219
E-mail : director@ils.res.in, drajayparida@gmail.com
Website : www.ils.res.in

नालको चौक, भुवनेश्वर-७५१०२३, ओडीशा, भारत
दूरभाष : + ९१-६७४-२३०१९०० (सी), फैक्स : + ९१-६७४-२३००७२८
ईपीएबिएक्स : २३००१३७, २३०१४६०, २३०१४७६, २३०१२१९
ई-मेल : director@ils.res.in, drajayparida@gmail.com
वेबसाईट : www.ils.res.in

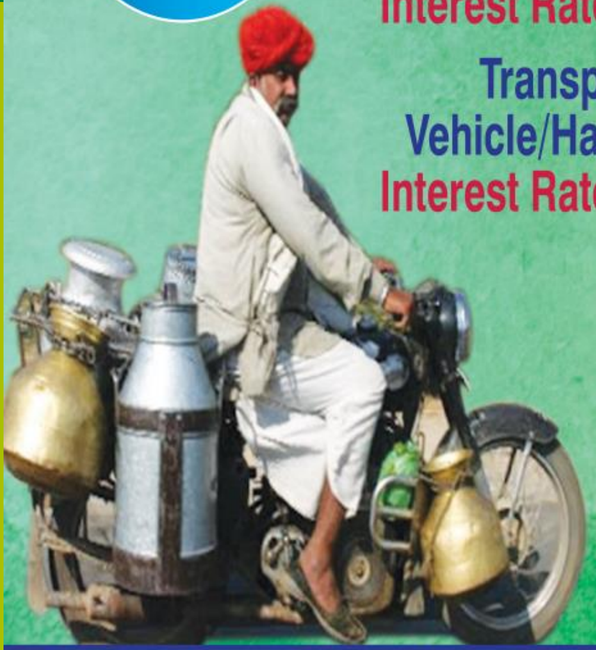
Credit Outreach - Agri
Supporting dreams of farmers

सेन्ट्रल बैंक ऑफ़ इंडिया
Central Bank of India
1911 से आपके लिए ''केंद्रित'' "CENTRAL" TO YOU SINCE 1911

CENT KISAN VAHAN LOAN

Buy 2/4 wheeler
upto 15 lakhs
Interest Rate 7.25%*

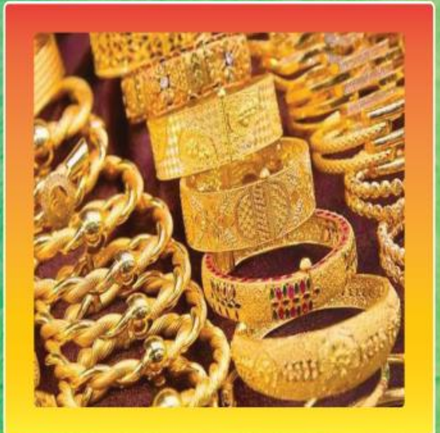
Transport
Vehicle/Harvester
Interest Rate 7.60%*



CENT AGRI GOLD LOAN

Upto ₹3 lakhs
Interest Rate 7%

Make your idle
gold earn for you



CENT AGRI INFRA

Upto ₹2 crore
Interest Rate 8%*

Toll Free Number 1800-22-1911
www.centralbankofindia.co.in

https://www.facebook.com/CentralBankofIndia
https://twitter.com/centralbank_in

For any enquiry please
contact the nearest branch.

*Subject to change as per change in MCLR

Evation

AGRI Vision 2022

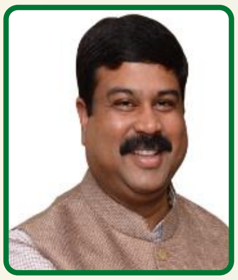
PILLARS OF SUPPORT

https://agrivision.in

Evation is indebted for your unconditional support & kind help. Thank you!!!

Shri Narendra Singh Tomar
Hon'ble Union Minister of
Agriculture and Farmers
Welfare , Govt. of India

Shri Parshottam Rupala
Hon'ble Union Cabinet Minister of
Fisheries, Animal Husbandry and
Dairying, Govt. of India



Shri Dharmendra Pradhan
Hon'ble Union Minister of
Education, Skill Development and
Entrepreneurship, Govt. of India

Dr. Mansukh Mandaviya
Hon'ble Union Minister of Minister
of Health and Family Welfare,
Chemicals & Fertilizers,
Govt. of India

Shri Rameswar Teli
Hon'ble Minister of State, Ministry
of Labour & Employment, Ministry of Petroleum & Natural Gas
Govt. of India

Er. Bisweshwar Tudu
Hon'ble Minister of State, for
Jal Shakti & Tribal Affairs
Govt. of India

Shri Prafulla Kumar Mallik
Hon'ble Minister of Minister, Steel
and Mines and Works
Govt. of Odisha

Dr. Arun Kumar Sahoo
Hon'ble Minister of Agriculture &
Farmer's Empowerment, Fisheries
& Animal Resources Development,
and Higher Education,
Govt. of Odisha

Shri Pratap Jena
Hon'ble Minister, Panchayati Raj
& Drinking Water, Law, Housing
& Urban Development.

Shri Jyoti Prakash Panigrahi
Hon'ble Minister of Odia
Language, Literature, & Tourism
Govt. of Odisha

Shri Prasanna Acharya
Hon'ble Member of Parliament
(Rajya Sabha)

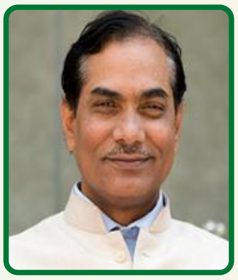
Shri Pratap Chandra Sarangi
Hon'ble Member of Parliament
Lok Sabha, Balasore

Shri Mahesh Sahoo
Hon'ble Member of Parliament
Lok Sabha, Dhenkanal

Shri Ramesh Chandra Majhi
Hon'ble Member of Parliament
Lok Sabha, Nabarangpur

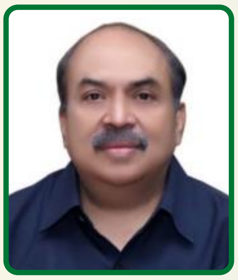
Shri Brij Bhusan Sharan Singh Hon'ble Member of
Parliament, Lok Sabha, Gonda

Shri Pranab Prakash Das
Hon'ble Member of Odisha
Legislative Assembly, Jajpur



Dr. Trilochan Mohapatra
Secretary (DARE) & DG, ICAR,
Govt. of India

Dr. Mrutyunjay Mohapatra
DGM, India Meteorological
Department, Govt. of India



Shri Sanjay Agrawal
Secretary, Dept. of Agriculture
& Farmers Welfare, Govt. of
India

Dr. Joykrushna Jena
DDG (Fisheries Science), ICAR,
Govt. of India

Prof. (Dr.) Sanjay K. Nayak
Vice Chancellor, Ravenshaw
University, Cuttack, Odisha

Dr. Pawan Kumar Agrawal
Vice Chancellor, Odisha University of Agriculture & Technology,
Bhubaneswar, Odisha

Dr. Ajay Parida
Director, Institute of Life Sciences,
Bhubaneswar, Odisha

Dr. Anil Kumar
Director (A), ICAR-CIWA
Bhubaneswar, India

Dr. Saroj Kumar Swain
Director, ICAR-CIFA,
Bhubaneswar, Odisha

Dr. Ashiho Asosii Mao
Director, Botanical Survey of
India, Govt. of India

Dr. S. S. Dash
Scientiest E, Botanical Survey of
India, Govt. of India

Dr. Padmini Swain
Director(A), ICAR-National Rice
Research Institute, Cuttack, Odisha

Dr. M. N. Sheela
Director, ICAR-CTCRI
Thiruvananthapuram, Kerla

Porf. (Dr.) Tanuja Nesari
CEO, NMPB

Dr. K.P. Jithendran
Director (Acting), CIBA

Shri Sadananda Nayak, I.A.S.
Managing Director, OSCDC Ltd

Ms. R. Jaya , I.A.S.
Managing Director, TRIFED

Shri Sridhar Patra
Managing Director, OMC

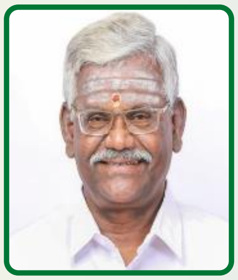
Shri Matam Venkata Rao
MD & CEO, Central Bank of India

Shri Atanu Kumar Das
MD & CEO, Bank of India

Dr. Madhaiyaan Angamuthu
Chairman, APEDA

Dr. G. R. Chintala
Chairman, NABARD

Shri Rajbir Singh Panwar
Chairman, CDB

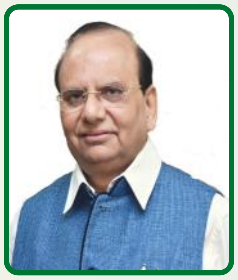


Shri D. Kuppuramu
Chairman, Coir Board, Govt. of India

Shri. CH. S. S. Mallikarjuna Rao
MD & CEO, Punjab National Bank

Shri. Rajkiran Rai G.
MD & CEO, Union Bank of India

Shri L V Prabhakar
MD & CEO, Canara Bank



Shri. Vinai Kumar Saxena
Chairman, KVIC, Govt. of India

Shri. M Kumara Raja
Secretary, Coir Board

Shri Arun Kumar Singh
Chairman & MD, BPCL

Shri S N Subrahmanyan
CEO & MD, L&T

Shri Ajit Samal
Chief Executive, Special Projects, L&T

Dr. Shiv Kumar Agrawal
Regional Coordinator, ICARDA
South Asia and China Program

Dr. Nigamananda Swain
Project Watershed/Water
Scientist, ICARDA

Shri. Rajan Chowdhry
MD, KRIBHCO

M.S. Preeta Verma
CEO, KVIC

Shri Pradeep Kumar Patnaik
Regional Manager, NSC

Shri Sudhi Ranjan Mishra
Head, Corporate Affairs, PPL

Shri Sachin Ramchandra Jadav
Director Tourism, Govt of Odisha

Shri M.S. Boje Gowda
Chairman, Coffee Board

Evation

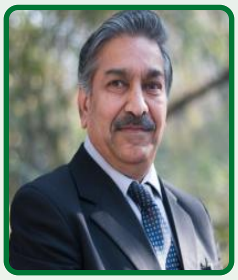
AGRI Vision 2022

ORGANIZING COMMITTEE MEMBERS

https://agrivision.in

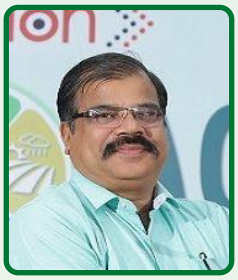
Organizing Committee Members

Prof. C. Kole
President, Genome India International, India



Prof. K. C. Bansal
Secretary, National Academy of Agricultural Sciences, India

Dr. Himansh Pathak
Director, ICAR-NISAM Baramati, India



Dr. Arup K. Mukherjee
Principal Scientist, ICAR-NRRI, Cuttack, India

Dr. Narottam P. Sahu
Joint Director, ICAR-CIFE, Mumbai, India

Dr. Nedunchezhiyan M.
Head (I/C) ICAR-CTCRI Bhubaneswar, India

Prof. B.C. Tripathy
Prof. Jawaharlal Neheu University, New Delhi India

Dr. Ashok Kumar
Director (I/C), ICAR-NBPGR, New Delhi, India

Prof. S. K. Singh
Institute of Agricultural Science, BHU, Varanasi India

Dr. Soumendra K. Naik
Head, Dept. of Botany, Ravenshaw University Cuttack, India

Prof. P. K. Mohapatra
Prof. Dept. of Botany, Ravenshaw University, Cuttack, India

Dr. Jitendra K. Sundaray
Principal Scientist, ICAR-CIFA, Bhubaneswar, India

Organizing Committee Members

Dr. Luna Samanta
Prof. Dept. of Zoology
Ravenshaw University
Cuttack, India

Dr. Sanhita Padhi
Assoc. Prof, Dept. of Botany
Ravenshaw University, Cuttack,
India

Dr. Asna Urooj
Prof. Dept. of Food Science
& Nutrition, University of
Mysore, India

Dr. Bijoy Kumar Sahoo
Dean, Institute of Agricultural
Sciences, SOA University,
Bhubaneswar, India

Dr. Kuldeepp Tripathi
Scientist, ICAR-NBPGR,
New Delhi, India

Dr. Pushpalatha G.
Prof. Centurion University of
Technology & Management,
Paralakhemundi, India

Dr. Raghunath Satpathy
Asst. Professor, School of
Biotechnology, G. M. University
Sambalpur, India

Dr. Sauren Das
Asso. Scientist, Agricultural
& Ecological Research Unit,
Indian Statistical Institute
Kolkata, India

Dr. Gyanranjan Mahalik
Associate Professor,
Dept. of Botany, Centurion University of
Technology & Management,
Bhubaneswar, India

PURE FOR SURE

Bharat Petroleum

Aane se pehle hee pay for your fill

Just UFill

Swift | Secure | Smart

ADVANCE PAY

even before coming to fuel station

Use Any UPI App
to pay digitally

Get Instant QR Code
for automated fuelling

Zero Wait Time
post fuelling

UPI ID paybpcl@idfcbank

Ab Control ko Feel Kar

BHIM | UPI | Google Pay | Paytm | PhonePe

Evation

AGRI Vision 2022

AGENDA: AGRIVISION– 2022

https://agrivision.in

Evation AGRI Vision 2022

AGENDA

Day-1 Mar 06 **Place: Annex-1**

09:00- 09:30	**Registration**
09:30- 09:45	Opening Ceremony, Candle Lighting Ceremony & Opening Remarks
09:45- 10:00	**Welcome Speech** **Prof. Pradipta Kumar Mohapatra** HOD, Dept. of Botany, Ravenshaw University, Cuttack, India
10:00- 10:25	**Plenary Session:** Genetic manipulation of Chlorophyll biosynthesis and degradation pathways increases photosynthesis and stress tolerance **Prof. Baishnab Charan Tripathy** Jawaharlal Nehru University, New Delhi, India
10:25- 10:50	**K1:** Doubling Farmers Income: Role of Trichoderma spp. in sustainable Agriculture **Dr. Arup Kumar Mukherjee** Principal Scientist, ICAR-National Rice Research Institute, Cuttack, India
10:50-11:10	**Coffee Break & Group Photo** **@ Annex-1 Lobby**
Virtual	**Keynote Speech:**
11:10- 11:35	**K2:** Entrepreneurship development in tuber crops value addition **Dr. M. Nedunchezhiyan** Head (I/C), ICAR-CTCRI, Regional Centre, Bhubaneswar, India
11:35-12:00	**K3:** Precision plant breeding with CRISPR-Cas tools **Dr. Kutubuddin Ali Molla** ICAR- National Rice Research Institute, Cuttack, India 📹
12:00- 12:25	**K4:** An integrated system of fish and plant farming **Dr. Yashaswi Nayak** HOD, Dept of Zoology, CUTM, Bhubaneswar, India 📹
12:25- 12:50	**K5:** Unlocking potential of Genebank collections for climate resilient agriculture **Dr. Ashok Kumar** Director (I/C), ICAR-NBPGR, New Delhi, India
12:50- 13:00	Q & A Session
13:00- 14:00	**Lunch & Networking** **@ Botany Dept. Garden**
14:00- 14:25	**K6:** Freshwater aquaculture technologies for sustainable livelihood development **Dr. Saroj Kumar Swain** Director, ICAR-CIFA, Bhubaneswar, India
14:25-14:50	**K7:** Valorisation of leaf meal for replacement of DORB (De Oiled Rice Bran): A forwarding approach for sustainable aquaculture **Dr. Narottam P. Sahu** Joint Director, ICAR-CIFE, Mumbai, India
14:50-15:15	**K8:** Genetics and biotechnology to augment aquaculture production & food security **Dr. Jitendra Kumar Sundaray** Principal Scientist, ICAR-CIFA, Bhubaneswar, India
15:15- 15:30	**S1:** Current Drivers of Taxonomic Biodiversity Loss in Honeybee, Apis cerana L. and Innovative Strategies to Conserve Them under Temperate Conditions of Kashmir **Dr. Shahnawaz Ahmad Dar** Scientist, Sher-e-Kashmir University of Agricultural Sciences & Technology, Kashmir, India
15:30- 15:45	**S2:** Oxford Nanopore Sequencing Technology and its Applications **Dr. Sutar Suhas Bharat** Assistant Professor at CUTM, Bhubaneshwar, India
15:40- 16:00	**Coffee Break & Networking** **@ Annex-1 Lobby**
16:00- 17:00	**Inauguration of Stall Exhibition, Inaugural speech & Felicitation**

17:00-17:25	**Felicitation & Valedictory Ceremony: Day-1**
17:25- 17:30	**Closing Remarks & End of Day-1**

PARALLEL SESSION

Day-1 Mar 06

Place: Annex-2

	Young Investigator Forum
Chair	• **Dr. Anjula Pandey,** Principal Scientist, ICAR-NBPGR, New Delhi, India • **Dr. Sauren Das,** Associate Scientist, ISI, Kolkata, India • **Dr. Pushpalatha Ganesh,** Professor, CUTM, Paralakhemundi, India
14:00- 14:15	**Y1:** Chlamydospore formation in Trichoderma and its utilization for the sustainable health management of rice crop **Harekrushna Swain** Scientific Staff, Botanical Survey of India
14:15-14:30	**Y2:** Transcriptome dynamics of Asiatic and Western carrots (Daucus carota L.) to decode candidate genes for root adaptability **Chaitra C Kulkarni** 🎥 University of Horticultural Sciences, Bagalkote, India
14:30- 14:45	**Y3:** Potential natural enemies associated with sorghum shoot bug, Peregrinus maidis (Ashmead) **Dharavath Saicharan** 🎥 University of Agricultural Sciences, Dharwad, India
14:45- 15:00	**Y4:** Cross kingdom RNAi during the interaction between Allium cepa and Fusarium basal rot pathogen **Bijayalaxmi Mahanty** Rama Devi Women's University, Bhubaneswar, India
15:00- 15:15	**Y5:** Profiling of candidate microRNAs responsive to fluoride toxicity in rice (Oryza sativa L.) **Tamarapalli Sravya Sruti** Rama Devi Women's University, Bhubaneswar, India
15:15- 15:30	**Y6:** Plant growth promoting activities of endophytes isolated from drought resistant plant Calotropis procera **Sonali Jaiswal** 🎥 D.D.U. Gorakhpur University, Gorakhpur, India
15:30- 15:45	**Y3:** Lactobacillus mediated fermentation of UV-B irradiated mushroom powder to augment nutraceutical properties: A green approach towards nutraceuticals demands and bioeconomy **Abhay Tiwari** 🎥 Indian Institute of Technology Delhi, India
15:40- 16:00	**Coffee Break & Networking @ Annex-1 Lobby**

AGENDA

Day-2 Mar 07

Place: Annex-1

09:00- 09:20	**Registration**
09:20- 09:30	Opening Ceremony, Candle Lighting Ceremony & Opening Remarks
09:30- 09:50	**K1:** CRISPR/Cas9 genome editing towards enhanced disease resistance in Chili pepper (*Capsicum annum L.)* **Dr. Rukmini Mishra** HOD, Dept. of Botany, CUTM, Bhubaneswar, India
09:50- 10:10	**SP1: Shri D.P. Dash** Assistant General Manager, **NABARD,** Odisha Regional Office
10:10- 10:30	**K2:** The Most Vulnerable Tropical Forest and its Sustainability **Dr. Sauren Das** Associate Scientist, Indian Statistical Institute, Kolkata, India
10:30- 10:50	**K3:** Photosynthetic Pigment Fluorescence Under Pesticide Stress **Prof. Pradipta Ku. Mohapatra** HOD, Dept. of Botany, Ravenshaw University, Cuttack, India
10:50-11:00	**Coffee Break & Group Photo @ Annex-1 Lobby**
11:00- 11:20	**K4:** Comparative Proteomics reveals augmentation in allergens as a function of water born toxic metals in the Notopterus notopterus from Mahanadi River **Dr. Luna Samanta** Professor, Dept. of Zoology, Ravenshaw University, Cuttack, India
11:20-11:40	**K5:** Organic farming for sustainable agriculture **Dr. Bijoy Kumar Sahoo** Dean, IAS- SOA University, Bhubaneswar, India
11:40- 12:00	**K6:** Bioinformatics tools and Techniques for mining of simple sequence repeat (SSR) markers in plant genomes **Dr. Raghunath Satpathy** 📹 Asst. Professor, Gangadhar Meher University, Sambalpur, India
12:00- 12:20	**K7:** Biotechnology in rice improvement: Recent developments and future prospectives **Dr. Sanghamitra Samantaray** Principal Scientist, ICAR-National Rice Research Institute, Cuttack, India
12:20- 12:40	**K8:** Conservation, Cultivation and Sustainable use of Medicinal Plants **Dr. Gyanranjan Mahalik** Associate Professor, CUTM, Bhubaneswar, India
12:40- 13:00	**K9:** Azotobacter vinelandii helps to combat chromium stress in rice by maintaining antioxidant machinery **Dr. Ranjan Kumar Sahoo** HOD, Dept. of Biotechnology, CUTM, Bhubaneswar, India
13:00- 14:00	**Lunch & Networking @ Botany Dept. Garden**
14:00- 14:20	**K10:** Hope and approaches needed for doubling farmers' income through aquaculture and allied technologies **Dr. Padmanav Routray** Principal Scientist, ICAR-CIFA, Bhubaneswar, India

14:25-14:45	**K11:** Strategies to double farmers' income by 2022 through sustainable Agricultural System **Dr. Samarendra Mahapatra** HOD, Dept. of Agribusiness Management, OUAT, Bhubaneswar, India
14:50-15:15	**S1:** Allium genetic resource in India: prioritization and study on neodomestication trend **Dr. Anjula Pandey** Principal Scientist, ICAR- NBPGR, New Delhi, India
15:15- 15:30	**S2:** Combined application of gamma irradiated chitosan and thiourea improves growth and productivity of rice under nitrogen deficient conditions **Dr. Manish Pandey** Scientist, Bhabha Atomic Research Centre, Mumbai, India
15:30- 15:45	**S3:** Identification of candidate genes associated with oil content through allele mining in safflower **Dr. Usha Kiran Betha** 📹 ICAR-Indian Institute of Oilseeds Research, Hyderabad, India
15:45- 16:00	**S4:** Insight of the Economic Impact of Aflatoxin contamination of maize and groundnut in Senegal **Dr. Papa Madiallacke DIEDHIOU** 📹 Gaston Berger University, Dakar, Senegal
16:00- 16:15	**Coffee Break & Networking @ Annex-1 Lobby**
16:15-16:30	**S5:** Molecular and Biochemical characterization of tuberous legume crop Yam bean [Pachyrhizus erosus (L.) Urban **Dr. Kalidas Pati** Regional Centre, ICAR-CTCRI, Bhubaneswar, India
16:30- 16:55	**Plenary Session:** Genome Editing: Applications in Agriculture and Meeting SDGs 📹 **Prof. K. C. Bansal** Secretary, National Academy of Agricultural Sciences, New Delhi, India
16:55- 17:00	**QA Session**
17:00- 17:15	**S6:** A comparison between tolerant (Aspergillus niger M-RU01) and wild type strain of Aspergillus niger while degradation of four OP insecticides **Dr. Debasish Mohapatra** Ravenshaw University, Cuttack, India
17:15- 17:30	**S7:** Biopriming of Rice for Physio-chemical induction of defense against Xanthomonas oryzae pv. Oryzae **Dr. Shasmita** Ravenshaw University, Cuttack, India
17:30- 17:40	**Closing Remarks & End of Day-2**

POSTER SESSION

Day-2 Mar 07

Place: Annex-1 Lobby

	Poster Presentation Group-1
Chair: Poster G1	• **Dr. Sanghamitra Samantaray,** Principal Scientist, ICAR-NRRI, Cuttack, India • **Dr. Padmanav Routray,** Principal Scientist, ICAR-CIFA, Bhubaneswar, India
09:30- 09:40	**P1:** Role of helicase in stresses tolerance of plants **Monalisha Dasmohapatra** Centurion University of Technology & Management, Bhubaneswar, India
09:40- 09:50	**P2:** Towards efficient photosynthesis: genetic transformation of rice **Suchismita Prusty** Centurion University of Technology & Management, Bhubaneswar, India

09:50- 10:00	**P3:** Turmeric's Secondary Metabolites and Pharmacological Values: Preserving and Expanding Our Indigenous Knowledge Base **B Jyotirmayee** Centurion University of Technology & Management, Bhubaneswar, India
10:00- 10:10	**P4:** Effect of vermicomposting on growth and nutrient content in Triticum aestivum L. under organic farming system **Ananya Mishra** Centurion University of Technology & Management, Bhubaneswar, India
10:10- 10:20	**P5:** Genome wide transcriptome profiling of Embelia species towards characterization of trait specific genes **Sunanya Das** Centurion University of Technology & Management, Bhubaneswar, India
10:20- 10:30	**P6:** Genome editing towards disease resistance in Chili pepper (Capsicum annum L.) **Rashmi Ranjan Sutar** Centurion University of Technology & Management, Bhubaneswar, India
10:30- 10:40	**P7:** CRISPR/Cas9 mediated genome editing towards Tomato improvement (Solananum lycopersicum L.) **Sonupriya Sahu** Centurion University of Technology & Management, Bhubaneswar, India
10:40- 10:50	**P8:** Rapid development of SNP markers towards bacterial wilt resistance in Tomato (Solanum lycopersicum L.) **Debasmita Das** Centurion University of Technology & Management, Bhubaneswar, India
10:50- 11:00	**P9:** Genome-wide identification and expression studies of FHY3/FAR1 gene in Manihot esculenta for salt tolerance **Sonali Sucharita Jena** Centurion University of Technology and Management, Paralakhemundi, India
11:00- 11:10	**P10:** Genome-wide identification of FAR1 genes and it's expression analysis in Sugarbeet (Beta vulgaris) Plants **Sreedhara Ambareesh** Centurion University of Technology and Management, Paralakhemundi, India
11:10- 11:20	**P11:** Genome-wide identification of FHY3 genes and it's expression analysis in Tomato (Solanum lycopersicon) Plants **Samikhya Jena** Centurion University of Technology and Management, Paralakhemundi, India

	Poster Presentation Group-2
Chair: Poster G2	• **Dr. Jitendra K Sundaray,** Principal Scientist, ICAR-CIFA, Bhubaneswar, India • **Dr. Bijoy Kumar Sahoo,** Dean IAS-SOA University, Bhubaneswar, India
09:30- 09:40	**P12:** Genome-wide identification of FAR1 genes and it's expression analysis in Cucumber (Cucumis sativus) Plants **Ram Prasad Behera** Centurion University of Technology & Management, Paralakhemundi, India
09:40- 09:50	**P13:** Genome-wide identification of FAR1 genes and it's expression analysis in Spinach (Spinacia oleracea) Plants **Santanu Mishra** Centurion University of Technology & Management, Paralakhemundi, India
09:50- 10:00	**P14:** Genome-wide identification of FAR1 genes and it's expression analysis in Chilli (Capsicum annum) Plants **Shreya Shree Nayak** Centurion University of Technology & Management, Paralakhemundi, India
10:00- 10:10	**P15:** Genome-wide identification of FHY3 genes and it's expression analysis in Radish (Raphanus sativus) Plants **Tanmayee Mohanty** Centurion University of Technology & Management, Paralakhemundi, India

10:10- 10:20	**P16**: Salt tolerance analysis, the role of CYP85A1 gene and its expression studies on Tobacco (Nicotiana tabacum) **Sanchita Mishra** Centurion University of Technology & Management, Paralakhemundi, India
10:20- 10:30	**P17**: Drought tolerance analysis, role of ZmPYL genes and expression studies on Water mealon plant (Citrullus lanatus) **Ch. Sai Swetha** Centurion University of Technology & Management, Paralakhemundi, India
10:30- 10:40	**P18**: Assessment of adulteration in raw herbal parts of medicinal plants in India by using molecular techniques **Raghavendra P** Centurion University of Technology & Management, Paralakhemundi, India
10:40- 10:50	**P19**: Developmental growth analysis of maize (Zea mays L.) genotypes and expression analysis of transposase genes **S. Veera Vishnu** Centurion University of Technology & Management, Paralakhemundi, India
10:50- 11:00	**P20**: The gene Expression studies of ZmPLY and its genome-wide identification in Maize Plants (Zea mays) **Sanchari Pandit** Centurion University of Technology and Management, Paralakhemundi, India
11:00- 11:10	**P21**: Screening of taro (Colocasia esculenta Linn.) genotypes for salt tolerance under in-vitro condition **Dr. Vijay Bahadur Singh Chauhan** ICAR-CTCRI, Bhubaneswar, India
11:10- 11:20	**P22**: Impact of heat stress on callus regeneration in rice (Oryza sativa L.) in vitro **Nibedita Swain** ICAR-NRRI, Cuttack, India

	Poster Presentation Group-3
Chair: Poster G3	• **Dr. Samarendra Mahapatra,** HOD, Dept of ABM, OUAT, Bhubaneswar, India • **Dr. Nedunchezhiyan M.,** Head (I/C), ICAR- CTCRI RC, Bhubaneswar, India
09:30- 09:40	**P23**: Molecular biomarker as a tool in assessing reproductive toxicity in fish **Ipsita Iswari Das** ICAR- CIFA, Bhubaneswar, India
09:40- 09:50	**P24**: Assessment of Genetic Diversity in Doubled Haploid population derived from indica rice hybrids **Byomkesh Dash** ICAR- NRRI, Cuttack, India
09:50- 10:00	**P25**: Molecular marker-based characterization of BLB in the DH population derived from BS6444G **Sudhansu Sekhar Bhuyan** ICAR- NRRI, Cuttack, India
10:00- 10:10	**P26**: Cold extremes: Effect on callus growth and regeneration in rice (Oryza sativa L.) **Manjusha Chandravani** ICAR- NRRI, Cuttack, India
10:10- 10:20	**P27**: Establishment of new method for in vitro propagation and cormlet production of Crocus sativus L. **Namita Muduli** Ravenshaw University, Cuttack, India
10:20- 10:30	**P28**: Micropropagation and genetic fedility study of Mucuna gigantea (Willd.) DC.-An endangered medicinal plant of Odisha **Sanjay Kumar Madkami** Ravenshaw University, Cuttack, India
10:30- 10:40	**P29**: Applying Agrobacterium rhizogenes, for hairy root induction in Vitex negundo, a therapeutic plant. **Bhaswatimayee Mahakur** Ravenshaw University, Cuttack, India

10:40- 10:50	**P30:** A report on preliminary phytochemical analysis of Uvaria hamiltonii Hook. f. & Thomson: A valuable medicinal plant **Srushti Prajna Mohanty** Ravenshaw University, Cuttack, India
10:50- 11:00	**P31:** Light and nutrient stress induced alteration in PS II photo-function of Petunia atkinsiana **Smrutirekha Mishra** Ravenshaw University, Cuttack, India
11:00- 11:10	**P32:** Combined effect of Salinity and Desiccation Stresses on Synechocystics sp. PCC 6803 **Barsha Bhushan Swain** Ravenshaw University, Cuttack, India

	e-Poster Presentation
Chair: e-Poster	• **Dr. Arup Kumar Mukherjee,** Principal Scientist, ICAR-NRRI, Cuttack, India • **Dr. Luna Samanta,** Professor, Dept. of Zoology, Ravenshaw University, Cuttack, India
09:30- 09:40	**EP1:** Studies on biology and morphometry of sorghum shoot bug, Peregrinus maidis (Ashmead) **Dharavath Saicharan** University of Agricultural Sciences Dharwad, India
09:40- 09:50	**EP2:** Performance of pre release medium maturity maize genotypes under varying planting density and nutrient levels **A.P. Sivamurugan** Tamil Nadu Agricultural University, Coimbatore, India
09:50- 10:00	**EP3:** Botanicals against soil-borne fungal pathogens of Capsicum annuum L. **Himanshu Arora** Indian Institute of Technology Delhi, India
10:00- 10:10	**EP4:** Evaluation of Nutritional Properties and Health Benefits of Barnyard Millet **Revathy K** Madras Christian College, India
10:10- 10:20	**EP5:** Anthocyanin rich wheat: Food for healthy gut **Payal Kapoor** National Agri-Food Biotechnology Institute, Mohali, India
10:20- 10:30	**EP6:** Surface Water Quality Evaluation & Predictions of Kulik River, West-Bengal **Pramod Kumar Jena** Raiganj University, West Bengal, India
10:30- 10:40	**EP7:** Evaluation of suitable fertigation interval and optimum fertilizer level for subsurface drip irrigated sugarcane under Cauvery command area **Ningaraju G. K** University of Agricultural Sciences, Bengaluru, Karnataka, India
10:40- 10:50	**EP8:** Advances in crop management to boost up the yield in pomegranate **Aravind Rathod** AEEC, UAS, Raichur, Karnataka, India
10:50- 11:00	**EP9:** Survey on anthracnose of chilli **Dr. Bindhu K G** AEEC, UAS, Raichur, Karnataka, India
11:00- 11:10	**EP10:** The Effect of Essential Oil of Black Pepper, Fennel and Turmeric on Growth Performance and Haematological parameters of Gallus gallus **Lopamudra Samantaray** Centurion University of Technology & Management, Bhubaneswar, India

PARALLEL SESSION

Day-2 Mar 07

Place: Annex-2

	Young Investigator Forum
Chairs	• **Prof. Pradipta Ku. Mohapatra,** HOD, Dept. of Botany, Ravenshaw University, Cuttack, India • **Dr. Rukmini Mishra,** Associate Professor, CUTM, Bhubaneswar, India
11:30- 11:45	**Y1**: Endophytic fungus isolated from wild rice species promotes growth of rice crops and showing defense response towards rice diseases such as Sheath blight and Bacterial Leaf Blight **Rupalin Jena** ICAR- NRRI, Cuttack, India
11:45-12:00	**Y2**: Evaluating the potential role of plant natural products from Cleome gynandra with urease inhibiting properties on concatenated phenomena of nitrogen utilization -A rhizospere manipulation strategy. **Rajashree Dutta** 🎥 Indian Statistical Institute, Kolkata, India
12:00- 12:15	**Y3**: Maleic and L-tartaric acids as new anti-sprouting agents for potatoes during storage in comparison to other efficient sprout suppressants **Ekta Bhattacharya** Indian Statistical Institute, Kolkata, India
12:15- 12:30	**Y4**: Isolation of Halophilic bacteria from the Agricultural Soils of South 24 Parganas, Indian Sundarbans **Sreemoyee Mitra** Indian Statistical Institute, Kolkata, India
12:30- 12:45	**Y5**: Identification and metabolomics characterization of two new post-harvest fungi from Indian Gooseberry **Madhurima Dutta** Indian Statistical Institute, Kolkata, India
12:45- 13:00	**Y6**: Haploid doubling in another culture of elite indica rice hybrid CRHR32 **Prachitara Rout** ICAR- NRRI, Cuttack, India
13:00- 14:00	**Lunch & Networking @ Botany Dept. Garden**
14:00- 14:15	**S1**: Machine learning and genome editing for doubling yield and income of rice farmers in Odisha, India **Dr. Parameswaran C** ICAR- NRRI, Cuttack, India
14:15- 14:30	**S2**: A novel non-antibiotic-based selection technology to develop the marker-free transgenic plants **Dr. Khirod Sahoo** Ravenshaw University, Cuttack, India
14:30- 14:45	**S3**: Pi54 and its ortholog genes: role in the effective management of rice blast disease **Dr. Devanna BN** ICAR- NRRI, Cuttack, India
14:45- 15:00	**S4**: TMT-based Proteomics approach reveals key players of pre-implantation and endometrium receptivity during Embryo- Endometrial Epithelial cell Interaction in buffaloes **Dr. Shradha Jamwal** 🎥 ICAR-National Dairy Research Institute, Karnal, India
Chairs	• **Dr. Gyanranjan Mahalik,** Associate Prof, CUTM, Bhubaneswar, India • **Dr. Sanghamitra Samantray,** Principal Scientist, ICAR-NRRI, Cuttack, India
15:00- 15:15	**Y7**: A comparative account of seasonal germ cell proliferation and maturation patterns in two types of spawners Labeo rohita (Hamilton, 1822) and Oreochromis niloticus (Linnaeus, 1758) **Bibekananda Panda** Ravenshaw University, Cuttack, India

15:15- 15:30	**Y8:** The effect of "Anthocyanin biofortified wheat on gut micobiota and associated implications in mice **Payal Kapoor** National Agri-Food Biotechnology Institute, Mohali, India
15:30- 15:45	**Y9:** Contract Farming and its Welfare Impact Assessment: A Case of Wheat Growers in North India **Saroj** Shri Mata Vaishno Devi University, Katra, J&K, India
15:45- 16:00	**Y10:** Genome Wide Mining of Alleles to Identify Candidate Genes Conferring Folate Content in Rice **S. R. Harish Chandar** Centurion University of Technology and Management, Paralakhemundi, India
16:00- 16:15	**Coffee Break & Networking** **@ Annex-1 Lobby**
16:15- 16:30	**Y11:** Vigna vexillata: An underutilized tuber crop **Srija Priyadarsini** SOA University, Bhubaneswar, India
16:30- 16:45	**Y12:** Physiological and molecular characterisation of sugarcane varietal response to nitrogen deficiency **Saktishree Jena** Karapaga Vinayaga college of Engineering and Technology, Anna University, Chennai, India
16: 45- 17:00	**Y13:** Impact of harmonic Octave Consonants (Classical Musical Notes) on the distinct physiognomic characters and different biochemical aspects in two different plant species viz; Stevia rebaudiana (Bertoni) and Chamaecostus cuspidatus (Nees & Mart.) C. Specht & D.W. Stev. **Rageshree Swain** Ravenshaw University, Cuttack, India
17:00- 17:15	**Y14:** Effects of 2G, 3G and 4G mobile phone radiations on germination of seeds and biochemical processes of Vigna radiata and Phaseolus vulgaris **Pragyan Rout** Ravenshaw University, Cuttack, India
17:15- 17:30	**QA Session**
17:30- 17:40	**Closing Remarks & End of Day-2**

AGENDA

Day-3 Mar 08

Place: Annex-1

09:00- 09:30	**Registration**
09:30- 09:40	Opening Ceremony, Candle Lighting Ceremony & Opening Remarks
09:40- 10:00	**K1**: R &D Strategies for Sustainable Food security and Nutrition **Dr. Asna Urooj** Professor, University of Mysore, Mysore, India
10:00-10:20	**K2**: Some conservation concern medicinal plant species identified for Odisha: Propagation by various approaches of tissue culture aiming at sustainability **Dr. Soumendra K. Nayak** Professor, Department of Botany, Ravenshaw University, India
10:20- 10:40	**K3**: AgriGenomics – Transform the future of Agriculture **Dr. Pushpalatha Ganesh** Professor, CUTM, Paralakhemundi, India
10:40- 11:00	**K4**: Genomic-assisted breeding for enhancing genetic gain in rainfed rice **Dr. Sharat Kumar Pradhan** Principal Scientist, ICAR-NRRI, Cuttack, India
11:00-11:15	**Coffee Break & Group Photo @ Annex-1 Lobby**
11:15- 11:35	**K5**: TBA 📹 **Prof. S.K. Singh** Professor, Banaras Hindu University, Varnasi, India
11:35-11:55	**S1**: Bt. cotton transplanting to improve ecosystem services in semi-arid Agro-ecology of South Asia **Dr. Sudhir Rajput** 📹 Professor, Banaras Hindu University, Varanasi, India
11:55- 12:15	**S2**: Arrowroot: A starch source rhizomatous crop **Dr. M. Nedunchezhiyan** Head (I/C), ICAR-CTCRI, Regional Centre, Bhubaneswar, India
Chair	• **Dr. Sharat Kumar Pradhan**, Principal Scientist, ICAR-NRRI, Cuttack, India • **Dr. Asna Urooj**, Professor, University of Mysore, Mysore, India
12:15- 12:30	**Y**: A novel report of "Pipercyclobutanamide-A" with strong antimicrobial and allelopathic potential from the stem of Piper chaba, Hunter. - A less known spices **Sayani Saha** National Institute of Technology, Durgapur, India
12:30- 12:50	**S3**: Identification of Diagnostic keys for Vigna vexillata (L.) A. Rich. **Dr. Ravi Kishore Pamarthi** ICAR-National Bureau of Plant Genetic Resources, New Delhi, India
12:50- 13:00	**QA Session**
13:00- 14:00	**Lunch & Networking @ Botany Dept. Garden**
14:00- 14:20	**S4**: Self-Incompatibility studies in Almond cultivars in North-western Himalayas **Dr. Susheel Kumar Raina** 📹 ICAR-NBPGR Regional Station Srinagar, India
14:20- 14:40	**S5**: Impact of Spacing and Nitrogen Levels on Yield and Economics of Chia (Sylvia hispanica L.) **Dr Dillip Ranjan Sarangi** ICAR- NRRI KVK, Cuttack, India
14:40-15:00	**S6**: Effect of new generation herbicides on weed density, yield attributes and yield of irrigated maize 📹 **Dr. A.P. Sivamurugan** Tamil Nadu Agricultural University, Coimbatore, India
15:00- 15:20	**S7**: Evaluation of doubled haploid population for grain morphological traits **Dr. Reshmi Raj K.R.** ICAR-NRRI, Cuttack, India

15:20-15:30	**QA Session**
15:30- 16:00	Special Session: **Dr Mrutyunjay Mohapatra** Director General of Meteorology, India Meteorological Department, Government of India
16:00- 16:15	**Coffee Break & Networking** @ Annex-1 Lobby

PARALLEL SESSION

Day-3 Mar 08

Place: Annex-2

	Farmers and Industry Expert Interactions
10:00-10:30	**Success Story:** Integrated Farming and Rural Economy Development **Mr. Sudhanshu Ranjan** Founder, The Farm Enterprise, Cuttack, India
10:30- 11:00	**Success Story:** Banana Cultivation by drip irrigation, Tissue culture Technology and Integrated Nutrition Management **Mr. Dhirendrakumar Bhanubhai Desai** Bharuch, Gujrat, India
11:00- 11:30	**Success Story:** Integrated farming, Horticulture, Floriculture and cash crops: Experience sharing **Mr. Jyoti Prakash Mohanty** Mallipur, Cuttack, India
11:30- 12:00	**Success Story:** Integrated fish & pearl farming: A practical experience sharing **Mr. Manoj Kumar Bisoi** Samantarapur, Cuttack, India
12:00- 12:45	**QA round and Discussions**
12:45- 14:00	**Stall Visit & Lunch** @ Botany Dept. Garden
14:00- 16:00	**Session: Panel discussion and special session by Industry/ Academic experts**

- **APEDA**
- **ICARDA**
- **Department of Biotechnology, Govt of India**
- **National Medicinal Plant Board**
- **Coconut Development Board**
- **CTCRI**
- **CIWA**
- **KRIBHCO**
- **Central Horticulture Experimental Station**
- **CIFA**
- **CIBA**
- **NBPGR**
- **NRRI**
- **Coffee Board**
- **Ruchi Food line**
- **Directorate of Animal Husbandry, and Veterinary Service**
- **Directorate of Fisheries**
- **OMFED**
- **Central Bank of India**
- **Ruchi Food Line**

16:00- 16:15	**Coffee Break & Networking** @ Annex-1 Lobby
16:15- 16:30	**Closing Remark, Felicitation and end of the Conference**

Virtual Presentation

Zoom Meeting link will be shared one day prior to the Conference.

Abbreviation

- K: Keynote Speaker
- S: Speaker (Oral)
- SP: Sponsored Slot
- P: Poster
- EP: e-Poster
- Y: Young Investigator

Awards @ Agri Vision-2022

Dr. Sabuj Sahoo Memorial Lifetime Achievement Award

- **Dr. Joykrushna Jena,** DDG (Fisheries), ICAR, New Delhi
- **Prof. B. C. Tripathy,** Professor, JNU, New Delhi
- **Dr. Ashok Kumar,** Director, ICAR-NBPGR, New Delhi

Krushak Bandhu Awards

- **Mr. Dhirendrakumar Bhanubhai Desai,** Bharuch, Gujrat
- **Mr. Jyoti Prakash Mohanty,** Mallipur, Cuttack
- **Mr. Manoj Kumar Bisoi,** Samantarapur, Cuttack

The Goal Setter Award

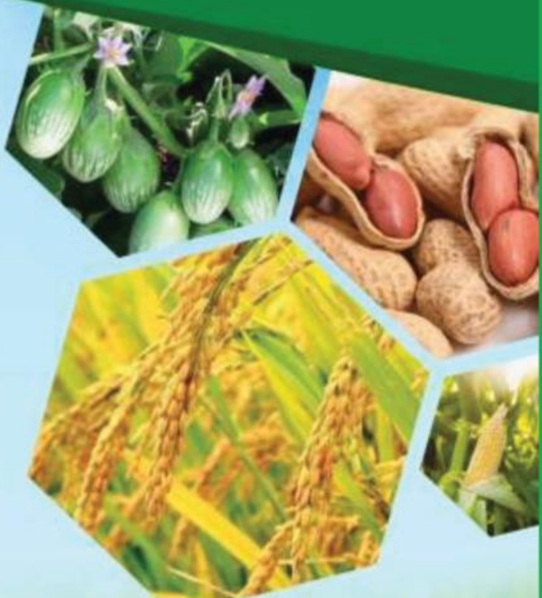
- **Ms. Deepak Fertilisers and Petrochemicals Corporation Ltd.**

The Business Innovator Award

- **Dr. Sarat Kumar Sahoo,** Managing Director, Ruchi Foodline Limited

SEEDS OF PROSPERITY

58th year in the service of Indian Farmers



As India's largest seed producer of cereals, oilseeds and pulses, NSC lives up to its reputation as a reliable supplier of quality seeds to the farmers since 1963-by spreading prosperity throughout the country, with seeds that are:

- Produced under ideal agro-climatic conditions in NSC's farms and through abort 12500 registered seed growers;
- Available in a board-spectrum range which covers about 600 varieties/hybrids of over 60 crops including cereals, oilseeds, pulses, fodder, fiber and vegetables;
- Certified by independent seed certification agencies; and
- Approx 3200 dealers/distributors spread over across the country under 11 Regional Offices, 8 Farms, 48 area Offices, 30 Seeds Praduction Centres, 107 Seed Marketing Centres different district wise area offices/Sub units and 4 Quality Control Labs.

