



NABS *News Letter*

National Academy of Biological Sciences

Volume - 14(2)

FOR PRIVATE CIRCULATION ONLY

July 2023

Founder President Prof. Dr. S. Kannaiyan

Formerly
Vice Chancellor, Tamil Nadu Agricultural University &
Chairperson, National Biodiversity Authority,
Government of India, Chennai, Tamil Nadu

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Contents

- From the President's Desk
2. Message from the Vice President
3. Message from the Editor
4. Research Highlights
5. News and Events
6. Activities of Members
7. Awards, Honours and Recognitions
8. Publications (Books & Book Chapters)
9. Become a Member & Be a part of NABS



From the Desk of President.....

Dear NABSians,

My hearty greetings to all the Members.

We are all Biologists interested in studying different varieties of life on earth. The topic of current interest is Biodiversity which deals with the diversity of biological resources like plants, animals and microorganisms in one area. Biodiversity helps to maintain balance between living things and their environment. Each of these species work together in ecosystems like an intricate web, to maintain the balance and support of life. Biodiversity supports everything in nature we need to survive like food, water, clean air, shelter, clothing, fuel, medicine, ecosystem services like stabilizing climate, recycling and storage of nutrients, protecting soil and water resources, combating pollution etc. India is one of the 17-mega diverse countries of the world. With only 2.5% of the land area, India already accounts for 7.8% of the global recorded species. It ranks 9th in terms of plant species richness. Four of the world's 36 biodiversity hotspots are in India. India is the origin of important crop species like red gram, brinjal, cucumber, cotton and sesame. India is equally diverse in faunal wealth. There are about 91,000 animal species found in India.

We are aware that biodiversity is declining at an alarming rate in recent years mainly due to human activities, land use changes, pollution, climate change, over-exploitation of resources, loss of habitat, diseases etc. The increasing concern about dwindling biological resources lead to the Convention on Biological Diversity in 1992. India is also a signatory to the CBD. The loss of biodiversity could have serious implications for human health, food security, economics, livelihoods, cultures and much more. As we are all biologists, we can contribute to the extent possible to conserve biodiversity and prevent biodiversity loss for the benefit of our future generations.

I request all the members to contribute towards the progress, welfare and upliftment of NABS. Looking forward meeting you during the next 14th Annual Conference of NABS slated at Manonmaniam Sundaranar University, Tamil Nadu, during October 2023.

With Best wishes

(D.J. Bagyaraj)
President, NABS

2. Message from Vice-President...



*Dear Members of NABS,
Greetings.*

The two decade of NABS's journey was smooth by the able leadership of the Founder President Prof. S. Kannaiyan sir till 2012 followed by Dr. V.A. Parthasarathy sir until 2023, who were ably supported by Prof. Prof. N. Anand and Dr. D.J. Bagyaraj as Vice Presidents, Prof. T. Marimuthu and Prof. T.L. Baskaran as Secretary and Treasurer, respectively and committed EC members and of course the earnest support of all of you. I remain ever thankful to the then President, Dr. V. A. Parthasarathy sir and all the office bearers who have given me the responsibility as Vice President (Head Quarters) in March 2023. As you are all aware that recently Prof. D. J. Bagyaraj sir has taken the charge as the President of NABS and I have been assigned the role of Vice President. In this background, I humbly seek your encouragement and support to exercise my duty with sincere and dedication to take forward the NABS to next higher levels. I keep watching the growth and achievements of NABS since its inception and I am glad to record that it has reached far and wide not only in the country and also in overseas with impressive strength of Life members. NABS is also committed to propagate the latest development in Biological Sciences through organizing Conferences, workshops, etc. and also recognizing the contributions of scientists, research scholars and students by decorating with fellowships and various awards annually through transparent and unbiased selection processes. One of the visions of Prof. SK is to organize the seminars/conferences/ workshops in the semi-urban and rural locations mainly for the benefit of students in those areas. NABS is strictly following his vision and organizing the events periodically in different parts of our country. NABS has recently initiated dialogue with Manonmaniam Sundaranar University, Thirunelveli to organize the 14th NABS National Conference in October 2023, for which the announcement hopefully would be released soon. In this regard, NABS is looking forward to have your support and participation to make the conference a grand success. My respected fellow NABSIANS, as you are all aware that we are now in technology driven era, where the modern techniques and tools are changing radically the research and innovations at global level. The emerging subjects such as Artificial Intelligence, Virtual Reality, Data Science, Machine Learning, Automation & Robotics, Alternative Energy, etc. are going to change our day-to-day activities enormously. In this given situation, please let us come together to discuss diligently to address the future challenges in research and innovations in cutting-edge areas of Biological Sciences.