NATIONAL SEEDS CORPORATION LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING- "MINI RATNA" COMPANY)
CIN : U74899DL1963GOI003913

An ISO 9001:2015 & 14001:2015 Certified Company

Head Office

BEEJ BHAWAN, PUSA COMPLEX, NEW DELHI-110 012
Phone : 011-25846292, 25846295, 25842383, 25842672
Website : www.indiaseeds.com, e-mail: nsc@indiaseeds.com

Regional Office

NATIONAL SEEDS CORPORATION LTD.
Block-A.Q., Plot No. 12, Sector-V, Salt Lake City
Kolkata-700 091 (West Bengal)
Phone : 033-23671077, 23671074

Azadi Ka
Amrit Mahotsav

adventz

canonfire

PARADEEP PHOSPHATES LIMITED
www.paradeepphosphates.com

Evation

AGRI Vision 2022

DAY-01

Mar 06, 2022

KEY NOTE SPEECH

https://agrivision.in

विर्जिन नारियल तेल
हर उम्र के लिए

ले लें
विर्जिन नारियल तेल
सीमित मात्रा में
पा लें चुस्त और तंदुरुस्त शरीर

शरीर सुरक्षित रहता है
त्वचा की बीमारियों से

त्वचा बनती है मुलायम और कोमल •
नमी रहती है बरकरार •
रोगाणु रोधी •
बढ़ती उम्र से छुटकारा •

अधिक जानकारी के लिए बोर्ड की वेबसाइट देखें: www.coconutboard.gov.in
नारियल विकास बोर्ड
(कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार)
कोची, केरल, फोन: 0484-2377266, 67
किसान कॉल सेंटर टोल फ्री नंबर: : 1800-180-1551

For more details, visit Board's website: www.coconutboard.gov.in
Coconut Development Board
[MINISTRY OF AGRICULTURE & FARMERS WELFARE,
GOVERNMENT OF INDIA] KOCHI, KERALA. PH : 0484-2377266, 67
Kisan Call Centre Toll Free Number : 1800-180-1551

KEYNOTE

Genetic manipulation of Chlorophyll biosynthesis and degradation pathways increases photosynthesis and stress tolerance

Prof. Baishnab Charan Tripathy
J C Bose National Fellow, School of Life Sciences
Jawaharlal Nehru University, New Delhi Odisha, India

Garima Chauhan, Namrata Kharbas, Vivek Ambastha and Baishnab C Tripathy
Sharda University, Greater Noida , Uttar Pradesh, India

Abstract:

High light is known to damage plants that range from reversible photo-inhibition to irreversible photo-oxidative damage. The chlorophylls have a special position among the natural tetrapyrroles due to their unique roles in the biological transformation of solar energy to chemical energy via photosynthesis. Biosynthesis and breakdown of chlorophylls occur throughout plant development. When the photosynthetic apparatus of plants is overexcited by high light the solar energy can then be transferred from chlorophylls, chlorophyll biosynthetic and catabolic intermediates to oxygen, resulting in the production of reactive oxygen species (ROS), especially singlet oxygen that can damage the photosynthetic apparatus leading to photo-inhibition and ultimately irreversible photo-oxidative damage to plants. To prevent the accumulation of intermediates of chlorophyll biosynthesis and degradation, Arabidopsis thaliana was genetically transformed to overexpress protochlorophyllide oxidoreductase C (PORC), a critical chlorophyll biosynthetic gene and pheophorbide a oxygenase (PAO) involved in chlorophyll degradation. Overexpression of these genes led to decreased accumulation of the biosynthetic intermediate protochlorophyllide and catabolic intermediate pheophorbide especially during high light conditions. This substantially reduced the generation of singlet oxygen and prevented high light-induced programmed cell death and photo-oxidative damage. This approach could be replicated in crop plants to protect them not only from high light but also other abiotic stresses.

Biography:

Prof. Baishnab Charan Tripathy, from Cuttack, Odisha earned his BSc and MSc degrees with Botany major from Utkal University, after which he joined Jawaharlal Nehru University where he worked for his PhD on Primary processed of photosynthesis and plant productivity. From 1981-1987 he worked in Ohio State University, Columbus and University of Illinois, Urbana, USA on photosynthesis and respiration. He joined as Assistant Professor in the School of Life Sciences, Jawaharlal Nehru University, New Delhi in 1987 where he started his photobiology laboratory and subsequently promoted to Associate Professor and Professor. On deputation from JNU, in 2011, Professor Tripathy joined as Vice-Chancellor of historic Ravenshaw University, Cuttack, Odisha and worked with distinction on education reforms and infrastructure development of the University. Upon completion of his 3 year tenure as VC, he joined back Jawaharlal Nehru University and served as the Dean, School of Life Sciences, JNU. Currently he is working as a Distinguished Professor of Biotechnology, Sharda University, Greater Noida.

Academic & Research Contribution: His research interests are in the area of molecular on photobiology and molecular biology of photosynthesis. He significantly contributed to our knowledge of photosynthesis.On leave from JNU, he worked for National Aeronautics and Space Administration (NASA), Kennedy Space Center, Florida, USA and worked on space-grown plants and studied the effect of zero (micro) gravity on photosynthesis that could generate oxygen for human survival in space. He has till now authored more than 100 research articles and patent, 3 books published by Springer, and is on the editorial board of several journals. He has so far mentored 30 PhD students and large number of M. Phil and M.Sc. students.

Awards/Honors: Because of his excellent research contributions rofessor Tripathy was elected as a fellow of the Indian National Science Academy in 2005. He is also a fellow of National Academy of Sciences and National Academy of Agricultural Sciences. He is recipient of JC Bose National Fellowship of Govt. of India. His name appears in Marquis “Who is Who in the World”. He was NASA/NRC Senior Fellowship, Kennedy Space Center, USA, and recipient of Rockefeller Foundation Biotechnology Career Award, USA, Samant Chandra Shekhar Award in Science, Gold medal for outstanding contribution to science by Srivastav Foundation, Lucknow, Professor P. Parija Samman etc.

E: baishnabtripathy@yahoo.com

KEYNOTE

Genome editing: Applications in agriculture and meeting SDGs

Prof. K.C. Bansal
Secretary, National Academy of Agricultural Sciences, India
Former Director, ICAR- National Bureau of Plant Genetic Resources, New Delhi, India

Abstract:

For meeting the Sustainable Development Goals of United Nations (SDGs-2030) and to address the rising concerns of climate change, sustainable development of agriculture is the primary concern of plant scientists and breeders today for achieving food and nutritional security. Since, the challenges posed by the climate change are putting pressure on the already shrinking land and water resources to increase the crop production, the use-efficiency of natural resources like land, water and nutrients need to be enhanced substantially to produce more from less.

While, India witnessed green revolution in 1960s -70s resulting in the increased food production from a mere 50 million tonnes in 1950-51 to over 300 million tonnes in 2020-21, further increase in food production to feed an ever-increasing global population, which is likely to touch a 10-billion mark by 2050, we need to harness the full potential of the modern tools of science and technology. In this context, recently developed CRISPR-Cas-based genome engineering is in focus globally, which has revolutionised crop improvement programmes. Genome editing has emerged as the most potent tool for sustainable development of agriculture and allied sectors. This necessitates identification of natural genetic variation in different crops by applying the modern approaches of genomics and pan genomics resulting in novel genes and alleles discovery for resistance to emerging pests/pathogens and climate resilience, and their deployment by multiplex genome editing technologies for sustainable agriculture.

With the advent of genome editing as the next generation crop breeding technology, plenty of opportunities are now available to develop varieties with increased input use efficiency of nutrients, water and radiation, and create crops with inbuilt resistance to emerging pathogens and environmental stresses on a much faster timescale, not practically feasible with the use of conventional breeding approaches alone. Further, gene editing technologies could simplify the use of crop wild relatives and landraces in breeding programmes for expanding the specific allelic variation, broadening the genetic base and for eliminating the linkage drag. However, to harness the full potential of these technologies, urgent attention will be needed to simplify the process of generating genome edited crop events by developing efficient genetic transformation systems in a range of agriculturally important crops. Similarly, successful genetic transformation of wild crop species and innovations in developing simplified methods for introducing genetic material will prove useful for accelerating crop domestication with improved traits related to climate resilience and nutritional quality improvement. More importantly, we need to promote the use of such versatile genetic technologies for the development of improved crops through an enabling science-based regulatory regime for sustained food, nutritional and environmental sustainability.

E: kcbansal27@gmail.com

Doubling Farmers Income: Role of Trichoderma spp. in sustainable Agriculture

Dr. Arup Kumar Mukherjee
Principal Scientist, Molecular Plant Pathology Laboratory
Division of Crop Protection, ICAR-National Rice Research Institute
Cuttack, Odisha, India

Abstract:

In a recent movement special emphasis has been given to double the farmers' income by using multipronged approaches which include use of latest technologies, deploying microbial resources, reducing the use of different agrichemicals to minimize the cost of cultivation. We have given an attempt to use different biocontrol agents as a replacement of chemical pesticides which in turn will reduce the cultivations costs as well as will have minimum effect on the environment. This approach will not only save the farmers from using excessive and costly pesticides but also make the environment safe. We have identified different Trichoderma spp. which are having different beneficial properties. Two Trichoderma spp have been identified which are excellent growth promoters besides having biocidal effects. One Trichoderma species has been identified which helps faster decomposition of rice straw and this de-composted straw have excellent growth promotion qualities. Few have been identified to induce drought tolerance in rice. The detail mechanisms of growth promotion also have been identified using molecular tools. Whole genome sequence of The ICAR-NRRI identified Trichoderma erinaceum also has been uncovered. Finally, an Indian patent has also been awarded to the ICAR-NRRI. The details of the above findings will be presented during lecture time.

Biography:

Dr. Arup Kumar Mukherjee is a Principal Scientist at Division of Crop Protection, ICAR-National Rice Research Institute, Cuttack, Odisha, India. He has completed his Ph. D. and Post Doc in Plant Biotechnology. Before joing ICAR-NRRI, he has worked as DBT Post Doctoral Fellow at NRC on Plant Biotechnology, IARI, New Delhi from, Scientist, Biotechnology at Regional Plant Resource Centre, Govt. of Odisha, Bhubaneswar, Visiting Scientist/DBT Overseas Associate at the Department of Biology, Israel Institute of Technology, Israel, Senior Scientist, Plant Pathology at ICAR-Central Institute for Cotton Research, Nagpur. He has 22 years of research experience after Ph.D. (nine years and eight months as Scientist in the Regional Plant Resource Centre, IRC Village, Bhubaneswar, Orissa). He guided 10 Ph.D. students, and 12 M.Sc. students. He has published 112 Research articles, 6 Newsletters, 3 Books/Technical Bulletins, 22 Book Chapters/Training Manual, 20 Symposium papers/Abstracts, 6 Review articles, 41 Gen Bank (NCBI Submission), 14 culture deposition in IMTECH, Chandigarh. He has Cumulative International IF of his publications is 160.019, with total citations=1297, H index 21, i10 index 43. He has developed 2 products and 1 patent. 8 scholars have been awarded with Ph.D under his guidance.Recently he has elected as Zonal President (Eastern Zone) (2020) of Indian Phytopathological Society, New Delhi and member of many repute associations/organizations. Developed one *Trichoderma* based bio fungicide against soil and seed borne cotton pathogens named as *TrichoCash* which performed extremely well for continuous three years (2013-14, 2014-15, 2015-16) in the All India Coordinated Cotton Improvement Project (AICCIP) against *Fusarium* wilt of cotton. Associated with release of 8 rice varieties namely **CR Dhan 506** (CVRC), CR Dhan 311(high protein & high Zinc) and CR Dhan 507 (SVRC) and CR Dhan 510 has been identified in the current year 2016-17 for CVRC.CR Dhan -309 (CVRC), CR Dhan -102 & CR Dhan 210 (SVRC); CR Dhan 312 (CVRC).

E: titirtua@gmail.com, arupmukherjee@yahoo.com

Entrepreneurship development in tuber crops value addition

Dr. M. Nedunchezhiyan
Head (I/C), ICAR– Central Tuber Crops Research Institute,
Bhubaneswar, Odisha, India

M. Nedunchezhiyan, Kalidas Pati, V.B.S. Chauhan and R. Arutselvan
Regional Centre of ICAR– Central Tuber Crops Research Institute, Bhubaneswar, Odisha, India

Abstract:

Tuber crops are most important food crop after cereals and grain legumes. The tropical tuber crops, including cassava (Manihot esculenta Crantz), sweet potato (Ipomoea batatas), yams (Dioscorea sp.), taro (Colocasia esculenta), elephant foot yam (Amorphophallus paeoniifolius) and other minor tuber crops play a crucial role in providing food security for about 2.2 billion people in the World besides contributing to animal feeds and industry. Among total World production, about 45% of root and tuber crop production are consumed as food, with the rest converted as animal feed or industrial products. Tuber crops are important sources of starch after cereals. Cassava and sweet potato are the most important among the tuber crops. Cassava starch finds application in array of industrial products, textiles, corrugation box, paper conversion, liquid gum for domestic sector, paper industry etc. Besides food, sago industry is the major one.

A number of stable and marketable food products as well as less stable snack food can be made from tuber crops. Cassava rawa, semolina and fried cassava chips are successful stable products that can be made from cassava tubers. Besides, cassava flour fortified with cereals and legumes flours can be used for making extruded fried foods which also have good post product shelf life. Cassava starch is a valuable stock for bioethanol and biodegradable plastic production. Sweet potato is used as raw materials in the manufacture of products such as deep processing starch, alcohol, liquid glucose, high fructose syrup, maltose and for food processing fresh roots dry flour or starch can be used for noodles, fried chips and canned flakes production. In feed processing the main product is sweet flour used by the compound feed industry. The industrial utilization of sweet potato is rudimentary in India. Starch of colocasia and arrowroot is very fine and it is used in cosmetic and pharmaceutical industries.

Biography:

Dr. Maniyam Nedunchezhiyan, Principal Scientist & Head (i/c), Regional Centre of ICAR-Central Tuber Crops Research Institute, Bhubaneswar – 751 019, Odisha, India is a renowned agronomist in root and tuber crops. He has 30 years experience in tropical root and tuber crops. He is specialized in root and tuber crops based farming and cropping systems, weed and drip fertigation management. He is also looking after production and distribution of quality planting materials of root and tuber crops. He has more than 200 research papers in International and National peer reviewed journals and more than 90 popular articles. He has authored 14 books, 30 book chapters, 7 technical bulletins and 10 training manuals. Last twenty years he is working in hilly areas for food and nutritional security of tribal farmers of Eastern and North-Eastern India through tuber crop technologies. He has guided 4 Ph.D. students and 3 M.Sc. students. He is a life member of 7 scientific societies. He is a reviewer and referee of 7 scientific research journals including international journals.

Research Interest: Nutrient, water and weed management in tuber crops based cropping systems

E: m.nedunchezhiyan@icar.gov.in

KEYNOTE

Precision plant breeding with CRISPR-Cas tools

Dr. Kutubuddin Ali Molla
Scientist (Ag-Biotechnology) ,
ICAR-National Rice Research Institute
Cuttack, Odisha, India

Abstract:

The availability of CRISPR-Cas genome editing system provided us unprecedented ability to manipulate crop genomes. We are witnessing an explosion of CRISPR/Cas-derived precise breeding tools for crop improvement. The CRISPR-Cas toolbox empowers us to perform targeted gene knockout, gene activation and repression, epigenome editing, single-base alteration, and precise insertion/deletion/replacement with either HDR or prime editing. My talk is intended to present an overview of the spectrum of CRISPR-Cas-derived breeding tools and their application in crop improvement.

Biography:

Dr. Kutubuddin Molla is a faculty scientist at the ICAR-National Rice Research Institute, Cuttack, India. He has obtained his Ph.D. from the University of Calcutta, Kolkata. Dr. Molla has done his post-doctoral research at Pennsylvania State University, USA, availing the prestigious Fulbright scholarship. He is interested in precise genome editing and uses CRISPR-Cas and other advanced editing techniques for crop improvement. Dr. Molla has been awarded the 'Young Scientist Award' by the Indian Science Congress Association, Kolkata, 'Jawaharlal Nehru outstanding Ph.D. thesis award' by the Indian Council of Agricultural Research, New Delhi and 'INSA Medal for Young Scientist-2020' by the Indian National Science Academy, New Delhi. He is also the recipient of the AAAS/Science Program for Excellence in Science from the American Association for the Advancement of Science (AAAS), Washington D.C. Dr. Molla is a selected member of Indian National Young Academy of Science (INYAS), New Delhi. He has recently co-edited a two volumes of Springer protocol book on 'CRISPR-Cas Methods'. In addition, Dr. Kutub has recently been selected to sereve as an Assistant Features Editor of 'The Plant Cell' journal.

E: kutubuddin.molla@icar.gov.in

KEYNOTE

Aquaponics- An integrated system of fish and plant farming

Dr. Yashaswi Nayak
Associate Professor, School of Applied Sciences
Centurion University of Technology and Management,
Bhubaneswar, Odisha, India

Abstract:

Aquaponics is an emerging method of local food production worldwide, using closed integrated production systems to grow vegetables and fish in a variety of contexts, including urban environments. It may be defined as an integrated, quasi closed-loop, multi-trophic food production system, comprising a recirculating aquaculture system (RAS) and a hydroponic unit, ensuring high levels of water reuse and nutrient recycling. Aquaponics is a multidisciplinary topic that includes aquaculture (fish feed, fish health, fish yield, fish wellbeing, sludge waste, sludge mineralization, sludge reuse, and so on), hydroponics (plant yield and growth, plant nutrition, plant nutrition through sludge recirculation, plant protection, and so on), water (water quality, water waste, water recirculation, and so on), microbiology (biological properties, microbiota (elaboration of production systems, sizing, modelling, monitoring of the systems, monitoring of water and water quality, automation, etc.).A successful development of aquaponics could insure, in the next decades, a substantial part of human food while having a neutral impact on the environment.

Keywords: Multi-trophic food production system, , hydroponics , Microbiology

Biography:

Dr. Yashaswi Nayak presently serving in Centurion University of Technology and Management as faculty and Head of the Department of Zoology and taken the charge of Dean, SoAS has around twenty years of teaching experience and possess specialization in Poultry management , vermicomposting processes. Her area of interest is Fishery Science and Vermicomposting. She did her MSc , M.Ed from Regional Institute of Education Bhubaneswar in the year 1996 She completed her Ph.D. (Environmental Science) with specialization in Poultry management from Utkal University in 2014. She has published research papers in the journals of repute and also presented some of her research papers in various National and International conferences held in Bhubaneswar. She has also undergone few training programs on â€˜Poultry Managementâ€™ in CPDO (Central Poultry Development Organisation) Bhubaneswar, Odisha. Presently she is teaching MSc and BSc students and guiding six number of PhD students . She is absorbed in the Research Centre of Aquaculture group and working on developing Aquaponics in Bhubaneswar campus.

E: yashaswi.nayak@cutm.ac.in

KEYNOTE

Unlocking potential of Genebank collections for climate resilient agriculture

Dr. Ashok Kumar
Director (Acting)
ICAR-National Bureau of Plant Genetic Resources
New Delhi, India

Abstract:

Plant Genetic Resources (PGR) refers to germplasm‖ or genetic diversity of actual or potential value that exists among individuals or group of individuals belonging to a species. The full spectrum of PGR consists of diverse type of collections such as those derived from the centres of diversity, centres of domestication and from breeding programmes. PGR broadly includes landraces, farmers‘ varieties, breeding material, genetic stocks, obsolete and modern varieties, wild and weedy relatives of cultivated plants, and potential domesticates such as wild species. Amongst the total number of species of higher plants which have been identified worldwide (250,000), PGR comprise 40% of these species, while the crop plants (cultivated as agricultural or horticultural species) cover only 2.8% of the species. Nevertheless, it is often stated that only 30 species "feed the world" providing more than 90% of calories or prote into human nutrition (FAO, 2010). Intensive modern breeding efforts in these staple food crops for higher yields have led to a narrowing of the gene pool by concentrating more on favorable alleles. Furthermore, the increasing genetic uniformity of crop varieties combined with climate change effects makes crops more vulnerable to various biotic and abiotic stresses. Characterization, evaluation and regeneration of germplasm are an integral component of Plant Genetic Resources management. Characterization and evaluation of germplasm is the key to accelerate utilization in crop improvement programme by exposing the actual value of germplasm. The characterization of germplasm deals with the understanding and recording of highly heritable characters which may be used in establishing taxonomic identity, while, the germplasm evaluation deals with assessing the agronomic potential of an accession including quality parameters and response to various abiotic and biotic stresses. Maintenance of germplasm without losing genetic integrity is also a prime objective in PGR management. PGR are therefore important for maintaining genetic diversity for and preventing such losses, which may have serious consequences for food, nutrition and environmental security.

Biography:

Dr. Ashok Kumar is presently working as Director (Acting) of ICAR-National Bureau of Plant Genetic Resources, New Delhi. He has long working experience of >35 years with various aspects of plant genetic resources management. After M Phil/ Ph. D in Agricultural Botany (Genetics & Plant Breeding), joined ARS as Scientist (Plant Breeding) at ICAR-NRRI (the then CRRI), Cuttack in 1986 and moved to ICAR-NBPGR in 1988. Visited USA for three months for Professional Enhancement Programme on Plant Genetic Resources under USAID Project. He was associated with the planning, monitoring and execution of NATP Sub-project “Sustainable Management of Bio-diversity” in Mission mode which was included under Prime Minister’s coveted “Jai Vigyan National Science and Technology Mission on Conservation of Agro-Biodiversity (PGR)”. Associated with the development of value rich genetic stocks, technologies and databases for utilization of genetic resources and successfully completed the projects funded by DBT, NMPB, ISM&H etc. for collection, evaluation and conservation of medicinal and aromatic plants (MAPs). As Head, Division of Germplasm Evaluation, ICAR-NBPGR, he has planned, executed and coordinated the activities of germplasm evaluation at national level. He has also established linkages with crop based institutes and state agricultural institutes/central agricultural universities for characterization, evaluation and utilization of PGR. He has organized several Germplasm Field Days/ visits for enhanced utilization of germplasm in applied and basic research. He has also coordinated the activity of characterization and evaluation at national level through Consortium Research Platform (CRP) on Agro biodiversity of ICAR. He is also coordinating Network Project on “Leveraging genetic resources for accelerated genetic improvement of linseed using comprehensive genomics and phenotyping approaches” under Mission Programme on “Minor Oilseeds of Indian Origin” sponsored by Department of Biotechnology, Government of India. He has been associated with the identification of several trait specific germplasm and registered 35 trait specific accessions as unique genetic stocks with Plant Germplasm Registration Committee (PGRC) of ICAR. He has more than 150 publications comprising research papers published in national and international journals, book, book chapters, training manuals, invited lectures, extended summaries, abstracts etc. In addition, he has participated and presented papers in national and international seminars, symposia, conferences etc. He is member of several professional societies and has been recognized as Fellow of various professional societies.

E: drashok1962@gmail.com

KEYNOTE

Freshwater aquaculture technologies for sustainable livelihood development

Dr. Saroj Kumar Swain
Director
ICAR– Central Institute of Freshwater Aquaculture
Bhubaneswar, Odisha, India

Abstract:

Presently, India is the 4th largest capture (marine and inland) fishery and second largest aquaculture fish producing country in the world (FAO, 2020). India's total fish production stands at 13.76 million metric tonnes (2018-19), which is about 7.6 per cent of total global fish production. Traditionally, marine fisheries have revealed growth in India's fisheries sector, contributing about 70 per cent of total fish production during the 1950s. India's marine fisheries sub-sector is now performing with a downward trend, with 60% of Exclusive Economic Zone (EEZ) stocks over-exploited and the rest fully exploited. The marine fishery potential in the Indian waters has been estimated at 4.41 MMT, constituting more than 47% demersal, 48% pelagic and 5% oceanic groups. The dwindling trend in marine capture fisheries limits the scope of further augmentation in harvest capture as out of 1,368 species available, 200 commercially important species also require attention for their survival due to their complex food chain and interdependent existence. The inland water resources of the country are comprised of 29,000 km of rivers, 0.3 million ha of estuaries, 0.19 million ha of backwaters and lagoons, 3.15 million ha of reservoirs, 0.2 million ha of floodplain wetlands and 0.72 million ha of upland lakes, which contribute about close to 2 million tonnes of fish annually (ICAR, 2011). The present average yield of riverine systems is estimated at about 1 tonnes per km. Freshwater aquaculture showed an overwhelming growth from 0.37 million tonnes in 1980 to 8.90 million tonnes in 2018-19, with a mean annual growth rate of over 7 percent in the recent past. Freshwater aquaculture contributes to over 95 percent of the total aquaculture production. Freshwater aquaculture in India has evolved from a state of homestead activity in few pockets of Eastern Indian states during the 1950s to the present state of a vibrant enterprise that has spread wing all over the country. As the premier institute of aquaculture research in the country, ICAR-CIFA has a variety of technological offerings in its basket to augment the fish production: Technology packages for more than thirteen fish species, Jayanti Rohu- a genetically improved strain of Rohu which gives 18 percent additional growth in a year after eleven generations of selection; CIFABROOD- a broodstock diet helps in early maturation of fish; FRP hatchery – a portable small size hatchery facilitates to undertake breeding programs even in hilly terrains; CIFAX- a therapeutic formulation to combat disease problems in fish. Besides, ICAR-CIFA advocates different approaches to the state governments and other stakeholders to maximise the fish products, such as system diversification and species diversification concepts where the former focus upon to standardize a different kind of aquaculture systems ranging from back yard ponds to super-intensive systems, aquaponics and later concept thrusts upon bringing more species into culture system in order to increase per unit productivity of the water and culture system.

Biography:

Dr. Saroj Kumar Swain, Ph.D is presently heading Central Institute of Freshwater Aquaculture (CIFA) as Director which is a constituent of Indian Council of Agricultural research, New Delhi. He started his scientific career under Agricultural Research Services (ARS) in 1991 at ICAR-CIFA. He has been actively involved in research, technology development and extension since last 29 years and contributed immensely to develop the captive breeding technology of 16 indigenous ornamental fishes including some endangered ones of India leading to its commercialization. He has developed a new variety of ornamental fish as Shining barb through genetic mass selection. He is the architect behind the establishment of ICAR CIFA public aquarium and that was dedicated to the Nation during 2004. In his career of developmental research, Dr Swain has been honored with many National awards for outstanding work on his field of research and developments. He has to his credit more than 40 research papers published in academic journals and 5 books and a number of extension and technology series publications. He has a design PATENT of a mobile diesel operated aerator and commercialized CIFACURE, a medicine for controlling bacterial and fungal diseases of aquarium fishes. Under his guidance Mahanadi fish diversity study revealed few new ornamental fish species. One of them is Parasylorinchus swaini named after him. He led a Multi Institutional project as Consortium Principal Investigator of NAIP- Livelihood of World Bank funded project which uplifted the socio-economic conditions of more than 8000 farm families from three districts of Odisha besides he has instrumental in developing ornamental fish villages in a cluster approach at Deogard district of Odisha, India. He has also instrumental for developing actionable strategies for increasing freshwater aquaculture production in the country. As ornamental fish production research is his domen, he has developed action plan for enhancing ornamental fish production in the country.

E: swain_saroj2003@rediffmail.com

KEYNOTE

Valorisation of leaf meal for replacement of DORB (De Oiled Rice Bran): A forwarding approach for sustainable aquaculture

Dr. Narottam Prasad Sahu
Joint Director
ICAR- Central Institute of Fisheries Education
Mumbai, India

Abstract:

There is an increased demand for fish as a quality animal protein source due to the growing health consciousness of the people. Hence, the Pradhan Mantri Matsya Sampada Yojana (PMMSY) aims to enhance fish production to 220 lakh metric tons by 2024-25 from 137.58 lakh metric tons in 2018-19 at an average annual growth rate of about 9%. As the capture fisheries production is almost reached a plateau, aquaculture sector has been projected to meet the extra demand of fish. The intensification of aquaculture practices with farming priorities has shifted from non-fed to formulated feed based culture in India. Ultimately, the feed-based aquaculture demands more use of feed ingredients leading to high price rise. But, the industry's long-term viability will depend on its ability to reduce the cost of formulation and adapt to different alternative ingredients in a cost-effective and flexible formulation. In India, finfish especially carp farmers use farm-made feeds where groundnut oil cake, mustard oil cake, de-oiled rice bran (DORB) etc. are the commonly used ingredients.

Many farmers in India and Indian subcontinents use DORB as the most preferred ingredient for farm-made feed preparation at its highest inclusion rate due to its easy availability and low price. Furthermore, increasing fish production to match the requirement of ever increasing human population requires an additional amount of DORB, which will be insufficient in future considering the current production scenario. An alternative non-conventional ingredient that can replace DORB is leaf meal, which is the most unexplored resources, less expensive and readily available. The leaves which are having higher protein content (20-28% CP) are used for the preparation of leaf meal. These include either agricultural byproducts like leaves of sweet potato, black gram, green gram, horse gram, groundnut, soybean, green pea or other industrial byproducts like lemon grass, mentha, some aquatic and terrestrial weeds including terrestrial leaves. The leaves contain many antinutritional factors like protease inhibitors, lectins or haemaglutinins, tannins, phytates, oxalates, BOAA, mimosine, saponins, phytoestrogens etc., which will affect the consumption and its utilization. Accordingly, several treatments like water soaking, drying, heating, solid state fermentation, supplementation of synthetic amino acids, preparation of protein concentrate, exogenous enzyme supplementation etc can be effectively used as applicable to different leaves.

Solid State Fermentation (SSF) is the most convenient method for reducing the most of ANFs contents significantly and replaces DORB completely without compromising the growth and health of fish. ICAR-Central Institute of Fisheries Education, Mumbai has developed a low cost fermenter cum mixer for the fermentation of any leaf meal by the farmer himself. Only the availability of suitable culture media for the fermentation needs to be ensured. The future aquaculture has to depend upon the leaf meal as DORB may not be sufficient to support the demand of aquaculture sector. Awareness needs to be created among the aquaculture farmers for the optimum use of leaf meal in aquafeed.

E: npsahu@cife.edu.in

KEYNOTE

Genetics and biotechnology to augment aquaculture production & food security

Dr. Jitendra Kumar Sundaray
Principal Scientist & Head, Fish Nutrition and Physiology Division
ICAR-Central Institute of Freshwater Aquaculture,
Bhubaneswar, Odisha, India

Jitendra Kumar Sundaray, Lakshman Sahoo and Ipsita Iswari Das
ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha, India

Abstract:

As the global population escalates with an expectation of 9 billion heads by the year 2050 with no increment or expansion in the world's natural resources, the adequate and sustainable supply of foods for all, has become a flaming issue. Today, over 2 billion people are suffering from deficiency of one or more micronutrients. Food security refers to access of quality food for everyone at every time. The nutritional aspect is crucial for the concept of food security. In India, where one-third of the population is believed to be absolutely poor, the issue of food security needs to be closely studied and mitigated. The second largest populated country in the world (with more than 1.2 billion people) will not be able to feed itself unless improvement is made in the availability and access to food. A wide range of food commodities including produce from fishery and aquaculture is required to fulfill the nutritional security of the people.

Fish has an important role to play in nutrition and food security and there is a growing recognition of its nutritional and health-promoting qualities. Fish is 'nature's superfood', an important source of proteins and healthy fats, and a unique source of essential nutrients, including long-chain omega-3 fatty acids, iodine, vitamin D, calcium and other micronutrients. The nutrients found in fish regulates immune system and brain development.

Fish caught from the wild sources are in continual decline, to ensure the availability of the affordable form of protein; Aquaculture is considered a viable panacea. However, aquaculture is affected by complex series of factors including, availability of elite germplasm, physiology, growth, reproduction, diseases, type of species, production system, climate change, etc. throughout its value chain and production cycle. Aquaculture has become a crucial industry and genetics and biotechnology play a major role in shaping the industry towards sustainable production. The genetic background of fish and shellfish interconnects with most of the above-mentioned biological factors. As it determines the desirable phenotypes of cultured fish/shrimp by addressing the genetic factors along with environmental factors, its consideration is crucial for sustainable aquaculture practices. Scientific interventions like hybridization, transgenesis application of genomic technologies and genetic engineering with genome sequencing, genome editing (ex: CRISPR/Cas9), and gene knockouts to develop species of desired traits related to the disease resistance, stress resistance and high growth rates has proven to be useful to enhance the production and productivity. Selective breeding, inbreeding and interspecific crossbreeding, sex manipulation, gynogenesis, androgenesis, cloning, marker-assisted selection and genomic selection, and even epigenetics applications have paved the way towards development of strains/varieties with higher growth, better feed utilization and disease resistant. The application of genetics and biotechnology will uplift the sustainable aquaculture production to its next level.

Keywords: Aquaculture, Food security, Genetics, Biotechnology, Sustainable

E: jsundaray@gmail.com

Evation

AGRI Vision 2022

DAY-01

Mar 06, 2022

ORAL PRESENTATIONS

https://agrivision.in

ORAL

Chlamydospore formation in *Trichoderma* and its utilization for the sustainable health management of rice crop

Harekrushna Swain[1, 2, 3], Totan Adak[1], Arup K. Mukherjee[1]*, Sarmistha Sarangi[1], Shasmita[1, 2,] Pankajini Samal[1], Ansuman Khandual[1], 4, Rupalin Jena[1], Soumendra K. Naik[4] and Soma Samanta[1]
[1]*ICAR-National Rice Research Institute, Cuttack, Odisha, India*
[2]*Ravenshaw University, Cuttack, Odisha, India*
[3]*Botanical Survey of India, Eastern Regional Centre, Shillong, Meghalaya, India*
[4]*Sri Sri University, Cuttack, Odisha, India*

Abstract:

Trichoderma is one of the most important biocontrol fungi, which could produce mycelia, conidiophores, and chlamydospores three types of propagules under different conditions. Chlamydospores are produced in harsh conditions in various fungi, and may be more resistant to adverse conditions. However, the knowledge associated with the mechanism of chlamydospore formation remained unclear in *Trichoderma*. This study is aimed to explore the essential genes and enzymes associated with chlamydospore formation in *Trichoderma*. The culture condition, survival rate, and biocontrol effects of chlamydospores and conidiophores from Trichoderma strains were determined. Seven different spp. of *Trichoderma* were characterized according to morphological and molecular tools. Two of the isolated strains, namely *Trichoderma hebeiensis* and *Trichoderma erinaceum,* outperformed the other strains. Both of the strains controlled four important rice pathogens, i.e., *Rhizoctonia solani* (100%), *Sclerotium oryzae* (84.17%) and *Sclerotium rolfsii* (66.67%). Furthermore, the genes responsible under chlamydospore-producing and chlamydospore-nonproducing conditions were performed. Trichoderma isolates produced chlamydospores under particular conditions, and chlamydospore-based formulation of *Trichoderma* exhibited higher biocontrol ability against *Rhizoctonia solani* in rice plant than conidoiospore-based formulation. Significantly higher expression of some stress related enzymes was observed in Trichoderma treated plants which helped in better crop growth both under biotic and abiotic stresses.

These isolates helped both the varieties to accumulate more nutrients. This study proves that Trichoderma erinaceum obtained from tree bark may be incorporated in integrated rice crop management both as biocontrol agent and biofertilizer. The results would provide a basis on the molecular mechanisms underlying Trichoderma sporulation, which would assist the development and application of fungal biocontrol agents. This investigation also demonstrates that Trichoderma strains obtained from tree bark could be considered to be utilized for the sustainable health management of rice crop.

Keywords: Trichoderma hebeiensis; Trichoderma erinaceum; Chlamydospore; Biocontrol; Rice crop

Biography:

Harekrushna Swain did his B.Sc. from Ravenshaw University, Odisha and M.Sc. from Orissa University of Agriculture and Technology, Odisha. Now He is working as a Scientific Staff at BSI-ERC (Govt.of India),Shillong.Besides, also pursuing my PhD. at ICAR-National Rice Research Institute and Ravenshaw University, Odisha. Worked on Genomics and proteomics of host pathogen Trichoderma interactions, Molecular diagnostics of plant diseases, Management of Rice diseases by using biocontrol agents, Fungi-Plant Interactions

E: harekrushnaswain21@gmail.com

ORAL

Transcriptome dynamics of Asiatic and Western carrots (*Daucus carota L.)* to decode candidate genes for root adaptability

Chaitra C. Kulkarni[1], Sarvamangala S Cholin[1], Akhilesh Bajpai[2,3], Kulkarni M. S.[1]
[1]University of Horticultural Sciences, Bagalkote, *India*
[2]*VIT University, Vellore, Tamilnadu, India*
[3]*Shodhaka Life Sciences Pvt. Ltd. India*

Abstract:

Carrot (*Daucus carota* L.) is considered as the second most important vegetable crop next to potato for its nutritional value and economic importance (Spooner, 2019; Heywood, 2014). The present investigation was designed to elucidate the biology, genetics and molecular basis of secondary storage root development and adaptation secondary storage root among two important cultivated types of carrots i.e., Western and Asiatic types. This study included dynamic transcriptome profiling of root tissues with next generation sequencing (NGS) technology platforms. As per our knowledge, these high throughput genetic and molecular comparisons (between cultivar types and root tissues) are the first comprehensive information in carrot globally.

Triplicate samples from each of the cultivar and tissues were used to generate twelve RNASeq libraries with the raw reads of >140 million reads for roots and >200 million reads for floral tissues. For computational analysis, reference based (high quality carrot reference genome) as well as de novo assembly was developed from TopHat and Trinity tools respectively. High quality assembly was generated in both reference based with >70% assembly rate and de novo assembly having >89% BUSCO completeness and >98% assembly of the individual root transcriptome libraries. Further, identification of differentially expressed genes (DEGs) was performed by cufflinks, DESEq and edgeR tools. A total of 3544 and 2239 DEGs in reference based and de novo assemblies respectively were identified in root tissues. In which, 1818 and 1090 up-regulated DEGs in Asiatic and 1726 and 1149 genes up-regulated DEGs in Western cultivars from reference based and de novo assembly respectively were identified with p value <0.05 and log2 fold change >2. ~44k unigenes were identified in the present study with 477 total transcriptional factors (TF) with higher number of stress responsive TF were up regulated in Asiatic cultivar (bHLH, ERF, NAC and WRKY) than Western type. In the root transcriptome >45% of the genes were annotated with various annotation tools David, Blastx, Interpro etc considering Eudicot lineage.

Gene ontology (GO) categorization of the DEGs into biological process (BP), cellular components (CC), molecular functions (MF) as well as KEGG pathway enriched pathway analysis identified major important functions and terms in each of the category specific to Western and Asiatic cultivars. Major pathways enriched in Western cultivar roots were specific to 'photosynthesis', 'carbon metabolism' 'glycolysis', 'plant hormone signal transduction', etc, that helps in better source-sink translocation ability and accumulation of higher carotenoid in roots. Whereas, in Asiatic cultivars, enriched pathways included were mainly 'plant-pathogen interaction', MAPK signaling pathways, phenyl propanoid biosynthesis indicating better root plasticity adaptation and tolerance to biotic or abiotic stresses.

Gene regulatory network (GRN) analysis of root transcriptome also confirmed the co-expression of photosynthesis and vascular cambium related genes in association with stress responsive genes in Western cultivar and Asiatic cultivars and are considered as key factors that distinguish these two contrasting cultivar types of carrot for storage root development. Understanding the genetic architecture responsible for genotype plasticity may possibly provide useful breeding targets for crop improvement specifically in tropical or sub-tropical environments that constitute the major part of the carrot cultivation area across globe. The putative differentially expressed candidate genes responsible for adaptability and root development of the present study would be of great utility in development of 'superior tropical varieties' by 'genomic assisted breeding' in carrot and other crops of similar relevance.

Keywords: Population structure, GWAS, Candidate gene, RNASeq

Biography:

Chaitra C Kulkarni recently completed her Ph.D. in Genetics and Plant Breeding from the University of Horticultural Sciences Bagalkote (India). Her doctoral research was on "Transcriptome profiling of temperate and tropical adapted carrot (Daucus carota L. subsp sativus) cultivars to decode the candidate genes related to root adaptability and flowering". During her Master's, she has explored 144 Indian germplasm accessions of carrot for understanding the population structure with various molecular markers (Published in Journal of Applied Genetics 2020, 61(3): 303-312. IF: 3.24; NAAS: 9.24.) and marker-trait association for important root productivity traits. A few more articles are under review. **Research interest**: Genome-wide association studies, QTL analysis and discovery, NGS data analysis, Candidate gene discovery, marker-trait association, marker development, and molecular breeding strategies including MABC and MARS.

E: kchaitra642@gmail.com

ORAL

Potential natural enemies associated with sorghum shoot bug, *Peregrinus maidis* (Ashmead)

D Saicharan and S S Karabhantanal
University of Agricultural Sciences Dharwad, College of Agriculture, Vijayapur, Karnataka, India

Abstract:

Studies on recording potential natural enemies associated with sorghum shoot bug, *Peregrinus maidis* (Ashmead) had shown that, among the predator's predatory bugs [*Creontiades sp. and Tytthus parviceps* (Reuter)] and neuropterans [*Chrysoperla sp. and Micromus timidus* (Hagen)] reported abundantly and found predating throughout the cropping season on both eggs and nymphal stages. Further, beetles of coccinellidae [*Cheilonemus sexmaculata* (Fab.)] and chrysomelidae [*Monolepta signata* (Olivier)] also found predating on nymphal stage of the shoot bug. A rich spider diversity was found feeding on the nymphal and adult stages of sorghum shoot bug, they are viz., *Callitrichia* sp. (F: *Linyphiidae*), *Cheiracanthium approximatum (F: Cheiracanthiidae), Marengo sp. (F: Salticidae), Neoscona sp. (F: Araneidae), Plexippus petersi (F: Salticidae)* with an unidentified spider belongs to family *Linyphiidae* also found predating on nymph and adult stages. A parasitoid *Anagrus* sp. (Hymenoptera: *Mymaridae*) on eggs and a mite, *Erythraeus* sp. (*Trambidiformes: Erythridae*) was noticed on the adult shoot bug.

Keywords: Natural enemy, Neoscona, parasitoid, *Peregrinus maidis*, predatory bug, shoot bug, sorghum, *Tytthus parviceps*

Figure1. *Microscopic view of Anagyrus sp.*

Figure2. *Erythraeus sp.* clinging to thoracic region of shoot bug

Biography:

D Saicharan is a PhD scholar (Department of Entomology) at Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad. He went for graduation at College of Horticulture, Rajendranagar, SKLTSHU. Thereafter, he did my M.Sc. (Agril. Entomology) as a Junior Research Fellow (ICAR-JRF) from University of Agricultural Sciences, Dharwad, College of Agriculture, VijayapurHe has secured ST category 1st rank during 2019 AIEEA-PG examination conducted by ICAR and he has also qualified ICAR-ASRB-NET during 2021.

Research interest: Insect ecology and pest management

E: charan.dharavath@gmail.com

ORAL

Cross kingdom RNAi during the interaction between *Allium cepa* and *Fusarium* basal rot pathogen

Bijayalaxmi Mahanty and Raj Kumar Joshi
Rama Devi Women's University, Bhubaneswar, *Odisha, India*

Abstract:

Fusarium basal rot (FBR) caused by Fusarium *oxysporum* f. sp. cepae (Foc), is one of the most vicious fungal phytopathogen infecting onion and allied crops accross the world.The molecular mechanism leading to Foc -Allium interaction is not clear yet. We performed genome-wide small-RNA profiling of Foc post infection of onion and detected three Fx-sRNA (Fx-sR3, Fx-sR4 and Fx-sR9) that were significantly induced in Foc sensitive onion genotypes. Target prediction demonstrated effective binding of Fx-sRNA with plant defense responsive genes. Fx-sRNAs and corresponding targets exhibited reciprocal expression pattern and targeted silencing was confirmed through transient co-expression in *Nicotiana benthaminana.* Moreover, the silencing of the plant specific targets showed reduced susceptibility to Foc while the mutant lines with no Fx-sRNAs showed reduced pathogenicity on onion. Our studydemonstrate that Foc-sRNA (Fx-sRNA) can act as effectors in silencing the host plant immunity by taking over the host RNA interference machinery.

Keywords: *Fusarium oxysporum* f. sp. cepae (Foc), *Allium cepa*, fungal small RNAs, gene silencing, RNA interference

Biography:

Bijayalaxmi has completed her Msc. In Biotechnology from North Orissa University with 79.67%.After that have she has cleared CSIR NET four times with AIR 27, 31, 47 and 56.Now she is working as PhD scholar at Rama Devi Women's University on Delineating the small RNA network among Allium cepa L. and Fusarium oxysporum f sp cepae.

E: bijayalaxmi308@gmail.com

ORAL

Profiling of candidate microRNAs responsive to fluoride toxicity in rice (*Oryza sativa* L.)

Tamarapalli Sravya Sruti, Sasmita Mohanty, and Raj Kumar Joshi
Rama Devi Women's University, Bhubaneswar, Odisha, India.

Abstract:

Rice (*Oryza sativa* L.) is a water intensive cereal crop extensively cultivated across the fluoride infested states of India. MicroRNAs (miRNAs) are a class of small non-coding RNAs that act as important modulators of gene expression related to several stress responses. However, there is no report on miRNA expression in response to fluoride toxicity in rice. In the present study, two popular high yielding varieties of rice-Gobindabhog (GB) and IR64 which differ in their level of tolerance to fluoride toxicity were used to analyse the expression of miRNAs under fluoride stress. Fourteen conserved rice miRNAs with proven role in multiple abiotic stress response mechanisms were analyzed through qRT-PCR to study their role in fluoride stress response in the two rice genotypes. Results revealed that 8 out of 14 miRNAs were differentially expressed. miR156, miR166 and miR171 were significantly induced in the fluoride tolerant GB while miR160, miR390, miR396 and miR444 were prominently induced in the fluoride sensitive IR64. Further, we computationally predicted the miRNA targets many of which encoded transcription factors associated with stress response mechanism. These results indicate that multiple miRNAs are involved in fluoride toxicity and miRNA like miR156, miR166 and miR171 might be involved in augmenting fluoride tolerance in rice genotypes.

Keywords: *Oryza sativa*, Fluoride, Gobindabhog (GB), IR-64, miRNAs.

Biography:

Tamarapalli Sravya Sruti currently pursuing Ph.D. from the post graduate department of Biotechnology, Rama Devi Women's University. I have secured 81% and 80.2 % in 10th (ICSE) and 12th (ISC), graduated in Botany with first class honors from Khallikote Autonomous College and passed M.Sc. and M.Phil. in Biotechnology from Rama Devi Women's University with 76.82% and 74.67% respectively.

E: shravyashruti1995@gmail.com

ORAL

Plant growth promoting activities of endophytes isolated from drought resistant plant *Calotropis procera*.

Sonali Jaiswal, Anupama Ojha and Sarad Kumar Mishra
Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh , India

Abstract:

Bacterial and fungal endophytes are ubiquitous microorganisms resides in plant tissue either intracellularly or intercellularly and promotes plant growth. These microbes promote plant growth through various direct and indirect mechanisms such as production of plant hormones, acquisition of phytonutrients, mineral solubilisation, lowering stress responses and inhibition of pathogenic attack. Drought resistant plants can provide more potential plant growth promoting endophytes. Thus, the aim of this study was to isolate bacterial and fungal endophytes of *Calotropis procera* and characterize plant growth promoting traits. Among these, bacterial endophyte Enterobacter cloacae (GenBank Accession no. OK560111) and fungus *Penicillium citrinum* (GenBank Accession no. OK606060) produced indole acetic acid (IAA) ACC deaminase, ammonia and solubilize phosphate In addition, *P. citrinum* also produced siderophore However, invitro studies using these microbial inoculants is further to be investigated for effective role in plant growth promotion and to establish them in a sustainable agriculture system.

Keywords: endophytes, plant growth promotion

Biography:

Sonali Jaiswal, Research Scholar under guidance of Prof. Sarad Kumar Mishra in Department of Biotechnology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh, India..

Research Interest: Microbiology, Plant Biotechnology

E: jsonali9565@gmail.com

ORAL

Lactobacillus mediated fermentation of UV-B irradiated mushroom powder to augment nutraceutical properties: A green approach towards nutraceuticals demands and bioeconomy

Abhay Tiwari[1], Satyawati Sharma[1], Vasudha Sharma[2], Rupesh Kumar Srivastava[3]
Indian Institute of Technology, New Delhi, India
Jamia Hamdard, New Delhi, India
All India Institute of Medical Sciences, New Delhi, India

Abstract:

The continuous increase in population growth brings forward the burden of meeting the demands for quality food and achieving nutritional security. In today's scenario, the importance of nutraceutical enriched food and natural food products having health-promoting effects has attracted public attention. Due to the increase in health-related issues, there is an inclined shift in the demand for nutraceuticals with added health stimulating functions; therefore, probiotic mediated fermentation of foods can act as an excellent potential resource. Lentinus edodes are well established for their vast pharmaceutical properties. They are rich in various bioactive compounds, viz, polyphenols, flavonoids, minerals, and β-glucans, etc., which have significant roles in several diseases like cancer, tumour, etc., and can scavenge free radicals generated in our body. L. edodes also contains different non-digestible polysaccharides which act as potential prebiotics and hence it can stimulate the growth of Lactobacillus bacteria. This coupled effects of prebiotic (mushroom) and probiotics (Lactobacillus) in functional food will benefit the consumers. Our study focuses on the bioproduction of nutraceutically enriched mushroom powder, via probiotic-mediated fermentation, which can be used by the stakeholders to develop functional food products and use as a source for income generation. The results pertaining to the study will be presented at the conference.

Keywords: Edible mushrooms; Probiotics, Prebiotics, Functional foods; Nutraceuticals

Biography:

Abhay Tiwari is a Senior Research scholar at Center for Rural Development and Technology, Indian Institute of Technology, New Delhi, India, under the supervision of Professor Satyawati Sharma. His main area of research is to increase the nutraceutical potential of edible mushrooms and development of probiotic based functional food products having therapeutic potential.

Research Interest: Edible Mushrooms; Functional Foods; Probiotics and Prebiotics

E: tiwariabhay.19@gmail.com


CBMC/PSS/022022

Evation

AGRI Vision 2022

DAY-02

Mar 07, 2022

KEY NOTE SPEECH

https://agrivision.in

KEYNOTE

CRISPR/Cas9 genome editing towards enhanced disease resistance in Chili pepper (*Capsicum annum* L.)

Dr. Rukmini Mishra
Associate Professor & Head,
Department of Botany, School of Applied Science
Centurion University of Technology and Management
Bhubaneswar, Odisha, India

Rukmini Mishra[1], Rashmi Ranjan Sutar[1], Sutar Suhas Bharat[1], and Raj Kumar Joshi[2]
[1]*Centurion University of Technology and Management, Bhubaneswar, Odisha, India*
[2]*Rama Devi Women's University, Bhubaneswar, Odisha, India*

Abstract:

Pepper anthracnose, caused by Colletotrichum spp. complex is the most devastating disease of chili (*Capsicum annuum L.*) across the tropical and sub-tropical regions of the world resulting in an estimated yield loss of 29.5 % in India. Although the conventional and molecular breeding along with genetic engineering approaches are the most effective ways of developing crops, they are often laborious, cost intensive and haven't met with tangible success and the genetically modified varieties are not widely accepted due to regulatory concerns. Besides, the emergence of insensitive pathogens and variation in resistance response has always been a challenging task. Recent transcriptome and small RNA dynamics have revealed that CaERF28, a member of ERF transcription factors family act as a major susceptibility source during anthracnose infection in chilli pepper. The advent of multiple sequence specific nucleases has facilitated precise gene modification towards development of disease resistant crop variants. Among the genome editing platform, the CRISPR/Cas9 system has revolutionized the field of agriculture for its simplicity, flexibility and accuracy. We have utilized CRISPR/Cas9 system to introduce specific mutation at the CaERF28 locus in *Capsicum annuum* to successfully engineer complete resistance to Colletotrichum truncatum, the most belligerent anthracnose pathogen. The result from this study will be represented to understand the effectiveness of the CRISPR/Cas9 system as a new approach towards development of disease resistance in plants.

Keywords: Anthracnose, Chili, Cas9, Genome editing.

Biography:

Dr. Rukmini Mishra has a PhD in Agricultural Biotechnology from National Rice Research Institute (NRRI-ICAR), India. After her PhD, she received the prestigious Young Scientist Award from the Dept. of Science & Technology, DST Govt. of India to work as a Young Scientist at the Centre for Biotechnology, Siksha 'O' Anushandhan University (SOA University). After three years of successful research, she received the prestigious Talented Young Scientist Fellowship under the TYSP programme of the Ministry of Science and Technology, Govt. of China. She joined as a post-doctoral research associate at the Chinese Academy of Agricultural Sciences, Beijing, China, where she worked on CRISPR/Cas9 genome editing in rice towards disease resistance. Currently Dr Mishra is serving as an Associate Professor in the Dept. of Botany, School of Applied Sciences, Centurion University of Technology and Management. Recently, she has received the SERB-POWER grant from DST, Govt. of India to work on CRISPR/Cas9 genome editing in chili pepper towards disease resistance. Research Interest: Plant Biotechnology, Genetic Engineering and Genomics

E: rukmini.mishra@cutm.ac.in

KEYNOTE

Mangroves: The most vulnerable tropical forest and its sustainability

Dr. Sauren Das
Senior Scientist, Agricultural and Ecological Research Unit
Indian Statistical Institute
Kolkata, West Bengal, India

Abstract:

Mangroves, being a productive and protective halophilic group of plant community dwell in along the tropical and subtropical estuaries of the world. Being a protective buffer against the frequency and ferocity of episodic cyclones, hurricanes, Tsunami, storms and floods; the significance of mangrove restoration has claimed a priority research. According to FAO report 198,000 km2 of mangroves in 1980, and 157,630 km2 in 1990 presently represents only 146,530 km2 across the globe. Both demographic compulsions and changed climatic issues pose great threat on these vast greenery and have triggered the existence crisis of this important habitat.

Mangroves, a divergent plant community having more or less akin habitat are one of the most vulnerable ecosystems positioned at the intertidal zones of Tropical and Subtropical world. Being a transition ecosystem of marine and fresh-water, they possess an absolute ecological and economic significance to the environment and inhabitants.

Deprivation of mangrove ecosystems in India are mainly due to unplanned escalation of anthropogenic activities such as encroaching of mangrove wetlands for aquaculture and overexploitation of mangrove forest resources. Inhabitants of the vicinity of Sundarbans mangrove forest are at jeopardies of depriving their livelihood and at the same time, the ecological communities of the forest itself are in the verge of extinction.

Sundarbans is an extremely delicate ecosystem due to its complex geophysical features and richest species diversity along with accumulative population density. The region is exposed to coastal erosion and increasing salinity level of water and soil. The successful mangrove vegetation rely on primarily sweet water influx to the estuary from neighbouring river system. The distributaries of river Ganges have lost their navigability due to huge silt deposition in the river-bed and influx inadequate supply of fresh water causing salinity rise, that pose a massive degradation of vegetation pattern in this delta. Hence, high salinity tolerant species, such as, *Avicennia* spp., *Bruguiera* spp. and *Exocoecaria agallocha* etc. are gradually replacing comparatively week salt tolerant species, like *Heritiera fomes, Nypa fruticans, Kandelia candel, Xylocarpus* spp. and *Sonneratia casoelaris* etc.

The effective conservation and management of mangrove habitats should be employed in association with local civic participation and adoption of proper scientific exploration. Moreover, mangroves are considered as potential models for studying the salt tolerance mechanisms in plants. Hence, investigations on adaptive potential in individual mangrove species might be informative towards efficient salt management issues.

E: drsaurendas@gmail.com

KEYNOTE

Photosynthetic Pigment Fluorescence Under Pesticide Stress

Dr. Pradipta Kumar Mohapatra
Professor & Head,
Department of Botany, Ravenshaw University,
Cuttack, Odisha, India

Abstract:

Fluorescence is generated as emission from a molecule, atom, compound, ion or nanostructure on relaxation of an orbital electron from an excited singlet state to a stable ground state (may be via a more stable and less energetic triplet state). Photosynthetic pigments in general and chlorophyll a fluorescence in particular have been used as a non-invasive diagnostic technique to analyze the plant responses to various biotic and biotic stressors. Further the fluorescence is also used to standardize cultivation practices for augmented food production. Each photosynthetic pigment has its characteristic absorption and emission spectrum, which remain stable for a definite set of conditions. A variation in the quantity and quantity of emission and a shift in the fluorescence peak of a pigment and/or a pigment complex become useful to evaluate the effect of a stressor. Consequently the fluorescence of pigments has been applied to determine the impact of light, temperature, salt, chemicals, submergence, drought, nutrients and pathogens on plant growth and performance. Fluorescence technique have a wide range of application in photosynthetic organisms of all structural complexities, ranging from unicellular cyanobacteria to angiosperm.

Decrease in the intensity of fluorescence maximum (F_M), and increase in the proportion of fluorescence minimum (F_0) have been observed as general effects of most of the pesticides on algae and cyanobacteria. However, some pesticides like quinalphos and chlorfenvinphos delink the light harvesting chlorophyll complex and/or the phycobilisome complex from the PS II RC resulting in non-photosynthetic quenching of fluorescence. The stress indicating JIP parameters like V_J, M_0, φD_0, and DI_0/RC increase under pesticide stress. Correspondingly the performance indicating parameters like φP_0, ψ_0, φE_0, TR_0/RC, ET_0/RC and PI show a decrease under pesticide stress.

Biography:

Prof. P. K. Mohapatra is professor and Head of the Department of Botany, Ravenshaw University, Cuttack, India. He works in the broad area of stress physiology of planktonic green algae and Cyanobacteria and specific Area on fluorescence behavior of photosynthetic pigments under insecticide stress. His research covers four primary directions i) photosynthetic and physiological responses of algae to insecticide, herbicide and metal stress, ii) density, diversity and taxonomic studies of cyanobacteria of aquatic habitats and rice fields, iii) successional changes of the algal assemblage of rice fields in response to agrochemicals and agropractices, and iv) development of tolerance of fungi, cyanobacteria to OP and pyrethroid chemicals and the analysis of the mechanism of tolerance. Professor Mohapatra is a fellow of Alexander von Humboldt Foundation, Germany and has done his post doctoral research at Rostock University, Rostock and University of Duesseldorf, Duesseldorf, Germany. He has 29 years teaching experience at different universities in the state of Odisha. He is a recipient of Harihar Patnaik Memorial Award for Contribution to Algology by Odisha Botanical Society., Fellow NEA and LEAP of MHRD, Govt of India. He has published 101 research papers, 31 conference proceedings 21 popular articles, 7 book chapters, authored 5 books and edited 5 books. He has two patents to his credit.

E: pradiptamoha@yahoo.com

KEYNOTE

Comparative Proteomics reveals augmentation in allergens as a function of water born toxic metals in the *Notopterus notopterus* from Mahanadi River

Prof. Luna Samanta
Department of Zoology, School of Life Sciences
Ravenshaw University,
Cuttack, Odisha, India

Luna Samanta and Deepali Mohanty
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Reverine fish catch contributes to production of 1 Lakh ton fish in India while that for the state of Odisha is > 20000 ton. However, rapid urbanization and industrialization pose serious threat to water quality of rivers. Metals being non-biodegradable and persistent make the most dangerous pollutant worldwide. We have reported the effects of metal pollution and oxidative stress biomarkers in the tissues of *Notopterus notopterus* collected from three sites (one reference site and two experimental sites) along the course of Mahanadi river in and around Cuttack city (Odisha, India). High throughput comparative proteomic approach was employed to detect the differentially expressed proteins (DEPs) and also to find out the possible novel biomarkers in fish *Notopterus notopterus* exposed to metal contamination in situ. The liquid chromatography-tandem mass spectrometry (LC-MS/MS) Q-TOF analysis of hepatic proteome resulted in the quantification of total 535 proteins, of which 348 proteins are characterized. 31 proteins were found to be differentially expressed in experimental sites compared to the reference site. One of the most important finding is the up-regulation of three potential fish-allergens, namely beta enolase, parvalbumin-2 and parvalbumin-alpha, in the fishes collected from experimental sites that induce IgE response in humans. Expression levels of parvalbumins determine allergenicity of fish. Therefore, these proteins may be used as markers of fish quality in riverine fish catch.

Biography:

Dr. Luna Samanta received her Ph.D. in 1999 from Utkal University, India in Zoology. She was appointed as an Associate Professor of Zoology at Ravenshaw University, India in 2010. In 2014 she was promoted as Professor and Head of Department of Zoology. She was a Commonwealth Academic Fellow at the Institute of Reproductive and Developmental Biology, Imperial College London during 2012. During her tenure, her work on overlapping dose responses of spermatogenic and extragonadal testosterone actions revealed what jeopardizes the principle of male hormonal contraception. She was also the recipient of Govt. of India's Raman-Post-Doctoral Fellowship to USA and had worked at American Center for Reproductive Medicine at Cleveland Clinic Foundation, Cleveland, Ohio, USA. Her pioneering work established the role of human sperm mitochondria dysfunction in impairment of sperm function leading to infertility in varicocele. She was able to identify a panel of potential biomarker proteins in spermatozoa for infertility diagnosis. She is the recipient of several awards, such as the Young Scientist Award by Indian Science Congress Association, Young Scientist Award of Orissa Science Academy and K. K. Nair Prize for outstanding Research Publication by University of Kerala, India. Her current research interests are focused on identifying the biological markers of oxidative stress, DNA damage, apoptosis and autophagy using proteomic research tools and bioinformatics analysis as well as environmental impact assessment using redox markers with particular reference to male reproductive functions. She is actively involved in laboratory and clinical studies assessing the efficacy of certain antioxidants.

E: pradiptamoha@yahoo.com

KEYNOTE

Organic farming for sustainable agriculture

Dr. Bijoy Kumar Sahoo
Dean, Institute of Agricultural Sciences
S'O'A University
Bhubaneswar, Odisha, India

Abstract:

Now a days most countries are facing a major environmental challenges. It is a brainstorming question, how we can satisfy the needs of today's humanity while leaving the Earth in good condition for the generations that will inhabit it after us. The clear answer is sustainable production system. It is not a step backwards, but a progress for humanity: that of consuming not less, but better. The threat to chemical farming has shed light on the direction of organic farming and is the best natural tool to fight it. And before the ecosystem falls out of our hand, it is time to begin an ecological revolution. Organic farming is nature's way of farming with the adoption of our non-synthetic traditional agricultural knowledge i.e. farmer is just creating a composure environment where crops can grow. This farming method can overcome the ill effects caused by over the adoption of chemical farming and it shall increase the agricultural production and productivity in a healthy way without affecting the ecosystem balance for the growing population. Growing demand for organic food is due to the increase in disposal income at urban along with the Government supports, innovative technologies & investments and these factors are the drivers for organic farming and its marketing. These drivers provide immense potential and scope for the Indian organic sector but there are many challenges faced at producers, processors and consumer level and this can be solved by the organized working of organics promoting agencies at all levels to get on a smooth track. Farmers and companies are under strict Government approved practices and regulation to produce certified organic products with the use of renewable resources and they need to take regular certification and inspection to maintain the quality. The perfect dissemination and implementation from consumers to producers need an extension to play its roles and methods to reach and help at every corner of Indian farming.

Biography:

Dr. Bijoy Kumar Sahoo was born on 22nd June 1953 ,was a graduate, post graduate and Ph. D from the lone State Agricultural University, OUAT ,Bhubaneswar,. He joined OUAT service on 16th January 1976 and after rendering 37 years of Service in different capacity retired from OUAT service in April 2013. He has been awarded FAO Fellowship under Young and Talented Scientist Programme of ICAR,GOI and visited Texas Agriculture and Mechanical University ,Texas, USA (02.05.1995 to 31.07.1995) . He is a Life Member of five professional Society and co-opted member of CHSE, Odisha from 2001-2004 ,member Editorial board for Agriculture optional of BSE, Odisha from 2002 –05 and member Editorial board for Agriculture optional of CHSE, Odisha from 2007 -2013. He has taken courses in different faculties viz. College of Agriculture, Veterinary Science & Animal Husbandry and Forestry and guided five M.Sc (Ag) students. Dr. Sahoo has to his credit 110 research publications and co-author of two Text Books.His latest book in Odia "Gokhadya Fasalara Chasa "is being published by the Odisha Text Book Press for the cause of dairy farmers and entrepreneurs of the state. His significant achievements include developing agro-techniques for increasing production of Betel vine and its disease control, rainfed cropping for North Eastern Ghat and Mid Central Table Land Zone of Odisha, Forage based crop sequence, forage production in problem soil and creating awareness among dairy farmers, vetenarians and forest officials to grow fodder, Co- scientist in release of groundnut variety-Smruti (OG 52-1) by SVRC, Odisha, associated in development of sustainable models for rainfed farmers of Dhenkanal , Kondhamal and Kalahandi districts of Odisha and monitoring seed production activities of OUAT from September 2011 till June 2013.He joined as Professor (Agronomy) in the Faculty of Agricultural Sciences (Institute of Agricultural Sciences), Siksha 'O' Anusandhan (Deemed to be University), Bhubanswar on 5th August 2013 and presently continuing as Dean of the Institute.

E: dean.ias@soa.ac.in

KEYNOTE

Bioinformatics tools and Techniques for mining of simple sequence repeat (SSR) markers in plant genomes

Dr. Raghunath Satpathy
Assistant Professor, School of Biotechnology
Gangadhar Meher University
Sambalpur, Odisha, India

Abstract:

Applications of molecular markers are one of the important aspects in the areas plant genomics and breeding. Out of several types of molecular markers, the simple sequence repeats (SSRs) (microsatellites) are observed in both the coding and non-coding regions of the genome and associated with regulation and expression of the specific trait of the plant. The SSRs are the repetitive DNA in which the repetition occurs in the range of 2-5 base pairs. Due to their occurrence throughout the genome, they exhibit greater genetic diversity and are used as a suitable molecular marker. The applications of SSRs are important in the case of plants, as they are widely used for gene mapping, biodiversity study, and study of the desired traits. However, the traditional methods for the detection of SSR-based polymorphism are a difficult task. So, Bioinformatics tools and techniques are widely used to study these molecular makers. Due availability of a huge amount of genomic data in the form of the whole genome and Expressed sequence Tags (EST) provides the opportunity to implement the bioinformatics tools and methods to predict the SSR associated with the desired trait of the plants. Several computational programs along with the pipelines are available to predict the SSR sequences automatically by using the available genomic information.

Keywords: SSR markers, Bioinformatics techniques, Next generation sequencing, Plant breeding, Biodiversity study Genome annotation, Expressed Sequence Tags

Biography:

Dr. Raghunath Satpathy received his M.Sc in Botany from Berhampur University Odisha, (Post M.Sc.) Advanced P.G Diploma in Bioinformatics from University of Hyderabad, M.Tech. degree in Biotechnology from VIT University, Vellore India, also he was awarded the degree for the doctor of philosophy (PhD) in Biotechnology by Sambalpur University, Odisha. Previously he worked as an Assistant Professor and head in the Department of Biotechnology, Majhighariani Institute of Technology and Science (MITS) Odisha. Currently he is continuing as the Assistant Professor in the School of Biotechnology, Gangadhar Meher University, Odisha. He is having more than 11 years of experiences in both teaching and research. He has authored 28 journal papers, ten book chapters and one book to his credit and he is the recipient of many academic and research awards.

E: rnsatpathy@gmail.com

KEYNOTE

Biotechnology in rice improvement: Recent developments and future prospectives

Dr. Sanghamitra Samantaray
Principal Scientist (Agricultural Biotechnology)
ICAR-National Rice Research Institute
Cuttack, Odisha, India

Sanghamitra Samantaray and Sandeep Kumar Singh
ICAR-National Rice Research Institute, Cuttack , *Odisha, India*

Abstract:

Rice, an important food crop in developing countries, feeds more than 2 billion people as a staple food. Improvements in rice, since Green Revolution have been tremendous and biotechnology in the age of genomics offers unique opportunities for further improvements to achieve sustainable green agriculture. Plant biotechnology, a key component of agricultural biotechnology covers various aspects of plant tissue culture, genetic transformation, maker assisted selection and CRISPR/Cas9 technology. Tissue culture methods provide a wide range for the creation, maintenance and utilization of genetic diversity for rice improvement. Some basic techniques of tissue culture such as, anther/microspore culture, soma clonal variation, embryo culture and somatic hybridization are being exploited to generate useful genetic variability for obtaining incremental rice improvement. The anther culture derived doubled haploid technology is very useful in production of homozygous line, development of mapping population for bi-parental mapping (QTL mapping) by reducing the crop breeding cycle and subsequently reduce the time to produce and release new varieties. Development of hybrid variety is the major breakthrough to overcome the yield barriers in rice. However, it has not gained any popularity among the Indian farmers due to its complicated seed production system, repetitive replacement of seed in every season and higher seed cost. But the doubled haploid technology stands as an alternative for fixing of the hybrid vigour within a very short period of time.

In addition to this, the newly reported haploid inducer line (HIL) technique can trigger the doubled haploid production in rice. During the past 15-20 years, remarkable achievements have been made in the production, characterization, field evaluation and release of hybrids in rice. Research in genomics allows high resolution genetic analysis for physical mapping and positional gene cloning of useful genes for rice improvement. Molecular (DNA) markers help in precise characterization of germplasm, construction of linkage maps and DNA fingerprinting of crop varieties. Molecular markers are now increasingly used for marker-supported gene pyramid formation and foreign gene transfer. The biofortified rice, which is high in zinc and iron in polished seeds was developed using marker assisted selection techniques. By using gene pyramiding coupled with doubled haploid technology Xa21 rice now can be used in the farmers' fields. Recent development of apomictic line for fixation of heterosis using CRISPR/Cas9 technology in association with doubled haploid technology can reduce the breeding cycle, hence the cost of hybrid rice production will be reduced and subsequently farmers can produce more rice at lower cost with integrated crop protection.

E: smitraray@gmail.com

KEYNOTE

Conservation, cultivation and sustainable use of medicinal plants

Dr. Gyanranjan Mahalik
Associate Professor, Department of Botany, School of Applied Sciences
Centurion University of Technology and Management,
Bhubaneswar, Odisha, India

Abstract:

A key global concern increasing world population coupled with a widening economic divide between the poor and the rich is a serious global problem associated with the affordability of expensive quality healthcare by the economically weaker sections. According to the World Health Organization (WHO) recognition of traditional complementary and alternate systems of medicine to provide health security to the poor in developing nations is a welcome step. These systems widely use medicinal plants (MPs) for preparing drugs. Globally only 18% of world flora are presently used for healthcare. Only 900 medicinal plants are grown in different nations, mostly in developing economies, out of the 3000 medicinal plants traded in worldwide marketplaces. Unfortunately, the majority of the exported biomass is harvested from the wild often following non-scientific and unsustainable practices. Rapid habitat loss, indiscriminate overharvesting, global warming, and climate change are rapidly diminishing medicinal plant populations and threatening their usage in the future. Current worldwide and regional efforts to better understand and control the effects of wild harvesting, on the other hand, can significantly enhance the conservation, cultivation, and long-term use of this valuable plant resource.

Keywords: Conservation, Cultivation, Medicinal plants, Healthcare, WHO

Biography:

Dr. Gyanranjan Mahalik is working as an Associate Professor at Department of Botany, School of Applied Sciences, Centurion University of Technology and Management. He was awarded with UGC- JRF for carrying out his M. Phil Research work and RGNF-SRF Fellowship in Science by Union Grants Commission (UGC) in 2014, to undertake the Ph.D Programme at Utkal University, Bhubaneswar. Dr. Mahalik has published 2 books, 18 book chapters and more than 60 number of research papers in peer reviewed journals of national and international repute. He is currently working on different aspects of Plant taxonomy, Ethnobotany, Microbiology, Antimicrobial activity, Plant stress biology, Environmental science, Ecology and Biological sciences

E: gyanranjan.mahalik@cutm.ac.in

KEYNOTE

Azotobacter vinelandii helps to combat chromium stress in rice by maintaining antioxidant machinery

Dr. Ranjan Kumar Sahoo
Associate Professor, Department of Biotechnology
School of Engineering and Technology
Centurion University of Technology & Management
Bhubaneswar, Odisha, India

Abstract:

Chromium causes toxic effect (injury) in plants by generating reactive oxygen species (ROS) which create oxidative stress. *Azotobacter vinelandii* helps in growth and development of many crops; however, its role in chromium stress tolerance in rice has not been explored. Here we report the new function of *Azotobacter vinelandii* strain SRI Az3 (Accession number JQ796077) in providing chromium stress tolerance in Oryza sativa (var. IR64). The efficiency of the strain was checked under different concentrations (50, 100, 150, 200 and 250 µM) of chromium stress and it was observed that it provides stress tolerance to rice plant up to 200 µM concentration. Different agronomic growth parameters were found to be better in this strain of *Azotobacter vinelandii* inoculated rice plants as compared to un-inoculated one. The agronomic growth and photosynthetic characteristics such as net photosynthetic rate (PN), stomatal conductance (gs), intercellular CO_2 (Ci) were also found to be significantly increased with increasing concentration of *Azotobacter vinelandii* inoculation. The activities of antioxidant enzymes were significantly higher (35%) in rice plants inoculated with *Azotobacter vinelandii* as compared with un-inoculated rice plant. All these positive effects of *Azotobacter vinelandii* help rice to survive from the toxic effect of chromium.

Biography:

Dr. Ranjan Kumar Sahoo has 12 years teaching and 10 years research experience in the field of biotechnology. He has published 3 books, more than 50 research publications in reputed Indian and foreign journals. He has 1 patent and he has developed 2 new techniques/ protocols for generation of transgenic crop plants. He has published several publications on soil microbes, plant microbe interaction. He was working as a researcher in International Centre for Genetic Engineering and Biotechnology (UN organization), New Delhi, and School of Life Sciences, Jawaharlal Nehru University, New Delhi for 10 years.

E: ranjan.sahoo@cutm.ac.in

KEYNOTE

Hope and approaches needed for doubling farmers' income through aquaculture and allied technologies

Dr. Padmanav Routray
Principal Scientist Fish & Fisheries (Carp breeding),
ICAR- Central Institute of Freshwater Aquaculture
Bhubaneswar, Odisha, India

Abstract:

In the absence of a clear bench mark of farmers income from agriculture in general and aquaculture in particular, it becomes difficult for technocrats to apply any particular interventions to achieve it. Moreover, the average land holdings in India are very small in many states and the adoption level of technologies and investment capacity is very wide. In this scenario, many of the approaches proposed by government are taking time towards fulfilment. There is a strong hope associated with enthusiasm of farmers to make farming profitable at first place and then double that profit. The low and highly fluctuating farm income is causing detrimental effect on the interest in farming and farm investments, and is also forcing more and more cultivators, particularly younger age group, to leave farming. In this context, it is worth mentioning that the profit and income from aquaculture based enterprises has increased manifold. This has been possible due to the fact that many aquaculture technologies including seed production, grow-out, post-harvest and most importantly cold chain has developed in India. No distress sale has been reported in India from freshwater and brackish water aquaculture in the recent past. Having said this, it is important to note that, even aquaculture may fail when practiced in a stand-alone manner. So, the need of the hour is an integrated approach for the development of the whole agri-aqua sector and development of value chains in the particular commodity/species which is being carried out in a particular area. By only making a target without proper road map may lead to agrarian distress, so instead of hypes associated with farmers' income a strategy of integrated approach including animal-agriculture-aquaculture approach may yield successful result.

Biography:

Dr. Padmanav Routray, presently working as a Principal Scientist at ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar completed M.Sc. (Fisheries Management) from University of Bombay in 1991 and later obtained Ph.D. (Fisheries Science) from Tokyo University of Fisheries, Japan in 2003 and second Ph.D. (Life Science) from Sambalpur University, Odisha. He has worked as a Consultant for FAO of United Nations, in Nepal, Bangladesh, Namibia, and Sudan and as NAQDA consultant to Sri Lanka. His major research contributions are developing embryonic stem cells and adult stem applications in animal and human therapeutics, cryopreservation of embryonic cells and germ cells, fish breeding and surrogate fish production. He is the recipient of several honours and awards such as: two times recipient of ICAR Team Award, Scroll of Honour from Govt. of Sri Lanka, Gentleman Scientist Award from Govt. of Sudan, STA-2000 from Society of Cryobiologists, USA, Best Young Scientist Award- 2003 from ICAR-CIFE, Mumbai, Japanese Govt. Research Fellowship (MONBUSHO) - 1999. He has more than 80 research publications and authored/edited five books related to Aquaculture and Fisheries, supervised 10 Ph.D. Scholars. He has 5 patents and 3 products to his credit. He is the member of several Important Committees in Govt. of India and is the Vice-President (East Zone) of the ARS Scientists Forum, New Delhi.

E: routray30@yahoo.co.in

KEYNOTE

Strategies to double farmers' income by 2022 through sustainable Agricultural System

Dr. Samarendra Mahapatra
Professor & Head, Agribusiness Management
Odisha University of Agriculture & Technology
Bhubaneswar, Odisha, India

Introduction:

The strategy for the development of agriculture sector in India was through raising agricultural output as well as improving food security. An increase in productivity by way of having better technology, varieties, use of quality seeds, optimum use of fertilizer as well as agrochemicals' addition to that the incentive structure in the form of remunerative prices for some crops and subsidies on agricultural inputs. Public investments in field of Agriculture facilitating the institutions. During early 60's due to the adoption of green revolution in India food production multiplied by 3.7 times while population multiplied by 2.55 times which made India not only self-sufficient in food at aggregate but also a net food exporting country. Hence measures will be needed to harness all possible source of growth of farmers' income from agricultural sector and outside.

Within Agriculture sector like

Increase in cropping intensity

- Diversification to high value crop
- Improvement in productivity
- Efficiency in resource utilization

Outside Agriculture sector like

- Shifting from farm to non-farm occupations
- Improving in Trading

In one end farm land is decreasing due to commercialization and industrialization while in other end there is a demand for increasing agri-food production and productivity for the rising population. Improvement in total factor productivity is a vital source of output contributing to cost saving and income rise. Diversification to high value crops like fruits, vegetables ,milk,egg,fish and meat etc. Which contribute about 41% of total output with 19% of gross cropped area where as same contribution was made by staple crops with about 77% of gross cropped area. An increase in crop intensity will benefit farmers' and enhance their income which is feasible by increasing the net shown area in kharif and Rabi season crops. Shifting cultivators to non-farm and subsidiary activities can be taken care .Government initiatives for policy towards developmental and technological to reduce cost and raise output like Pradhan Mantri Krishi Sinchayee Yojana, Soil Health Card,Paramparagat Krishi Vikas Yojana, Pradhan Mantri Phasal Bima Yojana,PM-Kissan Yojana-NAM,KISSAN RAIL etc state level Schemes in Odisha like KALIA,BALARAM and SAMRUDHI etc. Besides the Model APMC Act., Modified Essential Commodity Act., Farmers' Produce Trade and Commerce bill2020,,Farmers agreement of price assurance and farm services bill2020.

Average Yearly Income of Indian Farmers in 2020

State	Income
Punjab	220000
Haryana	170000
J&K	150000
Kerala	140000
Karnataka	100000
Gujarat	96000
Maharashtra	88000
Rajasthan	88000
Tamil Nadu	83000
Assam	80000
MP	74000
Andhra Pradesh	73000
Chhattisgarh	62000
Odisha	59000
UP	58000
Jharkhand	56000
West Bengal	48000
Bihar	43000
All India basis	77124

Agriculture Orientation Index:

India is among top ten countries in government spending towards agriculture 7.3% of total expenditure. Budgetary allocation towards agricultural sector has increased by 4.4% in the Union budget 2022-23 which is lower in comparison to inflation rate 5.5-6%. Agriculture Orientation Index is developed as a part of goal for Zero Hunger of 2030 agenda for sustainable development in 2015.Sustainable Development Goal SDG2 emphasizes increase in investment in Rural Infrastructure, agriculture research & extension services, development of technology to enhance agricultural productivity and poverty elimination in low and middle income nations. AOI is given by dividing agricultural share of government expenditure by agriculture value added share of GDP. Ratio of government spending towards agriculture and agriculture sectors contribution to GDP. AOI is greater than one for China and Korea etc. India is 38th rank in the world while about 70% of population is dependent on agriculture and being the largest producer of several crops produced and consumed in the world. India is having low productivity with average land holding size of 1.08 hectare.

Cereasl yield in India is only 3282kg/hectare as compared to 4225kg/hectare in Asia. India and China are among the World's largest producers of Wheat, rice, cotton, maize etc. Budgetry support is low in crop insurance ,MSP ,market intervention scheme and price support scheme. Schemes need to ensure MSP based procurement for pulses and oilseeds which has serious implications for performance of the sector. The intensification in government spending in agriculture sector is key to attain SDG for higher growth and farm incomes. Capital investment is more crucial compared to price support programs in agriculture sector as it need to improve rural infrastructure as well as marketing facilities. Focus on irrigation facilities and connectivity increase in number of markets as per the National Commission on Farmers will enhance farmers access to markets integrating small and marginal farmers into agricultural supply chain to a great extent.

Government of India Schemes and policy initiatives:

- Federation of Indian FPOs and Aggregators (FIFA) registered in company's act 2013 New Delhi supported by NAFED in 2020 to provide Market linkage to FPOs, information, business plan ,market infrastructure, digitized marketing, special market for Positioning production clusters of various commodities, cluster based business organization, corporate for contract farming as well as FPO promotion through e-kisan mandies, input and grocery sales, honey collect-processing-branding and other agri allied development projects.
- Production of high value agri-commodities through value chain development.
- Contract farming for shifting market risk of producers/growers
- Adopting Integrated Farming System for profitability and sustainability in an eco-friendly manner.
- Taking advantage of Government of Odisha schemes like BALARAM, KALIA, SAMRUDHI, Millet Mission, Agroforestry etc.
- Farmers also can encash the benefits of Government of India schemes like Kissan Rail, e-NAM,APMC Act, Agri Commodity exchanges like NCDEX & MCX etc. Developmental programs, Schemes, reforms, policies with higher budgetsry support are-
- PM PBY: Pradhan Mantri Phasal Bima Yojana from kharif 2016 is the government sponsored crop insurance scheme that integrates multiple stakeholders on a single platform. Farmers have to register to use.It covers all stages of crop cycle, post-harvest risk with a low premium contribution.
- PM Kissan: PM Kissan Samman Nidhi scheme with 100% funding from Government of India. Pmkissan.gov.in can be used to check the status of payment and beneficiary status with Adhaar/Account/Mobile number. The fund will be directly transferred to the bank account of the beneficiaries.
- PM KMY: Pradhan Mantri Kissan Mann Dhan Yojana for old age pension to farmers @ 3000/- to small and marginal farmers after 60 years.
- Atma Nirbhar Bharat with reference to economic vision and development of Rural India and Agriculture includes market reforms and Agri infra fund of one lakh crore and Bee keeping initiative 500crore.
- Increase in MSP for Kharif and Rabi crop for 2018-19 season @ 150% of cost of production.
- Soil Health cards to farmers to rationalize the use of fertilisers.
- "Per drop more crop" initiative through drip/sprinkler irrigation for optimum use of reducing cost of inputs and increasing water productivity.
- PKVY-Paramparagat Krishi Vikas Yojana to promote Organic farming.
- E-NAM online national agriculture marketing portal provides farmers electronic transparent and competitive online trading platform.
- Promoting Agroforestry for additional income like National Bamboo mission.
- PM-AASHA- Pradhan Mantri Annadata Aay Sanrakhan Abhiyan to ensure remunerative price for farmers produce.
- MIDH-Mission for Integrated Development of Horticulture to hike productivity through pollination.
- To ensure adequate credit facility to agriculture sector extending reach of institutional credit to farmers on priority basis,
- Relief to farmers affected by natural calamities interest subvention of 2% to banks on restructured amount to small & marginal farmers with KCC upto 6months of postharvest.
- KCC to farmers for Animal husbandry and fisheries.

Market Reforms through ----

- Model APLMC Agril Produce Livestock Market Committee
- Grameen Agri-markets as aggregation platform
- Agri-export policy to double income by 2022.
- Farmers' Produce Trade and Commerce Ordinance 2020
- Farmers' Agreement on Price Assurance and Farm services ordinance2020.
- Essential Commodity Act 1955 modified and amended to deregulate agri-commodities.
- Promotion of 10000 FPOs by 2024.
- Corpus fund for micro-irrigation @500crore
- Agri-infra fund of one lakh crore for logistics development (Backward & Forward linkage)

Conclusion:

It needs to emphasize on the following for not only increasing farmers' income but also progressing towards sustainable agricultural system.

Measures to be taken:-

- Improving water conservation and storage measures.
- Providing incentives for selection of drought tolerant crop species.
- Managing crops to reduce water loss and low volume irrigation system.
- Improving energy efficiency and renewable energy application in agriculture.
- Crop rotation and crop diversity
- Integrated Pest Management
- Integrated Nutrient Management
- Integrating Livestock and crops
- Managing landscapes
- Environmental health-agroecology
- Economic profitability
- Social equity
- Organic manure and bio-fertilizers.
- Improving resource use efficiency and conserving natural ecosystems
- Protecting and improving rural livelihood and social wellbeing.
- Extensification process of decreasing the use of capital inputs: Fertiliser, pesticide and equipment etc.
- Sustainable intensification process of yield hike without environmental impact.
- Climate resilient zero budget natural farming.

E: samarendra.mahapatra@gmail.com

Evation

AGRI Vision 2022

DAY-02

Mar 07, 2022

ORAL PRESENTATIONS

Canara
GOLD
LOAN

ORAL

Allium genetic resource in India: prioritization and study on neodomestication trends

Anjula Pandey
ICAR-National Bureau of Plant Genetic Resources, Regional Station, Bhowali, Uttarakhand, India

Abstract:

Indian gene center has rich diversity in the genus *Allium* with about 35-40 taxa occurring wild, semi-domesticated and cultivated in the temperate and alpine regions of Himalaya. The western Himalaya record maximum concentration (over 85%) of *Allium* genetic resources followed by diversity in the eastern Himalaya (6%) (common in both the regions- 9%); vertical distribution of the taxa follows a trend- subtemperate-alpine region (2,500-4,500m; 25 species), followed by subalpine-alpine region (4,500 m and above; 4 species) and temperate region (1,500-2,500 m; 3 species).

The new crops (neodomesticates) of *Allium* are regionally important for food security and economic benefits to the farmers; and therefore require a systemic approach to enhance their commercialization in the wake of environmental change. Out of over 30 wild and semi-domesticated taxa in the genus, over 10 prioritized taxa have scope for domestication for the Indian region. Of the several taxa occurring in different stages of domestication here, *A. tuberosum, A. przewalskianum, and A. stacheyi* (western Himalaya) and *A. tuberosum, A. hookeri and A. fasciculatum* (north eastern hill region) were studied for diversity and systematic, trends of domestication and genetic resource value. A new species, *A. negianum* has been described recently from the western Himalaya. It was observed that these species responded to selection for some useful traits such as bulb tunic character, size of root and leaf, and plant aroma and some had developed adaptability under cultivation. The ICAR-National Bureau of Plant Genetic Resources, New Delhi has emphasized on this group and collected the germplasm from diversity rich areas. Over 21 native wild species are maintained, and evaluated in the field genebank (FGB) at regional station Bhowali, Uttarakhand and in in vitro repository. These new *Allium* crops need diversification of cultivable area, popularization, marketing, and value addition to enhance the scope of commercialization. Research thrust on adaptability trials, response to domestication process and value addition need prior focus.

E: anjuravinder@yahoo.com

ORAL

Combined application of gamma irradiated chitosan and thiourea improves growth and productivity of rice under nitrogen deficient conditions

Pandey M[1], Negi P[1,2], Radha Krishna P[1], Srivastava AK[1,2]
[1]*Bhabha Atomic Research Centre, Mumbai,* Maharashtra, *India*
[2]*Homi Bhabha National Institute, Mumbai,* Maharashtra, *India*

Abstract:

Nitrogen (N)-fertigation is closely associated with increased crop yield and productivity. However, a large fraction of field-supplemented N fertilizer is wasted due to several environmental factors and limited nitrogen use efficiency of the plants. In addition, excess N fertilizer is a major atmospheric pollutant with serious implications for human health. This necessitates the optimization of N fertilizer usage to achieve high crop yield with minimal environment-associated costs. In continuation of this, a formulation of chitosan and thiourea (CT), which consists of two well-accepted bioregulators-chitosan (a plant growth stimulator) and thiourea (a redox-based stress modulator)- was repurposed to enhance the nitrogen use efficiency in the staple cereal crop rice. Nitrogen deficiency (N50, N fertilizer reduced by 50%) severely affected rice growth and productivity; the leaf chlorophyll content and yield were reduced by 35.7 and 29.1%, respectively, under N50 conditions. In contrast, CT application was found to improve the yield by 29.8% as compared with plants grown under N50 conditions. Moreover, the activities of nitrate reductase (NR) and sucrose phosphate synthase (SPS) were found to be increased by 25.6 and 32.3%, respectively, under N50+CT conditions, as compared with those under N50 conditions. The improved nitrogen assimilation observed under N50+CT conditions was further validated by expression profiling of nitrate transporters (NRTs) and ammonia transporters (AMTs) genes. Specifically, *NRT1.6* and *AMT1.2* (in leaves) & *NRT 2.1* and *AMT1.3* (in roots) were found to be upregulated under N50+CT conditions than those without CT application. Taken together, our study indicates that CT application improves the nitrogen use efficiency of rice plants to minimize yield penalty under rationed N-fertigation. Our findings may facilitate curtailing of excess nitrogen input as a step towards sustainable agriculture, benefiting both farmers and environment alike.

Biography:

Dr. Pandey is working as a scientist in Bhabha Atomic Research Centre, Mumbai. He is working in the area of sustainable agriculture and abiotic stress management in crop plants and has published nine papers in peer reviewed international journals along with various presentations in National/International conferences. **Research Interest:** Plant physiology and biochemistry

E: manishp@barc.gov.in

ORAL

Identification of candidate genes associated with oil content through allele mining in safflower

Usha Kiran B[1], Dinesh Kumar V[1] and Uma A[2]
[1] *ICAR-Indian Institute of Oilseeds Research, Hyderabad, Telangana, India*
[2] *Jawaharlal Nehru Technological University, Hyderabad , Telangana, India*

Abstract:

Candidate genes associated with glycerol lipid metabolism, fatty acid biosynthesis, fatty acid elongation were identified from genome sequencing data and primers were designed for amplification. Initially, genes CtaccD (Acetyl CoA carboxylase D), CtFAD2-1, CtFAD2-2, CtFAD2-10 (Oleate desaturases), CtGAPDH (Glyceraldehyde3-Phosphate Dehydrogenase), Oleosin 1, 2, 3, 4, 5, 6, 7, 8 genes, CtDGAT-1, CtDGAT-2, CtDGAT-3 (Diacyl glycerol acyl transferases), CtFATA and CtFATB (Fatty acid thioesterases), CtGPAT (glycerol-3-phosphate acyltransferase), CtPDAT (Phospho-diacyl glycerol acyl transferase) have been studied for sequence variation in 40 germplasm lines in which oil content ranged from 23 to 48%. These lines had been phenotyped at four locations. Out of 20 genes studied, PCR based sequencing of 9 genes (CtDGAT1, CtDGAT2, CtPDAT, CtFATB, CtOleosin2, CtOleosin4, CtOleosin5 and CtOleosin9) showed nucleotide variation between 20 low and 20 high oil lines in safflower. Two different haplotypes were observed for all the nine genes analyzed. Ctoleosin 4, 5, 9 showed nucleotide change in the coding region in high oil lines leading to the change in the amino acid composition from methionine to lysine, threonine to serine and serine to glysine respectively. Whereas, CtOleosin2 showed nucleotide change in the 3' UTR region without amino acid change. Based on the sequence results, allele specific primers were designed for CtDGAT-1, CtFATB and CtPDAT and all the genotypes (192 no) in the mapping panel were screened.

Strong association was observed with CtDGAT-1 and oil content with R2 value of 0.76 and with CtPDAT, CtFATB has R2 value of 0.19 and 0.24 respectively. With Oleosin genes i.e., CtOleosin 2, 4, 5 and 9 as the alleles differ by single nucleotide or 3 nuclotide changes. Only with CtOleosin 4 and 9 allele specific primers are designed and validated in 96 panel which are again sequenced for further validation of marker efficiency. With these genes also strang association was observed with R2 value of 0.35 and 0.48 respectively. For expression studies, 5 low and 5 high oil lines in safflower GMU5701, A1, NARI57, GMU4558, GMU6794, EC736496, EC 736497, EC736499, EC736495, EC736500-1) was raised in the field. The cDNA was prepared from total RNA isolatedfrom developing seeds at different stages (0 DAF, 5 DAF, 10 DAF, 15 DAF, 20 DAF). cDNA was screened with primers designed for transcripts and sequenced which further confirmed nucleotide variations observed in 5'UTR, Exons and 3'UTR of 9 genes. The natural variation in the candidate genes provides a significant asset for further improving oil content in safflower

Biography:

Usha Kiran is Scientist (Sr.Scale) at ICAR-Indian Istitute of Oilseeds Research, Hyderabad, India. She has 12 years of research experiences in development of molecular markers in castor and Safflower, QTL mapping, genomics, association mapping, tissue culture and transformation. Presently working on allele mining for oil content in safflower and development of transgenics in castor for Botrytis resistance. Attend 3 months international exposure programme in the "International Agriculture and Rural Development, (IARD)" at Cornell University, College of Agriculture and Life Sciences, Ithaca, USA from November 2006 to January 2007. Awarded Andhra Pradesh Netherland programme (APNL) Gold medal for highest OGPA in M.Sc (Agril. Biotechnology), ANGRAU in 2009. Awarded CSIR-JRF fellowship for pursuing Ph.D in 2009. Guided 7 M.Sc (Biotechnology) students from different universities. She is the Fellow of the Indian Society of Oilseeds research, Hyderabad, 2020. Received Young Scientist award in "International conference for food and agriculture", ICFA during March 29-31st at Dhanbhad, Jharkhand in 2018. She has published 15 research papers and 10 book chapter and popular artices and technical bulletins.