Dr. N. Mathivannan
Vice-President

3. Message from Editor in Charge



*Dear Members of NABS,
Greetings.*

Black soldier fly as a tool to reduce, reuse and recycle food waste to protein

In recent past, population of human beings across the world is going on increasing. We would reach 9.0 - 10.0 billion population in near future. Increase in the population is directly proportional to the accumulation of food waste. Global food waste is approximately 1.3 billion tons per year (Kojima & Ishikawa, 2013). Moreover, food is wasted much in the industrialized countries compared to the developing countries and is the most challenging issue. Food wastes are rich in carbohydrates, proteins, lipids, and inorganic compounds. These are biodegradable waste that are discharged from food processing industries, households and hospitality sectors. They are usually incinerated or dumped in open areas or used as land fill which causes severe health and environmental hazards. Thus, management of food waste is very crucial. The management of food waste can be done by conversion of it to different value-added eco-friendly products.

On the other hand, several developing countries are starving due to malnutrition and they don't have a quality life. Research findings from Health Research and Development Agency emphasize that 8% of the population are suffering from malnutrition. It reduces the productivity and the quality life too. In this circumstances, affordability of proteinaceous food



by low-income households can be achieved through the supply of alternate quality protein-based food for aquaculture. In this circumstances, black soldier fly (BSF) can be an alternative feed for both aqua and poultry industries.

In spite, we may even think that, don't we have any other raw materials for the supply of quality protein?. Yes, there are, but the industrial production of quality protein with maggots of black soldier fly is feasible with the available organic wastes from households. As that of vermicomposting, there are feasibilities for producing quality protein-based food supplement with 45% protein for fish culture using the house hold organic waste. Mounting organic wastes are generated from the farm gate, markets, departmental stores and *etc.*, Hence, reusing organic waste is an effective means to reduce waste such as vegetables and fruits. The house-hold garbage can be effectively recycled into high value protein and could be reused. Further land filling of agro-waste can be avoided which leads to clean air and energy can be promoted.

A black soldier fly, *Hermetia illucens* of the family Stratiomyidae is a common and widespread fly with unique properties. It is an ecofriendly insect used to engineer the organic food waste into proteins. BSW are ecofriendly scavengers, since they are used to break down the organic substrates and they are designed in such a way to break down the bacteria in their food. BSW don't leave any bacteria in the organic waste after the digestion of waste materials. During the process of multiplication, they deter other house hold pests by releasing volatile compounds. The bio-efficacy analysis on the conversion of house hold waste into value added proteinaceous maggot indicated that, 100 Kg of raw material can be used for the production of 60-70 Kg larvae of BSW. Thus, application of pellet feed in fish culture can be reduced to a tune of 22.74%. Besides, black soldier fly can be used as a substitute supplement for aquaculture. Further if the entire mass rearing of fish is done using the maggots of BSW the production cost can be saved by 45.48%. BSF are widely used as an alternative protein source, which is ideal to be used as feed, especially young BSF larvae can be used as fish feed because they are smaller in size and suit the size of the fish mouth. The major advantage of BSW mass production is

- They are a clean food source
- They reproduce at higher rates. One female fly can lay up to 500 eggs.
- They can be harvested easily
- They have very short life cycle with maximum bio-efficiency
- They naturally live in closer densities and very easy to rear
- Farming of BSF is a best way to convert food waste to protein
- Area of one small car is sufficient to produce one tonnes of BSWL
- Production waste of BSW is an excellent source of fertilizer for crop plants

However, promotion of BSF needs a change in the mindset of policy makers and the public for value addition of organic waste as a substrate for the mass culturing of BSF. There is need to impart training on knowledge and skill empowerment. Besides, supply chain management has to be strengthened for conversion of organic waste in to enriched protein. Self-help group can be facilitated for empowering them in terms of knowledge and skill. In addition, to achieve it awareness and demonstrations on the technology has to be imparted right from school and college level which would kindle the young minds to venture into the production of BSF. Thereby several startups can be promoted across India to reduce, reuse and recycle the food waste into proteins.

(S. Nakkeeran)
Editor, NABS NL

4. News and Events

4.1.1. Dr. D.J. Bagyaraj, the then Vice President of NABS assumed as President of NABS w.e.f. 13 May, 2023.

Dr. Bagyaraj, the President of NABS is also the Chairman, Centre for Natural Biological Resources and Community Development, Bangalore. He initiated systematic investigations on arbuscular mycorrhizal fungi (AMF) in India and is considered to be a pioneering scientist in this area of research. He was invited by the European Commission to contribute on mycorrhizal fungi for the Global Atlas on Soil Biodiversity (only Indian scientist invited) which was released at Belgium in 2016. Honouring his contributions a mycorrhizal fungus has been named as *Glomus bagyarajii*. He is also the President of the Indian Society of Soil Biology and Ecology. He is/was also an Expert Committee Member of several funding agencies like ICAR, DST, DBT, CSIR, UGC, NBA, IFS (Sweden), AICAR (Australia), UNEP and FAO.

Dr. Bagyaraj received several awards and honours; to name a few, Shome Memorial Award; SR Vyas Memorial Award; Rangaswami Memorial Award; Prof. T.S. Sadasivan Lecture Award; Dr. V Agnihotrudu Memorial Lecture Award; Distinguished Asian Mycologist Award, 2019 conferred in Japan and many others. He is also the recipient of NABS-Recognition Award (2016) for his outstanding contributions to soil biology.

He has published 425 research papers, 114 review articles and written 11 books. He has taught Microbiology to UG and PG students for the past 50 years and has mentored nearly 65 M.Sc. and Ph.D. students.

4.1.2. Dr. N. Mathivanan, the then Vice President (HQ) of NABS assumed as Vice President of NABS w. e. f. 13 May, 2023.

Dr. N. Mathivanan earned his Ph.D. in Botany with specialization in Plant Pathology from University of Madras, Chennai. Currently, he is the Director & Head of the Centre for Advanced Studies in Botany, University of Madras.

His areas of interest includes Plant Pathology, Biological Control, Plant and Microbial Metabolites, discovery of drug candidates from actinomycetes, extremophiles and medicinal plants.

Prof. Mathivanan handled more than 22 major research projects from DBT, DST, ICAR, MHRD, MoES and UGC and also from industries with the total budget of more than INR 7.0 Crore.

He guided 4 P.D.F., 26 Ph. D. and 34 M. Phil. scholars and 45 M. Sc. and 3 M. Tech. students. Presently, he is guiding 1 P.D.F. and 4 Ph. D. scholars; published about 110 research articles in peer reviewed journals, 3 books, 2 technical bulletins, 24 book chapters and presented more than 300 papers and posters in national and international conferences, etc.

He is a fellow of National Academy of Agricultural Sciences; National Academy of Biological Sciences; Mycological Society of India; International Society of Noni Science; The Academy of Sciences, Chennai; Antiviral Research Society of India; Royal Society of Biology, United Kingdom; Honorary Fellow of the Indian Mycological Society, Kolkata

He is a Life Member in 7 Scientific Academies/Professional Societies and visited more than 20 Universities/Institutes for academic interactions and research collaborations.

4.1.2. The 14th NABS-National Conference.

The 14th NABS-National Conference is proposed to be held at Manonmaniyam Sundaranar University, Thirunelveli, Tamil Nadu. Preliminary discussion meeting was arranged (virtual mode) on 26 May, 2023. The following scientists participated.

From NABS side: Prof. Dr. D.J. Bagyaraj, President, NABS; Prof. Dr. N. Mathivanan, Vice President, NABS; Prof. Dr. S. Nakkeeran, Editor, NABS- NL

University Side: Prof. Dr. P. Ravichandran, Head, Department of Plant Science, MS University, Tirunelveli; Dr. A. Selvam, Associate Professor, Department of Plant Science, MS University, Tirunelveli; Dr. M. Udayakumar, Assistant Professor, Department of Plant Science, MS University, Tirunelveli.

It was decided to hold the conference on 12 & 13 October, 2023. The other formalities are being worked out and will be informed to the members of NABS in due course.

4.2. Events

4.2.1. Organizing 13th NABS-National Conference

The 13th NABS National Conference was successfully organized in collaboration with Periyar University, Salem, Tamil Nadu from 23 to 25 January, 2023 at the campus of the University.