E: ushakirandor@gmail.com

ORAL

Insight of the economic impact of Aflatoxin contamination of maize and groundnut in Senegal

Papa Madiallacké Diedhiou[1], **Idrissa Wade**[2] **and Babacar Samb**[3]
[1]Université Gaston Berger de Saint-Louis, Sénégal
[2]Université Iba Der Thiam de Thies, Sénégal
[3]Food Safety Specialist

Abstract:

This study was carried out to assess the economic impact of aflatoxin through contamination of groundnut and maize, some of the main dietary crops in Senegal. An analytical framework dedicated to that purpose, using published data and laboratory data, together with computer simulations was used. The exposure level was found to fluctuate according to the agro-climatic zones and consumer habits. Intake of maize alone leads to exposure to aflatoxins at levels varying from 6.4 to 192 ppb per day. Groundnut consumption exposes to aflatoxin levels ranging from 3 to 101 ppb daily. A combined intake of groundnut and maize in the same diet exposes to daily aflatoxin ingestion ranging from 11.7 to 200 ppb. The computed data, showed an incidence of 3 to 6 liver cancer cases per 100,000 inhabitants in Dakar, Saint Louis and Matam while high groundnut and/or maize production and consumption areas (Kaolack, Kaffrine, Tambacounda, Kédougou) would register between 10 and 17 cases of liver cancer per 100,000 inhabitants. This leads to liver cancer cases from 1057 to 1477 each year in Senegal deriving from aflatoxin effect. The estimated economic negative impact deriving from mortality and morbidity through the DALY calculations showed a yearly loss of more than 98,300 of healthy years in Senegal due to aflatoxins. The total cost related to aflatoxins is estimated to be at least $54 million corresponding to 0.4% of the GDP and a maximum of almost $95 million, corresponding to almost 0.6% of the GDP.

Keywords: Afaltoxins impact, Groundnut, Maize, Senegal, liver cancer

Biography:

Papa Madiallacké Diedhiou; PhD in Plant Pathology at Friedrich-Wilhelm University of Bonn (Germany), Lecturer at School of Agronomy (ENSA, Senegal) between 2003 and 2010, and from 2010 to date, Université Gaston Berger (UGB) de Saint-Louis. From 2006 to 2010 head of department Crop Science Agricultural Ingenieur College (ENSA Thies. From 2011 to 2013 head of department Crop Science Agricultural Faculty of Agriculture Université Gaston Berger

Research Interest: Plant pathology, mycotoxin studies, Pest Risk Analysis and SPS issues

E: papa-madiallacke.diedhiou@ugb.edu.sn

ORAL

Molecular and biochemical characterization of tuberous legume crop Yam bean [*Pachyrhizus erosus* (L.) Urban]

Kalidas Pati, Jeen Linkan Meher, Biswajit Jena, Anant Kumar, M. Nedunchezhiyan, VBS. Chauhan and R. Arutselvan
Regional Centre of ICAR-CTCRI, Bhubaneswar, Odisha, India

Abstract:

Yam bean [*Pachyrhizus erosus* (L.) Urban], is an underutilised legume crop with numerous health benefits due to its nutrients and medicinal properties. The cultivated yam bean yields a substantial root with a high starch and sugar content. However, genetic development of this crop is difficult due to the limited availability of proper documentation of the germplasm and genetic information. As a result, Molecular and biochemical characterisation of accessions is required for efficient germplasm management as well as genetic enhancement of the crop. Keeping in view, the current study was carried out at the Regional Centre of the ICAR-Central Tuber Crops Research Institute in Bhubaneswar, Odisha, between 2020 and 2021 to assess genetic variation in 30 yam bean cultivars using molecular markers and biochemical characteristics such as starch content, sugar content, ascorbic acid content, dry matter content, and skin and flesh colour. Ten SSR markers were employed to explore genetic variation in 30 yam bean cultivars. The SSR primer AIP 23 yielded the most polymorphic bands. It was recorded that the mean PIC value for the SSR markers used was 0.374. The mean major allele frequency was found to be 0.518. The observed heterozygosity in the mean value was 0.943 which was more than the mean expected heterozygosity value 0.498. The cluster containing three cultivars (YBBL15, YBBL12 and EC100544) are highly diversed from the rest making them suitable candidate for crop improvement and development of variety. For the 30 cultivars, the mean percentage values of starch content, sugar content, ascorbic acid content, and dry matter were 11.28±099 %, 5.31±0.51%, 13.94±0.97% and 8.82±1.27% respectively. Cultivars with increased levels of starch, sugar, ascorbic acid, and dry matter can be used to produce high-yielding variety with a high nutritional value.

Keywords: Yam bean, Pachyrhizus erosus, SSR, Diversity

Biography:

Dr. Kalidas Pati joined as a Scientist (Vegetable Science) at Regional Centre, ICAR-Central Tuber Crops Research Institute (ICAR-CTCRI), Bhubaneswar Odisha during 2012. He completed his M.Sc. and Ph.D. from ICAR-Indian Agricultural Research Institute (ICAR-IARI), New Delhi. He completed his Post-Doctoral Research at The University of Western Australia, Perth, Australia under Endeavour Research Fellowship, Australian Government, Department of Education and Training during 2018. He is working in genetic improvement of different tropical tuber crops, especially in development of high yielding nutrient rich yam bean variety, carotene and anthocyanin rich sweet potato variety. Identification and validation of SSR markers in different tuber crops. Phytochemical studies in different tuber crops. Collection and conservation of different tuber crops germplasm. **Research Interest:** Germplasm conservation, molecular characterization, phytochemical analysis, tissue culture, plant cytology.

E: kalidas.pati@icar.gov.in

ORAL

Current drivers of taxonomic biodiversity loss in Honeybee, *Apis cerana* L. and innovative strategies to conserve them under temperate conditions of Kashmir

Shahnawaz Ahmad Dar[1], Abdul Rouf Malik[2], Musarat Shafi[1] and T.A. Wani[1]
[1]KVK/ETC, Pulwama- Sher-e-Kashmir University of Agricultural Sciences & Technology, Kashmir, Jammu & Kashmir, India
[2]Faculty of Horticulture, Sher-e-Kashmir University of Agricultural Sciences & Technology, Jammu & Kashmir, India

Abstract:

Present investigations were carried during 2021-22 about biodiversity loss of Honeybee, *Apis cerana* under temperate conditions of Kashmir. Honeybee, A. cerana is considered as a vital pollinator in apple which is important fruit crop in Kashmir region. Loss of biodiversity directly affect the production and productivity level of apple because of its self-incompatibility in nature. Loss of taxonomic biodiversity of honeybees, *Apis cerana* in Kashmir can be attributed to colony losses by various drivers viz; Destruction of natural habitat (8.3%), Inclement weather conditions (6.2%), Insect pests and diseases (5.8%), Indiscriminate use of pesticides (6.8%) and Agricultural intensification (3.4%). For the conservation of local honeybee, *A. cerana*, an innovative strategies for the formation of mud hive has been introduced to reduce the bee mortality during winter. During the study, only 2% mortality of bees has been recorded in model hive compared to 17.6% in control, because of the capacity of the model hive to maintain its temperature during cold harsh winter conditions. Further the breeding of A. cerana viz; egg laying was extended till December end compared to normal mud hive which lasts until November end. The loss of taxonomic biodiversity in honey bees could somehow be controlled by breeding of local bee strains rather than imported ones. At the same time, conservation efforts also need to be reinforced and ensuring that endangered populations will be protected from uncontrolled introgression of imported strains to keep them available for the future generations.

Biography:

Dr. Shahnawaz Ahmad Dar is currently working as a Scientist - Entomology in KVK/ETC, Pulwama SKUAST Kashmir. He has completed his doctoral thesis on Genetic Diversity of Honeybee, *Apis cerana* F. using Morphological and Molecular Markers. Worked as Senior Research Fellow (SRF) in Horticulture Mini Mission Project entitled "Mass rearing of queen bees for multiplication of honeybee colonies to promote honeybees as pollinators" in the Division of Entomology, SKUAST Kashmir from April- 2006 to Dec-2007. Worked as Project Fellow (PF) in UGC project entitled "Biodiversity & Utilization of Aphidophagous Syrphid flies in Agro Ecosystem of Kashmir" w.e.f. Dec. 2012 to March. 2014 . About 7 years' experience as Agriculture Extension officer (AEO) in department of Agriculture Govt. of Jammu and Kashmir and 20 years' experience in Beekeeping at home level. He has published 46 Research articles, 8 Book chapters, 25 Conference papers, bagged 3 awards with 3 ongoing research projects in hand.

E: sadar20@gmail.com

ORAL

Oxford nanopore sequencing technology and its applications

Sutar Suhas Bharat, Ankita Choudhary, and Rukmini Mishra
Centurion University of Technology and Management, *Odisha, India*

Abstract:

Oxford Nanopore technology (ONT) is a third-generation sequencing technology that allows scientist to sequence nucleic acids such as DNA (deoxyribonucleic acid) or RNA (ribonucleic acid) in real time. A nanopore device has been used to sequence approximately one-fourth of all SARS-CoV-2 virus genomes to date. This is one of the latest generations in sequencing platform, the technique identifies the sequence of nucleotides in DNA or in RNA by measuring changes in an electric current as the DNA or RNA molecule passes through a nanopore. The nanopore, a tiny hole one billionth of a meter in diameter, is implanted in a membrane that separates two chambers containing electrolyte solutions. When a modest voltage is supplied, an enzyme steadily ratchets the molecule through the nanopore along with an ionic current. Specialized software figures out its sequence based on how much short sequences of individual nucleotides block the flow of ions and tiny changes in electrical current. Both DNA and RNA contain adenosine (A), cytosine (C) and guanine (G) nucleotides. They also distinguished by one nucleotide i.e., thymine (T) in DNA, while uracil (U) in RNA. The discovery of the MinION platform in 2014 established ONT at the forefront of low-cost sequencing platforms. It was quickly followed by the GridION which contains five MinION flowcells and PromethION which designed to run 24 or 48 larger capacity flow cells, utilize the same core technology as the MinION but are designed for larger sequencing loads. ONT has been used to sequence small genomes such as that of the bacterium *Escherichia coli* as well as large and repetitive plant and animal genomes. Examples include the human genome and plant genomes.

Keywords: Oxford nanopore, SARS, MinION, GridION, PromethION, *Escherichia coli*.

Biography:

Currently, Sutar Suhas Bharat is working as Assistant Professor at CUTM, Bhubaneshwar. I have completed Ph.D. at Institute of Crop Sciences, Chinese Academy of Agricultural Sciences, Beijing, China. I have pursued MSc. (Biotechnology) from TNAU, Coimbatore, TamilNadu. I was awarded as DBT fellow and obtain DBT scholarship for my master degree. For my Ph.D. I got a scholarship from the ministry of HRD Govt. of India and CSC China. Research area: Genome editing in plant (CRISPR/Cas9), Oxford nanopore sequencing, Marker assisted selection

E: Sutar.suhasbharat@cutm.ac.in

ORAL

A comparison between tolerant (*Aspergillus niger* M-RU01) and wild type strain of *Aspergillus niger* while degradation of four OP insecticides

Debasish Mohapatra[1], Saktikanta Rath[2], and Pradipta K Mohapatra[1]
[1]Ravenshaw University, Cuttack, Odisha, *India*
[2]*RamadeviWomens' University, Bhubaneswar, Odisha, India*

Abstract:

The organophosphate insecticides are one of the most toxic groups of chemicals deliberately added into the environment for domestic and agricultural pest control. Malathion is a very commonly used OP insecticide applied in over 100 food crops in agriculture and post-harvest storage. Different species of *Aspergillus* have shown their efficiency to degrade OP chemicals. However, malathion residues are found in the agricultural fields needing their rapid post application removal. A malathion mutant of *Aspergillus niger* MRU01 developed by prolonged malathion exposure was tested for its efficiency to degrade malathion as well as other commonly used OP insecticides. The mutant grew efficiently in the presence of 500 µM of malathion and the biomass production of *A. niger* M-RU01 was significantly higher than of untreated as well as treated wild type. Except dehydrogenase, the activities of phosphatases and esterase of *A. niger* M-RU01 strain was significantly higher than of the wild type at 500 µM of malathion, the degradation ability of tolerant strain was found to be 39% more as compared to wild type during first five days of treatment. The mutant strain was also able to degrade other OP like dimethoate and chloropyrifos with equal efficiency while a lower efficiency of degradation of parathion was observed. The strain can be used for field application to degrade diverse OP compounds.

Keywords: *Aspergillus niger,* malathion mutant, OP insecticides, esterases, phosphatases, removal.

Biography:

Dr. Debasish Mohapatra (born on 26/08/1988) has passed 10th from Cambridge School, Cuttack and 12th from Netaji Subash Memorial City College, Cuttack. He has completed Graduation (Biotechnology Hons.) and Post Graduation (Biotechnology) from Utkal University, Cuttack, Odisha. He has been awarded with Ph.D. degree in 2020 from the Department of Botany, Ravenshaw University, Cuttack, Odisha. His doctoral thesis is focused on development of fungal preparation for accelerated degradation of organophosphate. Apart from his thesis work, he has also been worked on plant tissue culture of medicinal plants. He has published 11 research papers in reputed and peer reviewed Journals, and actively participated and presented work in 11 National & International conferences/ Workshops. Dr. Debasish Mohapatra currently holds the position of Guest Faculty in the Department of Botany, Ravenshaw University, Cuttack, Odisha. Research Interest: Bioremediation of pesticide

E: debasish2050@gmail.com

ORAL

Biopriming of Rice for Physio-chemical induction of defense against *Xanthomonas oryzae* pv. *oryzae*

Shasmita[1,2], Pradipta K Mohapatra[2], Soumendra K Naik[2], and Arup K. Mukherjee[1]
[1]ICAR-National Rice Research Institute, Cuttack, Odisha, *India*
[2]*Ravenshaw University, Cuttack, Odisha, India*

Abstract:

Rice is an important cereal crop of Asian countries. An armada of pathogens (bacterial, fungal and viral) significantly limits the production of rice. Bacterial blight is caused by *Xanthomonas oryzae pv. oryzae* (Xoo), which causes necrosis of leaf tissue and down-regulation of photosynthesis, resulting in huge loss (50 %) of annual rice grain yield. Excessive application of agrochemicals of diverse types has been considered as the primary option to control pathogens and enhance rice production thereby leading to selection of populations of resistant pathogen to the active ingredients. Inducing resistance in rice by using safe and novel biotic/ abiotic agents provides an efficient eco-friendly alternative to effectively manage rice pathogens. In the present investigation, rice seeds were bio-primed with *Trichoderma erinaceum*, *Bacillus subtilis and B. megaterium* and the mechanism of defense induction was studied as response in alteration of Photosystem II (PSII; by using chlorophyll a fluorescence technique) function and defense enzymes activity. Among all the biotic agents, *B. subtilis* provided most promising result in inducing defense against Xoo by improving the photosynthetic efficiency, PSII and, superoxide dismutase, catalase, and peroxidase activity. Field experiment conducted with B. subtilis showed no detrimental effect on rice grain yield thereby suggesting that priming rice plants with B. subtilis provides an effective way to manage bacterial blight disease of rice. Further studies are needed to understand the molecular mechanism of rice-Xoo-*B. subtilis* interaction.

Keywords: Induced resistance, chlorophyll a fluorescence, photosynthesis, catalase, peroxidase, superoxide dismutase

Biography:

Dr. Shasmita (born on 09/09/1989) has passed 10th and 12th from Kendriya Vidyalaya Mathura Cantt, Uttar Pradesh and Kendriya Vidyalaya Bidanasi, Cuttack, respectively. She has completed Graduation (Botany Hons.) and Post Graduation (Botany) from Ravenshaw University, Cuttack, Odisha. She has been awarded with Ph.D. degree in 2020 from the Department of Botany, Ravenshaw University, Cuttack, Odisha. Her doctoral thesis is focused on induction of defense against Sheath blight and Bacterial blight diseases of rice. Apart from her thesis work, she has also been worked on plant tissue culture of medicinal plants. She has published 9 research papers in reputed and peer reviewed Journals, and actively participated and presented work in 7 National & International conferences/ Workshops. She is Gold Medalist in Botany at both U.G. and P.G. level. She has qualified CSIR-UGC NET and GATE in Life Sciences. She has availed DST INSPIRE Fellowship from 2015-2020 for pursuing her Ph.D work. Dr. Shasmita currently holds the position of Guest Faculty in the Department of Botany, Ravenshaw University, Cuttack, Odisha. Research Interest: biotic stress biology, photosynthesis.

E: shasmita0108@gmail.com

ORAL

Machine learning and genome editing for doubling yield and income of rice farmers in Odisha, India

Parameswaran C
ICAR– National Rice Research Institute, Cuttack, Odisha, India

Abstract:

There is no substitute for rice cultivation in Kharif season in most of the parts of Odisha, India due to agro-climatic factors. The recent increase in productivity of rice in Odisha, India is greatly facilitated by cultivation of popular locally adapted rice varieties and due to increase in the supply of quality rice seed production. Though, varietal traits for popularity is well understood, ranking of different yield related traits for varietal popularity requires further understanding. In this regard, machine learning uses computer algorithms and ranks the traits of importance based on loss function models. In our analysis using supervised random forest machine learning models, it was identified that number of spikelets per panicle and panicle branches are more important in the varieties highly popular among the farmers in Odisha, India. Further, a major gene in rice namely Ideal Plant Architecture (*IPA1*) which regulates number of spikelets per panicle was targeted using genome editing approach for improving the number of spikelets per panicle. The edited lines showed ~23% increase in number of spikelets per panicle in popular cultivar, Swarna. Thus, machine learning and genome editing can be effectively utilized for improving the yield and income of rice farmers in Odisha, India.

Biography:

Parameswaran C has been working on cloning and characterization of genes for heat stress in rice and chickpea. The major basal thermotolerance gene of chickpea CarMBF1C (Multiprotein bridging factor 1) was characterized through heterologous expression in Arabidopsis. Additionally, he has been associated in characterization of a notch-like receptor gene in root knot nematode and MIPS1 gene for phytate levels in soybean through RNAi approach. Currently, he is working on CRISPR-Cas9 approach for editing IPA1 gene of rice for increasing the number of spikelets per panicle in the HKR-127, Naveen, and Swarna cultivar. The developed genome edited plants showed 25-30% increase in number of spikelets per panicle. Additionally, heterologous characterization of Urochondra genes in rice is being carried out to enhance the reproductive stage salinity tolerance in rice. Overall, 35 research publications related to gene characterization, genome-wide phylogenetic analysis, utilization of molecular markers for trait association in rice have been published in reputed international journals from his work.

E: agriparames07@gmail.com

ORAL

A novel non-antibiotic-based selection technology to develop the marker-free transgenic plants

Khirod Kumar Sahoo
Ravenshaw University, Cuttack, *Odisha, India*

Abstract:

Production of marker-free transgenic plants is the need of the hour and became minimum criteria for field trial to analyse its efficacy. Methylglyoxal (MG) is ubiquitously produced in all living organisms as a byproduct of glycolysis, higher levels of which are cytotoxic, leading to oxidative stress and apoptosis in the living systems. Though its generation is spontaneous, detoxification of MG involves glyoxalase pathway genes. Based on this understanding, the possible role of MG as a novel non-antibiotic-based selection agent in rice was established. Further, by metabolizing MG, the glyoxalase pathway genes viz. glyoxalase I (GLYI) and glyoxalase II (GLYII), may serve as selection markers. Transgenic rice harboring GLYI-GLYII genes (as selection markers) was developed and assessed the effect of MG as a selection agent. It was found that 3 mM MG concentration to be optimum for the selection of transformed calli, allowing efficient callus induction and proliferation along with high regeneration frequency (55%) of the transgenic calli. Since the transformed calli exhibited constitutively higher activity of GLYI and GLYII enzymes than the wild type calli, the rise in MG levels was restricted even upon exogenous addition of MG during the selection process, resulting in efficient selection of the transformed calli. Therefore, it is believed that the MG-based selection method is a useful and efficient system for selection of transformed plants without compromising the transformation efficiency. It is suggested, this MG-based selection system for raising marker-free transgenic plants is bio-safe and can pave way towards better public acceptance.

Biography:

Dr. Khirod K. Sahoo is Assistant Professor in the Department of Botany since 2014. He has 10 years of research experience. He has more than 15 publications in peer reviewed International journals and 01 national patent to his credit. He did his doctoral research on developing the salinity and drought tolerant transgenic rice through pyramiding genes in 2010 at International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi and in collaboration with School of Life Sciences, JNU, New Delhi. He further did his postdoctoral research for more than 2 years at ICGEB, New Delhi on transgenic rice and on RNAi Technology. After that, he served as Senior Technical Officer in Biotechnology Division at CSIR-Institute of Himalayan Bioresource Technology (IHBT), Govt. of India, Palampur. Currently, he has research collaboration with ICAR-National Rice Research Institute (NRRI), Cuttack and Imgenex India, Pvt. Ltd., Bhubaneswar. Currently his research is focused on crop improvements through plant genetic engineering, plant proteomics and metabolomic study. His research aims to make plants economically viable through tissue culture and hydroponic methods.

E: khirod555@gmail.com

ORAL

Pi54 and its ortholog genes: Role in the effective management of rice blast disease

Devanna BN, Kumari M, Singh J, Arora K, Samantaray S, Parameswaran C, Katara JL, Sharma TR
ICAR– National Rice Research Institute, Cuttack, Odisha, India

Abstract:

Blast is one of the most devastating diseases of rice, leading to 10-30 annual average yield losses in rice. Under severe conditions, complete loss of grain is also reported by blast disease in rice. Resistance (R) gene deployment is one of the highly preferred approach by the breeders for the management of this disease. *Pi54*, a major blast R gene was cloned from indica rice line Tetep using map based cloning approach, and it provides broad spectrum resistance against many strains of blast pathogen Magnaporthe oryzae. Many alleles and orthologs of *Pi54* were identified and some of them from wild rice species showed better blast resistance response. Using rice genetic transformation, the functional role of *Pi54,* as well as its orthologs in blast resistance was validated in rice. The cellular and sub-cellular localization of these R proteins was deciphered using gene-fusion analysis, and the structural properties of these proteins was performed using various in silico and in vitro approaches. These proteins form atypical horse-shoe structure, and interact with the Avr counterpart through direct protein-protein interaction. Efforts are also made to pyramid *Pi54* and its ortholog into different rice lines for durable blast resistance. Our study also reveals that *Pi54* mediated resistance is affected by different miRNAs. *Pi54* is one of the highly studied rice blast R gene, and is deployed in different countries in different rice genetic backgrounds for the efficient management of blast disease. The future scope includes exploring the wild orthologs of *Pi54* for their deployment in rice for the management of new emerging strains of blast pathogen.

Biography:

Dr. Devanna is working as a Scientist in Crop Improvement Division, ICAR-National Rice Research Institute, Cuttack. He did his PhD in Ph.D. in Molecular Biology and Biotechnology. He has received several awards like; ICAR- Jawaharlal Nehru Award for P.G. Outstanding Doctoral Thesis Research in Agricultural and Allied Sciences -2015, IARI Gold Medal for best student (Ph. D) in 2014, CSIR & ICAR Senior as well as Junior Fellowship. He has published 19 Research papers, 5 Review papers, 3 Popular articles, 1 Technical bulletin, and 3 Book chapters.

E: trsharma1965@gmail.com

ORAL

TMT-based Proteomics approach reveals key players of pre-implantation and endometrium receptivity during Embryo- Endometrial Epithelial cell Interaction in buffaloes

Shradha Jamwal[1], Nikunj Tyagi[1], Sudarshan Kumar[1], and Ashok Kumar Mohanty[2]
[1]*ICAR-National Dairy Research Institute, Karnal, India*
[2]*ICAR-Indian Veterinary Research Institute, Mukteshwar, India*

Abstract:

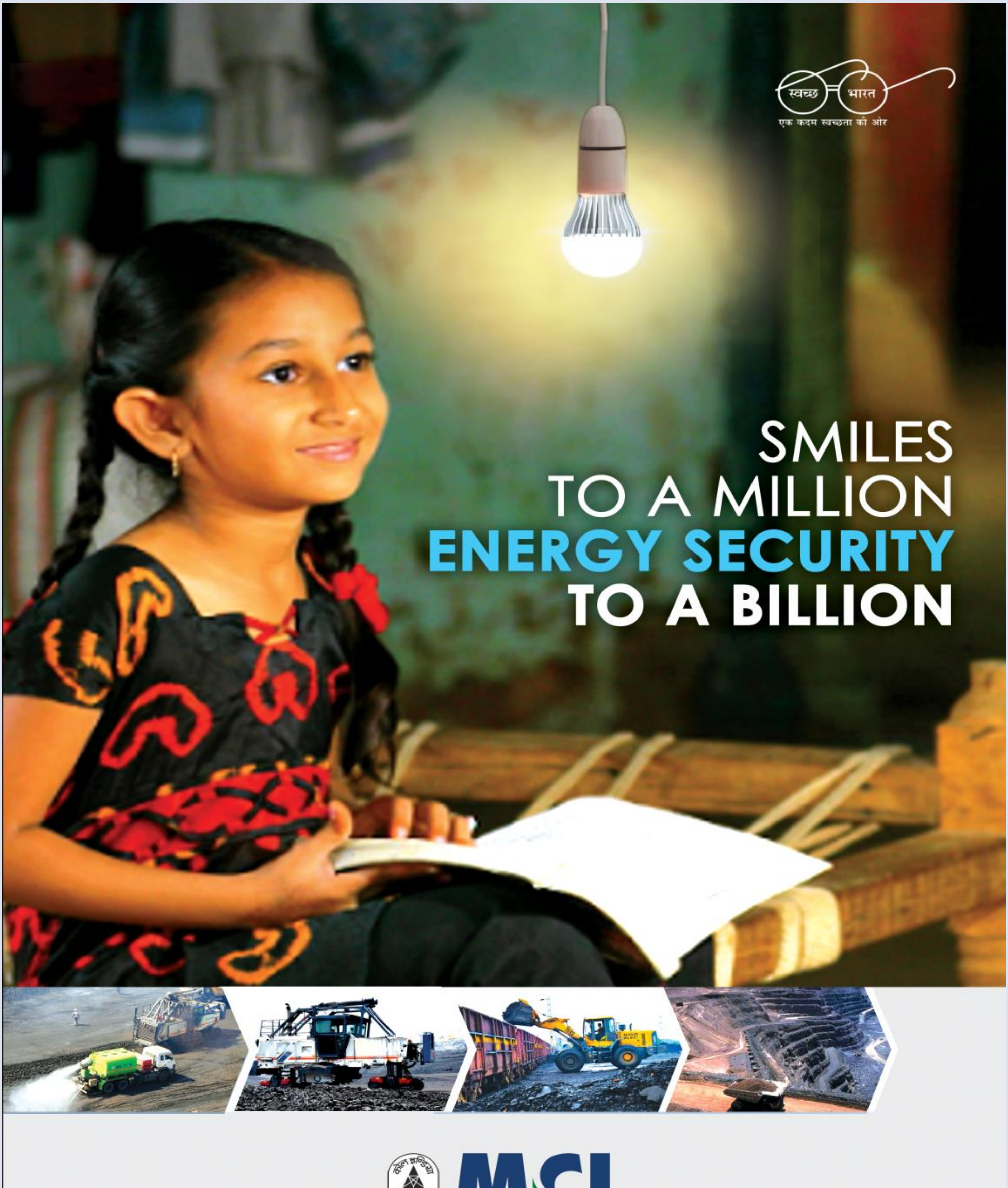
Pregnancy failure in dairy cattle is a major factor that hampers profitability of dairy farms. Pre-implantation period is considered critical for embryo development in ruminants as most of the pregnancy losses occur in this period. In ruminants about 50-75% of blastocysts fail to implant. In cattle, the early embryonic mortality is explained as death of fertilized ova and embryos up to day 28 of gestation. A bidirectional communication between the embryo and the uterine endometrium is required for a successful pregnancy in early phase of pregnancy. The implantation of embryo starts with adhesion of trophoblast cells to epithelial lining of the endometrium. However, the mechanism of cross talk between embryo and endometrium is not completely understood and remains a limiting step in optimizing pregnancy success. Therefore, in present study, we have attempted to establish a model of co-culture of in-vitro produced blastocysts and primary buffalo endometrial epithelial cells (buEECs) which mimics the in vivo attachment process in buffalo.

Tandem Mass Tag-based quantitative proteomics and ClueGOTM approaches were employed to analyse the proteome wide changes in buffalo endometrial cells during pre-implantation. A total of 69 differentially expressed proteins (DEPs) were identified in co-cultured embryo-endometrial epithelial cells in comparison to endometrial epithelial cells. buEECs were enriched in known players of endometrium receptivity including adhesion molecules (ITGA3), antioxidant molecules (PRDX1/2), inflammatory stimulant (PPI), cytoskeletal regulator (EZR, GSN, TPM4), signaling regulator (PCK2) and focal adhesions (ITGA, FLNA) which collectively function to regulate reactive oxygen species (ROS) metabolism, cell-cell adhesion, tissue morphogenesis, signal transduction, and embryo implantation. Outcomes of this study revealed key proteins involved in embryo-epithelium interaction in pre-implantation stage which demonstrates the molecular basis of implantation essential for successful pregnancy and fertility. Thus identified proteins could be potential targets for improving the uterine environment to enhance the fertility in dairy animals.

Biography:

Shradha Jamwal is PhD scholar of Animal Biotechnology at ICAR-NDRI, Karnal (Haryana). Her research work focuses on production of recombinant protein; embryonic stem cell culture and proteomic approach to understand the molecular basis of implantation in early pregnancy. She has obtained her Master's degree in Animal Biotechnology from GADVAU, Ludhiana and Bachelor's degree in Biotechnology from Himachal Pradesh University, Shimla. BIG (Biotechnology ignition grant) was awarded from BIRAC (Biotechnology Industry Research Assistance Council) in 2019, ICAR-NDRI Scholarship (2014-2017), Indian Council of Agriculture Research-National Eligibility Test (NET) in Animal Biotechnology (2018), DBT scholarship (2012-2013) and Merit certificate for Master's degree from GADVASU (2013). Research Interest: Molecular biology, Stem cell biology, reproduction biology and proteomics.

E: ishuangel17@gmail.com


स्वच्छ भारत
एक कदम स्वच्छता की ओर
SMILES
TO A MILLION
ENERGY SECURITY
TO A BILLION

Evation

AGRI Vision 2022

DAY-02

Mar 07, 2022

Young Investigator Forum

https://agrivision.in

TEA BOARD INDIA
www.teaboard.gov.in

INDIA TEA
World's Gold Standard

CELEBRATE LIFE WITH INDIAN TEA AND YOGA

Set out on a fulfilling journey of wellness, healing and peace through the two invaluable gifts from India — Yoga and Tea. Scientific studies have shown that both Tea and Yoga help relieve stress and anxiety, and have proven health benefits for the patients with diabetes, hypertension and cardiovascular diseases.

We welcome you to connect with your inner self and discover the perfect harmony of mind, body and soul through the unique confluence of Yoga and Indian Tea.

DARJEELING · ASSAM · ASSAM ORTHODOX · NILGIRI · NILGIRI ORTHODOX · DOOARS - TERAI · KANGRA TEA · SIKKIM TEA ORGANIC · TRIPURA TEA

ORAL

Endophytic fungus isolated from wild rice species promotes growth of rice crops and showing defence response towards rice diseases such as Sheath blight and Bacterial Leaf Blight

Rupalin Jena, Harekrushna Swain, Ansuman Khandual, Soma Samanta, Pankajini Samal, Motilal Behera, and Arup K Mukherjee
ICAR– National Rice Research Institute, Cuttack, Odisha, India

Abstract:

Endophytes are the harmless microbes which reside inside the plant tissue. Their informal alliance and potential coevolution with their plant partners have stemmed in them providing to an assortment of plant growth benefits varying from augmented growth and biomass accretion, forbearance to abiotic and biotic stresses and in nutrient asset. The previous couple of spans have observed a rapidly increasing sequence of events on the starring role of endophytes in controlling plant development and growth and their adjustment to abiotic and biotic aggravations. The use of endophytes is foreseen as a method to decrease the production expense and onus on the natural environment by minimizing the reliance on breeding for yield enhancement and agrochemicals. Unfortunately, apart from a few well recorded instances of their usage, a smidgen of these perceptions has been transformed into tangible agricultural applications.

Here, we imitate on this paucity and elaborate on some of the important bottlenecks that might stand in way of fully realizing the potential that endophytes hold for crop improvement. The wild rice species are the major sources of different economically important traits like resistant to biotic stresses, tolerant to abiotic stresses etc. So, we stress on the endophytic fungus which are isolated from wild rice species such as *Oryza rufipogon, Oryza nivara, Oryza granulate, Oryza barthii, Oryza latifolia, Oryza fficinalis, Oryza grandiglumis* etc. to study the growth promotion and numerous facades of the endophyte-plant connotation for their lucrative bid in the disease control mechanism.

In the present proposal, we focussed on the isolation and molecular characterization of endophytic fungus from different plant parts such as seed, root, leaf and stem of wild rice species. We studied the antagonistic effects of the identified endophytic fungus against different rice diseases both in vitro and in vivo conditions. We also focused the growth promotion of rice crops in in-vitro condition and the better health management of rice crops. Primarily we have isolated twenty-eight endophytic fungus on the basis of their morphological characteristics using microscope and by molecular markers like ITS, TEF, RPB-II and endophytic specific primer. Dual culture assay was performed against Sclerotium oryzae, Rhizoctonia solani, Sclerotium rolfsii and Sclerotium delphinii.

Net house experiment on pot was performed through seed treatment of selected endophytic fungus to know about their effect on rice plants both for protection against pathogens and growth promotion. We inoculated disease such as Sheath Blight and Bacterial Leaf Blight artificially both on the endophyte treated and control rice crops. It was observed that some of the treated endophytic fungal rice crops showed higher growth promotion with better disease control capacity compared to the control one. Total Phenol Content, Chlorophyll Content, Root Length, Shoot Length, Dry Shoot Weight and Dry Root Weight of the treated plants were also statistically analysed. So, it can be concluded that the endophytes may be an alternative for chemical treatment for better plant health management which is also environment friendly.

Biography:

Rupalin Jena. Is currently working a PhD. Scholar under principal scientist Dr. Arup Ku. Mukherjee at ICAR NRRI, Cuttack as DST INSPIRE FELLOW. She is doing her research on Endophytic Fungus isolated from wild rice species. She did her M.Sc degree from Annamalai University. She loves to do research and involve with new and interested technology and always want to develop her skills.

E: rupalinjena2015@gmail.com

ORAL

Evaluating the potential role of plant natural products from Cleome gynandra with urease inhibiting properties on concatenated phenomena of nitrogen utilization -A rhizospere manipulation strategy

Rajashree Dutta and Suparna Mandal Biswas
Indian Statistical Institute, *Kolkata, West Bengal, India*

Abstract:

Ureases, enzymes that catalyze urea hydrolysis, have received considerable impact on living organisms' health and life quality. On the one hand, the persistence of urease activity in human and animal cells can be the cause of some diseases and pathogen infections. On the other hand, food production is negatively affected by ureases which in turn, lead to losses of nitrogenous nutrients in fields supplemented with urea as fertilizer. In this context, nature has proven to be a rich resource of natural products that decrease the ureolytic activity of ureases. Therefore, efforts to design, synthesize and evaluate new inhibitors of urease from potential plant natural products are of great clinical and/or agricultural interests.

Cleome gynandra L., commonly known as cat's whiskers, is an erect, branched, annual herb originated in tropical Africa and Southeast Asia. It possesses numerous medicinal values, yet it is considered as a neglected and underutilized weed species (NUS) in most of the world. The inhibition kinetics of the crude extract of C.*gynandra* was explored where the whole plant extract of C.*gynandra* synergistically showed better inhibition activity against JBU at varying concentration compared to the leaf and stem part alone. The whole plant exhibited more than 50% inhibitory activity. The kinetic parameters indicated non-competitive mode of inhibition. Further characterization of the bioactive compound was performed using HR-LCMS showed eight sharp peak having eight corresponding compounds. From the present observation it can be concluded that C. *gynandra* plant needs further study for efficient management and improvement of urea fertilizer in agriculture.

Biography:

Rajashree Dutta has pursued her B.sc in Microbiology from Calcutta University and did her M.sc in Biotechnology from Jadavpur University. She have attended various conferences and achieved various rewards for her efficient work and dedication. She is currently pursuing her PhD from Indian Statistical Institute, Kolkata. She has been given authorship in three to four research papers. Beside her dedication in research she is also very enthusiastic and confident in her field of study.

Research Interest: enzyme kinetics, microbiology, biochemistry, molecular biology

E: rajashree1026@gmail.com

Maleic and L-tartaric acids as new anti-sprouting agents for potatoes during storage in comparison to other efficient sprout suppressants

Ekta Bhattacharya[1], **Panchanan Pramanik**[2], **Suparna Mandal Biswas**[1]
[1] *Indian Statistical Institute Kolkata, West Bengal, India*
[2] *GLA University, Mathura, India*

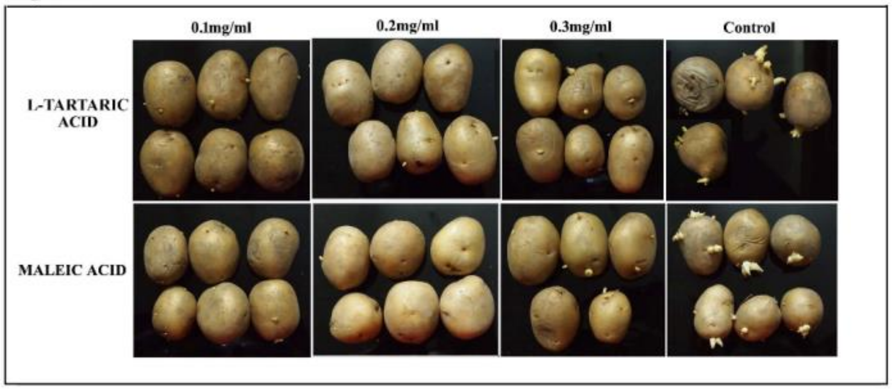
Abstract:

Inhibiting sprouting of potatoes is an interesting subject needed for potato storage and industry. Sprouting degrades the quality of tuber along with releasing α-solanine and α-chaconine, which are harmful for health. Sprout suppressants, available in the market, are either costly or toxic to both health and environment. So, there is a need for developing countries to explore new sprouting suppressant compound which is cheap, non-toxic and reasonably efficient in comparison to commercial ones. We have established that simple maleic acid and L-tartaric acid are effective sprout suppressing agents. Both can hinder sprouting up to 6 weeks and 4 weeks post treatment respectively at room temperature in dark. These do not affect the quality parameters, retain the moisture content and maintain the stout appearance of the tubers along the total storage period. Thus maleic acid and L-tartaric acid would qualify as alternative, cheap, efficient sprout suppressant for potato storage and processing.

Keywords: Antisprouting, tartaric acid.

Effect of maleic acid and L(+) tartaric acid at different concentrations (ranging from 0.1 -0.3 mg/ml) on potato tubers after 6 weeks of storage at room temperature in dark.

Figure 1.



Biography:

Ekta Bhattacharya is working in the esteemed institute of Indian Statistical Institute. She is pursuing her Doctoral degree under the supervision of Dr. Suparna Mandal Biswas in the Agricultural and Ecological Research Unit of the institute. She is working on developing new techniques for increasing the shelf life of potatoes post-harvest. The technique She is proposing is simple, effective and cheap for small retailers which store the potatoes released from cold storage facilities. These potato tubers have the shelf life of hardly 5 to 7 days. But, using the proposed technique, the shelf life can be increased upto 1 month without sprouting.

Research Interest: Postharvest biology, biochemistry

E: ektabhattacharya1990@gmail.com

ORAL

Isolation of Halophilic bacteria from the Agricultural Soils of South 24 Parganas, Indian Sundarbans.

Sreemoyee Mitra and Pabitra Banik
Indian Statistical Institute, Kolkata, West Bengal, India

Abstract:

The Indian Sundarbans despite being a world heritage is constantly under adversities like frequent cyclones, soil salinity. Agriculture is one of the prime sources of livelihood in these areas. But due to its position in the delta region and the frequent flooding of saline water, cultivation here is a struggle the farmers have to overcome every year. Therefore, the work involves finding few indigenous halophilic bacteria from the agricultural fields of the Indian Sundarbans. With this aim, 18 soil samples were collected from the agricultural fields of 6 different locations of the South 24 Parganas region of the Indian Sundarbans. These soil samples were subjected to serial dilutions. NaCl tolerant bacteria were isolated by screening the isolated colonies in different salt concentrations up to 20%. The highly halophilic bacterial isolates were further tested for their nutrient providing characteristics. This work aims in aiding farmers without any external chemical fertilizers in facilitating the crop yield, and hence for a better future in a sustainable manner.

Biography:

Sreemoyee Mitra. currently pursuing PhD under the supervision of Prof. Pabitra Banik, Head and Professor, Agricultural and Ecological Research Unit, Biological Science Division, Indian Statistical Institute, Kolkata, West Bengal. Her work revolves around saline soil agriculture and its microorganisms, mainly bacteria, and how they influence the cultivation in various regions of Indian Sundarbans. The mentioned work is a small part of my PhD thesis, with future works in the field of biofertilizers.

Research Interest: Saline soil agriculture, exremophiles, halophilic bacteria, biofertilizers

E: mitra.sree2020@outlook.com

ORAL

Identification and metabolomics characterization of two new post-harvest fungi from Indian Gooseberry

Madhurima Dutta, Anjan Hazra, Rajashree Dutta, Ekta Bhattacharya, Suparna Mandal Biswas
Indian Statistical Institute Kolkata, West Bengal, India

Abstract:

Postharvest infections by pathogenic microbes causes a severe threat toward harvested fruits leading to huge losses of fruits. *Phyllanthus emblica* Gaertn belongs to the family *Phyllanthaceae*, is known to be a highly acidic fruit with ascorbic acid content about 20 times higher than that of orange. Still numerous postharvest diseases caused by fungal pathogens have been reported in it. In our present study, we have isolated two new pigment producing fungal species from the rotten fruit surface of it. Of which one strain produces red pigments while the other strain yields yellow pigments. Amplification and sequencing of internal transcribed spacer (ITS) region and beta-tubulin (BenA) gene led to confirmation of the isolates as *Talaromyces atroroseus* and *Penicillium choerospondiatis*. These two fungal strains grow separately on PDA media for 21 days and extracted with solvent mixture in the ratio of Ethyleacetate-Acetone-Methanol :: 2:1: 1. The recovered secondary metabolites of these two fungus concentrated and tested for phytopharmacological analysis. Biochemical analysis of crude extract of *T. atroroseus and P. choerospondiatis* shown to have total phenolics (mg/g of GAE) of 26.35 mg and 30.9 mg GAE/g of dry extract respectively. DPPH activity with IC_{50} (mg/ml) of 47.1491 and 25.07 was detected by crude extract of *T. atroroseus and P. choerospondiatis* respectively. Further high-throughput biochemical and molecular analysis would be required for authentication of the bioactive components and their further implication in pharmaceutical industry.

Keywords: Postharvest fungus, *Phyllanthus* emblica, pathogenic fungi, phytochemicals, *Talaromyces atroroseus*, *Penicillium choerospondiatis*

Biography:

Madhurima has completed her Master's degree from Ramakrishna Mission Vivekananda Educational and Research Institute (formerly known as Ramakrishna Mission Vivekananda University). Currently, she is pursuing her PhD. Degree at Indian Statistical Institute, Kolkata; under the supervision of Dr. Suparna Mandal Biswas.

E: duttamadhurima465@gmail.com

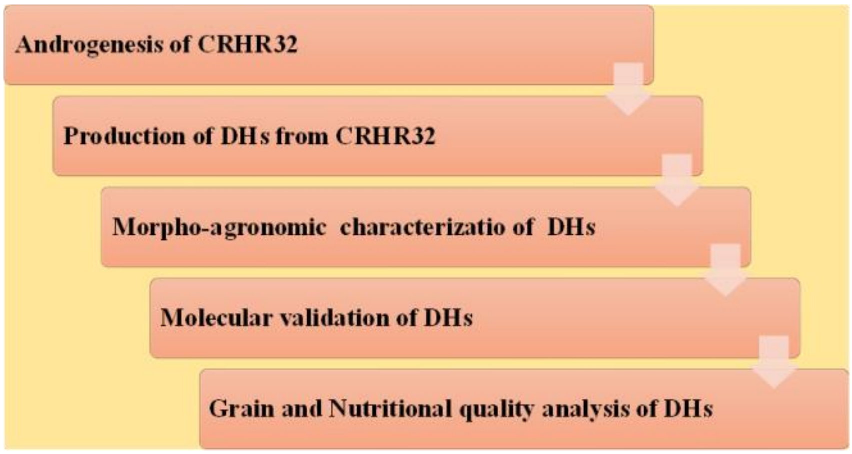
ORAL

Haploid doubling in anther culture of elite indica rice hybrid CRHR32

Prachitara Rout, Jawaharlal Katara, Ram Lakhan Verma, Parameswaran C, Sanghamitra Samantaray
ICAR-National Rice Research Institute, Cuttack, Odisha, India

Abstract:

Cultivation of hybrid rice is one of the feasible options for meeting the challenge of food scarcity. Though several rice hybrids are released for commercial cultivation in India, still it does not gain its acceptance among the farmers mainly for exorbitant seed cost and poor grain quality. Doubled haploid (DH) technology through androgenesis has changed the rice-breeding landscape in recent years. Androgenesis is a paramount biotechnological mechanism for rapidly recovering fixed breeding lines with unique gene combinations that would otherwise dissipate over the course of a long period of segregating generations using traditional breeding procedures. Through the utilization of this natural method of doubling, a total of 150 DHs were generated from an elite indica rice hybrid, 'CRHR32' for which an androgenic method was developed by manipulating the physical and chemical factors. The maximum callus frequency was achieved in N6 medium + 2.0 mgL−1 2,4-D + 0.5 mgL−1 6-BAP + 3% maltose. Calli induced in N6 media also showed significant green shoot regeneration in MS+ 0.5 mgL−1 NAA + 0.5 mgL−1 Kn+ 1.5 mgL−1 6-BAP + 3% sucrose producing 186 green plants. Employment of 40 SSR markers could discriminate one heterozygote from 150 fertile regenerants. Six DH lines produced higher grain yield than the hybrid parent (2.0-5.16%) which suggests the possibility of exploiting hybrid vigor in indica rice through development of DH lines of high yielding hybrids. A single DH showed considerable amount of zinc, iron, protein and phytate with yield of 6 t/ha. The amount of micronutrients along with quality and yield in DHs could prove the power of DH technology in development of promising lines.