Inaugural function:

- The inaugural function was held in the AN of 23 January, 2023 at Periyar Kalaiyaram of the University which started with Thamizh Thai Vazthu followed by lighting the ceremonial lamp by the guests.
- **Prof. R. Balagurunathan**, the Convener of 13th NABS National Conference and the Registrar (FAC), Periyar University welcomed the delegates.
- **Dr. V. A. Parthasarathy**, President, NABS honoured the guests on the dais and conferred Dr. APJ Abdul Kalam Memorial NABS-Life Time Achievement Award for the year 2021 on Prof. Dr. R. Raghavendra Rao, Honorary Guest Faculty, JSS Academy of Science (DU) and INSA Honorary Scientist.
- **Dr. P. Thangavel**, Organizing Secretary, briefed about the 13th NABS National Conference.
- **Prof. Dr. S. Kannan**, Dean, Collage Development Council & Professor & Head, Department of Zoology, Periyar University offered his felicitations.
- **Thiru. S. Jayaprakash**, Cluster Officer, NABARD, Salem also offered his felicitations.
- **Dr. D.J. Bagaraj**, Vice President, NABS gave an overview of NABS activities.
- **Dr. N. Mathivanan**, Vice President (HQ), NABS & Director & Head, CAS in Botany, University of Madras, Chennai, briefed about the NABS News Letter.
- **Prof. Dr. R. Jaganathan**, Vice Chancellor, Periyar University, who presided over the inaugural function conferred Prof. S. Kannaiyan Memorial Award for 2022 on Prof. Dr. S. C. Sharma, Director, National Assessment and Accreditation Council, Bangalore (on virtual mode) and delivered the Presidential address.
- **Prof. Dr. R. Raghavendra Rao**, the Laureate of Dr. APJ Abdul Kalam Memorial NABS-Life Time Achievement Award and Honorary Guest Faculty, JSS Academy of Science (DU) and INSA Honorary Scientist inaugurated the conference and delivered the inaugural address.
- **Dr. T. L. Baskaran**, Treasure, NABS proposed vote of thanks.
- The inaugural function was concluded with National Anthem

Photo gallery of Inaugural function



Periyar Kalaiyaram where the conference was held



Guests on the dais stand for Thamizh Thai Vazhthu



Lighting the ceremonial Lamp



Prof. Dr. R. Balagurunathan, the Convener of the Conference welcomes the delegates



View of Delegates at the Conference



Dr. P. Thangavel, the Organizing Secretary briefs about the Conference



Dr. R. Jagannathan, Vice Chancellor of Periyar University, releases the abstract book of the Conference



Dr. T. Marimuthu, Secretary, NABS reads out the citations of Prof. SK Memorial Award & Dr. APJ Abdul Kalam Memorial NABS Life Time Achievement Award laureates



Dr. R. Jagannathan, Vice Chancellor of Periyar University confers Prof. S. Kannaiyan Memorial Award on Prof. Dr. S. C. Sharma (Dr. Ponmudi Raj receives the award on behalf of Prof. Sharma)



Dr. R. Jagannathan, Vice Chancellor of Periyar University confers Dr. APJ Abdul Kalam Memorial NABS Life Time Achievement Award on Prof. Dr. R. Raghavendra Rao



Dr. S. Kannan, Dean (CDC) & Professor & Head, Department of Zoology offers felicitations



Thiru. S. Jayaprakash, Cluster Officer, NABARD, Salem offers felicitations.



Dr. D. J. Bagyaraj, Vice President, NABS briefs about the activities of NABS.



Dr. N. Mathivanan, Vice President (HQ) briefs about the NABS NL



Dr. T. L. Baskaran, Treasurer, NABS proposes vote of thanks.

Special Technical Session

Special technical session was held after the inaugural function in which Prof. Dr. S.C. Sharma, the Laureate of Prof. S. Kannaiyan Memorial Award and Prof. Dr. R. Raghavendra Rao, the Laureate of Dr. APJ Abdul Kalam Memorial NABS-Life Time Achievement Award delivered the lectures

The Laureate of Dr. APJ Abdul Kalam Memorial Award spoke.

Technical Session Chairs : **Dr. V.A. Parthasarathy**
President, NABS &
Dr. D.J. Bagyaraj
Vice President, NABS

Technical Session Co-Chairs : **Dr. K. Selvam**
Professor of Botany, Periyar University

Dr. N. Mathivanan
Vice President (HQ), NABS

Rapporteur : **Dr. T. Marimuthu**
Secretary, NABS

Prof. S. Kannaiyan Memorial Oration : **Dr. S. C. Sharma**
Laureate of Prof. S. Kannaiyan Memorial Award

Topic : 'The 2030 Agenda: The role of Quality Life Science Education and Research in Achieving Sustainability in Environment and Agriculture' [delivered in virtual mode]

Special Lecture : **Prof. Dr. R. Raghavendra Rao**
Laureate of Dr. APJ Abdul Kalam Memorial
NABS-Life Time Achievement Award

Topic : The Taxonomy and Biological Sciences

Speakers

Prof. Dr. S. C. Sharma
Laureate of Prof. S. Kannaiyan Memorial Award
Director, National Assessment & Accreditation
Council, Bengaluru

Prof. S. Kannaiyan Memorial Oration
(virtual)
Topic: The 2030 Agenda: The Role of Quality Life Science Education
and Research in Achieving the Sustainability in Environment and
Agriculture

Prof. Dr. R. Raghavendra Rao
Laureate of Dr. APJ Abdul Kalam Memorial Award &
Honorary Guest Faculty, JSS Academy of Science
(DU) and INSA Honorary Scientist

Special Address (Key Note address)



Left to Right: Dr. K. Selvam (Co-Chair); Dr. N. Mathivanan (Co-Chair); Dr. V.A. Parthasarathy (Chair);
Dr. D. J. Bagyaraj (Chair); Dr. R. Raghavendra Rao (Speaker); Dr. T. Marimuthu (Rapporteur)

Technical Sessions

The technical sessions consisted of Invited Lectures, Oral and Poster Presentations.

Invited Lectures :

Vertical Farming-The future of farming

Safeena, S. A. and Aswath, C.
Division of Flower and Medicinal Crops, ICAR-Indian Institute
of Horticultural Research, Bengaluru

Scarab beetles (Coleoptera: Scarabaeidae-Ecology, ethology and economic importance

Kolla Sreedevi

Division of Germplasm Collection and Characterization, ICAR-National Bureau of Agricultural Insect Resources, Bengaluru

Food and animal Bioscience: Impacts of Feed ingredients and supplementations in Livestock

Balamuralikrishnan Balasubramanian

Department of Food Science & Biotechnology, College of Life Science, Sejong University, Seoul, South Korea

Diversity and Bioprospecting of actinobacteria from rare habitats in India

Radhakrishnan, M.

Centre for Drug Discovery and Development, Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu

Enhancement of carotenoids in marine microalgae

Gothandam, K. M.

School of Biosciences and Technology, Vellore Institute of Technology, Vellore, Tamil Nadu

Microalgae-A potential bioresource for Energy, Environment and Halath

Thajuddin, N.

Professor, Department of Microbiology & Coordinator & Chair, School of Life Sciences, Bharathidasan University Tiruchirappalli, Tamil Nadu



The Technical Sessions (Oral and Poster)			
No.	Name of Technical Session	No. of papers listed	
		Oral	Poster
1	Agriculture and Ecosystem- Oral	33	18
2	Biochemical and Pharmaceutical Applications	24	8
3	Energy and Environment	23	14
4	Nanotechnology and its Advancements	17	12
5	Plant, Animal and Microbial Research	37	20
Total		134	72

Oral Presentations



Poster Presentations



Young Scientists and Students made Oral and Poster presentations during the conference

4.2.2. Student Award competition

The Student Award competition was held on 24 January, 2023.

Participants for Carl Linnaeus Award competition (Ph. D. Students)

1. P. S. Anisha, Elephant's Ecological role as seed dispersers in Nilgiri Biosphere Reserve, India.
2. Mahendra Kadiri, Mining the genome of bacterial endophytes unveils the biocontrol potential against late blight of potato incited by *Phytophthora infestans*
3. Kuleshwar Prasad Sahu, Phyllo-microbiome assisted mitigation of blast disease in rice
4. Saravanan R. *Bacillus velezensis* (YE66R6) promote plant growth and reprograms the defense genes transcript in banana leading to the suppression of *Fusarium oxysporum* f.sp. *cubense*
5. Walter Devaa, J. C., Current status of rainbow trout fisheries in the Ooty hills, Western Ghats of South India
6. Ezekiel Raj J., Intraspecific diversity of *Aegle marmelos* (L.) Correa in Tamil Nadu and determination of the marker compound, marmelosin