Biography:

Prachitara Rout has completed her Ph.D (Biotechnology) in 2017 from ICAR-NRRI, Cuttack. She has also qualified ICAR- NET. She has, 3 publications, 1 poster and 3 oral presentations including best poster award at International Rice Symposium, Hyderabad,2015 and 1 patent (applied). Now currently joined as Senior Research Fellow at ICAR-NRRI. She has a strong inclination for applied science and am actively looking for new opportunities in the field of research.

Research Interest: Plant tissue culture, Molecular Biology

E: prachitararout@gmail.com

ORAL

A comparative account of seasonal germ cell proliferation and maturation patterns in two types of spawners *Labeo rohita* (Hamilton, 1822) and *Oreochromis niloticus* (Linnaeus, 1758)

B. Panda, L. Samanata and P. Routray
Ravenshaw University, Cuttack, Odisha, India
ICAR- Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha, India

Abstract:

In general fish reproduction is like to be affected by increasing and decreasing water temperatures arising from climate change. By this, the endocrine function may alter leading to either advance or retard gametogenesis and maturation process. The present work was undertaken in order to determine the seasonal variations in the germ cell status and maturation pattern for selected fish species of *L. rohita and* O. *niloticus*. These two spawners have two distinct germ cell proliferation patterns and spawning habits in nature. In rohu the maximum GSI of female (19.5 ± 1.29) and male (4.2 ± 0.24) were observed in the month of July whereas, in tilapia it attains maximum a value which is nearly twice during April and October in a year. Histological observations of male and female gonads of tilapia revealed a specific pattern of proliferation of germ cells. Germ cells are considered to be immortal since they create a link between generations and multiply through mitosis. GCs were present in the gonads with different stages of development almost throughout the year. Here, we have compared the different factors affecting maturation patterns in tilapia (*Oreochromis niloticus*) which shows asynchronous type of spawning and IMCs rohu, *Labeo rohita* that exhibits synchronous type of spawning.

Keywords: Maturation, GSI, Germ cell proliferation, Histology, Gamete morphology, L. *rohita, O. niloticus*

Biography:

Mr. Mr. Bibekananda Panda is currently is a PhD scholar and recently submitted his thesis on Factors affecting germ cell proliferation and maturation in fish. He did his research work at ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar and PhD is registered under Ravenshaw University., Cuttack. He is a Gold Medalist from Berhampur University (2013). Worked as a DST INSPIRES Fellow Govt of India, December 2014 – November 2019 ensuing work station at ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha. Field of Research: Cryobiology, Animal cell culture, Microbial Techniques, Molecular Biology, Pharmaceutical biotechnology and Medical Microbiology

E: bibekanandapanda.jsp@gmail.com

ORAL

The effect of "Anthocyanin biofortified wheat on gut micobiota and associated implications in mice

Payal Kapoor and Monika Garg
National Agri-Food Biotechnology Institute, Mohali, *Punjab, India*

Abstract:

The majority of majority of calories consumed by humans and cattle come from seeds, particularly whole grain cereals. Whole grain is composed of the endosperm, germ and the bran layer, laden with all vital nutrients that confer peculiar health benefits like lowering the risk of diabetes, heart diseases and hypertension. Wheat is the second most important staple crop after rice and is used in the form of bread, pasta, noodles, biscuits and chapattis (Indian flattened bread). Mostly wheat is white or red in color, but colored (blue, black and purple) wheats has emerged as a whole new concept as special wheat. The different colors of wheats are imparted due to the anthocyanins which are such naturally existing bioactive compounds with known antioxidant properties. Besides anthocyanins, they also contain high dietary fibers. Collectively, anthocyanins and dietary fibers have long been implicated in neutralizing the oxidative stress and inflammation. But information about modulatory effects of dietary anthocyanins on gut microecology is limited. Henceforth, the current study was designed to study the gut microbiota modulating effects of colored wheat which is attributed to cumulative phytochemicals, low GI and high dietary fibres (fructan) content.

Keywords: Anthocyanins, Biofortified colored wheat, Prebiotics, Gut microbiota

Biography:

Payal Kapoor is a full time PhD student at National Agri Food Biotechnology Institute (NABI), India. Her research activity is focused on the genome wide identification of anthocyanin biosynthesis genes in anthocyanin biofortified wheat (colored wheat) and assessment of its prebiotic like effect on the gut microbiome in murine model.

Research Interest: Agriculture Biotechnology

E: ssspayalkapu@gmail.com

ORAL

Contract farming and its welfare impact assessment: A case of wheat growers in North India

Saroj , Kirtti Ranjan Paltasingh, and Pabitra Kumar Jena
Shri Mata Vaishno Devi University, Katra, Jammu & Kashmir, *India*

Abstract:

Contract farming is widely seen as a welfare enhancement strategy in rural India where agriculture is the primary source of livelihood. Critics, however, argue that contract farming is likely to pass risks to smallholders, favoring large-scale growers at the cost of small-scale growers. This study explores the returns to contract farming and its distribution across various groups of wheat growers in Haryana, a major agrarian state in North India. Using endogenous switching regression model on cross-sectional data collected from 754 farm households, we found that contract farming adopters would lose about 29 percent of their gross margins and about 10 percent of their crop yield if they didn't adopt contract farming. Non- contract farmers, meanwhile, would have gained about 32 percent and 9 percent of their gross margin and crop yield, respectively, if they were contract farming adopters instead. However, there is heterogeneity in returns, where medium and large-scale growers are reaping more benefits as compare to small-scale growers. Thus, it should be promoted among smallholders by removing contracting firms' reluctance to them as well as heterogeneity in return to contract farming.

Keywords: Contract farming; heterogeneity; endogenous switching regression; Indian agriculture

Biography:

Saroj Varma is a research scholar in School of Economics at Shri Mata Vaishno Devi University Katra, Jammu and Kashmir. My broad research area is agricultural economics. My research interest is contract farming, agricultural extension, agricultural marketing challenges and technology adoption. I am determinant to learn new facts and contribute to the mentioned research domain.

E: vermasaroj477@gmail.com

ORAL

Genome wide mining of alleles to identify candidate genes conferring folate content in rice

S. R. Harish Chandar and G. Pushpalatha
Centurion University of Technology and Management, Paralakhemundi, Odisha, India

Abstract:

Rice (*Oryza sativa*) is a major staple food crop for over half of the world population. Dietary folate deficiency occurs mostly due to majority of plant foods that loose folate upon processing and cooking and its deficiencies causes neural tube defects and other diseases. Folate (Vitamin B9) is important in red blood cell formation and for healthy cell growth and function. To address such challenges, commercially important and high yielding variety Samba Mahsuri (BPT5204) was used which was treated with EMS (Ethyl-Methane Sulfonate) to generate mutants. Allele mining is a promising way to dissect naturally occurring allelic variants of candidate genes with essential agronomic qualities. In the present study, we have used 35 lines EMS imposed mutation, followed by the nano-pore sequencing. Thus, few novel genes specific to folate content were identified among the rice genotypes. The outcome of the study will have a major social impact on developing countries like India where most of the people suffer from folate and micronutrient malnutrition in a cost effective manner.

Keywords: chemical mutagenesis, EMS , allele mining.

E: pushpabhagyalakshmi@gmail.com

ORAL

Vigna vexillata: An underutilized tuber crop

Srija Priyadarsini*, M. Nedunchezhiyan, Alok Nandi
Institute of Agricultural Sciences, SOA University, Bhubaneswar, *Odisha, India*

Abstract:

Vigna vexillata (L.) (family-Fabaceae) is a potential and under-exploited legume known by several names viz. tuber cowpea, zombi pea, wild cowpea, etc. *V. vexillata*, a wild species closely related to the cowpea is used for its storage roots, protein-rich seed, forage and erosion control plant. It is one of the underutilized legumes with potential for commercial exploitation. It is usually a vigorous twining or scrambling vine with large, showy purple or purplish-yellow flowers with fleshy tuberous roots from which the plants perenniate. Among various domesticated species of Vigna, tuber cowpea is one of the least researched crop for its genetic resources, especially in the Indian region. *V. vexillata* is a tropical tuberous legume which is fascinating for multiple uses in India. It is a climate-resilient legume and reported as a source of bruchid resistance, abiotic stresses tolerance and proteinaceous tubers. Protein content in tubers of *V. vexillata* was recorded up to eightfold higher than that in sweet potato and tapioca. This species has the potential to meet the future needs of food and nutritional security. In Africa, the roots are eaten in times of severe hunger. The tubers are soft, easy to peel, and possess a creamy, white, tasty interior. They are eaten boiled or raw. Protein content of the tubers is near the 15% level, which is high compared to the 1-7% for potatoes and yams. They can be boiled or roasted like sweet potato or cassava. Young leaves, pod and seeds are cooked and eaten as a vegetable. Leaves and young shoots are cut into small pieces and cooked with salt and chilli, and garnished with mustard seeds, curry leaves and onions in oil.

Keywords: Vigna vexillata, Tuber cowpea, Root and tuber crops.

Biography:

Srija Priyadarsini is a meritorious agriculture graduated from Centurion University in 2019. Currently she is pursuing masters degree in Horticulture from 2020-2022 at Institute of Agricultural Sciences, SOA University. She had undertaken hydroponic based research during her graduation program. She had presented a poster on experience in hydroponics cultivation at national seminar held at Koraput in 2019. She is well versed with the horticultural inventions and enthusiastic in undertaking horticultural research. She has upgraded analytical skill during her tenure as research fellow at ICRISAT.

E: srijasanu1229@gmail.com

ORAL

Physiological and molecular characterisation of sugarcane varietal response to nitrogen deficiency

Aparna T.[1], Saktishree Jena[1], A. Sheela Devi[1], R. Gomathi[2], V. Krishnapriya[2], Sanhita Padhi[3]
[1]Karapaga Vinayaga college of Engineering and Technology, Anna University, Chennai, Tamil Nadu, *India*
[2]*ICAR Sugarcane Breeding Institute, Coimbatore, Tamil Nadu, India*
[3]*Ravenshaw University, Cuttack, Odisha, India*

Abstract:

Sugarcane produces high biomass and high sucrose content due to efficient C4 photosynthetic system and this result in high yields of dry matter. Generation of nutrient efficient varieties will be an appropriate solution to improve crop production and to tackle problems arising due to shortage of mineral fertilizers. The present study evaluated differences in photosynthetic efficiency, antioxidant capacity, root analysis traits and plant growth morphology under nitrogen deficiency in five sugarcane varieties (Co 86032, Co 0212, Co 09006, Co 0238 and Co 10026). The photosynthetic pigments and photosynthetic efficiency of Variety Co 10026 performed best among other varieties under low N condition. Antioxidant capacity and plant water status revealed that Co 86032 were efficient under nitrogen deficiency with Lipid peroxidation (0.0071µg/g), SOD activity (1.813mg/g), Peroxidase (61.92µg/g), Catalase (7.47µmol/mg), Cellular membrane stability (47.50%g) and Relative water content (85.44g). Metabolic parameters like total soluble proteins, phenolic, and amino acids contents were assessed. Observation in nitrogen deficit varieties exhibited reduction in carbohydrate accumulation, reducing sugars, non-reducing sugars and starch content of sugarcane crops. Growth characters like plant height, leaf area, total biomass and biomass partitioning were found maximum in nitrogen deficient crop of Co 10026. Variety Co 86032 performed efficiently under Nitrogen deficiency environment and recorded high root surface area (52.92cm2). Same trend was recorded for root length (cm), root volume (cm3), and average root diameter (cm2) under nitrogen deprivation.

Two varieties Co 10026 and Co 86032 were identified as promising under nitrogen deficiency and the gene expression of the respective crops that regulate nitrogen use efficiency will be evaluated in future.

Keywords: Sugarcane, C4 photosynthetic system, photosynthetic efficiency, antioxidant capacity, root analysis traits, plant growth morphology, nitrogen deficiency

E: saktijena2504@gmail.com

ORAL

Impact of harmonic Octave Consonants (Classical Musical Notes) on the distinct physiognomic characters and different biochemical aspects in two different plant species viz; *Stevia rebaudiana* (Bertoni) and *Chamaecostus cuspidatus* (Nees & Mart.) C. Specht & D.W. Stev.

Sanhita Padhi, Rageshree swain, Pragyan P. Rout
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Music is an integral part of our nature and society. The harmonic octave consonants and their frequencies now-a-days used as a therapy, being popularly called as music therapy. However, the impact of music on our physical and physiological processes has been acknowledged since ages. Rhythmic and comforting music has an influence on physical and physiological conditions and behavior of living organisms such as humans, plants and animals. According to various studies, Indian Classical music has been confirmed to encourage plant growth positively and it has also been observed to dominate the other important genres of music such as metal rock, rock, pop, and monotonous sounds. The present research work is aimed at finding the exclusive impact and effect of the harmonic octave consonants and their frequencies in different strings and closed-pipe Indian classical instrumental music displayed through various *Ragaas*, viz: *Raga Kedar* (flute), *Raga Kedar* (santoor), *Raga-Rageshree* (sitar), *Raga-Bhairavi* (flute), *Raga- Shree* (Sarangi), *Raga- Milan ki Todi* (Sarod), *Raga-Ramkali* (Sitar) on the distinct physiognomic characters and different biochemical aspects in two different plant species viz; *Stevia rebaudiana* (Bertoni) and *Chamaecostus cuspidatus* (Nees & Mart.) C. Specht & D.W. Stev.

The results were surprising as the treated plants showed higher efficiency in terms of both its physiognomic and biochemical aspects as compared to the control plants. The results were depicted via various tabulations and figures. Physiognomic parameters like plant height, no of branches per plant, no. of leaves per plant, leaf length, leaf breadth, leaf texture, leaf color, spread of plant in east-west and in north-south directions and diameter of the stem for a period of 30 days. Treated plants showed an increment in the growth as compare to the control and survived longer than the control plants. For instance, in Stevia rebaudiana, the average no. of leaves in control was 53 per plant and 64 in treated plants. Similarly, the average height of the treated (experimental) plant was found to be greater i.e., 28 cm as compared to the lower average height of 21 cm as shown by the control (untreated) plant samples. The biochemical analysis also revealed some promising observations. The biochemical experiments with the leaves of the plant, Stevia rebaudiana (both control and experimental), the total protein, carbohydrate and chlorophyll content in the treated plant leaves was found to be much higher i.e., 142.25 mg/gm, 114 mg/gm and 34.69 µg/gm fresh weight, respectively. The control plants showed much lesser values such as 87.5 mg/gm, 79 mg/gm and 16.44 µg/gm for total protein, total carbohydrate and total chlorophyll content respectively.

The other plant *Chamaecostus cuspidatus* also exhibited quite parallel results thus showing an upsurge in the total protein (117 mg/gm), carbohydrate (17 mg/gm) and chlorophyll (8.135 µg/gm) content, in treated plant as compared to the control plants that displayed lesser amount of total protein content (107.5 mg/gm), very less total carbohydrate value (7.9 mg/gm) and much lesser chlorophyll content with a value of 3.45 µg/gm fresh weight. The ascorbic acid content was also analyzed for both the plants (experimental and control). The leaves of treated (experimental) *Stevia rebaudiana* showed a superior value of 75.66 mg/100gm whereas the control leaves showed 42.52 mg/100 gm of ascorbic acid. The ascorbic acid content in the leaf of *Chamaecostus cuspidatus* (treated and control) was found to be 53.56 mg/100gm and 21.42, respectively.

Keywords: Music therapy, Indian Classical Ragas, Harmonic octave consonants, Strings and closed-pipe, Physiognomy, Biochemical aspects

Abbreviations: Hz-Hertz, I-Sound Intensity, L-Sound Intensity Level, Db- Decibel

E: ravingrageshree@gmail.com

ORAL

Effects of 2G, 3G and 4G mobile phone radiations on germination of seeds and biochemical processes of *Vigna radiata* and *Phaseolus vulgaris*

Pragyan P. Rout, Rageshree swain, Dinesh Panda and Sanhita Padhi
Ravenshaw University, Cuttack, Odisha, India

Abstract:

The usage of mobile phones during the last decades has resulted in an increase in the levels of electromagnetic radiations in natural environments causing electromagnetic pollution like electromagnetic field smog which has harmful effects on the living organisms. Experiments were conducted to observe the effects of radiations on the plants. It was designed to observe the effects of electromagnetic radiations emitted from mobile phones on the physiological and biochemical changes in the emerging seedlings of *Phaseolus vulgaris and Vigna radiata*. The seeds were subjected to three different mobile networks (2G, 3G and 4G). The seeds which were subjected to 4G cell phone radiations showed much earlier seed germination that is within two days of sowing as compared to the 2G and 3G electro-magnetic radiation in which the seed germination was observed after four days of sowing in case of *Vigna radiata*. The percentage of seed germination in *Vigna radiata* reduced to 40%, 25% and 25% in case of the seeds subjected to 2G, 3G and 4G mobile radiations respectively. The seed germination in case of *Phaseolus vulgaris* was delayed for four days of sowing the seeds. Only 25% of the seeds were germinated in each of the case. The length of the radicle was found to be 1.4cm, 0.7cm 0.4cm when exposed to 2G, 3G and 4G mobile radiations respectively in case of *Vigna radiata* whereas it was found to be 2.1cm, 3cm and 6.5cm when exposed to 2G, 3G and 4G mobile radiations respectively in case of *Phaseolus vulgaris*. The height of the seedlings of Vigna radiata is maximum in-case of the seedlings that were subjected to 2G cell phone radiations which was found to be 2.2cm.

The radiations greatly interfered in the biochemical processes of the seedlings of both the varieties. There was a marked decrease in the carbohydrate, lipid, protein and chlorophyll contents in case of both the varieties. The total chlorophyll content in Vigna radiate was found to be minimum in case of the seedlings exposed to 4G mobile radiations i.e 200µg/ml. The total chlorophyll content in Phaseolus vulgaris was found to be minimum in case of the seedlings exposed to all the three types of mobile radiations i.e 340µg/ml. The lipid content was reduced when compared with that of the control seedlings, but it was found to be minimum in case of plants of Vigna radiate when exposed to 4G radiations that is 0.06gm and in case of plants of Phaseolus vulgaris when exposed to 3G radiations that is 0.4gm. The carbohydrate concentration was reduced in case of plants exposed to mobile radiations as compared to that of the control plants. It was found to be minimum in case of the seedlings of both Vigna radiate and Phaseolus vulgaris when exposed to 4G radiations which was 0.09mg/ml and 0.6mg/ml respectively.

Keywords: Mobile phone radiations, Seed germination, Biochemical processes, electromagnetic field smog, electromagnetic pollution, Phaseolus vulgaris, Vigna radiata

E: pragyanrout89@gmail.com

Evation

AGRI Vision 2022

DAY-02

Mar 06, 2022

POSTER PRESENTATIONS

ODISHA STATE WAREHOUSING CORPORATION

PLOT NO-02, CUTTACK ROAD,
BHUBANESWAR-751006

- 64 years of service in the field of warehousing in the State
- Operates 69 warehouses in 30 districts of the State with a storage capacity of 5.35 lakh MT capacity godowns.
- Offers scientific storage facilities for food grains, agricultural produce, fertilizers, cotton bales, paper, cement, relief materials, tyres, equipments and other notified commodities.
- Provides services on scientific preservation and distribution of food grain stock in 4.00 lakh MT capacity storage godowns to its major stakeholders like Odisha State Civil Supplies Corporation Ltd. & Food Corporation of India.
- Offers open space in the warehouse complexes for storage of industrial goods, pipes and other materials.
- Ensures safety and security of stock stored in the warehouses against the risk of loss due to flood, fire, theft and burglary through insurance coverage.
- Provides handling and transportation services of different commodities to its valued depositors through experienced contractors.
- Offers pest control services of agricultural produce to different depositors at a reasonable rate.
- Depot Online System has been implemented in warehouses utilized by FCI for monitoring operation of food grains on real time basis and timely data reporting.
- Warehouse Management Solution is under process for implementation in the warehouses to digitize operation of warehouses and monitor other related activities.

Managing Director
OSWC

For availing warehousing facilities, Please Contact: Corporate Office, OSWC,
Plot No.-02,Cuttack Road, Bhubaneswar (Ph.-0674-2575157,2575498)

POSTER

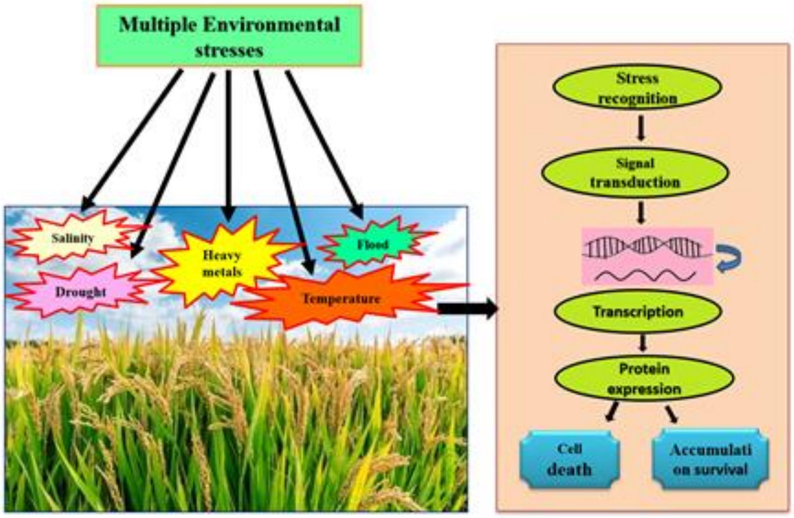
Role of helicase in stresses tolerance of plants

Monalisha Dasmohapatra and Ranjan Kumar Sahoo
Centurion University of Technology & Management, Bhubaneswar, Odisha, India

Abstract:

Food is the essential component of life sustainability and crucial for living beings. But annually Food and Agriculture Organization (FAO) reported that globally malnutrition and hunger killing more than 5 million children. The extreme climate variation induces a complex set of stresses, such as abiotic and biotic. Among all stresses drought and salinity are always shopping list of Indian farmers. In this current scenario all type of stresses are harshly damaging the agricultural plants as well as cultivated lands and strongly targeting towards the future food conservation. In Previous year, it had been technically difficult to produce improved cultivars through conventional breeding because of the involvement of complex nature of traits. Therefore, to overcome this challenging situation, researchers were positively working on modern transgenic approaches to develop the agricultural plant growth and yielding under multiple stress environment. Recently helicases are reported to be involved in plant responses to abiotic stress and plants molecular process like DNA/RNA replication, repair, recombination, transcription and translation. Helicases are the member of protein, that catalyze the unwinding double strand DNA and rearranging the RNA secondary structure by the help of ATP hydrolysis. In both eukaryotes and prokaryotes, these enzymes are largest and highly conserved. Here we attempt to review the role of helicase and their used as a key enzyme to increase plant productivity.

Keywords: Helicase, abiotic stresses



Biography:

Monalisha Dasmohapatra received her B.Sc. degree from Fakir Mohan University (2013) and M.Sc. in Biotechnology from Berhampur University (2015). She obtained her M.Phil. degree from Fakir Mohan University. She is currently working as Ph.D. research scholar at CUTM Bhubaneswar under the supervision of Dr. Ranjan Kumar Sahoo. Her research interest includes abiotic stresses in rice plants.

Research Interest: Abiotic stresses in rice plants.

E: monalishadasmohapatra283@gmail.com

POSTER

Towards efficient photosynthesis: Genetic transformation of rice

Suchismita Prusty and Ranjan Kumar Sahoo
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

Purpose: To find an efficient solution to improve crop productivity by increasing photosynthesis

We have raised 5 transgenic rice variety (Oryza sativa L. cv. IR64) lines that have over expressed marker free SUV3 gene. Reports suggest that increased efficiency of photosynthesis and salinity toleration (up to 200mM NaCl) in the T1 generation of rice can be obtained by the over expression of CaMV35 promoter driven SUV3 gene. Validation of the stability in the expression and the incorporation of SUV3 gene in transgenic rice is confirmed by molecular criterions like PCR, southern blotting RT-PCR, and western blotting analyses. After considering all parameter while comparing the transgenic lines and the vector control (VC) and wild type (WT) plants under salt stress, it was observed that the transgenic varieties showed higher photosynthetic attributes (23-32%) like elevated photosynthesis rate (PN) due to increase in chlorophyll content, intercellular carbon dioxide and the stomatal conductance along with higher activity (21-37%) of enzymatic antioxidants for example glutathione reductase (GR), ascorbate peroxidase (APX), guaiacol peroxidase (GPX) and superoxide dismutase (SOD). Howbeit uniform results were obtained from the transgenic variety as well as the VC and WT plant when the photochemical efficacy of PSII as estimated from variable to maximum chlorophyll a fluorescence (Fv/Fm) was taken into consideration. Altogether the motif of presented experimentation was development of marker- free SUV3 over expressing transgenic lines for improving the photosynthetic efficiency of the plant as well as conferring tolerance against salinity stress.

Keywords: Transgenic rice; photosynthetic efficiency, abiotic stress, SUV3 gene, stress tolerance.

Biography:

Suchismita Prusty is a pre doctoral candidate at Centurion University of Technology and Management, Bhubaneswar after completing her MSc from OUAT, Bhubaneswar. Her current work focus on tissue culture techniques after being certified from MSME skill development program on tissue culture and completed dissertation work from NRRI, cuttack. Her previous work includes comparative analysis of miRNA expression in androgenic and organogenic Calli of Arize 8433DT rice variety;role of native efficient Azotobacter and Azospirillum spp. Formulations for Var. IR64 rice variety in field experiments and her current work focus on genetic modification of rice varieties and increasing its photosynthetic efficiency for economic development.

E: suchiprusty02@gmail.com

POSTER

Turmeric's secondary metabolites and pharmacological values: Preserving and expanding our Indigenous knowledge base

B. Jyotirmayee and Gyanranjan Mahalik
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

Traditional medical knowledge's main objective is to preserve and disseminate herbal medicine expertise. Several conventional treatments rely heavily on plants, plant parts, and plant products of various types, especially those having medicinal characteristics. On the other hand, Traditional Knowledge is rapidly deteriorating because of a lack of documentation, fast land-use change, and a lack of intergenerational knowledge exchange. There are many different secondary metabolites found in medicinal plants. Each may be synthesized by a unique regulatory pathway and transported via a unique transport route inside specific organs, tissues, and cells. Stress and developmental processes alter the SM content in medicinal plants with the exact genetic origin. Recent years have seen an increase in sophisticated biotechnological methods in selecting and cultivating plants used in traditional and contemporary medical preparations and drug development. Turmeric's role in Ayurveda, modern medicine, and home remedies for various ailments has been broadly considered over several decades. Every molecular ingredient of turmeric has a different biological function. For example, at least 20 antimicrobial compounds and 14 of their components have recognized cancer-preventive properties. Antitumor and anti-inflammatory properties are also found in 12 of its components. In addition to its anti-inflammatory capabilities, it has at least ten anti-oxidant molecular ingredients.

Turmeric has been linked to 326 different biological, clinical, and pharmacological roles. Because of this, it is regarded as the most valuable medicinal plant in the region. Plants' therapeutic advantages to human health are studied in ethnobotany, phytochemistry, and pharmacology to learn how these discoveries might be used for medical advancement. Research into plant species that have been used for medicinal purposes in the past helps to ensure the safety of herbal therapies and the discovery of novel medicines.

Keywords: Ayurveda, Pharmacology, Turmeric, Traditional, Secondary Metabolites (SM)

E: bjyotirmayee00@gmail.com

POSTER

Effect of vermicomposting on growth and nutrient content in *Triticum aestivum L.* under organic farming system

Sagarika Parida and Ananya Mishra
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

Organic farming, a rapidly growing sector in many nations, is assessed in terms of sustainability. Everyone wants a sustainable agriculture, but how to progress is not clear. In this study, vermi-compost was applied in various compositions to enhance the growth and micronutrient composition of wheat (*Triticum aestivum* L.) crop under pot experiments. This experiment was conducted at Centurion University of Technology and Management, Bhubaneswar campus. Pot cultivation was done by taking different soil and vermicompost proportion, i.e. normal soil, soil: vermi-compost (1:1), soil: vermi-compost (2:1), soil: vermi-compost (4:1), soil: cow dung (1:1) and soil: NPK to evaluate the vegetative crop growth, and impact on growth, micronutrient content and tillering initiation. NPK was used in equal proportion of 20:20:20. Ten plants were randomly selected from each replication to measure the root and shoot length after 45 days of showing. The leaves were collected separately from each treatment to analyze the nutritional content by X-ray-Fluorescence Spectroscopy (XRF). Length of the shoot was measured to be more in the pot containing equal proportion of soil and vermi-compost followed by soil: vermi- compost (4:1), soil: cow dung (1:1), soil: NPK and least in controlled condition of soil. Root length was found to be highest in the pot containing soil: vermi-compost (4:1) followed by soil: NPK, soil: cow dung (1:1), soil: vermi-compost (2:1, controlled soil and least in equal proportion of soil: vermi-compost suggesting the quick availability of the nutrient in the pot containing equal proportion of soil and vermi-compost. The mineral contents of the leaves were also analyzed from all the treated plots to know their nutritional status.

Keywords: Growth, *Triticum aestivum* L., micronutrients, Organic farming, vermi-compost

Biography:

Ms Ananya Mishra is now working as a full time Ph.D. scholar in the Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar. She has also completed the internship programme in the project "Solid Waste Management" under Green Skill Development Programme, ENVIS, after completing M.Phil. degree from the Department of Biotechnology and Bioinformatics, Sambalpur University. She completed her master Degree from Department of Botany, Berhampur University. Three articles and two Book chapters have been published in WoS indexed journals and "Medico Biowealth of Odisha, Vol.II" and "Aromatherapy" Book respectively. **Research Interest:** Antimicrobial activity study, Green nanoparticle synthesis, Organic Farming, Drug Design using Biovia Discovery Studio

E: ananyamishra698@gmail.com

POSTER

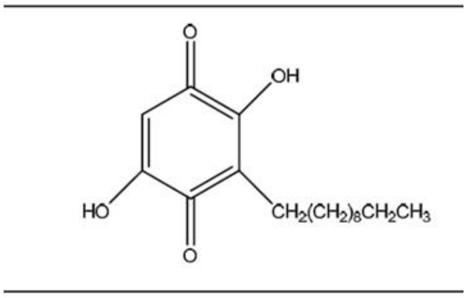
Genome wide transcriptome profiling of Embelia species towards characterization of trait specific genes

Sunanya Das, Subhasmita Mallick, Payal Priyadarshini, and Rukmini Mishra
Centurion University of Technology and Management, *Bhubaneswar, Odisha, India*

Abstract:

Medicinal plants act as obelisk for pharmaceutical industries which leads to their over-exploitation. *Embelia ribes Burm F.* is large scandent shrub, which belongs to the family Myrsinacae and is commonly known as false black pepper or Vidanga. *E. ribes* can be found at an altitude of 1,500m in central and lower Himalayas, Assam, Bengal, Arunachal Pradesh, Odisha, and Kerela. *E. ribes* is a plant with multitudinous medicinal properties such as antidiabetic, anticancer, antimicrobial, antitumor, antifertility activity and wound healing properties. It has been placed under endangered status due to overexploitation by local farmers as well as pharmaceutical companies. The information on its genetic and molecular exploration is scanty because of its threatened status. Tapping into the molecular circuitry of secondary metabolites of *Embelia* sp. will open numerous doors for biopharmaceutical industries. The species is highly specialized for the richness of biologically active dihydroxy benzoquinone, Embelin (2,5-dihydroxy-3-undecyl-p-benzoquinone) which have high market value and less supply. Transcriptomic studies of *E. ribes* will enlighten the researchers about the molecular mechanism of embelin and its production. Identification of genes which are involved directly or indirectly in production of embelin will pave the way for further studies.

Keywords: Medicinal plants, *Embelia ribes*, transcriptome profiling, phytochemicals, Embelin.



Embelin

Biography:

Sunanya Das is in the 1st year of her Ph.D. under the supervision of Dr. Rukmini Mishra. She is currently working on transcriptomic studies, metabolic profiling and other molecular techniques involved in medicinal plant biotechnology. Her previous works include ethno-botany and molecular Docking. Apart from research she is avid fictional books reader and likes to spend time in nature. Research Interest: Plant biotechnology and Bioinformatics.

E: dsunanya2016@gmail.com

POSTER

Genome editing towards disease resistance in Chili pepper (*Capsicum annum* L.)

Rashmi Ranjan Sutar, Dibyashree Soumyakanta Jena, Sutar Suhas Bharat, and Rukmini Mishra
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

Chilli pepper (C*apsicum annum* L.) is one of the major spice crops that grow in both tropical and sub-tropical regions of the world. several Biotic factors like fungi, bacteria, and viruses accounting for significant pre-and post-harvest yield losses across the world. Several agricultural approaches including conventional plant breeding approaches are used to control the effect of the disease which was not fully effective due to the narrow range of the gene pool. To overcome this barrier, genetic engineering is gradually becoming a functional aspect of classical breeding programs and boosting the improvement in crops. In the past few years, several genes responsible for taste, color, and resistance against different pathogens in chili have been isolated and characterized. This knowledge should certainly facilitate chili pepper improvement or the genetic manipulation of different biosynthetic pathways by genetic engineering. Among this genetic engineering cascade, sequence-specific nuclease emerged as the most powerful tool to manipulate the genome in an organism. Out of all the SSNs, the CRISPR/ Cas9 system is the most efficient tool for genome editing. Although a majority of CRISPR/Cas9 systems make use of a dual promoter system (one each for Cas9 and sgRNA) to edit the desired segment of the gene, due to less availability of gRNA-based promoter in the capsicum genome make it less suitable to use CRISPR/Case9 system that uses dual promoter. The recent development of advanced CRISPR/ Cas9 systems like base editing, prime editing, and single transcript cas9 unit shows a road map to develop a pathogen-resistant variety of chili paper, and also using these techniques we can improve the overall quality of the food in a transgenic free mechanism.

Keywords: CRISPR/Cas9, genome editing.

Biography:

Rashmi Ranjan Sutar is a Junior Research fellow at department of Botany Centurion University of Technology and Management, Bhubaneswar after completing his MSc from central university of Punjab Bathinda, Punjab. His current work focus on genome editing towards disease resistant in various crop.

E: rashmisutar123@gmail.com

POSTER

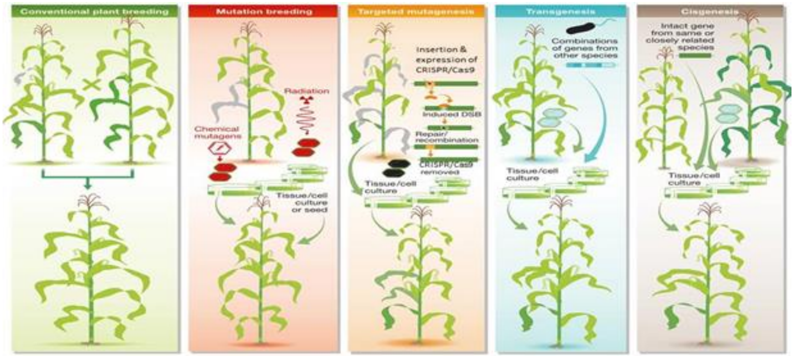
CRISPR/Cas9 mediated genome editing towards Tomato improvement (Solananum lycopersicum L.)

Sonupriya Sahu*, Subham Jyoti Sahoo, Rukmini Mishra, and Sutar Suhas Bharat
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

Tomato (*Solanum lycopersicum*) is the second major vegetable crop in the world. It is agronomically important crop due to its nutritional values, which includes vitamins, carotenoids, and phenolic compound. Besides, it is rich in physiological properties like anti-allergenic, anti-inflamatory, anti oxidant, and antimicrobial property. Each year 182.3 million tons of tomato are produced in 4.85 ha area. Various biotic and abiotic stresses causes up to 10-90 % yield loss in tomato. The traditional plant breeding systems have been performed to improve stress tolerance but still it is not efficiently controlled. Genetically engineered varieties are not widely acceptable because of regulatory concerns. The advent of sequence specific nucleases has emerged as an alternative to the plant breeding techniques. CRISPR/Cas9 mediated genome editing technology has the potential to target the negative regulatory genes against the stresses and produce gene edited lines with enhance yield, biotic and abiotic stress tolerance.

Keywords: Biotic, Abiotic, stress, tomato, CRISPR/Cas9, NHEJ, HDR, mutants



Biography:

Sonu Priya Sahu is a pre doctoral candidate at Centurion University of Technology and Management, Bhubaneswar after completing her MSc from Centurion University of Technology and Management, Bhubaneswar. Her current work focus on Genomics and Molecular Biology. Her previous work includes computational biology specifically molecular docking of derived phytochemicals from medicinal plants against various disease causing bacterial proteins and her current work focus on Genome editing using Modern technology for crop improvement. Research Interest: Molecular biology,Genetics and Genomics, Computational Biology,Biotechnology.

E: Sonupriyasahu111@gmail

POSTER

Rapid development of SNP markers towards bacterial wilt resistance in Tomato (*Solanum lycopersicum* L.)

Debasmita Das, Bhagwat Prasad Nayak, Chinmaya Ranjan Sahoo, and Rukmini Mishra
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

In order to feed the ever-growing population, food production needs to be marginally accelerative. Tomato (*Solanum lycopersicum* L.) is a major horticultural crop in our country for which, India is the second largest country globally in terms of volume of tomatoes produced with more than 20 million tons. In the fiscal year 2019-2020. Bacterial wilt of tomato is a major concern in India causing more than 10.80-92.62% of total loss in yield. Ralstonia solanacearum is the 2nd most important plant pathogenic bacteria in molecular plant pathology which causes bacterial wilt disease among a very wide range of hosts. Bacterial wilt of tomato is a highly versatile, soilborne bacterial disease which is one of the devastating ailments known for tomato cultivation. However convectional resistance breeding practices might require a long and problematic procedure to establish resistant genotypes with other desirable characters like early and high yield. Even identification of such genotypes can take several months to years. With the help of reliable linked sequence-based SNP marker associated with the genetic sequences responsible for resistance against bacterial wilt of tomato, one can easily screen and establish resistant and susceptible lines with more accuracy while requiring less time. Development of such tightly linked SNP markers allows early detection of response towards such aliments and might open up great prospects for breeder and agriculturists.

Keywords: Tomato, Bacterial Wilt, SNP Marker, Resistance Breeding, Plant Pathogen, Molecular Breeding, Crop Improvement

Biography:

Debasmita Das is a pre doctoral candidate under department of Botany at Centurion University of Technology and Management, Bhubaneswar after completing her MSc in Botany from the same. Her current work focus on genomics and molecular biology. Her previous work includes computational biology specifically molecular docking of derived phytochemicals from medicinal plants against various diseases causing bacterial proteins and her current work focus on development of tightly linked SNP markers for early detection of bacterial wilt resistance in tomato. Research Interest: Molecular Biology, Genetics & Genomics, Computational Biology, Biotechnology.

E: das.smitadeba@gmail.com

POSTER

Genome-wide identification and expression studies of FHY3/FAR1 gene in *Manihot esculenta* for salt tolerance

Sonali Sucharita Jena and Pushpalatha Ganesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

The FHY3/FAR1 transcription factor plays important roles in light signal transduction and also in several developmental processes. The identification of FHY3/FAR1 transcription factor family has not been studied in many plants. In this study 50 FHY3/FAR1 genes have been identified in Manihot esculenta. While performing genome wide study, these genes were classified into six subgroups by phylogenetic analysis. They show potential regulatory roles in light signal transduction and photomorphogenesis, plant growth and development. The genome wide study revealed all the information of FHY3/FAR1 genes such as its gene structure, subcellular location and all the protein properties. Several conserved motifs has also been identified. By expression analysis it has been seen that FHY3/FAR1 genes expressed differently in different tissues, but expressed strongly in leaves. Most of the genes are resistance to salt stress, as they were expressed positively in that case but some genes were expressed negatively to salt stress. These results will help in further studies and provide a strong base for the functional studies on FHY3/FAR1 transcription factor family. Also it can be a framework for breeding and developing several varieties of Manihot esculenta with high light efficiency and stress resistance.

Keywords: signal transduction, transcription factor, motifs, salt stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Genome-wide identification of FAR1 genes and it's expression analysis in Sugarbeet (*Beta vulgaris*) Plants

Pushpalatha Ganesh, Sreedhara Ambareesh, Ram Prasad Behera, Santanu Mishra, Sanchari Pandit, Sanchita Mishra, Sai Swetha
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

The FAR1 transcription factor family plays important role in light signal transduction, and in the present study, 15 FAR1 genes were identified in the sugar beet plant genome through a genome-wide study. Their potential regulatory roles in light signal transduction, plant growth and development. Several conserved motifs have also been identified. An expression analysis revealed FAR1 genes are strongly expressed, and most of these genes were positively expressed under salt stress (NaCl). These results will provide the foundation for functional studies of the FAR1 family, and will contribute to the breeding of sugar beet varieties with high light efficiency and strong stress resistance against salinity.

Keywords: gene family; light; abiotic stress; expression pattern

E: pushpabhagyalakshmi@gmail.com

POSTER

Genome-wide identification of FHY3 genes and it's expression analysis in Tomato (*Solanum lycopersicon*) Plants

Pushpalatha Ganesh, Samikhya Jena, Shreya Shree Nayak, Tanmayee Mohanty, Ram Prasad Behera, Santanu Mishra and Sreedhar Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

The FHY3 transcription factorplays important roles in light signal transduction. In this study 14 FHY3 genes have been identified in Solanum lycopersicon and their expression analysis was performed. While performing genome wide study, these genes were classified into five subgroups by phylogenetic analysis. They show potential regulatory roles in light signal transduction, plant growth and development. The genome wide study explains all the information of FHY3 genes such as its gene structure, subcellular location and all the protein properties. By expression analysis it has been seen that FHY3 genes expressed differently under different salt concentrations. Most of the genes are resistance to salt stress, as they were expressed positively in that case. Such results will facilitate in further studies and provide a strong base for the functional studies on FHY3 transcription factor family.

Keywords: Gene expression, transcription factor, motifs, salt stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Genome-wide identification of FAR1 genes and it's expression analysis in Cucumber (*Cucumis sativus*) Plants

Pushpalatha Ganesh, Ram Prasad Behera, Santanu Mishra, Shreya Shree Nayak, Samikhya Jena, Tanmayee Mohanty, and Sreedhar Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

The FAR1 transcription factor plays important roles in light signal transduction and has not been studied in cucumber plants. In this study, 14 FAR1 genes have been identified in Cucumis sativus. The genome wide study showed all the information of FAR1 genes such as its gene structure, subcellular location and all the protein properties. Several conserved motifs has also been identified. By expression analysis it has been seen that FHY3/FAR1 genes expressed differently in different salt concentrations. Most of the genes are resistance to salt stress, as they were expressed positively. These results will be a fundamental basis in further studies and provide a strong base for the functional studies on FHY3/FAR1 transcription factor family.

Keywords: Gene expression, transcription factor, motifs, salt stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Genome-wide identification of FAR1 genes and it's expression analysis in Spinach (*Spinacia oleracea*) Plants

Pushpalatha Ganesh, Santanu Mishra, Ram Prasad Behera, Shreya Shree Nayak, Samikhya Jena, Tanmayee Mohanty and Sreedhar Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

The FAR1 transcription factor plays important roles in light signal transduction and has not been studied in many plants. In this study, 14 FAR1 genes have been identified in Spinacia oleracea and classified into several subgroups by phylogenetic analysis. The genome wide study revealed all the information of FAR1 genes such as its gene structure, subcellular location and all the protein properties. By expression analysis it has been seen that FAR1 genes expressed differently in different salt concentrations. Most of the genes are resistance to salt stress, as they were expressed positively. These results will laid foundation for further studies and provide a strong base for the functional studies on FAR1 transcription factor family.

Keywords: Gene expression, transcription factor, motifs, salt stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Genome-wide identification of FAR1 genes and it's expression analysis in Chilli (*Capsicum annum*) Plants

Pushpalatha Ganesh, Shreya Shree Nayak, Samikhya Jena, Tanmayee Mohanty, Ram Prasad Behera, Santanu Mishra, , and Sreedhar Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

The FAR1 transcription factor plays important roles in light signal transduction and its identification has not been studied in many plants. In this study 14 FAR1 genes have been identified in Capsicum annum. The performance of genome wide study revealed certain subgroups by phylogenetic analysis by exhibiting the potential regulatory roles in light signal transduction, plant growth and development. The genome wide study revealed all the information of FAR1 genes such as its gene structure, subcellular location and all the protein properties. Several conserved motifs has also been identified. Most of the genes are resistance to salt stress, as they were expressed positively for salt tolerance. These results will help in further studies and provide a strong base for the functional studies on FAR1 transcription factor family.

Keywords: Gene expression, transcription factor, motifs, salt stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Genome-wide identification of FHY3 genes and it's expression analysis in Radish (*Raphanus sativus*) plants

Pushpalatha Ganesh, Tanmayee Mohanty, Samikhya Jena, Shreya Shree Nayak, Ram Prasad Behera, Santanu Mishra, and Sreedhar Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, *India*

Abstract:

Radish (Raphanus sativus) is an important root vegetable crop in family Brassicaceae ,which provides diverse nutrients for human health and is closely related to Brassica crop species. The identification of FHY3 transcription factor family has not been studied in many plants. In this study 12 FHY3 genes have been identified in Raphanus sativus. They show potential regulatory roles in light signal transduction, plant growth and development. The genome wide study revealed all the information of FHY3/FAR1 genes such as its gene structure, subcellular location and all the protein properties. Several conserved motifs has also been identified. By expression analysis it has been seen that FHY3/FAR1 genes expressed differently under different salt concentrations. These results will help in further studies and provide a strong base for the functional studies on FHY3/FAR1 transcription factor family. Also it can be a framework for breeding and developing several varieties of radish with high light efficiency and stress resistance.

Keywords: Gene expression, transcription factor, motifs, salt stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Salt tolerance analysis, the role of CYP85A1 gene and its expression studies on Tobacco (*Nicotiana tabacum*)

Pushpalatha Ganesh, Sanchita Mishra, Ch. Sai Swetha, Sanchari Pandit, Sreedhara Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, India

Abstract:

Tobacco, an important model plant and economic crop, has made strides in salt tolerance thanks to transgenic technology. Salt stress has emerged as a critical area of study in abiotic stress research. Because of the increased use of poor quality water for irrigation and soil salinization, salinity is a major abiotic stress limiting plant growth and productivity in many parts of the world. Understanding the mechanism of abiotic tolerance and developing abiotic tolerance germplasm are critical components of plant research. Wild-type genes have the potential to improve abiotic resistance in cultivated species. Tobacco research advances understanding of critical adaptations for survival in high salinity environments, such as cellular ion transport, osmotic regulation, antioxidation, signal transduction and expression regulation, and cell stress protection. CYP85A1, a key Brassinosteroids (BRs) specific gene is used to identify the genome-wide distribution in tobacco genotypes. BRs are essential for plant growth, development, and responses to a variety of abiotic stresses. Increased endogenous BR content may improve resistance to salt stress in tobacco plants overexpressing CYP85A1 by enhancing the activity of defence enzymes. Thus, the present study envisages the genome-wide evaluation of CYP85A1 gene and its role to increase accumulations of proline and soluble sugars thereby, enhancing the tolerance of tobacco genotypes against salt stress.

Keywords: expression, salinity, proline, sugar, tolerance

E: pushpabhagyalakshmi@gmail.com

POSTER

Drought tolerance analysis, role of ZmPYL genes and expression studies on Water mealon plant (*Citrullus lanatus*)

Pushpalatha Ganesh, Ch. Sai Swetha, Sanchari Pandit, Sreedhara Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, India

Abstract:

Drought is the major abiotic stresses affecting agriculture and programs of breeding to produce drought - resistant crops is an import challenge in science community. Watermelon is known as is a fruit crop belonging to the family Cucurbits. PYLs, responsible for encoding the abscisic acid (ABA) receptors, play crucial roles in ABA signaling, but the function of these gene in drought response of crops is still largely unknown. The change in expression of these gene under different stresses were indicative of the role of ClPYLs in responding to multiple abiotic stresses. Transgenic analyses of ClPYL genes in Arabidopsis showed that overexpression of certain genes significantly enhances the sensitivity of transgenic plants to ABA. Proline accumulation and activated expression of drought-related maker gene shows a relatively positive regulation of ClPYL genes in water melon plants. Thus, results of such studies strengthen the knowledge of the function of PYL genes in water melon genotypes in responses to abiotic stresses and serves as potential molecular makers in breeding programs.

Keywords: genome, expression, drought, molecular, abiotic stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Assessment of adulteration in raw herbal parts of medicinal plants in India by using molecular techniques

Pushpalatha G.[1] **and Raghavendra P.** [2]
[1]*Centurion University of Technology and Management, Paralakhemundi, Odisha, India*
[2]*Himalaya Wellness Company, Bengaluru, Karnataka, India*

Abstract:

A number of reports have demonstrated that there could be an extensive adulteration in the trade of raw herbal of medicinal plants. Such substitutions could possibly compromise the health and safety of the consumers. In the present study, the Tridex procumbens was used to check the level of adulteration and its specific importance in southern part of Odisha. Short sequence diversity of standardized specific coding gene regions was used to compare and differentiate the plant species. Subsequently, all the samples were used for molecular work, purified and sequenced successfully. The phylogenetic study showed a distinguished relationship. Thus, the result indicated that the molecular approach is more successful in identifying the adulteration in the medicinal plants and certain genes are considered to be novel candidates for the same.

Keywords: herbal, medicinal, phylogenetic, sequence, species.

E: pushpabhagyalakshmi@gmail.com

POSTER

Developmental growth analysis of maize (*Zea mays* L.) genotypes and expression analysis of transposase genes

S. Veera Vishnu, S. R. Harish Chandra, and G. Pushpalatha
Centurion University of Technology and Management, Paralakhemundi, Odisha, India

Abstract:

Transposable elements make important contributions to adaptation and evolution of their host genomes in maize genotypes. The well-characterized transposase-derived transcription factor FAR-RED ELONGATED HYPOCOTYLS3 (FHY3) and its homologue FAR-RED IMPAIRED RESPONSE1 (FAR1) have crucial functions in plant growth and development. In addition, FHY3 and FAR1 are the founding members of the FRS (FAR1-RELATED SEQUENCE) and FRF (FRS-RELATED FACTOR) families. We demonstrated the varied developmental pattern in maize genotypes under salinity and drought stress. The expression analysis of transposase gene showed varied regulation among the maize genotypes under salt and drought stress conditions.

Keywords - gene family, molecular, gene expression, genotypes, variation.

E: pushpabhagyalakshmi@gmail.com

POSTER

The gene Expression studies of *ZmPLY* and its genome-wide identification in Maize Plants (*Zea mays*)

Pushpalatha Ganesh, Sanchari Pandit, Sanchita Mishra, Sai Swetha, Sreedhara Ambareesh
Centurion University of Technology and Management, Paralakhemundi, Odisha, India

Abstract:

One of the major abiotic stresses affecting world agriculture is drought. Thus, the breeding of drought-resistant crops is an important challenge for plant biologists. Maize, better known as corn is a cereal crop belonging to the family Poaceae. It is an important cereal crop ranking third to rice and wheat. PYLs, responsible for encoding the abscisic acid (ABA) receptors, play crucial roles in ABA signaling, but the function of these genes in drought response of crops is still largely unknown. A number of PYL family members in maize were identified. The changes in expression of these genes under different stresses were indicative of the role of ZmPYLs in responding to multiple abiotic stresses. Transgenic analyses of ZmPYL genes in Arabidopsis showed that overexpression of certain genes significantly enhances the sensitivity of transgenic plants to ABA. Accumulation of proline and enhanced expression of drought-related marker genes in transgenic lines further confirmed the positive roles of ZmPYL genes in plant drought resistance. The results of such studies deepen the knowledge of the function of maize PYL genes in responses to abiotic stresses, and the natural variants identified in ZmPYL genes may serve as potential molecular markers for breeding drought-resistant maize cultivars.

Keywords: genome, proline, drought, molecular, abiotic stress

E: pushpabhagyalakshmi@gmail.com

POSTER

Screening of taro (*Colocasia esculenta* Linn.) genotypes for salt tolerance under *in-vitro* condition

V.B.S. Chauhan, Reshmi Das, Kalidas Pati, R. Arutselvan and M. Nedunchezhiyan
ICAR-Central Tuber Crops Research Institute, Regional Centre, Bhubaneswar, Odisha, India

Abstract:

Taro (*Colocasia esculenta* Linn.) is one of the important tuber crops grown throughout the tropical and sub-tropical regions. It is widely cultivated for its starchy corms, leaves and petioles. The corms and leaves of taro are an excellent source of energy, fiber and nutrients such as calcium, iron, zinc, potassium and phosphorous. In climate changing scenario such as rising sea level and frequent dry and wet conditions leads to increased soil salinity particularly in coastal region and it limit taro cultivation. Keeping in view of fact present investigation were carried out for selection salt tolerance lines under in-vitro condition. Taro lines Andman, Megh-19, T-12, NEH-44, NEH-12, Panchamukhi, Ciruli local, Pipply, Megh-18, T-102, NEH-14, TCR-696, TCR-887 B, T-416940, TCR-913, NBPGR-7, NBPGR-14, T-032986, T-012504 and T-412459 were established in tissue culture via buds of the seed corm using Murashige and Skoog (MS) medium.

Effect of different concentrations and combination of plant growth regulators (PGRs) along with the control were investigated for the standardization of MS media by using in vitro culture techniques for direct plantlet regeneration from the buds of the seed corm. The experiment revealed that the explants cultured on MS medium supplemented with IBA 0.1 mg L-1 + Kinetin 0.1 mg L-1 was found to be the best as compared to other treatments. Taro buds isolated from seed corms were planted on MS culture media containing different concentrations of NaCl (0%, 0.5%, 1.0%, 1.5% and 2.0%). Data were recorded for days taken for shoot initiation and numbers of shoots per explants after five weeks, number of leaves per plantlet after five weeks, number of roots per plantlet after five weeks, shoot length after five weeks and roots length after five weeks. It was found that different lines of taro able to grow up to salinity level 1.5% of Na Cl concentration. Increasing the salinity concentrations resulted in reduction of shoots, leaves and roots numbers of the taro. Among all 20 genotypes only T-032986, NEH-14, T-102, Ciruli local, NEH-12, T-416940, T-012504, NEH-44 and NBPGR-14 were survived at salinity concentration of 2% of NaCl salt. The genotype T-012504 was found best salt tolerance line which produced maximum shoots, leaves and roots at 2 % of Na Cl salt mediated medium.

E: vijay97veg@gmail.com

POSTER

Impact of heat stress on callus regeneration in rice (*Oryza sativa* L.) in vitro

Nibedita Swain, Manjusha Chandravani, Byomkesh Dash, Sudhansu Sekhar Bhuyan, Snigdha Sameer Pattanaik, Sanghamitra Samantaray
ICAR-National Rice Research Institute, Cuttack , Odisha, India

Abstract:

A new and rapid method for optimum callus production was established in 8 rice (*Oryza sativa*) varieties. Mature seeds were used as a starting material for callus induction experiment using a particular concentrations of 2,4-D, Kinetin, BAP, and NAA. Higher percentage of callus induction was obtained in MS +Kn (0.1mg/l)+ 2,4-D (3.0mg/l) media. Embryogenic callus was noticed which were compact in texture and globular and light yellowish in colour. For calli regeneration, induced calli of higher efficiency of Shaktiman variety were treated with various concentrations of Kn (0.5-1.5mg/l), BAP (0.5-2.0mg/l), NAA (0.1mg/l) along with 5mg/l Glutamine. The shoot regeneration was found maximum in MS media supplemented with BAP (1.5mg/l)+ Kn (1.0mg/l)+NAA(0.1mg/l) along with 5mg/l Glutamine within 4 weeks of culture. Here, the effect of high temperature on callus induction and shoot regeneration of Shaktiman variety were assessed, and it was observed that the heat stressed calli of Shaktiman variety shows early and rapid growth in callus size (40°C for 18 hours and 10 mm increment) within 10days of incubation as compared to control (25°C). However, 35°C stressed calli exposed for 12 hours responded to late shoot regeneration with highest frequency (50%) than the calli grown in control condition for 28days.

Biography:

Nibedita Swain is the presenting author of the abstract. She has completed her MSc. (Biotechnology) in 2018 from MITS School of Biotechnology. She has done my dissertation on plant tissue culture at ICAR-NRRI, Cuttack. She has also qualified ICAR-NET (Agricultural Biotechnology) and GATE (Life Sciences). She is currently working as Skilled Help at ICAR-NRRI, Cuttack.

Research Interest: Plant tissue culture, CRISPR Technology

E: nibeditaswain375@gmail.com

POSTER

Molecular biomarker as a tool in assessing reproductive toxicity in fish

Ipsita Iswari Das, Jitendra Kumar Sundaray, Aman Kumar Mohanty, Lakshman Sahoo, and Rajesh Kumar
ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha, India

Abstract:

Biomarkers can be broadly defined as any biological index, that is capable of being measured, which is associated with a defined biological endpoint such as developmental (physiological) or disease (acute or chronic) stage. Identifying and validating endocrine, cellular, and molecular biomarkers is critical for the successful diagnosis of toxicity and disease. Biomarkers are used to track biological changes that occur as a result of biotic and abiotic stresses. The study of aquatic toxicology has been prioritized by global researchers due to its impact on aquatic creatures, such as pollutants (Agrochemicals) on the health of fish or other aquatic organisms. A pesticide's ability to affect fish and aquatic species is mostly determined by its toxicity, exposure length, dose rate, and persistence in the ecosystem. Endocrine disruptors (EDCs) are a category of a xenobiotic that is identical to endocrine hormones in live beings and disrupts hormone release, producing physiological disorders in the neurological, endocrine, and reproductive systems. Endogenous hormones can be agonized, antagonized, or synergized by EDCs, resulting in physiological and behavioural problems in aquatic organisms. Biomarkers can assist in determining not just the degree of toxicity of a substance, but also the mechanisms through which that material causes hazardous effects. Xenobiotic chemicals disrupt fish physiological homeostasis and cause oxidative stress by increasing the generation of reactive oxygen species (ROS). Contaminants can modify miRNA expression profiles, resulting in a variety of physiological and behavioural changes. In fish, vitellogenin (VTG) is an egg yolk precursor protein that is being utilized as a biomarker to identify EDCs that interfere with estrogen synthesis.

The zebrafish is a well-known vertebrate model for toxicity research that has been extensively used to unravel the complexity of the AHR (Aryl hydrocarbon) pathway and post-transcriptional factor (microRNA). miRNAs function via a cascade of molecular processes. In contrast, microRNAs and vitellogenin have emerged as promising biomarkers for predicting the risk of xenobiotic exposure. The aryl hydrocarbon receptor is a ligand-activated receptor that is present in all eumetazoan organisms. Studies have shown that the endogenous and toxicological activities of the zebrafish Aryl hydrocarbons are diverse. Triflumezopyrim (Pexalon) is a new mesoionic insecticide designed to treat a wide range of insect pests in rice. It operates by blocking the nicotinic acetylcholine receptor from functioning. However, the influence of this pesticide on food or model fish has yet to be investigated. In this work, we looked at the effects of pexalon on zebrafish. To evaluate the influence of this new generation pesticide on Danio rerio and its microbiome, we conducted preliminary research on the impact of pexalon on physiology using histology and microbiological assays. The in silico study elucidated the interaction mechanism with Vitellogenin- 1, Ahr 2, and microRNA. Pexalon interacts with the vitellogenin- 1. However, in cases of Ahr2 and miRNA-21, the ligand molecule possessed binding affinity, but no interaction was observed between them. This investigation will add to our understanding of the detailed mechanism and interaction of pexalon with biomarkers.

Keywords: Biomarker, EDC, Vitellogenin, AHR, and MicroRNA.

Biography:

Ipsita Iswari Das, M.Sc (Microbiology) from Orissa University of Agriculture and Technology, Bhubaneswar, Odisha, qualified ICAR- ASRB- NET 2018. She has been a research scholar since 2019 at ICAR- Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar, Odisha. She has worked in the DBT-Centre of Excellence Project “Genetic enhancement of freshwater fish *Catla catla* by using genetic and molecular approaches” and in DBT funded Project on Assessment of Endocrine Disruption in Fish Reproduction. She has been awarded with the Best Poster Presentation in the 3rd International Symposium on Genomics in Aquaculture 2020 (ISGA-III) held at ICAR- Central Institute of Freshwater Aquaculture, Bhubaneswar. She is currently involved in the research related to Biomarkers, reproductive toxicology, and metagenomics.

E: jsundaray@gmail.com

POSTER

Assessment of Genetic Diversity in Doubled Haploid population derived from indica rice hybrids

Byomkesh Dash, Sudhansu Sekhar Bhuyan , Nibedita Swain, Alina Singh, Parmeswaran C, and Sanghamitra Samantaray
ICAR-National Rice Research Institute, Cuttack, Odisha, India

Abstract:

Anther culture is a revolutionary biotechnological technology for producing true homozygous lines that has greatly decreased the breeding cycle. It could be used to create doubled haploids (DHs) that perform at par with the hybrids while removing the issues that come with hybrid rice production. Doubled haploids have various advantages, including reducing the breeding cycle by rapid homozygozity fixation, high selection efficiency, and increased genetic variability through gametoclonal variant formation. Plant breeders use genetic diversity as a major factor when planning future breeding programmes. Understanding genetic links, including parentage, as well as successful germplasm management, necessitates it. Plant genetic diversity and population divergence may now be investigated because to the rapid development of molecular markers. Simple sequence repeats (SSRs), also known as microsatellites are frequently utilized in plants to explore genetic diversity and evolutionary relationships as allele-specific and codominant markers. Because of their abundance, these markers are useful for genetic mapping and population studies. Under this study SSR markers and the Neighbour Joining approach were used to examine genetic diversity and population divergence in the DH population of two indica rice hybrids. A total of 36 and 31 SSR markers were employed in 23 and 47 doubled haploids obtained using anther culture from two indica rice hybrids, "Arize8433DT" and "Arize Bold," respectively.

The results indicated mean polymorphism information content (PIC) values ranged from 0.3293 (Arize8443DT) to 0.3696 (Arize Bold). While, RM297 (Arize8443DT) and RM278 (Arize Bold) were found to be best marker for the identification of genetic diversity. The Jaccard's similarity coefficient in DHs derived from Arize8443DT and Arize Bold was found to be 0.74 and 0.72 respectively. The parent hybrids were distant from the doubled haploid population in separate clusters indicating the phenomenon of meiotic recombination in spontaneous chromosome doubling. The study shows the effectiveness of SSR marker based molecular fingerprinting which served as a sound basis in the identification of genetically distant as well as in the duplicate sorting of the morphologically close population.

E: dashbyom.k@gmail.com

POSTER

Molecular marker-based characterization of BLB in the DH population derived from BS6444G

Sudhansu Sekhar Bhuyan[1], Durga Prasad Barik[2], Byomkesh Dash[1], Manjusha Chandravani[1], Nupur Naik[1], Devanna B[1], Sanghamitra Samantaray[1]
[1]*ICAR-National Rice Research Institute, Cuttack, Odisha, India*
[2]*Ravenshaw University, Cuttack*

Abstract:

Bacterial leaf blight caused by the bacterial pathogen Xanthomonas oryzae pv oryzae (Xoo) limits rice yield in all major rice-growing regions of the world, especially in irrigated lowland and rain fed conditions where predisposition factors favor disease development to epidemic proportions. Since bacterial pathogens are difficult to manage, development of host plant resistance is the most effective means of disease management. As many as 24 major genes conferring resistance to various races of the pathogen have been identified and utilized in rice breeding programs. However, large-scale and long-term cultivation of varieties carrying a single gene for resistance resulted in a significant shift in pathogen race frequency with consequent breakdown of resistance in these cultivars. To combat the problem of resistance breakdown, pyramiding of resistance genes into different cultivars is being carried out. Pyramiding of resistance genes is now possible with molecular markers that are developed for individual genes. This article discusses the role of four major bacterial blight resistance genes (xa4, xa5, xa7 and xa21) and their corresponding molecular markers against the BB in the doubled haploid population developed from an elite indica rice hybrid BS6444G. The study comprises identification of various gene combinations and their phenotypic response against the cut-strip inoculation of BB pathogen in the developed DH population. Using various bioinformatics tools (Principle Coordinate analysis, AMOVA and Neighbour-end joining (Jaccard's Coefficient)) for establishing the correlation between the gene combination identified and phenotypic data. Our findings showed the presence of 3 major clustures among the population showing clear division of Highly resistance and resistance in the same clusture group. While the moderately resistant and moderately susceptible group are clustered into same group. The third clusture comprise of the highly susceptible and susceptible. The verify the finding corelating the molecular data with the phenotypic analysis.

E: sudhansubhuyan88@gmail.com

POSTER

Cold extremes: Effect on callus growth and regeneration in rice (Oryza sativa L.)

Manjusha Chandravani, Nibedita Swain, Byomkesh Dash, Snigdha Sameer Pattanaik, Sudhansu Sekhar Bhuyan, Sanghamitra Samantaray
ICAR-National Rice Research Institute, Cuttack , Odisha, India

Abstract:

A new and rapid method for optimum callus production was established in 8 rice (Oryza sativa) varieties. Mature seeds were used as a starting material for callus induction experiment using a particular concentrations of 2,4-D, Kinetin, BAP, and NAA. Higher percentage of callus induction was obtained in MS +Kn (0.1mg/l)+ 2,4-D (3.0mg/l) media. Embryogenic callus was noticed which were compact in texture and globular and light yellowish in colour. For calli regeneration, induced calli of higher efficiency of Shaktiman variety were treated with various concentrations of Kn (0.5-1.5mg/l), BAP (0.5-2.0mg/l), NAA (0.1mg/l) along with 5mg/l Glutamine. The shoot regeneration was found maximum in MS media supplemented with BAP (1.5mg/l) + Kn (1.0) +NAA (0.1mg/l) along with 5mg/l Glutamine within 4 weeks of culture. Here, the effect of low temperature on callus induction and shoot regeneration of Shaktiman variety were assessed, and it was observed that the cold stressed calli of Shaktiman variety shows late and minimal growth in callus size (4°C for 18 and 1.8mm increment) within 10days of incubation as compared to control (25°C). However, 4°C stressed calli exposed for 12 hours responded to shoot regeneration with highest frequency (45%) after 15 days of culture; the calli grown in control condition showed 60% shoot regeneration when cultured for 28days.

Biography:

Manjusha chandravani is the presenting author of the abstract. She has completed her MSc.(Biotechnology) in 2018 from Siksha O Anusandhan deemed to be university. She has done her MSc dissertation in plant tissue culture at CSIR- National Rice Research Institute, Cuttack. Now currently joined as Young Professional-II at ICAR-NRRI.

Research Interest: Plant tissue culture, Molecular Biology

E: manjusha.chandravani@gmail.com

POSTER

Establishment of new method for in vitro propagation and cormlet production of *Crocus sativus L.*

Namita Muduli and Khirod Kumar Sahoo
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Saffron (*Crocus sativus L.*) is a monocot, perennial, triploid plant. The stigma of Crocus sativus L. flower is the most expensive spice of the world. It is commonly used to flavour and colour food. Crocus sativus contains a number of phytochemicals and biologically active compounds such as apocarotenoids, flavonoids, tannins, anthocyanin etc., which have been used to treat several medical conditions. Saffron plants can only be propagated vegetatively by corm due to its sterility. Vegetative propagation also has significant drawbacks, such as preventing species genetic variability, which can result in lower saffron yields under various stress conditions. Because the plants are genetically homogeneous, they are vulnerable to pathogenic plant viruses, bacteria, and fungi, which cause a variety of diseases. In this scenario, plant tissue culture offers a great potential for its sustainable production. We have standardised the medium with growth regulators for shoot induction, callus production, somatic embryo development, multiple shoot regeneration, and cormlets production under *in vitro* condition. The macrocorms grown under *in vitro* (F1 generation), were successfully acclimatised and transferred to soil under controlled cold conditions for 2-3 generations to reach the appropriate size for flowering. This method of mass producing pathogen-free Saffron plants will be a novel approach to genetic modification and the development of new plant varieties.

Keywords: Saffron, somatic embryo, callus, corm, stigma

Biography:

Namita Muduli is a Ph.D. Research Scholar at Department of Botany, Ravenshaw University, Cuttack, Odisha. Her research interest include plant biotechnology, plant molecular biology

E: namitamuduli18a@gmail.com

POSTER

Micropropagation and genetic fedility study of *Mucuna gigantea* (Willd.) DC.– An endangered medicinal plant of Odisha

Sanjay K. Madkami, Arpita Moharana, Soumendra K. Naik, and Durga P. Barik
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Mucuna gigantea (Willd.) DC belongs to family Fabaceae is a climber and commonly known as sea bean. The plant is an associates mangrove mostly found near coastal regions and is valued for its nutritional, pharmacological and medicinal properties. Plants in this genus have high protein content as compared to other legumes including soyabean and thus used as food and fodder. The plant extracts are beneficial for the treatment of various diseases including Parkinson's, helminthiasis, gonorrhoea, and aphrodisiac. Due to its medicinal and nutritional properties the plant is being overexploited and has been enlisted under endangered category of plant in Odisha. Thus, there is a need to conserve the species. To meet the commercial demand of the plant, plant tissue culture methods are alternative to conventional methods. For the purpose an efficient micropropagation protocol for Mucuna gigantea was developed using cotyledonary node explants derived from 07-10 days old axenic seedlings.

Highest percentage (93.0%) of seed germination was found using fresh seeds on ½ MS medium without any plant growth regulators. Multiple shoots were induced and proliferate from cotyledonary node on MS medium supplemented with BAP 2.0 mg/l most effectively. On this medium 100 % shoot regeneration was observed. After harvest of primary shoots the mother cotyledonary node was repeatedly sub-cultured on fresh medium of same composition. The highest number of shoots (19-21) per explant with an average 4.7 cm was observed during third culture passage. Axenic shoots were also culture on MS + 2.0 mg/l BAP for upscaling of shoots. Rooting was best induced in in vitro shoots on ½ MS + 0.5 mg/l IBA. Plantlets with well developed roots were acclimatized in sand and soil (1:1) and subsequently established in pots with garden soil. The genetic stability of the regenerated plants were confirmed using randomly amplified polymorphic DNA (RAPD) analysis employing 14 operon primers. This system provides high fidelity micro-propagation system for efficient and rapid micro-propagation of this important endangered medicinal plant of Odisha.

Keywords: Mucuna gigantea, Associates mangrove, Micropropagation, Cotyledonary node, RAPD analysis

E: sanjaybabu073@gmail.com

POSTER

Applying *Agrobacterium rhizogenes*, for hairy root induction in *Vitex negundo*, a therapeutic plant.

Bhaswatimayee Mahakur, Soumendra K. Naik, and Durga P. Barik
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Vitex negundo L. (Family: Verbenaceae) is an aromatic, woody, blooming shrub that grows to be a small tree and may be found in many countries across the world. *V. negundo* is a traditional medicinal plant that has been utilized in both classic and new medicine. Root juice is tonic, expectorant and is used to treat colic, worms, rheumatism, dyspepsia, leprosy, boils etc.

Agrobacterium rhizogenes, a gram-negative soil bacterium that causes hairy root disease in dicotyledonous plants. When the bacterium infects the plant the T-DNA between the LB and RB segments of the Ri plasmid in the bacteria is transmitted and incorporated into the nuclear genome of the host plant. Hairy root, and useful by-product of the transformation process, will develop more or less at the infection site. We have used in-vitro internode from 01-02 months old *Vitex negundo* in-vitro plant. The internode was cut into segments of 1.5 to 2.0 cm in length.

The internode was pierced using a sterile needle and dipped into the bacterial suspension (MTCC 532) for 30 minutes, 45 minutes, and 60 minutes. The explants were then removed from the bacterial suspension and touched once with a sterile tissue paper to remove any excess Agrobacterium before being inoculated in a flask containing half MS, half MS+AS medium. The mouth was then cotton plugged and maintained in a dark chamber at 24°C. Hairy root induction is lowered in media containing half MS+AS and dipping times of 30 and 45 minutes in bacterial suspension. Hairy root induction is better in media containing half MS+AS and 60 minutes dipped in bacterial suspension, with four to five numbers of roots induce from the tip of the internode.

Biography:

Bhaswatimayee Mahakur is a Ph.D. Scholar at Department of Botany & Biotechnology, Ravenshaw University, Cuttack, Odisha. She is doing her Ph. D. under the guidance of Dr. Durga Prasad Barik of Ravenshaw University.

E: bhaswatimahakur@gmail.com

A report on preliminary phytochemical analysis of *Uvaria hamiltonii* Hook. f. & Thomson : a valuable medicinal plant

Srushti Prajna Mohanty and Durga Prasad Barik
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Uvaria hamiltonii Hook.f. & Thomson belonging to Annonaceae family is an important medicinal plant. This is a woody climber commonly known as Lakankuli, Latkan, Zawl-thei or Taipak. In India, it has been dispersed mainly throughout Uttar Pradesh, Bihar, Sikkim, West Bengal, Assam, Meghalaya, Tripura, Odisha, Andhra Pradesh. Traditionally, it has been used as efficient drug against several diseases like diabetes mellitus, bronchitis, malarial fever and minor bacterial infections. Thus, this study was undertaken to evaluate its phytochemical properties in a preliminary manner. The results obtained indicate presence of phytochemicals like alkaloids, steroids, phenolics, saponins, tannins, terpenoids, iridoids and cardiac glycosides in leaf, stem and stem bark aqueous extracts. Only aqueous stem bark extracts showed positive result for flavonoids. Interestingly, anthraquinones are exhibited only in aqueous stem extracts. These findings provide scope for extensive investigation regarding bioactive compounds of this medicinal plant.

Keywords: Annonaceae, Aqueous, Phytochemicals, *Uvaria hamiltonii*

Table: Phytochemical screening of aqueous extracts of different plant parts of *U. hamiltonii*

PHYTOCHEMICALS	LEAF EXTRACT	STEM EXTRACT	STEM BARK EXTRACT
ALKALOIDS			
Wagner's Test	+	+	+++
Mayer's Test	+	+	+
Hager's Test	+	+	+
Tannic Acid Test	+++	+++	++
STEROIDS			
Salkowski Test	+++	+++	+++
PHENOLIC COMPOUNDS	+	++	++
CARDIAC GLYCOSIDES	+	-	+
SAPONINS	+++	++	+++
TANNINS	+++	++	-
TERPENOIDS	+++	++	++
FLAVONOIDS	-	-	+
ANTHRAQUINONES	-	++	-
IRIDOIDS	+++	+++	++

NB: '+' means present in trace amount , '++' means present in moderate amount, '+++' means present in abundance, '-' means absent

Biography:

Srushti Prajna Mohanty has completed her post graduation degree in Botany from Ravenshaw University, Cuttack, with specialisation in Plant Biochemistry. Acknowledging the need for conservation of plants, she is pursuing her research work in the field of Plant tissue culture as a Ph.D scholar in the Department of Botany, Ravenshaw University, Cuttack, Odisha. Her area of interest includes in vitro culture and phytochemical analysis of endangered plants. She has so far focussed on writing articles related to biodiversity and environmental issues. She strongly believes in the idea that rational efforts at individual level can lead to a greener and healthier earth. **Research Interest:** Plant tissue culture, Phytochemical analysis, Pharmacological studies and Molecular biology

E: srushtibotany@ravenshawuniversity.ac.in

POSTER

Light and nutrient stress induced alteration in PS II photo-function of *Petunia atkinsiana*

Smrutirekha Mishra and Pradipta Kumar Mohapatra
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Light is considered as an important parameter in regulating the growth and metabolic efficiency of plants. At the same time plant performance are significantly affected by high light stress. Similarly nutrient stress also influences the plant growth and photosynthetic efficiency. This work was done to study the impact of light stress on *Petunia atkinsiana* grown under different nutrient regime. Results showed that in unamended pots or the pots containing organic carbon only plant performance was severely affected by high light stress. There was reduced PS II electron transport function and energy dissipation under light stress with nutrient deficiency. On the other hand, plants grown with both nitrogen and phosphorus supplementation showed better light tolerance and PS II function. Further the susceptibility to light stress was influenced by the level of nutrients supplied. Comparison of two intensities of light 800 $\mu E/m^2s$ and 1800 $\mu E/m^2s$ taken for the imposition of light stress showed that nutrient amendments would neutralize the light stress impact at 800 $\mu E/m^2s$ but at 1800 $\mu E/m^2s$ the protection by nutrient was not complete.

Keywords: *Petunia atkinsiana,* light stress, nutrient, PS II, fluorescence, dissipation

Biography:

Smrutirekha Mishra, currently working as a full time research scholar in the department of botany, Ravenshaw University, Cuttack. For her research oriented work she has joined the "stress biology" lab of the department and have worked in the same for the completion of my master's dissertation paper in the year 2019. Plants have been always fascinating for me as a toddler and now as a grown up their physiology and metabolism are the areas that always draw her attention. Apart from the lab and its associated works, I love to teach, which often works as a stress relief therapy for her.

Research Interest: plant physiology, stress biology, genetics and molecular biology

E: smrutirekhamishra08@gmail.com

POSTER

Combined effect of Salinity and Desiccation Stresses on *Synechocystics* sp. PCC 6803

Barsha Bhushan Swain and P. K. Mohapatra
Ravenshaw University, Odisha, India

Abstract:

Salinity is a major constraint in costal flooded soil affecting about 40 million hectares of agricultural land worldwide. It has also emerged as a limiting stress on the agroecosystem of the costal Odisha, more or less affecting the production of around 5 lakh ha of agricultural land. The soil algal flora and the soil microbial primary production have been severely affected by salinity stress. *Synechocystis* sp. PCC 6803 is salinity tolerant cyanobacteria commonly found in costal agricultural soil and water bodies and it has a significant contribution of organic carbon to soil microbial food chain. The present work was done to evaluate the response of *Synechocystis* sp. PCC6803 to different levels of salinity under normal and desiccated conditions. The stock culture of the *cyanobactrium* was maintained in BG11 medium. Exponentially growing cells were taken for the study of impact of salinity (0-700mM) and desiccation (0-16 hr) stress separately and in combination. The cyanobacteria were exposed for different time intervals to graded salinities and the response was measured as growth, pigment content, photosynthetic and fluorescence yields and the OJIP fluorescence transients. At different levels of salinity, the cyanobacteria were allowed to desiccate to different moisture levels and growth and fluoresce responses were measured at intervals. The growth rate and fluorescence behavior were affected by both the stresses. Combination of stress was more intensive than of the stress applied separately. The pigment dynamics growth pattern changes and OJIP and bioenergetics responses are discussed in this work.

Keywords: Synechocystis, salinity, desiccation, growth, fluorescence.

Biography:

Barsha Bhushan Swain was born on July 24, 1997. She is from Jaipur district of Odisha, India. She received her Bachelor's Degree from Utkal University, Odisha, Master's Degree from Department of Botany, Berhampur University, Odisha. She also has completed her M.Phil. from Department of Botany of Ravenshaw University, Cuttack. She is GATE and CSIR-JRF qualified and continuing her Ph. D. in Stress Biology and Ecotoxicology Lab under the supervision of Prof. P.K. Mohapatra of Department of Botany, Ravenshaw University. She has published two popular articles and two book chapters are in press. Her research work mainly focuses on the effects of pesticides on agricultural microbiota.

Research Interest: Plant physiology, Photosystem study, Effects of different stresses on plant and microbial health.

E: barsha.bhushan.swain@gmail.com

POSTER

Studies on biology and morphometry of sorghum shoot bug, *Peregrinus maidis* (Ashmead)

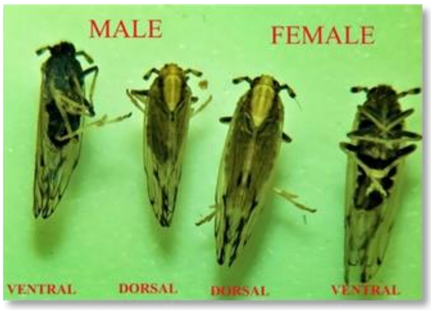
D Saicharan and S S Karabhantanal
University of Agricultural Sciences Dharwad, College of Agriculture, Vijayapur, Karnataka, India

Abstract:

The present findings to study sorghum varietal influence on biology of *Peregrinus maidis* had projected that the highly resistant variety (Y-75) recorded lowest incubation period and fecundity with 4.30 ± 1.04 days and 21.00 ± 3.60 eggs. Whereas, highest fecundity was Hathi kunta (55.30 ± 7.01) and M 35-1 (42.00 ± 8.74) reported highest fecundity over Y 75. Moreover, the survival percentage revealed that, Y-75 (25%) reported lowest survival percentage followed by M 35-1 (60%) but highest survival per cent reported in Hathi Kunta (90%). The total life span (days) was lowest in case of Y-75 (33.50 ± 3.01) but Hathi kunta reported highest with 45.00 ± 4.83 days whereas M 35-1 like Hathi kunta with 42.10 ± 5.07 days. Reports of morphometry and description had shown that, egg is smaller and cannot be seen with naked eyes with 1.06 ± 0.02 mm length and 0.27 ± 0.02 mm width. Among five nymphal stages reported the length ranged from 1.35 to 3.97 mm whereas width ranged from 0.38 to 1.14 mm, respectively. The highest length (3.97±0.12 mm) and width (1.14±0.01mm) was reported from fifth instar. Among adult's female was longer and broader in comparison with male with 4.73±0.23 mm length and 1.57±0.06 mm width.

Keywords: Biology, morphometry, shoot bug

Group of shoot bug eggs inside the leaf tissue



Biography:

D Saicharan is a PhD scholar (Department of Entomology) at Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad. He went for graduation at College of Horticulture, Rajendranagar, SKLTSHU. Thereafter, he did my M.Sc. (Agril. Entomology) as a Junior Research Fellow (ICAR-JRF) from University of Agricultural Sciences, Dharwad, College of Agriculture, VijayapurHe has secured ST category 1st rank during 2019 AIEEA-PG examination conducted by ICAR and he has also qualified ICAR-ASRB-NET during 2021. **Research interest:** Insect ecology and pest management

E: charan.dharavath@gmail.com

POSTER

Performance of pre release medium maturity maize genotypes under varying planting density and nutrient levels

A.P. Sivamurugan and R. Ravikesavan
Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India

Abstract:

Field experiment was carried out at Department of Millets, Tamil Nadu Agricultural University, Coimbatore during *Kharif*, 2020 to study the performance of pre release medium maturity maize genotypes to different planting density and NPK levels with their interactions. The experiment was laid out in a split – split plot design. In the main plot, two planting densities viz., D1- 60 x 25 cm and D2 - 60 x 20 cm and in the sub plot, two nutrient levels viz., N1: 100%RDF and N2: 150% RDF and in the sub sub plot, five genotypes viz., G1: JKMH 15303, G2: DKC 9194, G3: HT 18607, G4: Bio 9544 and G5: CMH 08-292 were tried in three replications. Experimental results revealed that planting densities and nutrient levels failed to exert significant influence on yield attributes and yield of genotypes. The interaction effect was not significant. In respect of genotypes, G1 (JKMH 15303) registered higher cob length (18.4 cm), cob girth (15.8 cm), no. of grain rows/cob (14.8) and no. of grains/row (38.1).With respect to yield, G1 (JKMH 15303) recorded higher yield of 8112 kg ha-1 and it was comparable with G2, G3 and G5 and it was significantly superior to G4.Among the medium maturity maize genotypes,G1(JKMH 15303)was found to be the promising genotype under 60 x 20 cm spacing with 100 % RDF(200:65:80 NPK kg/ha) which recorded higher grain yield (8231 kg ha-1), net return (Rs. 79914/ha) and BC ratio (2.43).

Keywords: Maize, Herbicides, effect, weed density, yield.

Response of pre release medium maturity genotypes to different planting density and NPK levels

Treatments	Plant height (cm)	Cob length (cm)	Cob girth (cm)	No.of grains/ row	No.of grain rows/cob	100 seed weight (g)	Grain yield (kg/ha)	Stover yield (kg/ha)
Main plot								
D_1	233.6	18.2	15.4	37.5	14.7	37.3	7496	11791
D_2	235.2	17.3	14.6	36.5	14.4	36.3	8034	12656
CD (p=0.05)	NS	0.8	NS	NS	NS	NS	512	NS
Sub plot								
N_1	233.3	17.5	14.7	36.9	14.5	36.5	7617	12035
N_2	235.4	18.0	15.2	37.2	14.7	37.0	7913	12412
CD (p=0.05)	NS	NS	NS	NS	NS	NS	NS	NS
Sub sub plot								
G_1	235.0	18.4	15.8	38.1	14.8	38.9	8112	12306
G_2	226.9	17.5	14.6	36.5	14.5	35.6	7634	11368
G_3	238.9	17.9	15.4	37.5	14.6	37.8	7935	12768
G_4	238.0	16.8	13.6	35.2	14.3	33.1	7112	12646
G_5	233.2	18.3	15.5	37.8	14.8	38.4	8031	12031
CD (p=0.05)	5.7	NS	1.3	NS	NS	2.8	505	748

Biography:

Working as Assistant Professor (Agronomy) at Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore. Specialized in Farming systems and Maize Agronomy. Involved in teaching of undergraduate and post graduate students. Worked in AICRP on Maize from 2015 to 2021 and written more than 30 research articles in peer reviewed journals with high NAAS rating and 5 books (ISBN).

Research Interest: Weed management and nutrient management

E: apacsivamurugan@gmail.com

POSTER

Botanicals against soil-borne fungal pathogens of *Capsicum annuum L.*

Himanshu Aroraa[1], Abhishek Sharmab[2], and Satyawati Sharmaa[1]
[1]*Indian Institute of Technology, New Delhi, India*
[2]*Amity University, Noida, Uttar Pradesh, India*

Abstract:

Capsicum annuum L. is one of the most important horticulture crops grown worldwide. Smaller pungent varieties are widely used for culinary purposes and also possess pharmaceutical properties. However, their production has been hindered by many biotic and abiotic stresses, from which soil-borne fungal diseases continue to be a constant menace. This study focuses on two of the soil-borne fungal diseases of chilli, Fusarium wilt and damping-off caused by *Fusarium oxysporum* and *Pythium aphanidermatum*, respectively. Although largely managed using chemical control strategies, heedless use of these chemical interventions causes the emergence of deleterious repercussions. This detrimental aftermath of chemical pesticide usage calls for a safer and lasting substitute. Botanicals such as plant extracts and essential oils provide an effective alternative due to their safe-to-use nature and synergism of different bioactive compounds. Here, based on literature various plant species with antifungal properties were selected and extracts were prepared using cold water (CW), methanol, and hexane. The prepared extracts were evaluated for their inhibitory effect against *F. oxysporum* and *P. aphanidermatum* using the poison food assay. Methanol and CW extracts of *Polyalthia longifolia* were the most effective against *F. oxysporum*, exhibiting 50.68% and 53.06% mycelial inhibition, respectively. The methanol and CW extracts of P. longifolia were also the most effective against *P. aphanidermatum* showing 54.09% and 49.35% mycelial inhibition, respectively. These screened botanicals are being further evaluated for their in-vivo disease control. The data pertaining to the yield of extract obtained and mycelial inhibition shown by extracts will be presented at the conference.

Keywords: Biopesticide, botanicals, phytopathogens

Biography:

Himanshu Arora is a UGC-JRF funded research scholar at the Center for Rural Development and Technology, Indian Institute of Technology, New Delhi, India, under the supervision of Professor Satyawati Sharma. His research work focuses on developing plant-based pesticides in the management of fungal phytopathogens of horticultural crops.

Research Interest: Plant Pathology, Bioformulation development

E: himanshuarora592@gmail.com

POSTER

Evaluation of nutritional properties and health benefits of Barnyard millet

K. Revathy
Madras Christian College (Autonomous), Affiliated to University of Madras, Chennai, India

Abstract:

Barnyard millet is one of the important nutritional crops and cultivated across the countries such as China, Japan, Korea and India. Barnyard millet is a C4 grass that has important economical and nutritional values in many parts of the world. In the present study, the nutritional properties and bioactive components present in the barnyard millet were analyzed. Barnyard millets are especially rich in proteins, dietary fiber, iron and calcium. It is a low glycemic food and recommended for diabetics and cardiovascular disease. The low glycemic index in millet slows down the digestion process and keeps the blood sugar level at a constant ratio. Also, this crop is gluten free and it is an appropriate food for patients those suffering from celiac diseases. Phytonutrients present in the barnyard millet help to reduce the risk of colon cancer and breast cancer. It is also decrease blood pressure which relaxes the muscles that line inside the arterial wall. This millet consists of high antioxidants fights against free radicals present in the body which slows down the ageing process. Consuming barnyard millet has been motivated because of numerous health benefits arising from their bioactive components.

Keywords: Antioxidants, Barnyard millets, Bioactive components, Cancer, Diabetics

Biography:

Currently, Revathy is doing a PhD at Madras Christian College, Chennai, Tamil Nadu under the guidance of Dr. S. Ravi Shankar. My area of research is plant growth and development of barnyard millet.

Research interest: Plant Physiology, Plant Anatomy, Plant Histochemistry, Plant Biochemistry

E: revathy8888@gmail.com

POSTER

Anthocyanin rich wheat: Food for healthy gut

Payal Kapoor and Monika Garg
National Agri-Food Biotechnology Institute, Mohali, Punjab, India

Abstract:

Whole grain encompasses an indispensable part of a balanced diet for ages. Whole grain is composed of the endosperm, germ and the bran layer, laden dietary fibres and bioactive compounds which are vital nutrients exerting peculiar health benefits. Intake of whole-grain cereal has been linked to lower the risk of diabetes, heart diseases and hypertension. Wheat is the second most important crop after rice, consumed in the form of bread, pasta, noodles, biscuits and chapattis (Indian flattened bread). Mostly wheat is white or red in color, but colored (blue, black and purple) wheats have emerged as a whole new concept as speciality wheat. The different colors of wheats are imparted by anthocyanins which possesses antioxidant properties and neutralizes the oxidative stress and inflammation. The preventive effects of anthocyanins against the chorionic metabolic disorders have long been known. But the information about modulatory effects of dietary anthocyanins on gut microecology is limited. Henceforth, the current study was designed to study the gut microbiota modulating effects of colored wheat attributed to cumulative phytochemicals, low GI and high fructan content.

Methods and Results: Various wheat varieties (white, purple, black wheat) were examined for GI and fructan content. Black wheat exhibited lowest GI and highest fructan content, followed by purple and white. The in vivo experiments involved healthy male swiss albino mice grouped into 7 groups and subjected to isocaloric diet interventions: Normal pellet diet (NPD), White wheat flour and chapatti (WF and WC respectively), Purple wheat flour and chapatti (PF and PC respectively) and Black wheat flour and chapatti (BF and BC respectively) for 11 weeks. The amplicon sequencing of mice caecum revealed that the colored wheat varieties augmented the abundance of beneficial phyla and improved the ratio of Bac/Fir compared to white wheat. Abundance of beneficial bacteria (Bacteroides and Prevotella) was increased, whereas, bacteria potentially related to diseased conditions (Rikenellacea, Ruminococcus and Clostridia) were decreased. In addition, the concentration of the short chain fatty acids (SCFA's) i.e. acetate, butyrate and propionate were also increased following colored wheat interventions.

Conclusion: Colored wheat especially black wheat with low GI and high fructan has potential to positively modulate gut microbiome and exert prebiotic-like effect.

E: ssspayalkapu@gmail.com

POSTER

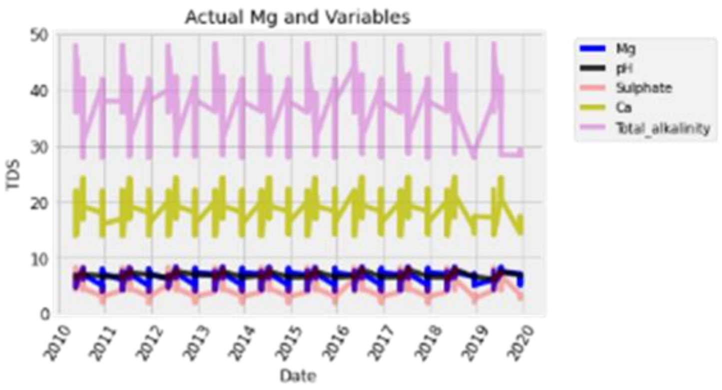
Surface water quality evaluation & predictions of Kulik river, West-Bengal

Pramod Kumar Jena[1], Sayed Modinur Rahaman[1], Pradeep Kumar Das Mohapatra[1],
Durga Prasad Barik[2], Dikshya Surabhi Patra[3]
[1]Raiganj University, West Bengal, India
[2]Ravenshaw University, Cuttack, Odisha, India
[3]Sambalpur University Institute of Information Technology Burla, Odisha, India

Abstract:

All of a person's basic needs are dependent on water. The dynamic nature of these valuable water resources makes it the most vulnerable to the contamination due to more waste load from many sources. Monitoring water quality is critical in water environment management, and successful monitoring gives direction and verification of water management efficacy. Modelling surface water quality using artificial intelligence-based models is essential in projecting suitable mitigation measures. However, it remains a challenge and requires further research to enhance the modelling accuracy. Because of the serious effects of low water quality, a faster and less expensive solution is required.With this motivation, this research explores a series of supervised machine learning algorithms to estimate the water quality. The proposed approach employs Random Forest for modelling and also useful for predicting surface water quality in the Kulik geographic region of West Bengal, India. It is a good tool for evaluating the quality and assurance of safe drinking water use. Various water quality parameters(Total dissolved solids, pH, alkalinity, chloride, nitrate, total hardness, calcium, magnesium, iron, fluoride, total coliform, fecal coliform, and E. coli) measured seasonally(winter, summer, rain) over a 10 years (2010-2019).