Participants for Prof. M.S. Swaminathan Award competition (M.Sc. Students)

1. Firoz Mondal, Evaluation of resistance behaviour of Ty-gene(s) containing donor lines of tomato and indexing of naturally occurring begomoviruses infecting them
2. Suhail Ashraf Deciphering the mode of action of secondary metabolites produced by bacterial endophytes for the management of Meloidogyne incognita infecting banana

Award winning Papers:

Carl Linnaeus Award

Saravanan R., *Bacillus velezensis* (YE666) promote plant growth and reprograms the defense genes transcript in banana leading to the suppression of *Fusarium oxysporum* f.sp. *cubense*



Dr. R. Saravanan receives Carl Linnaeus Award certificate and Cash Award from Chief Guest, Dr. P. Lakshmanaperumalsamy

Prof. M.S. Swaminathan Award

Firoz Mondal, Evaluation of resistance behaviour of Ty-gene(s) containing donor lines of tomato and indexing of naturally occurring begomoviruses infecting them

- Cash Prize of Rs. 5000/- and a certificate and Rs.4000/- and a certificate were presented to the winners of Carl Linnaeus Award and Prof. M. S. Swaminathan Award respectively during the valedictory function held on 25 January, 2023.



Thiru. Firoz Mondal receives Prof. M.S. Swaminathan Award certificate and Cash Award from Chief Guest, Dr. P. Lakshmanaperumalsamy

The awards were conferred by Dr. P. Lakshmanaperumalsamy, Emeritus Professor, Bharathiar University, Coimbatore and the Chief Guest of Valedictory function.

4.2.3. Executive Council Meeting of NABS

The 23rd Executive Council Meeting was held on 23 January, 2023 by 12:00 noon under the chairmanship of the President, NABS, Dr. V.A. Parthasarathy.

4.2.4. Annual General Body Meeting of NABS



President, Vice President, Vice President (HQ), Secretary, Treasurer and EC members are on the dais.



Dr. T. Marimuthu, Secretary, NABS presents Annual Report of NABS and briefs about the NABS- News Letter



Dr. T. L. Baskaran, Treasurer, NABS presents the financial report of NABS

The 17th Annual General Body Meeting was held on 25 January, 2023 by 10:00 am under the chairmanship of the President, NABS, Dr. V.A. Parthasarathy. President, NABS.

4.2.4.1. Paying homage to Prof. Dr. Kirti Singh



The AGM paid homage to Noni Ratna Prof. Kirti Singh, President of International Society for Noni Science who passed away on 23 January, 2023

The members of NABS and all delegates of the conference paid their respect and homage to Prof. Dr. Kirti Singh, the founder President of International Society for Noni Science, Chennai and Founder Chairperson, World Noni Research Foundation, Chennai who passed away on 23 January, 2023 at Jaunpur,UP.

4.2.4.2. Conferment of Fellowship and other NABS awards

Dr. V. A. Parthasarathy, President, NABS / Dr. D. J. Bagyaraj, Vice President, NABS conferred Fellowship and other NBAS awards for the Election Year 2019, 2020 & 2021 with a certificate and citation. The photo gallery represents the recipients of the Fellowship and awards in person.

4.2.4.1. Fellowship for 2019, 2020 & 2021

Election Year: 2019

A. Fellowship

Under Agriculture & Forestry Science

Dr. Anirban Roy; Dr. Chirantan Chattopadhyay ; Dr. P. M. Haldankar; Dr. S. Thirumeni

Under Basic Sciences

Dr. M. Chandrasekaran ; Dr. K. M. Gothandam



Dr. Anirban Roy receives Fellowship (EY-2019) under AFS



Dr. Chirantan Chattopadhyay receives Fellowship (EY-2019) under AFS



Dr. P. M. Haldankar receives Fellowship (EY-2019) under AFS



Dr. S. Thirumeni receives Fellowship (EY-2019) under AFS



Dr. M. Chandrasekaran receives Fellowship (EY-2019) under BS



Dr. M. Gothandam receives Fellowship (EY-2019) under BS

B. NABS-Best Woman Scientist Award

i. Dr. E. K. Janaki Ammal Memorial NABS-Best Woman Scientist Award [Under Agriculture & Forestry Science]