Keywords: Water Quality, Random Forest,WQI



Biography:

Pramod K Jena has completed MSc. Biotechnology from Ravenshaw university and working with water purification process etc.

Research Interest: Microbiology, Water Quality, Machine Learning for modelling & prediction.

E: pramodkumarjena@gmail.com

POSTER

Evaluation of suitable fertigation interval and optimum fertilizer level for subsurface drip irrigated sugarcane under Cauvery command area

Ningaraju, G. K. and Shankaralingappa, B. C
University of Agricultural Sciences, *Bengaluru, Karnataka, India*

Abstract:

A field experiment was conducted during 2015-16 and 2016-17 at Zonal Agricultural Research Station, V.C. Farm, Mandya to find out the suitable fertigation interval and optimum fertilizer level for sugarcane under subsurface drip fertigation. The treatment combinations consisting of three fertigation intervals (fertigation once in 2, 4, and 6 days) and four fertilizer levels (75, 100, 125 and 150% of recommended dose of fertilizers) along with conventional method of sugarcane cultivation were replicated thrice in factorial RCBD. The cane yield, growth and yield components of sugarcane were significantly influenced by interactions between fertigation intervals and fertilizer levels. Fertigation once in 2 days with 150 per cent RDF produced significantly 95.1 and 99.5 per cent higher cane yield (308.3 t ha-1 and 291.3 t ha-1 in plant and ratoon cane, respectively) than conventional method of cultivation (158.0 and 146.0 t ha-1), fertigation once in 6 days with all levels of RDF, fertigation once in 2 or 4 days with 75 and 100 per cent RDF and was on par with fertigation once in 2 days with 125 per cent RDF and fertigation once in 4 days with 150 and 125 per cent RDF. The juice quality parameters were not significantly affected by interactions. Higher water use efficiency (2.58 and 2.40 t ha-cm-1) with water saving of 56.23 per cent, higher net returns (. 5,16,149 ha-1 and .5,34,527 ha-1) and B:C ratio (3.18 and 3.95) in plant cane and ratoon cane, respectively were obtained with fertigation once in 2 days with 150 per cent RDF than conventional method (. 2,36,618 and . 2,29,300 ha-1 and 2.07 and 2.15) and other combinations of fertigation intervals and fertilizer levels under subsurface fertigation in sugarcane.

E: rajuagron@gmail.com

POSTER

Advances in crop management to boost up the yield in pomegranate

Aravind Rathod, Bindhu, K. G. and Vanishree, S
Agricultural Extension Education Center, Lingasugur, UAS, Raichur, *Karnataka, India*

Abstract:

The trail on improved management practices in pomegranate was conducted in 60 ha with 100 no. of farmers at Gudihal, Guntagol, Hanchinal, Gurgunta, Kalapur, Rodalabanda and Echanal villages of Lingasugur taluk, Raichur district. The results revealed that management of sucking pests along with improved crop management practices right from pruning to fruiting and harvesting yielded upto 28.7% increase in demonstration compared to the farmers practice with support of technology as recommended by package of practices on Horticulture, UAHS, Bagalkot.

E: arvindr4625@gmail.com

POSTER

Survey on anthracnose of chilli

Bindhu, K. G. , Aravind Rathod, Vanishree, S and Zaheer Ahamed
Agricultural Extension Education Center, Lingasugur, UAS, Raichur, Karnataka, India

Abstract:

The spicy delights of Indian food are well-known and enjoyed around the world. The flavour and scent of food created by the use of spices leaves an indelible impression. Agriculture extension education center, Lingasugur scientists have conducted a survey during the year 2021 around the chilli growing villages. The fall in chilli production has been attributed majorly due to crop diseases such as anthracnose and fruit rot, which account for the majority of crop losses. The disease causes severe damage to mature fruits in the field as well as during storage under ideal conditions, resulting in a significant reduction in the yield and overall production of about minimum of 44 per cent. Anthracnose and die back disease has been described as a serious limitation in the production of chillies due to the prevailing favourable environmental conditions. So the timely management is very much essential for the control of the disease.

E: bindhukg77@gmail.com

POSTER

The effect of essential oil of Black pepper, Fennel and Turmeric on growth performance and haematological parameters of *Gallus gallus*

Lopamudra Samantaray and Dr. Yashaswi Nayak
Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract:

Antibiotic residues in poultry products are becoming increasingly well-known among consumers, prompting the search for a safe alternative, such as the usage of phytobiotics. The purpose of this study was to see the effects of black pepper, fennel, and turmeric phytobiotic supplements on growth performance, weight gain, feed intake, and haematological parameters in *Gallus gallus* using six different experimental combinations (1% black pepper, 1% turmeric, 1% fennel, and combinations of 0.5% black pepper, 0.5 percent turmeric, and 0.5 percent fennel). The results of this study revealed that the inclusion of a 0.5% black pepper and 0.5% fennel combination diet, as well as a 1% turmeric diet, significantly ($p<0.05$) improved body weight in birds. As compared to a 1% diet of phytobiotics, a combination diet of black pepper and turmeric improved feed consumption significantly ($P<0.05$). The Haemoglobin concentration, MCV, and MCH values were found to be higher in the case of birds fed with a combination diet of 0.5% black pepper and 0.5% turmeric as well as 1% black pepper. The RBC count increased with the addition of 1% fennel as well as 0.5% black pepper and 0.5% fennel to the diet of birds. The black pepper, turmeric, and fennel treatment groups grew more rapidly than the control group ($p<0.05$), but the group treated with a combination of turmeric and fennel grew notably slower than the other treatment groups. As a result, it may be concluded that these phytobiotics have health-promoting properties in the diet of *Gallus gallus*.

Keywords: Phytobiotics, impact, Growth, feed intake

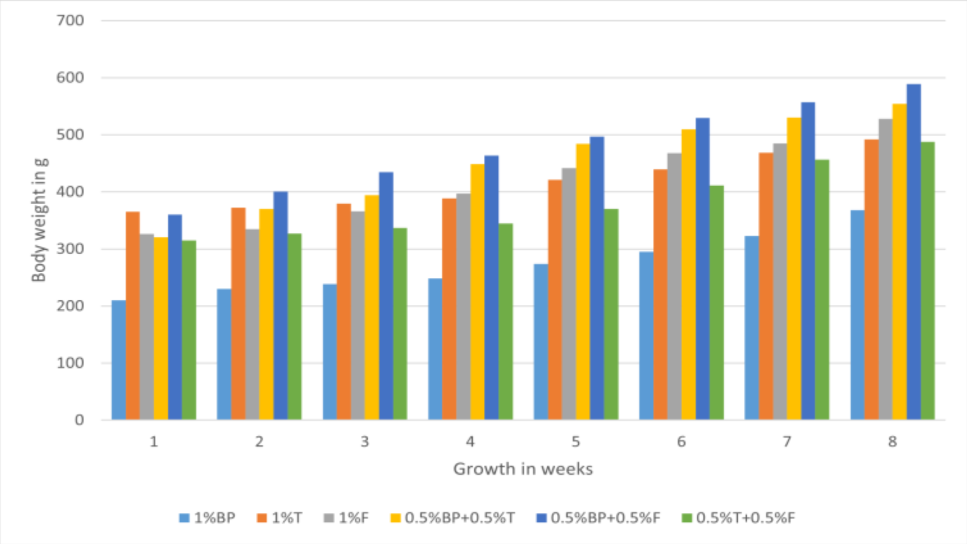


Figure. Growth rate of poultry birds in terms of weight (in grams) with respect to different diet composition

*BP- Black Pepper, T-Turmeric, F-Fennel

Biography:

Lopamudra Samantaray, a Ph.D. student in the Department of Zoology at Centurion University of Technology and Management (CUTM), Bhubaneswar, Odisha. Prior to her studies, she worked at Dhenkanal Auto. College in Dhenkanal as a lecturer. She has completed M. Phil in Zoology at CUTM, Bhubaneswar, Odisha. Her research focuses on investigating natural feed additive possibilities for livestock diets and determining their effects using Artificial Neural Network (ANN) Models for both poultry birds and their eggs.

E: lopamudraray88@gmail.com

Evation
AGRI Vision 2022

DAY-03

Mar 08, 2022

KEY NOTE SPEECH

https://agrivision.in

KEYNOTE

R&D Strategies for Sustainable Food security and Nutrition

Dr. Asna Urooj
Professor
Department of Studies in Food science and Nutrition,
University of Mysore, Mysore , India

Abstract:

Food security implies meeting minimum energy and protein norms along with requisite micro-nutrients for all, at affordable prices. With the increase in income, the demand for food in India is bound to further rise. Population growth and increased demand from non-food sources are the major challenges for reaching long-term sustainable agricultural production and food security. Concerted and focused efforts are required for addressing the challenge of stagnating productivity levels in agriculture. This calls for speedy improvement in yield in order to increase production through adequate investment in research and development (R&D). A holistic approach, spanning agricultural research and development, dissemination of technology, and provision of agricultural inputs such as quality seed, fertilizers, pesticides, and irrigation, would help achieve higher levels of productivity. Crops developed through biotechnology are key to increasing yield while surviving pest & pathogen attacks that have been rising due to global warming. There have been significant advancements in science, its discovery, management and transfer of technology to end users. 'Science of delivery' is a relatively new concept to motivate scientists, development practitioners and extension agencies to collaborate beyond their own disciplines and institutions. Given the fact that traditional norms of agriculture are still practised by the Indian farming communities, transformation in agricultural production combined with integrated farming system (IFS) approaches is indeed a great challenge in the Indian context. Ensuring availability of a more diversified food basket through food- based safety nets to tackle food and nutritional insecurity. The impact of public R&D investment on agricultural productivity and long-term food security through R&D driven approaches is discussed.

Biography:

Dr. Asna Urooj, is serving as the Professor of the Postgraduate Department of Studies in Food Science & Nutrition, University of Mysore, Mysore, India. Her areas of research interest are Diabetes, Starch digestibility & glycemic responses, chemistry and applications of Natural antioxidants, Anti-hyperglycemic and hypolipidemic effects of medicinal plants, Disease-specific food formulations and Women's health and nutritional issues. She has completed 14 research projects funded by UGC, DST, MHRD, and BBSRC-UK. She is the coordinator for the UGC – Special Assistance Program. She serves as a reviewer and editor for several National and International journals. She has 180 research papers published in peer-reviewed journals, with 2821 citations and h-index of 26, i10-index of 63. 16 candidates have completed PhD under her guidance, while 8 are working. She is a recipient of the prestigious Dr. Kalpana Chawla State award (2009) for young women scientist, Prof G.S. Bains Lifetime achievement award (2011), bestowed by Association of Food Scientists & Technologists and Dr. Rajammal Devadas Oration award conferred by Nutrition Society of India (2017). She has received Young scientist awards, 40 best paper awards and several other awards for her outstanding achievement and contribution in the field of Nutritional Sciences. She was the first President of Indian Dietetic Association, Mysore chapter.

E: asnaurooj@foodsci.uni-mysore.ac.in

KEYNOTE

Some conservation concern medicinal plant species identified for Odisha: Propagation by various approaches of tissue culture aiming at sustainability

Prof. Soumendra K. Naik
Professor, Department of Botany and
Controller of Examinations
Ravenshaw University, Cuttack, Odisha, India

Shashikanta Behera, Biswaranjan Behera, Durga P. Barik, and Soumendra K. Naik
Ravenshaw University, Cuttack, Odisha, India

Abstract:

Many plant species are under stress in their natural habitat due to factors including unsustainable harvesting, deforestation, urbanization, and habitat fragmentation. The same is also true for a number of plant species in Odisha. During Conservation Assessment and Management Prioritisation Workshop (2007), plant species including *Symplocos racemosa*, *Hedychium coronarium and Paederia foetida* had been identified and enlisted as conservation concern medicinal plants of Odisha. Obviously, there is a requirement for urgent attention for their conservation. Conventional propagation of these plant species has their own limitations. Thus, propagation through various plant tissue culture approaches can be an alternate way for large scale production of these important plants. We have successfully developed different in vitro plant regeneration protocols for the production of S. *racemosa, H. coronarium and P. foetida*. Further, production of synthetic seeds by encapsulation of non-embryogenic explants using sodium alginate and CaCl2 has also been developed for plant propagation and germplasm exchange of *H. coronarium and P. foetida*. The biochemical and genetic stability of the in vitro regenerated plants was also ascertained in some of the protocols. The developed in vitro plant regeneration protocols of these threatened medicinal plant species may be useful for constant supply of planting materials for their reintroduction in the natural habitat. It may also be able to provide raw materials with uniform quality for industrial uses without disturbing the natural populations and overall sustainability could be achieved.

Biography:

Prof. Soumendra Kumar Naik is currently working as an Professor. He completed his Ph.D. (Botany) from Utkal University, Bhubaneswar, Odisha in 2002 and his doctoral research was on tissue culture of pomegranate. He carried out his post-doctoral work during 2007 as BOYSCAST Fellow on Genetic Engineering at University of Kentucky, USA. Prior to joining Ravenshaw University in 2010, he was working as a Lecturer in the Department of Biosciences and Biotechnology at Fakir Mohan University, Balasore. He has more than 19 years of experience in teaching and research. His research interests include conservation and sustainable utilization of plants resources using in vitro approaches of plant tissue culture and biotechnology and scientific validation of different ethnobotanical claims. Till date, under his guidance / co-guidance 6 Ph.D. & 9 M.Phil. students have successfully obtained their degrees. He has published more than 40 research papers in journals of national and international repute including book chapters. He is the recipient of UGC – Research Award (2016-2018), BOYSCAST Fellowship (2006-2007), Best Record of Publication (2017-2018 & 2018-2019; Ravenshaw University), and Sarojini G. Panigrahi Young Scientist Award (2001). Dr. Naik is a Fellow of Indian Botanical Society (FBS). He is the first person from Odisha to be elected (2019) as Member of 'Plant Tissue Culture Association of India (PTCA-I)'. At present, he is serving as an 'Associate Editor' of Physiology and Molecular Biology of Plants (Springer). Further, as a member of IUCN (Medicinal Plant Specialist Group), he is contributing actively towards conservation of medicinal plants of Odisha through his research work. In addition to teaching and research activities, he has discharged various administrative responsibilities including Head, Department (2012-2014) and Dean Students' Welfare (DSW) at Ravenshaw University (2015-2016). At present, he is serving as the Head of the Department of Botany and Coordinator of Biotechnology Program.

E: sknuu@yahoo.com

KEYNOTE

AgriGenomics – Transform the future of Agriculture

Dr. Pushpalatha Ganesh
Professor & Head, Department of Plant Biotechnology
M.S. Swaminathan School of Agriculture
Centurion University of Technology and Management,
Paralakhemundi, Odisha, India

Abstract:

Genomics in commercial agriculture including screening for novel traits through genotyping has shown crucial importance in modern farming and breeding approaches. The technologies of microarray, plant tissue culture, marker-assisted back-crossing, next-generation sequencing (NGS), genome editing, etc., are helpful for breeders and researchers to evaluate and envisage the genetic importance in plants and animals, addressing the elite specific selection and health. In this direction, backcrossing in agriculture aims to commercial applications with trait of interest like drought tolerance, high productivity, disease resistance. Marker-assisted backcrossing using NGS/Illumina facilitates to evaluate the transfer of trait –specific gene through genetically linked marker. Thus, the programs associated with breeding and improving plant genotypes are encouraged through agrigenomics.

Keywords: agrigenomics, commercial, certification, breeding, back-cross

Biography:

Over 13 years of multidisciplinary professional specializations including teaching and research experience in field of Biotechnology and Agricultural Sciences. Teaching experience in Biotechnology to post-graduate and undergraduate students with over eight years experience in screening and evaluation of germ-plasm varieties, allele mining of genes conferring salt tolerance, identification and validation of differentially expressed genes at National Institutes i.e., Indian Institute of Rice Research (IIRR)/Directorate of Rice Research (DRR), Hyderabad and National Research Centre of Plant Biotechnology (NRCPB), Indian Agricultural Research Institute (IARI), New Delhi. I possess a sound knowledge of PCR-based allele mining, qRT PCR, scanning electron microscope (SEM), drought screening techniques, physiological/biochemical analysis and micro-array techniques with demonstrated ability to use statistical analysis and well versed with different Bioinformatics techniques, molecular breeding techniques and statistical analysis tools. I possess the ability to work independently as well as in a team with strong interpersonal relationship and leadership skills.

E: pushpabhagyalakshmi@gmail.com

KEYNOTE

Genomic-assisted breeding for enhancing genetic gain in rainfed rice

Dr. Sarat Kumar Pradhan
Principal Scientist (Genetics & Plant Breeding)
ICAR-National Rice Research Institute
Cuttack, Odisha, India
Vice President, Indian Society of Genetics & Plant Breeding
New Delhi, India

Abstract:

The genetic gain achieved in rice is very low during the last few decades. However, marker-assisted breeding has been very successful in developing improved versions of superior varieties. Genomic (or genome-wide) selection is a method that has promise over marker assisted selection & other methods. Genomic assisted selection is to determine the genetic potential of an individual instead of identifying the specific QTL. To capture the total genetic variance, the effect of each marker in the whole marker-set is estimated in GS regardless of the significance threshold, assuming that markers are in linkage disequilibrium with the QTLs. Marker effects are estimated using individuals with both genotypic and phenotypic information. The estimated marker effects are combined with marker information of an individual to give the genomic-estimated-breeding-value. Genetic gains are linearly related to standardized selection differential, but not selection intensity. Selection of suitable elite parents in a training population is very important for achieving the desired gain through genomic selection. Prediction accuracy increases with increase in marker density. Suitable prediction models need to be used for optimization and estimation of breeding values.

Biography:

Dr. Sharat Kumar Pradhan did his Ph.D. in the year 2003 from GBPUAT, Pantnagar. He is a principal scientist at ICAR-National Rice research Institute,Cuttack. Dr. Pradhan has significantly contributed in the field of Rice Breeding. He has developed twenty nine rice varieties for various states of our country. A maximum of eleven varieties for lowland; eight for irrigated; seven for aerobic cultivation and three varieties for upland ecologies are notable contributions of Dr. Pradhan. He has received many awards, viz. three times best scientist award of ICAR-NRRI, Cuttack for the year 2006, 2010, 2015; Panchakhanda Samman 2014; Bharat Siksha Ratna award 2014 and Indo-Nepal Gold Star award 2015 by global Society for health & Educational Growth, Delhi and Indira Gandhi Gold Medal Award presented by Global Economic Progress & Research Association 2015. He has published about 60 research articles in reputed National and International journals. He has written six book chapters and handled five research projects funded by DBT,Govt.of India and NASF, ICAR. He has successfully guided five students for Ph.D. degree and five students for M.Sc thesis research work. Currently, Dr. Pradhan is Editor-in-Chief of the International Journal, Oryza.

E: pradhancrri@gmail.com

SEEDS OF PROSPERITY

58th year in the service of Indian Farmers

As India's largest seed producer of cereals, oilseeds and pulses, NSC lives up to its reputation as a reliable supplier of quality seeds to the farmers since 1963-by spreading prosperity throughout the country, with seeds that are:

- Produced under ideal agro-climatic conditions in NSC's farms and through abort 12500 registered seed growers;
- Available in a board-spectrum range which covers about 600 varieties/hybrids of over 60 crops including cereals, oilseeds, pulses, fodder, fiber and vegetables;
- Certified by independent seed certification agencies; and
- Approx 3200 dealers/distributors spread over across the country under 11 Regional Offices, 8 Farms, 48 area Offices, 30 Seeds Praduction Centres, 107 Seed Marketing Centres different district wise area offices/Sub units and 4 Quality Control Labs.

An ISO 9001:2015 & 14001:2015 Certified Company

NATIONAL SEEDS CORPORATION LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING- "MINI RATNA" COMPANY)
CIN : U74899DL1963GOI003913

An ISO 9001:2015 & 14001:2015 Certified Company

Head Office
BEEJ BHAWAN, PUSA COMPLEX, NEW DELHI-110 012
Phone : 011-25846292, 25846295, 25842383, 25842672
Website : www.indiaseeds.com, e-mail: nsc@indiaseeds.com

Regional Office
NATIONAL SEEDS CORPORATION LTD.
Block-A.Q., Plot No. 12, Sector-V, Salt Lake City
Kolkata-700 091 (West Bengal)
Phone : 033-23671077, 23671074

Evation
AGRI Vision 2022

DAY-03

Mar 08, 2022

ORAL PRESENTATION

https://agrivision.in

ORAL

Bt. cotton transplanting to improve ecosystem services in semi-arid Agro-ecology of South Asia

Sudhir Kumar Rajpoot, D. S. Rana and Anil Kumar Choudhary,Adarsh kumar, Vijay kumar S and Gaurendra gupta
Banaras Hindu University, Varanasi, India

Abstract:

Cotton–wheat cropping system (CWCS) is the 2nd most important cropping system after rice–wheat cropping system (RWCS) in south-Asia (4.5 M ha) in general and India (2.6 M ha) in particular which contributes significantly to agricultural economy and food security in the region (Das et al., 2014). Cotton (*Gossypium hirsutum* L.) is major industrial crop in India with acreage of ~11 M ha, largest one in the world. Being a cash and grain cropping system, it is highly remunerative with assured returns. However, the sustainability of CWCS in semi-arid regions of both India and Pakistan is at risk due to climatic- and resource-vulnerabilities The sustainability of the direct seeded cotton–wheat system in the Indo-Gangetic Plains (IGP) is at risk due to exhaustive nature of cropping system, inadequate crop stand of cotton, delay sowing of wheat. Raising seedlings of cotton in May–June under controlled conditions and their transplanting on the onset of monsoon, may be a way out to ensure optimum plant stand and reduce cost of cultivation through saving in irrigation and seed (Rajpoot et al. 2016). Bt-cotton transplanting technology may lead to system intensification with high value crops and summer legumes vis-à-vis higher water economy with resultant higher system crop and water productivity and profitability over conventional-CWCS. Transplanted Bt-cotton (TPC-cotton) considerably shortens the cotton crop duration over DSC-cotton (Rana et al., 2014). Hence, TPC-cotton based cropping systems can feasibly adjust 3rd crop in summers during window period of April to June viz. summer mungbean (*Vigna radiata* L. *Wilczek)* or vegetable/fodder cowpea (*Vigna unguiculata L. Walp.*) and/or fodder maize (*Zea mays* L.), etc. after normal duration of Rabi season crops like onion (*Allium cepa*) and wheat. Despite of improved crop and water productivity, the system intensification with high value crops and summer legumes can influence the energy input-output relationships, carbon dynamics and soil health in TPC-based systems. However, the influence of Bt-cotton transplanting on system intensification, energy budgeting, carbon footprints, soil health and ecosystem services is highly lacking which is of utmost importance for the sustainability of these TPC-cotton based cropping systems.

Biography:

Dr Sudhir Kumar Rajpoot , an IARI, New Delhi alumnus is the faculty member in the Department of Agronomy at Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, UP, India. His research areas include: Remote sensing, Sustainable diversification/intensification of cotton wheat cropping system, Crop establishment methods and Integrated Nutrient Management . Also associated with AICRPDA for farm demonstrations of dryland agro-technologies in cereals/pulses/oilseeds. Actively involved in imparting training and dissemination of technical knowledge and information to diversified end users. .He was awarded with M.Sc. Best Thesis award by ISA. He also published numerous articles/reviews in professional journals.

E: sudhir.iari@gmail.com

ORAL

A novel report of "Pipercyclobutanamide- A" with strong antimicrobial and allelopathic potential from the stem of Piper chaba, Hunter. - A less known spices

Bhattacharya E., Saha, S, Dutta R., Dutta, M. and Biswas, S. M
Indian Statistical Institute Kolkata, West Bengal, India

Abstract:

Piper chaba, Hunter. belonging to family Piperaceae is a less known spices. This plant possess a wide array of bioactive compounds. Medicinal properties of bioactive compounds obtained from this plant has been studied comprehensively but its role as various types of agrochemicals has not been studied yet. So, in the present work, we are interested to explore its other biological activities. Fractionated quantitative biochemical analysis revealed that all the fractions contained substantial amount of phenolics (ranges from 863.75 mg to 1073.11 mg GAE/g of dry extract), flavonoids (164.01 mg to 244.57 mg QE/g of dry weight) and tannins (42.86 36 mg to 64.88 mg TAE/g dry extract) except acetone fraction in which lowest amount of phytochemicals was detected. All the fractions of Piper chabaat all concentrations revealed strong antifungal activity except acetone fraction. Antibacterial activity of all the fractions was more pronounced at 1.5 mg/ml and 2mg/ml concentrations. Dose dependent Bioassay experiment showed that methanol fraction of Piper chaba possess strong allelopathic activity followed by Acetone fraction whereas ethyl acetate fraction display stimulatory activity upto 1000 mg/ml concentration and hexane fraction upto 250mg/ml concentration. As methanol fraction of Piper chaba exhibited strong allelopathic activity, we are interested to identify the actual compound responsible for that. LCMS Spectra of purified PCMF revealed the presence of a novel "Pipercyclobutanamide-A" compound. The methanol fraction of Piper chaba could be used as natural source of agrochemical and antimicrobial agent for sustainable agriculture and pharmaceutical purposes.

Keywords: Piper chaba, Hunter.; Pipercyclobutanamide-A; Allelopathic potential, antimicrobial activity, spices, phytochemicals.

Biography:

Shayani Saha is pursuing her final year of B.Tech in Biotechnology at the National Institute of Technology Durgapur, India. She has done an internship at the Biological Science Division of Indian Statistical Institute under the supervision of Dr. Suparna Mandal Biswas. She has worked on a project based on the antimicrobial and allelopathic potential of the bioactive compounds from Piper chaba. She would be presenting the paper 'A novel report of "Pipercyclobutanamide-A" with strong antimicrobial and allelopathic potential from the stem of Piper chaba, Hunter. - A less known spices'.

Research Interest: Immunology, infectious diseases, cancer

E: sayanisaha236@gmail.com

ORAL

Arrowroot: A starch source rhizomatous crop

M. Nedunchezhiyan*, Kalidas Pati, V.B.S. Chauhan and R. Arutselvan
Regional Centre of ICAR-CTCRI, Bhubaneswar, Odisha, India

Abstract:

Root and tuber crops are major source of energy after cereals and grain legumes. They are mostly used for human consumption in raw as well as in processed forms and similar to other basic crops, they can also be utilized for developing starch. All most all major industries (food and non-food) have found some application of starch. The Indian starch and starch derivatives market is segmented such as maltodextrin, cyclodextrin, glucose syrups, hydrolysates, modified starch, and others; and its wide application in different end-user industries such as food and beverage, feed, paper industry, pharmaceutical industry, bio-ethanol, cosmetics, and others. In India, starch is produced in 3,75,000 tonnes. Out of which 1,87,000 tonnes used by the food sectors and the remaining goes to non-food sectors. In India, starch and starch derivative market is projected to grow at a CAGR of 5.1% during the forecast period 2020-2025. In India, small scale firms are important players in the starch industry especially for root and tuber crops starch processing and utilization.

In this paper, discussion is on arrowroot: a starch source. In India, three types of arrowroots are cultivated for starch purposes. They are (1) West Indian arrowroot (Maranta arundinacea L.), (2) East Indian arrowroot (Curcuma spp.) and (3) Queensland arrowroot (Canna edulis L.). The starch is extracted by traditional methods from the above three arrowroot crops by the farmers as an off-seasonal activity and marketed locally. The starch is mainly used as a functional food.

The starch is a fine white powder and it is tasteless and odourless. The starch granules are ovoid or ellipsoid in shape. The starch is easily digestible. The high quality starch of arrowroot is valued as food especially for infants, invalids and convalescents. Arrowroot biscuits are known in every corner in India. Its starch is also used as special glue and paste as a base for face powder and ice-cream stabilizer. Arrowroot starch possesses demulcent properties and is used in the treatment of intestinal disorders. In the middle of 18th century arrowroot was mainly used to cure the wounds from poisoned arrows and also started to be used as a source of starch. Recently it is also used in production of carbonless paper for computer printout. Arrowroot starch is also used in pharmaceutical industries such as barium meals and in manufacture of tablets. The fibrous material, which remains after the extraction of starch is used as a cattle feed or manure. The rhizomes are also eaten after baking or boiling.

Keywords: Root and tuber crops, tuber crops based cropping and farming system

Biography:

Dr. Maniyam Nedunchezhiyan, Principal Scientist & Head (i/c), Regional Centre of ICAR-Central Tuber Crops Research Institute, Bhubaneswar – 751 019, Odisha, India is a renowned agronomist in root and tuber crops. He has 30 years experience in tropical root and tuber crops. He is specialized in root and tuber crops based farming and cropping systems, weed and drip fertigation management. He is also looking after production and distribution of quality planting materials of root and tuber crops. He has more than 200 research papers in International and National peer reviewed journals and more than 90 popular articles. He has authored 14 books, 30 book chapters, 7 technical bulletins and 10 training manuals. Last twenty years he is working in hilly areas for food and nutritional security of tribal farmers of Eastern and North-Eastern India through tuber crop technologies. He has guided 4 Ph.D. students and 3 M.Sc. students. He is a life member of 7 scientific societies. He is a reviewer and referee of 7 scientific research journals including international journals.

Research Interest: Nutrient, water and weed management in tuber crops based cropping systems

E: m.nedunchezhiyan@icar.gov.in

ORAL

Identification of Diagnostic keys for *Vigna vexillata* (L.) A. Rich.

RK Pamarthi, K Tripathi, PG Gore and SP Ahlawat
ICAR-National Bureau of Plant Genetic Resources, New Delhi, India

Abstract:

Tuber Cowpea [(*Vigna vexillata* (L.) A. Rich.] is under-utilized and potential multi-purpose legume grown in the tropical world. Due to the diversity in the morphology of taxa, identification is one of the problems within collections or population. These diagnostic key features help in delineating the species identification and complexity. Selected accessions of tuber cowpea grown at ICAR-NBPGR experimental field New Delhi, during 2019-2020 for morphological characterization and development of key morphological characters for its characterization and preliminary evaluation. Important and specific morphological traits such as leaf shape and size, flowering behaviour, size, pod shape, colour, seed shape, size and colour, tuber shape, colour and tuber weight showed tremendous variability in the germplasm acts as a key diagnostic feature. Wide variation was recorded in qualitative traits in selected accessions. During the characterization process, 56 morphological descriptors exhibit high variability in both qualitative and quantitative characteristics. These key diagnostic features help in the development of descriptors. Based on critical analysis of existing variability in the germplasm, a set of 56 (37 qualitative and 19 quantitative) morphological descriptors have been proposed for characterization and preliminary evaluation of tuber cowpea germplasm.

Biography:

Dr. RK Pamarthi Presntly, working as a Scientist (Economic Botany & PGR) in ICAR-NBPGR, New Delhi. Joined as a Scientist in ICAR-NRC for Orchids, Pakyong, Sikkim in 2015 and since 2019 has been working at NBPGR, New Delhi. Good expertise in taxonomy of Orchids, herbarium and revised the genus *Thunia* in Indian context under the project "Flora of India" in Botanical Survey of India, Kolkata. Published 16 research papers, 3 Copy rights, 1 book, 7 technologies, 2 technical bulletins and 2 book chapters. Presently, involved in three institutional projects, exploration activities and working on systematics of *Vigna and Lathyrus* species. Research Interest: Botany, Plant Systematics, Plant Genetic Resources.

E: ravi.pamarthi@icar.gov.in

ORAL

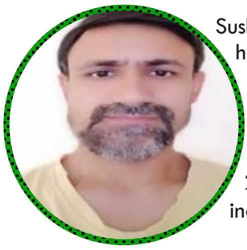
Self-incompatibility studies in almond cultivars in North-western Himalayas

Susheel Kumar Raina[1], **Javed Iqbal Mir**[2], **Sheikh M Sultan**[1], **Om Chand Sharma**[2]
[1]ICAR-National Bureau of Plant Genetic Resources, Regional Station Srinagar, Jammu & Kashmir, *India*
[2]*ICAR-Central Institute of Temperate Horticulture, Srinagar,* Jammu & Kashmir, *India*

Abstract:

Almond is one of important nut crops of Jammu and Kashmir but its cultivation is associated with several problems leading to low productivity. The non-availability of self-fruitful cultivars and less knowhow regarding self-incompatibility, suitable cultivars for cross pollination coupled with non-availability of late blooming cultivars and improper pollination management are some of the factors for low yield. Self incompatibility (SI) is a predominant phenomenon in almond and breeding for self-compatibility is an important objective in almond breeding. Recent developments in molecular methods have facilitated detection of self-incompatibility using PCR-based approaches. Although, there are numerous reports on characterization of SI-alleles in almond cultivars around the almond growing regions, such studies are scarce about almond cultivars grown in Kashmir valley, located in north-western Himalayan region of India. In the present study, genomic DNA was isolated from indigenous almond cultivars and amplified with SI-specific primers AS1 II F + AmyC5R. Single bands in the range of 500-2000 bp could be amplified in cultivars Makhdoom, Shalimar and Waris respectively. Sequencing of single bands amplified in Makhdoom and Shalimar cultivars confirmed presence of different SI-alleles. This study reveals the variability among the SI-alleles in almond cultivars of Himalayan region.

Biography:



Susheel Kumar Raina is working as a scientist at ICAR-NBPGR Regional Station, Srinagar, J & K. He has completed his Ph.D from National Institute of Plant Genome Research, (JNU), New Delhi in Plant Molecular Biology and M.Sc. (Ag.) in Plant breeding from CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur. He has published 17+ research papers, 6+ Book chapters, 5 Conference papers. **Notable awards**: Certificate of merit in National standard Examination in Chemistry (12th level) held by Indian Association of Physics Teachers, ICAR Junior Research Fellowship for M.Sc. programme (2001-02), CSIR Fellowship for Ph.D programme (Life Sciences-2004-2010). ARS-NET (Agriculture Research Service and National Eligibility Test for Lectureship) in Plant breeding conducted by ICAR (2007).

E: Susheel.Raina@icar.gov.in

ORAL

Impact of Spacing and Nitrogen Levels on Yield and Economics of Chia (*Sylvia hispanica* L.)

Punyasloka Mohanty[1], Umesha C.[2], and Dillip Ranjan Sarangi[3]
[1]*SEWAK, Sundargarh, Odisha, India*
[2]*NAI, SHUATS, Prayagraj, Uttar Pradesh, India*
[3]*National Rice Research Institute-KVK, Cuttack, Odisha, India*

Abstract:

A field experiment was conducted during kharif season of 2020 at experimental field of National Rice Research Institute (NRRI)-Krishi Vigyan Kendra (KVK), Cuttack to determine the "Impact of spacing and nitrogen levels on yield and economics of chia (Sylvia hispanica L.)". The experiment consisted of four, doses of nitrogen (40, 60, 80, 100 kg/ha) and two spacing (50 cm × 20 cm, 60 cm ×20 cm). The experiment was arranged in a statistical design of randomized block design (RBD) with three replications. Report of study indicate that, among different nitrogen levels the application of 100 kg N/ha at 50cm × 20 cm spacing produced significantly superior plant height (151.48cm), CGR (70.1 g/m2 /day) and seed yield (1210 kg/ha). The highest seed yield produced by the application of 100 kg N/ha at 50cm × 20 cm spacing is 49.58 % more than control plot (60 kg N/ha at 60 cm × 30 cm spacing). However, the application of 100 kg N/ha at 60 cm × 20 cm was found to be significantly effective in producing maximum number of leaves/Plant (603.20), Dry weight (159 g/plant), Number of spikes/ plant (91.07), Spike length (21.83 cm) and Haulm yield (6146.67 kg/ha). Treatment combination receiving 100 kg N/ha with 50 cm × 20 cm spacing fetched highest gross return (193600 `/ha), net return (138008 `/ha) and benefit cost ratio (2.48). The maximum net return obtained with application of 100 kg N/ha at closure spacing (50 cm × 20 cm) brought about 30 % more return than control.

Keywords: Chia, nitrogen levels, spacing, yield

E: dillipsarangi99@gmail.com

ORAL

Effect of new generation herbicides on weed density, yield attributes and yield of irrigated maize

A. P. Sivamurugan and R. Ravikesavan
Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India

Abstract:

Field experiment was carried out at Department of Millets, Tamil Nadu Agricultural University, Coimbatore during Kharif, 2020 to find out the effect of new generation herbicides on weed density, yield attributes and yield of irrigated maize. The experiment was laid out in a Randomized Complete Block Design (RCBD) with the following treatments viz., T1 – Weedy check, T2 – Weed free check, T3 – Atrazine 1kg/ha (PE) fb HW at 25 DAS,T4 – Atrazine 0.75kg/ha (PE) fb Topramezone 25.2 g/ha at 25 DAS, T5 – Atrazine 0.75kg/ha (PE) fb Tembotrione 120 g/ha at 25 DAS, T6 – Atrazine 1kg/ha (PE) fb Topramezone 25.2 g/ha at 25 DAS, T7 – Atrazine 1kg/ha (PE) fb Tembotrione 120 g/ha at 25 DAS, T8 – Topramezone 25.2 g/ha + Atrazine 0.75kg/ha at 15 DAS and T9 – Tembotrione 120 g/ha + Atrazine 0.75kg/ha at 15 DAS and replicated thrice. Experimental results revealed that weed management practices evinced significant influence on grassy weeds and BLW. Application of Topramezone at 25.2 g/ha + Atrazine at 0.75kg/ha on 15 DAS (T8) recorded lesser grassy weed count of 25.7 No/m2 which was on par with T6, T4 and T9 but was superior to T7 and T5. With respect to sedges, there was no significant influence of treatments. Nevertheless, application of Atrazine at 0.75kg/ha (PE) fb Tembotrione at 120 g/ha on 25 DAS(T5) and Atrazine at1kg/ha (PE) fb Tembotrione at 120 g/ha on 25 DAS (T7) recorded lesser count of 0 and 0.3 No/m2, respectively. Both the post emergence herbicides viz., Topramezone and Tembotrione were highly effective in controlling BLW. Weed management practices exerted significant influence on yield attributes of maize except grain rows/cob and 100 seed weight. In respect of new generation herbicides, application of Topramezone at 25.2 g/ha + Atrazine at 0.75kg/ha on 15 DAS (T8) recorded higher yield (7764 kg/ha), net return (Rs. 74,840 ha-1) and B: C ratio (2.38). Keywords: Maize, Herbicides, effect, weed density, yield.

Effect of weed management practices on growth, weed density, yield attributes and yield of maize

Treatments	Plant height (cm)	Cob length (cm)	Cob girth (cm)	Grain rows/ cob	Grains /row	100 seed weight (g)	Weed density on 50 DAS (No/m^2)			Grain yield (kg/ha)
							G	S	BLW	
T_1	239.3	15.3	14.1	13.2	28.5	36.8	58.0	7.3	4.0	5538
T_2	252.9	18.8	16.6	14.3	34.5	39.9	0	0	0	8029
T_3	248.7	18.7	16.4	14.1	34.4	39.9	30.3	3.3	0.3	7882
T_4	243.1	18.1	15.9	13.9	33.4	37.8	38.3	1.0	0	6791
T_5	240.1	17.2	15.3	13.6	29.8	36.1	55.3	0	0	6224
T_6	243.5	18.2	16.2	13.9	33.7	38.2	33.7	6.0	0	6923
T_7	241.3	17.7	15.6	13.6	31.1	36.4	53.3	0.3	0	6367
T_8	247.9	18.5	16.4	14.1	34.4	38.7	25.7	6.0	0.3	7764
T_9	242.1	17.8	15.8	13.7	32.1	36.6	47.3	2.7	0	6578
CD ($p=0.05$)	NS	1.70	1.22	NS	3.54	NS	27.3	NS	2.3	1062

Biography:

A.P Sivamurugan is working as Assistant Professor (Agronomy) at Water Technology Centre,Tamil Nadu Agricultural University, Coimbatore. Specialized in Farming systems and Maize Agronomy. Involved in teaching of undergraduate and post graduate students. Worked in AICRP on Maize from 2015 to 2021 and written more than 30 research articles in peer reviewed journals with high NAAS rating and 5 books (ISBN). **Research Interest:** Weed management and nutrient management

E: apacsivamurugan@gmail.com

ORAL

Evaluation of doubled haploid population for grain morphological traits

Reshmi Raj K.R*, S. Samantaray, C. Parameswaran, B.C. Patra
ICAR– NRRI, Cuttack, Odisha, India

Abstract:

Doubled haploid (DH) technology is a powerful tool which complements the conventional breeding program to shorten the breeding cycle for development of variety. The DH lines derived from the cross between Pokkali and Savitri were evaluated for grain length, grain width and L/B ratio. The data was recorded on 10 randomly selected grains of 117 DH lines and their parents. The data was analyzed for studying diversity, correlation and PCA. It was observed that the doubled haploid lines exhibited significant diversity for the grain morphological traits. The grain length in DH lines ranged from 6.90 to 10.27 mm with a mean grain length of 8.93 mm. While the parents, Savitri and Pokkali recorded a grain length of 6.90 and 8.50 mm. The grain width ranged from 1.82 to 5.78 mm with a mean of 2.89 mm. The grain width recorded for parents were 3.00 (Savitri) and 3.30 mm (Pokkali) respectively. The L/B ratio ranged from 1.73 to 5.33 mm, while it was 2.30 and 2.58 mm for the parents, Savitri and Pokkali. Based on the Standard Evaluation System (IRRI, 1998), the parents were categorized as medium sized grains, while the doubled haploid population comprised of bold, medium and slender grains, indicating the existence of considerable variation among the DH lines for these grain morphological traits. The grain length showed positive correlation with L/B ratio (r = 0.679**) and negative correlation with grain width (r = -0.314**). Negative correlation was observed between the grain width and L/B ratio (r = –0.865**). PCA analysis revealed that one among the three principal components were found significant (eigen value >1) which contributed to 75.45% of the total variation observed in the DH lines studied. The first Principal component (PC1) had an eigen value of 2.27 and was strongly associated with L/B ratio (0.66) followed by grain length (0.49), while grain width (-0.57) contributed negatively to the total variation. The second principal component (PC 2) with eigen value 0.70 was responsible for 23.21% of the total variation. The characters, grain length (0.80) and grain width (0.60) contributed positively, while L/B ratio (-0.08) contributed negatively to this component. The third Principal component (PC 3) had an eigen value of 0.04 and was responsible for only 1.3% of the total variation. The L/B ratio (0.75) and grain width (0.56) had positive contribution, while grain length (-0.35) contributed negatively to the total variation observed in the DH lines.

Biography:

Dr. Mrs. Reshmi Raj K.R is a Scientist in Crop Improvement Division, (Genetics & Plant Breeding) at ICAR-NRRI, Cuttack, India. She completed her Ph.D. in Genetics and Plant Breeding. She worked as Scientist (trainee), ICAR- National Academy of Agricultural Research Management, Hyderabad, Telangana, India from July 2018 to September 2018, Scientist (Plant Breeding and Genetics), ICAR-National Bureau of Plant Genetic Resources, Regional Station, Ranchi, India from October 2018 to August 2020 , and Scientist (Plant Breeding and Genetics), ICAR-National Rice Research Institute, Cuttack, Odisha, India from August 2020- continuing. She has received Received "University Gold Medal" for M. Sc. (Ag.) on fifth convocation held on 6th February 2017 at Uttar Banga Krishi Viswavidyalaya, West Bengal.

E: reshmirajkr@gmail.com

ମସଲା ସମ୍ରାଟ ଶରତ କୁମାର ସାହୁ

କବାଡ଼ି ଖେଳରୁ ଉଦ୍ୟୋଗପତି

ସଫଳତା ଓ ପ୍ରଗତି ପାଇଁ କୌଣସି ଗଡଫାଦର କି ଉଚ୍ଚ ପଦପଦବୀଧାରୀଙ୍କ ବିନା ସହଯାଗରେ **ଶରତ କୁମାର ସାହୁ** ଆଜି ଯେଉଁଠି ପହଂଚିଛନ୍ତି, ତାହା ତାଙ୍କ ଗଭୀର ନିଷ୍ଠା, ଆତ୍ମପ୍ରତ୍ୟୟ ଓ ସ୍ୱାଭିମାନର ଫଳଶ୍ରୁତି ବୋଲି କୁହାଯାଇପାରେ। ଓଡ଼ିଶାର ଶିଳ୍ପସାମ୍ରାଜ୍ୟରେ ରୁଚି ଉଦ୍ୟୋଗ ଓ ତା'ର ପ୍ରତିଷ୍ଠାତା ଶରତ କୁମାର ସାହୁ ସତରେ ଏକ ଅବିସ୍ମରଣୀୟ ପରିଚୟ ହୋଇ ରହିବେ। ଆଗାମୀ ପିଢ଼ିର ଉଦ୍ୟୋଗପତିଙ୍କ ପାଇଁ ମଧ୍ୟ ଶ୍ରୀ ସାହୁ ଏକ ଜୀବନ୍ତ ଉଦାହରଣ ହୋଇ ରହିଥିବେ

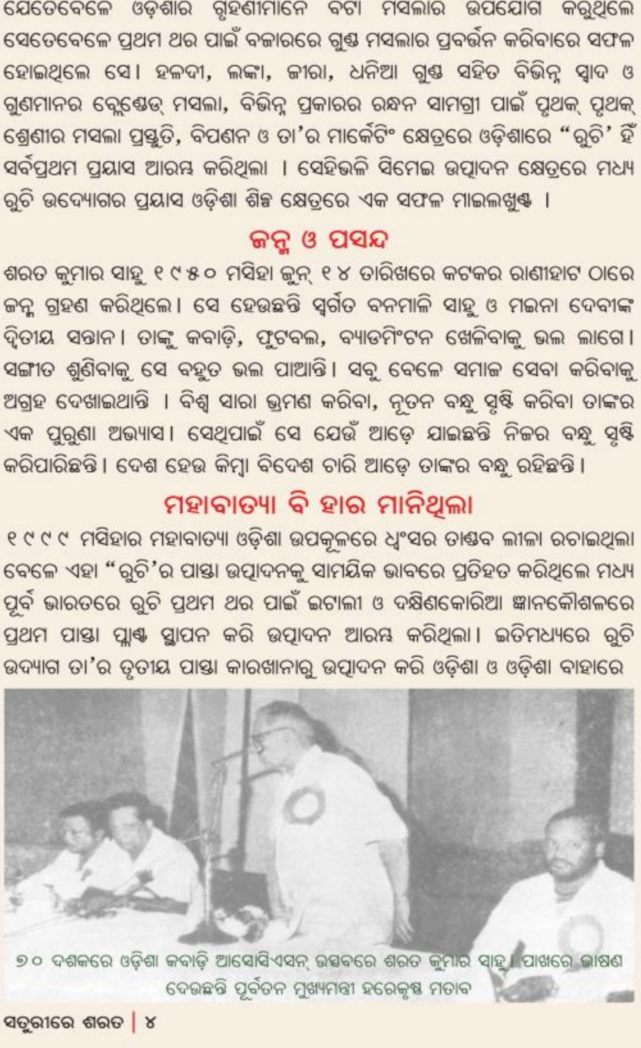
ଓଡ଼ିଶାର ଶିଳ୍ପ କ୍ଷେତ୍ରରେ "ରୁଚି' ଶିଳ୍ପୋଦ୍ୟାଗ ଓ ଏହାର ଅନ୍ୟତମ ପ୍ରତିଷ୍ଠାତା ଶରତ କୁମାର ସାହୁ ଏକ ଅତି ସୁପରିଚିତ ନାମ । ଦୀର୍ଘ ୪୦ ବର୍ଷ ଧରି ଓଡ଼ିଶାର ଘରେ ଘରେ "ରୁଚି' ମସଲାକୁ ପହଂଚାଇବା ଏବଂ ଗୁଣାତ୍ମକ ମାନର ମସଲା ଉତ୍ପାଦନ କରି ଶ୍ରୀ ସାହୁ ଓଡ଼ିଶାର ଶିଳ୍ପ କ୍ଷେତ୍ରରେ ଏକ ସ୍ୱତନ୍ତ୍ର ପରିଚୟ ସୃଷ୍ଟି କରିଛନ୍ତି। ଏକ ସାଧାରଣ ମେସିନରେ ଗୁଣ୍ଡ ମସଲାକୁ ଓଡ଼ିଶା ବଜାରରେ ପ୍ରଥମେ ପ୍ରବେଶ କରାଇଥିଲେ ଶ୍ରୀ ସାହୁ। ଯେତେବେଳେ ଓଡ଼ିଶାର ଗୃହିଣୀମାନେ ବଟା ମସଲାର ଉପଯୋଗ କରୁଥିଲେ ସେତେବେଳେ ପ୍ରଥମ ଥର ପାଇଁ ବଜାରରେ ଗୁଣ୍ଡ ମସଲାର ପ୍ରବର୍ତ୍ତନ କରିବାରେ ସଫଳ ହୋଇଥିଲେ ସେ। ହଳଦୀ, ଲଙ୍କା, ଜୀରା, ଧନିଆ ଗୁଣ୍ଡ ସହିତ ବିଭିନ୍ନ ସ୍ୱାଦ ଓ ଗୁଣମାନର ବ୍ଲେଣ୍ଡେଡ୍ ମସଲା, ବିଭିନ୍ନ ପ୍ରକାରର ରନ୍ଧନ ସାମଗ୍ରୀ ପାଇଁ ପୃଥକ୍ ପୃଥକ୍ ଶ୍ରେଣୀର ମସଲା ପ୍ରସ୍ତୁତି, ବିପଣନ ଓ ତା'ର ମାର୍କେଟିଂ କ୍ଷେତ୍ରରେ ଓଡ଼ିଶାରେ "ରୁଚି' ହିଁ ସର୍ବପ୍ରଥମ ପ୍ରୟାସ ଆରମ୍ଭ କରିଥିଲା । ସେହିଭଳି ସିମେଇ ଉତ୍ପାଦନ କ୍ଷେତ୍ରରେ ମଧ୍ୟ ରୁଚି ଉଦ୍ୟୋଗର ପ୍ରୟାସ ଓଡ଼ିଶା ଶିଳ୍ପ କ୍ଷେତ୍ରରେ ଏକ ସଫଳ ମାଇଲଖୁଣ୍ଟ ।

ଜନ୍ମ ଓ ପସନ୍ଦ

ଶରତ କୁମାର ସାହୁ ୧୯୫୦ ମସିହା ଜୁନ୍ ୧୪ ତାରିଖରେ କଟକର ରାଣୀହାଟ ଠାରେ ଜନ୍ମ ଗ୍ରହଣ କରିଥିଲେ। ସେ ହେଉଛନ୍ତି ସ୍ୱର୍ଗତ ବନମାଳି ସାହୁ ଓ ମଇନା ଦେବୀଙ୍କ ଦ୍ୱିତୀୟ ସନ୍ତାନ। ତାଙ୍କୁ କବାଡ଼ି, ଫୁଟବଲ, ବ୍ୟାଡମିଂଟନ ଖେଳିବାକୁ ଭଲ ଲାଗେ। ସଙ୍ଗୀତ ଶୁଣିବାକୁ ସେ ବହୁତ ଭଲ ପାଆନ୍ତି। ସବୁ ବେଳେ ସମାଜ ସେବା କରିବାକୁ ଅଗ୍ରହ ଦେଖାଇଥାନ୍ତି । ବିଶ୍ୱ ସାରା ଭ୍ରମଣ କରିବା, ନୂତନ ବନ୍ଧୁ ସୃଷ୍ଟି କରିବା ତାଙ୍କର ଏକ ପୁରୁଣା ଅଭ୍ୟାସ। ସେଥିପାଇଁ ସେ ଯେଉଁ ଆଡ଼େ ଯାଇଛନ୍ତି ନିଜର ବନ୍ଧୁ ସୃଷ୍ଟି କରିପାରିଛନ୍ତି। ଦେଶ ହେଉ କିମ୍ବା ବିଦେଶ ଚାରି ଆଡ଼େ ତାଙ୍କର ବନ୍ଧୁ ରହିଛନ୍ତି।

ମହାବାତ୍ୟା ବି ହାର ମାନିଥିଲା

୧୯୯୯ ମସିହାର ମହାବାତ୍ୟା ଓଡ଼ିଶା ଉପକୂଳରେ ଧ୍ୱଂସର ତାଣ୍ଡବ ଲୀଳା ରଚାଇଥିଲା ବେଳେ ଏହା "ରୁଚି'ର ପାସ୍ତା ଉତ୍ପାଦନକୁ ସାମୟିକ ଭାବରେ ପ୍ରତିହତ କରିଥିଲେ ମଧ୍ୟ ପୂର୍ବ ଭାରତରେ ରୁଚି ପ୍ରଥମ ଥର ପାଇଁ ଇଟାଲୀ ଓ ଦକ୍ଷିଣକୋରିଆ ଜ୍ଞାନକୌଶଳରେ ପ୍ରଥମ ପାସ୍ତା ପ୍ଲାଣ୍ଟ ସ୍ଥାପନ କରି ଉତ୍ପାଦନ ଆରମ୍ଭ କରିଥିଲା। ଇତିମଧ୍ୟରେ ରୁଚି ଉଦ୍ୟାଗ ତା'ର ତୃତୀୟ ପାସ୍ତା କାରଖାନାରୁ ଉତ୍ପାଦନ କରି ଓଡ଼ିଶା ଓ ଓଡ଼ିଶା ବାହାରେ ପାସ୍ତା ସାମଗ୍ରୀର ବିକ୍ରିବଟା କରିପାରୁଛି। "ରୁଚି' ଉଦ୍ୟୋଗ ୩୦୦ରୁ ଅଧିକ ମସଲା, ସିମାଇ, ପାସ୍ତାର ବିବିଧ ସାମଗ୍ରୀକୁ ଆଜି ଓଡ଼ିଶା, ଓଡ଼ିଶା ବାହାରେ ଏବଂ ଏପରିକି ଦରିଆପାରି ରାଷ୍ଟ୍ରରେ ବି ତା'ର ବାଣିଜ୍ୟିକ ସଫଳତାକୁ ପହଂଚାଇ ପାରିଛି। ବିଶ୍ୱ ମସଲା ମାନଚିତ୍ରରେ "ରୁଚି' ଆଜି ଏକ ପରିଚିତ ନାଁ। ମସଲା ସହିତ ସିମେଇ ଓ ପାସ୍ତା ଉତ୍ପାଦନ ଓ ବିକ୍ରିବଟା କ୍ଷେତ୍ରରେ ଏହାର ସ୍ଥାନ ସ୍ୱତନ୍ତ୍ର ଓ ଅନନ୍ୟ। ଭାରତର ବିଭିନ୍ନ ରାଜ୍ୟରେ ରୁଚି ମସଲା, ସିମାଇ ଓ ପାସ୍ତା ପ୍ରଡକ୍ଟର ଲୋକପ୍ରିୟତା ବେଶ୍। ଶରତ ସାହୁଙ୍କ ସାଧୁତା, ଉଚ୍ଚ ଗୁଣାବତ୍ତା ଓ ନିଷ୍ଠାପର ଉଦ୍ୟମ ଯାଗୁଁ ରୁଚି ନିଜର ସାମଗ୍ରିକ ଅଭିବୃଦ୍ଧି ଓ ସଫଳତା ହାସଲ କରିପାରିଛି। ଖାଦ୍ୟ ପ୍ରକ୍ରିୟାକରଣ କ୍ଷେତ୍ରରେ ବଜାରରେ ବିଶୁଦ୍ଧ ଓ ଗୁଣାତ୍ମକ ମାନର ଫ୍ରୋଜନ୍ ଫୁଡ୍ସ ମଧ୍ୟ ଉପଲବ୍ଧ କରାଉଛି ରୁଚି।


୭୦ ଦଶକରେ ଓଡ଼ିଶା କବାଡ଼ି ଆସୋସିଏସନ୍ ଉତ୍ସବରେ ଶରତ କୁମାର ସାହୁ। ପାଖରେ ଭାଷଣ ଦେଉଛନ୍ତି ପୂର୍ବତନ ମୁଖ୍ୟମନ୍ତ୍ରୀ ହରେକୃଷ୍ଣ ମତାବ

ମହିଳା ସଶକ୍ତିକରଣ ଓ ସମାଜସେବା

ରାଜ୍ୟର ମହିଳା ଓ ଯୁବତୀମାନଙ୍କୁ କର୍ମସଂସ୍ଥାନ ଯୋଗାଇ ଦେବା ପାଇଁ ରୁଚି ଖାଦ୍ୟ ପ୍ରକ୍ରିୟାକରଣ ଓ ଉନ୍ନତମାନର ପ୍ୟାକେଜିଂ କୌଶଳରେ ସେମାନଙ୍କୁ ସାମିଲ କରିଛି। ଏହା ମାଧ୍ୟମରେ ବ୍ୟବସାୟିକ ଅଭିବୃଦ୍ଧି ସହିତ ନିଜର ସାମାଜିକ ଉତ୍ତରଦାୟିତ୍ୱ ଭୂମିକା ନିର୍ବାହ କରିବା ପାଇଁ ରୁଚି ଅନୁଷ୍ଠାନ ପକ୍ଷରୁ ପ୍ରତିଷ୍ଠିତ ହାଇଛି ରୁଚି ପ୍ରତିଭା ଫାଉଣ୍ଡେସନ। ସାମାଜିକ ଜୀବନ କ୍ଷେତ୍ରରେ ଉଲ୍ଲେଖନୀୟ ଓ ଉତ୍ସର୍ଗୀକୃତ ଅବଦାନ ରଖିଥିବା ଯୋଗ୍ୟ ପ୍ରତିଭାମାନଙ୍କୁ ସମ୍ବର୍ଦ୍ଧିତ କରିବାର ଏକ ସୁସ୍ଥ ପରମ୍ପରା ଏହି ଫାଉଣ୍ଡେସନ ଆରମ୍ଭ କରିଛି। ରାଜ୍ୟର କୃତୀ ଛାତ୍ରଛାତ୍ରୀଙ୍କ ସମେତ କ୍ରୀଡ଼ା, ଚିକିତ୍ସାସେବା, ସୃଜନଶୀଳ ସାହିତ୍ୟ, ସମାଜସେବା, ପ୍ରଶାସନିକ ସେବା କ୍ଷେତ୍ରରେ ବିଶିଷ୍ଟ ପ୍ରତିଭାଧରମାନଙ୍କୁ ଗୋଟିଏ ମଞ୍ଚରେ ସମ୍ମାନିତ କରି ରୁଚି ପ୍ରତିଭା ଫାଉଣ୍ଡେସନ ସମାଜ ପ୍ରତି ନିଜର ଅଙ୍ଗୀକାରବଦ୍ଧତାର ପ୍ରମାଣ ଦେଇଛି।

ମେଧାବୀ ଛାତ୍ରଛାତ୍ରୀଙ୍କୁ ଦେଉଛନ୍ତି ସମ୍ମାନ

ରାଜ୍ୟର ମେଧାବୀ ଓ ପ୍ରତିଭାବାନ ଛାତ୍ରଛାତ୍ରୀଙ୍କ ଉଚ୍ଚଶିକ୍ଷା ଯାଗାଇଦେବା ପାଇଁ ତଥା ସେମାନଙ୍କୁ ପ୍ରାତ୍ସାହନ ଦେବା ପାଇଁ ରାଜ୍ୟର ୧୦୦ରୁ ଅଧିକ ଛାତ୍ରଛାତ୍ରୀଙ୍କୁ ମାସିକ ରୁଚି ମେଧାବୃତ୍ତି ପ୍ରଦାନ କରାଯାଉଛି। ଓଡ଼ିଶାର ଶିଳ୍ପବିକାଶ କ୍ଷେତ୍ରରେ ନିଜର ଉତ୍କର୍ଷତା ପାଇଁ ଏବଂ ସଫଳତା ପାଇଁ 'ରୁଚି' ଅନ୍ୟମାନଙ୍କ ପାଇଁ ଏକ ଜ୍ୱଳନ୍ତ ଉଦାହରଣ ପାଲଟିଯାଇଛି। ନିଜର ଗୁଣାତ୍ମକ ମାନରେ କେବେ ସାଲିସ୍ କରିନାହିଁ ରୁଚି ଉଦ୍ୟୋଗ। ତେଣୁ ଓଡ଼ିଶାର ଏମିତି କୌଣସି ରନ୍ଧନଶାଳା ନାହିଁ, ଯେଉଁଠି ରୁଚି ତା'ର ସୁଗନ୍ଧିତ ବାସ୍ନାକୁ ପହଂଚାଇ ପାରିନି। ଆଜି ଯଦି ଓଡ଼ିଶାର ଶିଳ୍ପ ବିକାଶ ଏବଂ ଶିଳ୍ପ ପ୍ରଗତି କ୍ଷେତ୍ରରେ କିଛି ସଫଳ ବ୍ୟକ୍ତିତ୍ୱ ଓ ସଫଳତମ ଉଦ୍ୟୋଗର ନାମ ନିଆଯିବ- ତେବେ ତା' ଭିତରେ ନିଶ୍ଚୟ 'ରୁଚି' ଓ ଏହାର ପ୍ରତିଷ୍ଠାତା ଶରତ କୁମାର ସାହୁଙ୍କ ନାମ ସର୍ବାଗ୍ରେ ଆସିବ।

ସଫଳତା ଓ ପ୍ରଗତି ପାଇଁ କୌଣସି ଗଡ୍ଫାଦର କି ଉଚ୍ଚ ପଦପଦବୀଧାରୀଙ୍କ ବିନା ସହଯାଗରେ ଶ୍ରୀ ସାହୁ ଆଜି ଯେଉଁଠି ପହଂଚିଛନ୍ତି, ତାହା ତାଙ୍କ ଗଭୀର ନିଷ୍ଠା, ଆତ୍ମପ୍ରତ୍ୟୟ ଓ ସ୍ୱାଭିମାନର ଫଳଶ୍ରୁତି ବୋଲି କୁହାଯାଇପାରେ। ଓଡ଼ିଶାର ଶିଳ୍ପସାମ୍ରାଜ୍ୟରେ ରୁଚି ଉଦ୍ୟୋଗ ଓ ତା'ର ପ୍ରତିଷ୍ଠାତା ଶରତ କୁମାର ସାହୁ ସତରେ ଏକ ଅବିସ୍ମରଣୀୟ ପରିଚୟ ହୋଇ ରହିବେ। ଆଗାମୀ ପିଢ଼ିର ଉଦ୍ୟୋଗପତିଙ୍କ ପାଇଁ ମଧ୍ୟ ଶ୍ରୀ ସାହୁ ଏକ ଜୀବନ୍ତ ଉଦାହରଣ ହୋଇ ରହିଥିବେ।

Evation

AGRI Vision 2022

DAY-03

Mar 08, 2022

SUCCESS STORIES

ଯେଉଁଠି ତିଆରି ହୁଅନ୍ତି ମସଲା ଆଉ ମଣିଷ

ଅବିଶ୍ୱାସକୁ ବିଶ୍ୱାସରେ ଓ ଅସମ୍ଭବକୁ ସମ୍ଭବରେ ଯିଏ
ବଦଳେଇ ପାରିଛି ସିଏ ହେଉଛି ରୁଚି ଉଦ୍ୟୋଗ।
ତେବେ ଏ ସମସ୍ତ ପ୍ରତିଷ୍ଠା, ସଫଳତା ପଛରେ ରହିଛି
ଶରତ କୁମାର ସାହୁଙ୍କ ଦିଗଦର୍ଶନ ଆଉ ଅଧ୍ୟବସାୟ

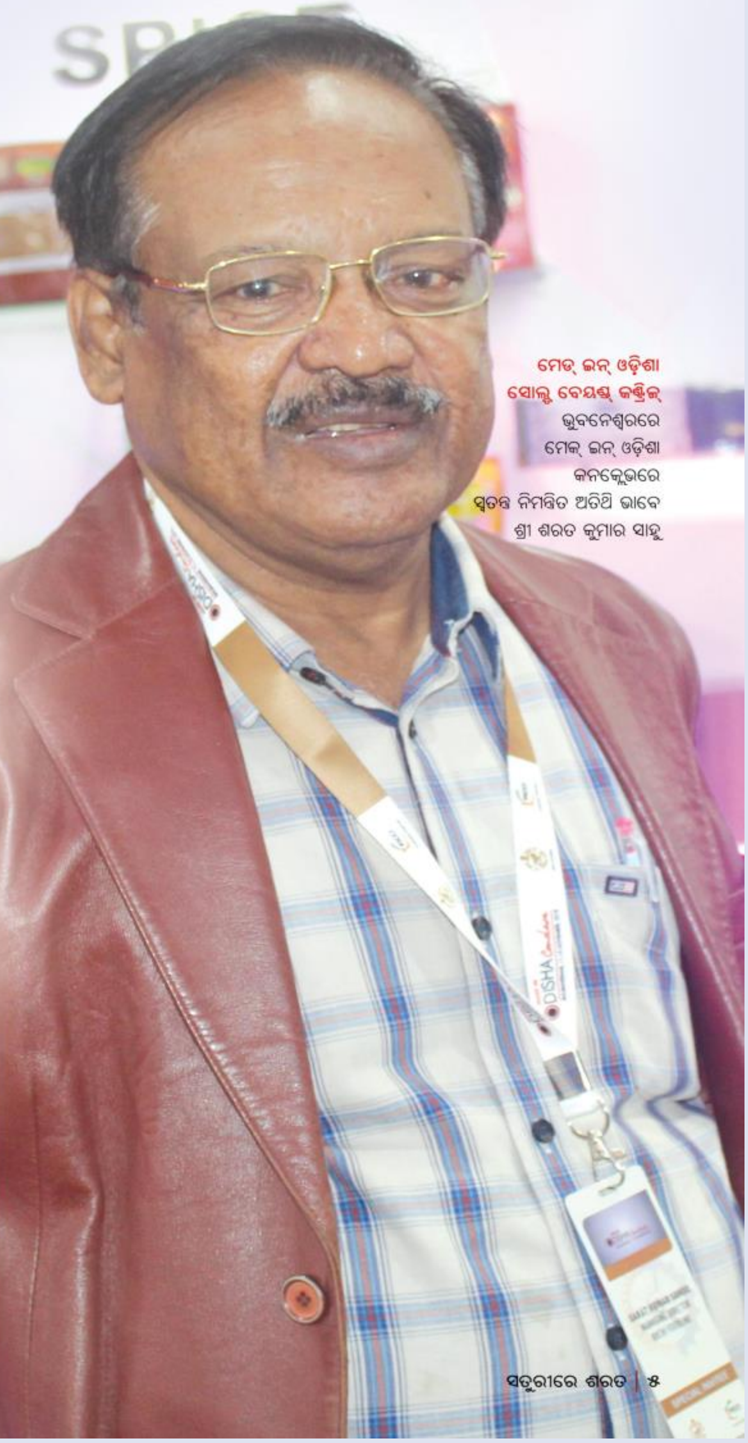
ରୁଚି ମସଲା କମ୍ପାନୀ ଏପରି ଏକ କାରଖାନା ଯେଉଁଠି ତିଆରି ହୁଏ ମସଲା ଓ ତିଆରି ହୁଅନ୍ତି ମଣିଷ। ଏହା ଏକ ପରିବାର ଯେଉଠି ସଭିଏଁ ଗୋଟିଏ ସୂତ୍ରରେ ବନ୍ଧା। ଏହି ବିଶାଳ ପରିବାରର ରୁଚିପୂର୍ଣ୍ଣ ମସଲାକୁ ଅପେକ୍ଷା କରିଥାନ୍ତି ଓଡ଼ିଶା ତଥା ଓଡ଼ିଶା ବାହାରର ଲକ୍ଷ ଲକ୍ଷ ପରିବାରର ରୋଷେଇଶାଳା। କାରଖାନାରୁ ରୋଷେଇଶାଳ ଗତିପଥରେ ସାମିଲ ଅଛନ୍ତି ଶହ ଶହ ଡିଲର ଓ ଲକ୍ଷ ଲକ୍ଷ ଖୁଚୁରା ବ୍ୟବସାୟୀ।

ଏହି ସ୍ୱପ୍ନ ଓଡ଼ିଶା ଓ ଭାରତ ସୀମାରେଖା ଡେଇଁ ପହଞ୍ଚିଛି ଯାଇ ଭୂଟାନ, କୋରିଆ, ଆମେରିକା, ଇଟାଲୀ, ଜର୍ମାନ, ନେପାଳ ଏବଂ ମସ୍କଟ ପରି ଦେଶମାନଙ୍କରେ। ଏହା ଏକ ନିରନ୍ତର ବଢି ଚାଲିଥିବା ସ୍ୱପ୍ନ, ଯେଉଁଥିରେ ସାମିଲ ହୋଇଛି ପାସ୍ତା ଭଳି ଅନ୍ତର୍ଜାତୀୟ ଖାଦ୍ୟ ଏବଂ ଫ୍ରୋଜିଟ ଭଳି ଏକ ଦମଦାର ବ୍ରାଣ୍ଡ। ଏଠି ଏକାଠି ହୋଇଛନ୍ତି ଶ୍ରମ ଓ ସଫଳତା, ପୁଣି ଏକାଠି ହୋଇଛନ୍ତି ସ୍ୱପ୍ନ ଓ ବାସ୍ତବତା।

ବିଶ୍ୱାସ ହେଉନି ଯେ ଏମିତି ଏକ ବିରାଟ ଉଦ୍ୟୋଗ ଓଡ଼ିଶାରେ ସୃଷ୍ଟି ହେଇପାରିଛି। ଅବିଶ୍ୱାସକୁ ବିଶ୍ୱାସରେ ଓ ଅସମ୍ଭବକୁ ସମ୍ଭବରେ ଯିଏ ବଦଳେଇ ପାରିଛି ସିଏ ହେଉଛି ରୁଚି ଉଦ୍ୟୋଗ। ତେବେ ଏ ସମସ୍ତ ପ୍ରତିଷ୍ଠା, ସଫଳତା ପଛରେ ଅଛି ଜଣେ ମଣିଷର ଦିଗଦର୍ଶନ ଆଉ କଠୋର ଅଧ୍ୟବସାୟ। ସେ ହେଉଛନ୍ତି କାରଖାନାର ପ୍ରାଣ ପ୍ରତିଷ୍ଠାତା ଓଡ଼ିଶାରେ ଭିନ୍ନ ଏକ ମଣିଷ ତିଆରି କାରଖାନାର ଉଦ୍ୟୋକ୍ତା ସ୍ୱପ୍ନଦ୍ରଷ୍ଟା ଶିଳ୍ପପତି ଶରତ କୁମାର ସାହୁ।

ସ୍ୱପ୍ନ, ସ୍ୱାଦ, ସମ୍ଭାବନା ଓ ସଫଳତାକୁ ଯିଏ ଏକାଠି କରିପାରିଛନ୍ତି ସେଇ ଶିଳ୍ପର ସେନାପତି ହେଉଛନ୍ତି ଶରତ କୁମାର ସାହୁ। ପ୍ରାୟ ୪୩ ବର୍ଷ ତଳେ କଟକର ରାଣୀହାଟରେ ସଫଳତାର ମଞ୍ଜି ବୁଣିଥିଲେ ସେତେବେଳର ପ୍ରଖ୍ୟାତ କବାଡ଼ି ଖେଳାଳି ଶରତ। ଯେତେବେଳେ ଶିଳ୍ପ ଉଧେଇ ପାରେନାହିଁ ବୋଲି ଏକ ବଳିଷ୍ଠ ଧାରଣା ଥିଲା ଅନେକଙ୍କର, ଠିକ ସେତିକିବେଳେ ନିଜ ଦୂରଦୃଷ୍ଟିରେ ଏକ ସୁନ୍ଦର ଭବିଷ୍ୟତର ସ୍ୱପ୍ନ ଦେଖିଥିଲେ ଏହି ଖେଳାଳି। ସେତେବେଳେ ମାତ୍ର ୫୦୦୦ ଟଙ୍କାର ଉଦ୍ୟୋଗରେ ମସଲା ଗୁଣ୍ଡ ତିଆରି ସ୍ୱପ୍ନ ଦେଖୁଥିବା ଶରତ ସାହୁଙ୍କ ସାଥିରେ ଥିଲେ ମାତ୍ର ଜଣେ କର୍ମଚାରୀ, ପିତା ବନମାଳୀ ସାହୁ ଓ ମାତା ମଇନା ଦେବୀଙ୍କ ଶୁଭକାମନା ଓ ସର୍ବୋପରି ଶ୍ରୀ ଲକ୍ଷେଶ୍ୱର ଦେବଙ୍କ ଆଶୀର୍ବାଦ।

ରୁଚିର ଯାତ୍ରାର ଏହି ରାସ୍ତା କେବେ ବି ସହଜ ନଥିଲା କି ଆଜୀବି ସହଜ ନାହିଁ। ନିରନ୍ତର ପ୍ରୟାସ ସର୍ବଦା ଜାରିରହିଛି। ପ୍ରତି ସମୟରେ ବାସ୍ତବତା ସହ ଲଢି ଆସି ପହଞ୍ଚିଛି ଏହି ମୁହୂର୍ତ୍ତରେ। ଦିନକୁ ଦିନ ବଢି ଚାଲିଛି ଏହାର ସାମ୍ରାଜ୍ୟ। ରୁଚି ସୃଷ୍ଟି କରିଛି ବିରାଟ ପାସ୍ତା ୟୁନିଟ। ଏକକାଳୀନ ୧୫ ଲକ୍ଷରୁ ଉର୍ଦ୍ଧ୍ୱ ଲୋକଙ୍କ ପାଇଁ ମସଲା ଗଚ୍ଛିତ ରଖିବାର କ୍ଷମତା ଥିବା ଶୀତଳ ଭଣ୍ଡାର ପ୍ରତିଷ୍ଠା କରିଛି ରୁଚି। ରୁଚି ଆଜି ହେଇପାରିଛି ପୂର୍ବ ଭାରତର ସର୍ବ ବୃହତ ମସଲା ଉଦ୍ୟୋଗ। ରୁଚିର ଆଉଏକ ମୁଖ୍ୟ ଶାଖା ହେଉଛି ଫ୍ରୋଜିଟ୍। ଏଥିରେ ସାମିଲ ହୋଇଛି ପୋଡ଼ପିଠା, ପଖାଳ ସହ ଶୁଖୁଆ ଭଳି ବହୁ ରୁଚିକର ଓଡ଼ିଆ ଖାଦ୍ୟ। ଖାଲି ସୁସ୍ୱାଦୁ ଖାଦ୍ୟ, ମସଲା ପ୍ରସ୍ତୁତି ରୁଚିର ଲକ୍ଷ୍ୟ ନୁହେଁ। ଏହା ରକ୍ତଦାନ ଶିବିର, ବୃକ୍ଷ ରୋପଣ ଆଦି କାର୍ଯ୍ୟକ୍ରମ ସାଙ୍ଗକୁ ମେଧାବୀ ଛାତ୍ରଛାତ୍ରୀଙ୍କୁ ପ୍ରୋତ୍ସାହନ ଓ ବିରଳ ପ୍ରତିଭାଙ୍କୁ ସମ୍ମାନ ଦେବା ସହ ବନ୍ୟା ପ୍ରପୀଡ଼ିତଙ୍କୁ ମଧ୍ୟ ବଢ଼ାଇଛି ସହାୟତାର ହାତ। ଏତିକିରେ ଥକି ପଡ଼ିନାହାନ୍ତି ଶରତ କୁମାର ସାହୁ ଓ ରୁଚିର ବିଶାଳ ପରିବାର। ଲକ୍ଷ୍ୟ, ବିଶ୍ୱର କୋଣ ଅନୁକୋଣରେ ରୁଚି ହେବ ଏକ ନମ୍ବର ମସଲା ଶିଳ୍ପ। ସ୍ୱପ୍ନ ତାଙ୍କର ଓଡ଼ିଶାରେ ପ୍ରତିଷ୍ଠା ହେବ ବିଶ୍ୱସ୍ତରୀୟ ଫୁଡ୍ ପାର୍କ। ନିକଟରେ ମେକ୍ ଇନ୍ ଓଡ଼ିଶା କନକ୍ଲେଭ୍‌ରେ ୧୦୦ କୋଟି ଟଙ୍କା ପୁଞ୍ଜି ନିବେଶରେ ଢେଙ୍କାନାଳରେ ଫୁଡ ପାର୍କ ପ୍ରତିଷ୍ଠା ନେଇ ଘୋଷଣା କରିଥିଲେ ଶ୍ରୀ ସାହୁ।



**ମେଡ୍ ଇନ୍ ଓଡ଼ିଶା
ସୋଲ୍ଡ ବେୟଣ୍ଡ କଣ୍ଟ୍ରିଜ୍**
ଭୁବନେଶ୍ୱରରେ
ମେକ୍ ଇନ୍ ଓଡ଼ିଶା
କନକ୍ଲେଭରେ
ସ୍ୱତନ୍ତ୍ର ନିମନ୍ତ୍ରିତ ଅତିଥି ଭାବେ
ଶ୍ରୀ ଶରତ କୁମାର ସାହୁ

ORAL

Successful cultivation of Banana by drip irrigation and tissue culture technology and integrated nutrition management

Dhirendrakumar Bhanubhai Desai
Panetha Village, Bharuch, Gujrat

Abstract:

Mr. Dhirendrakumar Bhanubhai Desai hailed from Panetha Village, Bharuch, Gujrat. Agriculture has been the only source of income or livelihood of his family. His father inherited farming from my forefather and so me too. Since it was the only source of his family livelihood he has to leave his schooling in-between and shouldered the responsibility of farming. He knew that I have to face a lot since the traditional farming was full of hardship like – lack of enough agricultural equipment, flood, shortage of water, financial crisis etc., then also I started cultivation. Moreover, he has to work in co-operative associations at his village to get extra earnings to feed his family. Experience has taught him that if we do farming timely with planning using technology, we can get more benefits. Every year using modern technology he keeps learning something innovative trends in agriculture. Now he is successful and progressive.

Innovative Cultivation of Banana:

- Adopted Micro irrigation system
- Modified precision farming Of Banana through tissue culture, drip irrigation and fertigation with helped in harvesting higher yield in short duration 1 crop 11 month, 2nd crop on ratoon in 7th month, 3rd crop as ratoon in 7th month , i.e. 3 crop harvest in 25 months.
- Developed constant crop cutting in a short time in lowcost banana in India there is no more production anywhere in such a short time.
- Good quality banana after grading packing is also exported is Middle East Countries.
- The productivity also increased from 15 MT / acre to 35 MT / acre. It was a result of radical change in Management practices.
- Annual income from farming average about Rs.18.0 Lakh · Awarded with Jagjivan Ram Abhinav Kisan Puraskar-2017 Best Zonal Award (Zone VIII). · Awarded with IARI INNOVATIVE FARMAR Award 2018 (IARI,New Delhi).

Successful cultivation of banana by Drip irrigation and integrated nutrition management

In the beginning of the year, he used to cultivate banana and sugarcane in an old way which resulted with little financial compensation. He got Information about drip irrigation system and tissue culture banana during the agricultural tour of Jain Irrigation, Jalgaon during the year 2004 and adopted this method since 2005.

- Drip irrigation system
- Planting Tissue Culture banana
- In the summer, they use timely and proportionate proportion of green manure and use of bio-compost, synthetic fertilizer as well as chemical fertilizer in last 10 years.
- For quality production of banana, sprinkle on banana with different spraying and cover them with plastic bag.
- After planting banana producing 3 times banana in 27 months. In the first year produces 32 to 35 tons in second year 25 tons and third year 20 tons of banana per acre. No such production is available in such a short time in India

- During 2014, we export bananas in the middle East Countries through 90% of the total production of "MERRITS" Company in Surat.
- Farmers from nearby Villages, Talukas and nearby states like Maharastra, Madhya Pradesh visited his farm and taken information about successful cultivation of our banana plantations.
- During April-2018, he exported bananas in the middle East Countries.
- During April-2021 also, he exported bananas in the middle East Countries.

Details of the last 5 years of Agricultural Achievement

YEAR	2016-17	2017-18	2018-19	2019-20	2020-21
CROP	BANANA	BANANA	BANANA	BANANA	BANANA
TOTAL AREA (HECTARE)	1.20	1.25	1.35	1.85	5
TOTAL PRODUCTION (KG)	110000	115200	117789	165419	467622
TOTAL INCOME (Rs.)	1045400/-	1076000/-	1085602/-	1608908/-	4558357/-
TOTAL EXPENSES (Rs.)	248000/-	242000/-	240000/-	289476/-	760000/-
TOTAL NET PROFIT (Rs.)	797400/-	834000/-	845602/-	1319432/-	3798352/-

Information per hectare area

YEAR	2016-17	2017-18	2018-19	2019-20	2020-21
CROP	BANANA	BANANA	BANANA	BANANA	BANANA
TOTAL AREA (HECTARE)	1	1	1	1	1
TOTAL PRODUCTION (KG)	73333	78846	87251	88400	91000
TOTAL INCOME (Rs.)	646933/-	658840/-	804150/-	839800/-	887250/-
TOTAL EXPENSES (Rs.)	183500/-	179500/-	177778/-	154500/-	152000/-
TOTAL NET PROFIT (Rs.)	463433/-	479340/-	626372/-	685400/-	735250/-

Ready to exporting banana in my farm.

Banana's Packing house.

Quality Banana's lime.

Prepare Banana to pack in box.

E: ddhiren2219@gmail.com
T: 94286 87219

ORAL

Integrated live stock farming

Shudhanshu Ranjan
The Farm Enterprise, Cuttack, Odisha, India

Abstract:

Livestock plays a major role in a Farmer's life and livelihood. When we are talking about doubling the income, without livestock it is impossible to achieve. When we say livestock, 'where there is life', 'there is stock'. Where there is "no life" there is "no stock". The demand for the milk, meat and eggs has jumped over all records. The demand is created by the consumers and the farmer needs to take advantage of it. Another advantage of this is that the price of the meat and other animal products increasing exponentially. But there are so many challenges in doing livestock, firstly it takes a lot of land, infrastructure, skilled worker, modern technology and uninterrupted investment along with great marketing skills, if we want to do it in a Commercial livestock Farming.

In order to take advantage of the market potential, we need to think about integrated livestock management system instead of commercial livestock Farming. In integrated system a diversified agriculture is being practiced in a sustainable way, where the input is systematic and the return is gradually and which takes a peek when the systematic approach is right, the risk factor here is negligible. When we are talking about diversification, it refers to variety of farming activities like vegetables, horticulture, floriculture, beekeeping, pisciculture, goatery dairy, native chickens all organized in a sustainable way for better income and livelihood. In this system the crop residues are best used and converted to good market potential products. The residues of each have a practical benefit to other. In this way the input cost of the farmer can be reduced remarkably and a farmer can double the benefit without depending upon the commercial feed, which costs the most to a farmer.

When sustainable livestock is being practiced in a rotational basis then it gives a systematic income generation along with that a good number of people gets employment. In an integrated system the employment is generated for round the year, where the job security along with the livelihood and food security is also achieved in a sustainable way.

Goatery:

When it comes to livestock then goat keeping is the best way to add up some extra money anytime to the farmer's pocket. Goat meat has the highest market share in India.

In Odisha the breed name as BLACK BENGAL has the best quality meat in the world. We name it as “alive gold”, Every product has a marketing issue in farming sector but goat meat has no such Marketing problem. It has demand though out the year and the supply is still lacking so much. The farmers can take the best advantage of this demand and can concentrate on goat keeping while it comes to integrated farming system. The goats can thrive on any locally available resources, crop residues of any leguminous crops available locally, and the local grazing land, forests, river beds can make a good place for their feed and fodder arrangement. But the goat keeping is not at all easy task if it’s not done in scientific way. The systematic way of vaccination, deworming, supplementation and proper care leads to a profitable goatery. These days many youth and unemployed people are coming into goat keeping looking at the market potential. Even state and central government is influencing farmers to do more goat keeping through different schemes for financial help. While going for goat farming, it is not only giving employment to the same person but also it adds a worker for every 50-breeding stock of female goats. For a stock of 50 female breeding goats, it gives annual income of about 2 lakhs every year. When goat keeping is done commercially then it produces a lot of manure which adds good source of nutrition to the soil and thus it can be used as best source of organic nutrition to the vegetable Farming.

FREE RANGE DESI CHICKEN

These days free range chickens has a very good market potential as it is raised in free-range conditions and the quality of the meat is far better than the broiler chickens. It contains good amount of protein and there is no fat in the meat. Free-range eggs and meat are preferred mostly because of this reason only. In integrated farming system Desi chicken can be done in free range method in order to provide best quality meat and eggs. In free range system the input cost is very less and the birds thrive on naturally available resources, in fact we can use vegetable wastes, kitchen wastes and any other farming or household residues to feed the chicken and can get eggs and meat. We have been doing this since 2017 and it is our main source of income. There is no extra land needed to do big infrastructures for the birds. Any local material can be used to build a night shelter for the birds and in the day time they go for free ranging in the feed and fodder fields, which adds the manure to the field and they feed on worms and grasses. Every day we need to feed some grains as well. But mostly they get their feed from the nature. This is how the quality of the meat and egg is the best. In this way farmers can add chicken in their integrated farming system for extra income from Desi chicken farming.

FISHERY:

Fish is considered as the best meat. Fish farming can be done with small scale to large scale along with an integrated farming system. In order to feed the fish, the manures from all kinds of animals like Goat, chicken and cow can be used for production of natural feed as plankton. The IMC(Indian major carps) fish like Rohu, catla and mrigal are the three preferred type fish can be farmed in a pond culture system in an integrated livestock system along with goatery, chicken and dairy. There is no need of feeding extra commercial feed if fish farming is adopted with this system. But if a person wants to do it in commercially then there is always a requirement of commercially available feed which needs to be fed in regular basis to have an optimum return, but in integrated system the farmer himself can manage the feed from its farm and all animal waste can be best used to feed the fishes. In this way the fish farm can sustain and gives extra income to the farmer. When it comes to give employment then there is a 2hr of work needed for 1acre of pond by a worker every day. In terms of returns one can get a produce of about 5 to 7 quintals of fish every year as an extra source of income and which adds to better livelihood and also quality feed to the farmers family.

DAIRY:

Fish is considered as the best meat. Fish farming can be done with small scale to large scale along with an integrated farming system. In order to feed the fish, the manures from all kinds of animals like Goat, chicken and cow can be used for production of natural feed as plankton. The IMC(Indian major carps) fish like Rohu, catla and mrigal are the three preferred type fish can be farmed in a pond culture system in an integrated livestock system along with goatery, chicken and dairy. There is no need of feeding extra commercial feed if fish farming is adopted with this system. But if a person wants to do it in commercially then there is always a requirement of commercially available feed which needs to be fed in regular basis to have an optimum return, but in integrated system the farmer himself can manage the feed from its farm and all animal waste can be best used to feed the fishes. In this way the fish farm can sustain and gives extra income to the farmer. When it comes to give employment then there is a 2hr of work needed for 1acre of pond by a worker every day. In terms of returns one can get a produce of about 5 to 7 quintals of fish every year as an extra source of income and which adds to better livelihood and also quality feed to the farmers family.

There is always a commercial dairy farm comes to the point. But in order to do Dairy in an integrated livestock system it is very easy and very profitable as well. In Commercial dairy the input cost through the Breed animal, feed, medicines, infrastructure, Worker and the land needed is too high. But in integrated system the dairy can be done easily with Native breeds like Gir, tharparkar, Haryana and many more. The input cost here is very less in comparison to the Commercial dairy like HF and Jerseys. The Native cows are fed with low-cost feeds, available in the farm itself, the crop residues from leguminous crops harvested in an integrated Farming system, the breeds are very naturally fit and they don't require much medication or attention. The dairy can be start with one or two animals, if the farmer can handle much animal with time, then it's fine. This is how dairy unit can be set by a farmer with native breeds for production of milk, which adds an employment for every 5 cows and gives a good amount of money in this integrated livestock system.

We believe if farmers focus more on integrated farming system through livestock then it can improve their source of income and better way of living. With ever expanding income status of middle class families, coupled with food conscious ness, people are now preferring better food, especially of animal origin i.e. milk, meat, fish , egg & chicken. Also preference for organically grown vegetables, country birds, birds grown in free ranging system (low-in-put technology), organic eggs, A2 milk & milk products is overriding the preference of consumers. Here, integrated farming plays a great role with better price of their products & add to farmers' income. Added with vermin-composting, Biogas plant, different varieties of tree, hedge & perennial fodder, Azola & hydroponic fodder all make the system well sustainable.

<u>My experience through AGRIVISION</u>

In 2021 I have got the award of agri startup and took training from Cifa and where I learnt the best way of doing fisheries where we used the right technology to produce fish in our integrated farming system which adds good cash to our income.

The Odisha Agro Industries Corporation Limited
(A Govt. of Odisha Undertaking)

ଓଡ଼ିଶା କୃଷି ଶିଳ୍ପ ନିଗମ
The Odisha Agro Industries Corporation Ltd.

(A. Govt. of Odisha Undertaking)
Regd. H.O. : 95, Satyanagar, Bhubaneswar-751007
Tel. : (0674) 2570687, EPBX : 2570654, Fax : 2570313, Email : oaicho@orissaagro.com

DEAR FARMERS
IF YOU NEED

1. TRACTOR, POWER TILLER, AGRICULTURAL MACHINERIES & IMPLEMENTS.
2. DIESEL PUMP SETS.
3. INSTALLATION OF RIVER LIFT PROJECTS, SHALLOW TUBE WELL BORE WELLS AT YOUR SITE, ELECTRIC PUMPS FOR YOUR DUG WELLS AND MICRO LIFT IRRIGATION PROJECTS (JALANIDHI-II)
4. FERTILIZER, PESTICIDES, BIO-FERTILISER AND SURAVI BRAND GOOD QUALITY CATTLE FEED.

All as per the subsidized rate approved by the Government.

Please contact our District Offices throughout the State

Angul	06764-23709	Ganjam	0680-2291376	Malkangiri	06861-230375
Balasore	06782-262143	Jagatsinghpur	06724-220125	Nayagarh	06753-211233
Bargarh	06646-234865	Jajpur	06728-222102	Nawarangpur	06858-222450
Bhadrak	06784-240733	Jharsuguda	06645-272886	Nuapada	06678-223570
Bolangir	06652-232089	Kalahandi	06670-230836	Phulbani	06842-253802
Boudh	06841-222259	Kendrapara	06727-220836	Puri (Pipili)	06758-241038
Cuttack	0671-2301390	Keonjhar	06766-255347	Rayagada	06856-222536
Deogarh	06641-226052	Khurda	06755-220548	Sambalpur	0663-2522264
Dhenkanal	06762-224732	Koraput	06854-251154	Subarnapur	06654-220955
Gajapati	03815-222375	Mayurbhanj	06792-252307	Sundergarh	06622-272426

Sd/- Sadananda Nayak, I.A.S.
MANAGING DIRECTOR

ଓଡ଼ିଶା କୃଷି ଶିଳ୍ପ ନିଗମ
The Odisha Agro Industries Corporation Ltd.
(A. Govt. of Odisha Undertaking)
Regd. H.O. : 95, Satyanagar, Bhubaneswar-751007
Tel. : (0674) 2570687, EPBX : 2570654, Fax : 2570313, Email : oaicho@orissaagro.com

The Odisha Agro Industries Corporation Ltd. established in the year 1974 as a Government Company under the Department of Agriculture, Odisha, Bhubaneswar. This Corporation is engaged in carrying out different activities in the field of Agriculture with the following objectives in the State of Odisha.

- To promote and sale of improved agricultural implements, machineries and Tools to the Farmers of Odisha.
- To promote and develop Cattle and Poultry feeds, Deer feeds and Duck feeds.
- To train and educate farmers for utilization of Modern Technologies in farming sector.
- To promote, implement and execute the state / Central Government Schemes and Programmes in farming sector.
- To provide irrigation to the agricultural lands through installing dug wells, executing shallow tube wells, bore wells and River lift projects.
- To implement programs of the state Government as envisaged in the State Agriculture Policy.
- Supply and installation of electric and diesel pump sets, sprinkler irrigation and drip irrigation.
- Sale of Tractor, Power Tiller, Power Reaper and Storage bins etc.
- Establishment of SURAVI out lets in all 314 blocks of Odisha.
- Sale of Agri Shade-net and Mulch films.

Sd/- Sadananda Nayak, I.A.S.
MANAGING DIRECTOR

Note


Evation
AGRI Vision
2022

Let's Meet Again@

AGRI Vision 2023

ISBN: 978-81-956247-0-6

9 788195 624706

Evation Business Solutions (P) Ltd.
Das Villa, Jobra Majhi Sahi, College Square- 753003
Cuttack, Odisha, India
https://evationbusiness.com | https://evationconferences.com | https://agrivision.in
contact@agrivision.in | contact@evationbusiness.com | agrivision20@gmail.com
+91 9078 037 929/ 7978 444 300
/Agrivisionindia /company/evation/ /EvationBusiness /evationconferences/ /bit.ly/EvationIndia

www.agrivision.in | www.evationbusiness.com | www.evationconferences.com