1. Dr. Kolla Sreedevi

ii. Dr. Kamala Sohonie Memorial NABS-Best Woman Scientist Award [Under Basic Sciences]

2. Dr. M. Sathiyabama



Dr. Kolla Sreedevi receives Dr. E. K. Janaki Ammal Memorial NABS-Best Woman Scientist Award (EY-2019) under AFS



Dr. M. Sathiyabama receives Dr. Sohonie Memorial NABS-Best Woman Scientist Award (EY-2019) under BS

C. NABS-Best Scientist Award

i. Dr. B.P. Pal Memorial NABS-Best Scientist Award [Under Agriculture & Forestry Sciences]

Dr. Krishna Gopal Mandal



Dr. Krishna Gopal Mandal receives Dr. B.P. Pal Memorial NABS- Best Scientists Award (EY-2019) under AFS

Election Year: 2020

Under Agriculture & Forestry Science

- 1. Dr. Amod Kumar Thakur**
- 3. Dr. M. Prabhakar**
- 5. Dr. Kajal Kumar Biswas**

- 2. Dr. Kalyan K. Mondal**
- 4. Dr. R. Gomathi**
- 6. Dr. V. Srinivasan**



Dr. Amod Kumar Thakur receives Fellowship (EY-2020) under AFS



Dr. Kalyan K. Mondal receives Fellowship (EY-2020) under AFS



Dr. M. Prabhakar receives Fellowship (EY-2020) under AFS



Dr. R. Gomathi receives Fellowship (EY-2020) under AFS



Dr. Kajal Kumar Biswas receives Fellowship (EY-2020) under AFS

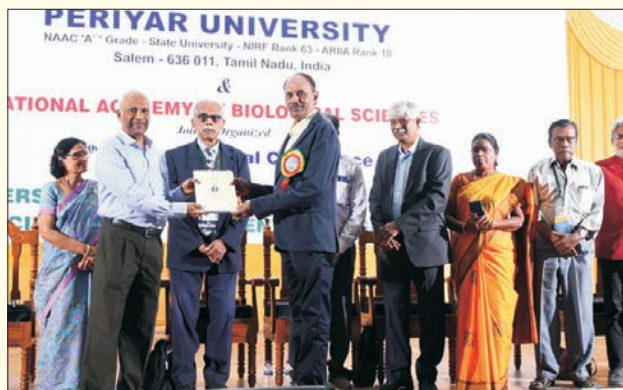


Dr. V. Srinivasan receives Fellowship (EY-2020) under AFS

Under Basic Sciences

1. Dr. R. Balagurunathan

2. Dr. N. Thajuddin



Dr. R. Balagurunathan receives Fellowship (EY-2020) under BS



Dr. N. Thajuddin receives Fellowship (EY-2020) under BS

Under Veterinary & Fishery Sciences

1. Rajeeb K. Mohanty



Dr. Rajeeb K. Mohanty receives Fellowship (EY-2020) under VFS

NABS-Best Research Paper Award-2020

**Prof. G. Rangaswami Memorial NABS- Best Research Paper Award
[Under Agriculture & Forestry Sciences]**

Dr. Prem Lal Kashyap



Dr. Prem Lal Kashyap receives Prof. G. Rangaswami Memorial NABS-Best Research Paper Award (EY-2020) under AFS

Election Year: 2021

**Fellowship
Under Agriculture & Forestry Science**

- 1. Dr. C. Appunu**
- 2. Dr. Prem Lal Kashyap**
- 3. Dr. Sanjib Kumar Behera**
- 4. Dr. R. Thangavelu**
- 5. Dr. Vikas, V.K.**



Dr. C. Appunu receives Fellowship (EY-2021) under AFS



Dr. Prem Lal Kashyap receives Fellowship (EY-2021) under AFS



Dr. Sanjib Kumar Behera receives Fellowship (EY-2021) under AFS



Dr. R. Thangavelu receives Fellowship (EY-2021) under AFS



Dr. Vikas, V. K. receives Fellowship (EY-2021) under AFS

Under Basic Sciences

1. Dr. M. Sathiyabama



Dr. M. Sathiyabama receives Fellowship (EY-2021) under BS

Veterinary & Fishery Science

1. Dr. G. Kandeepan

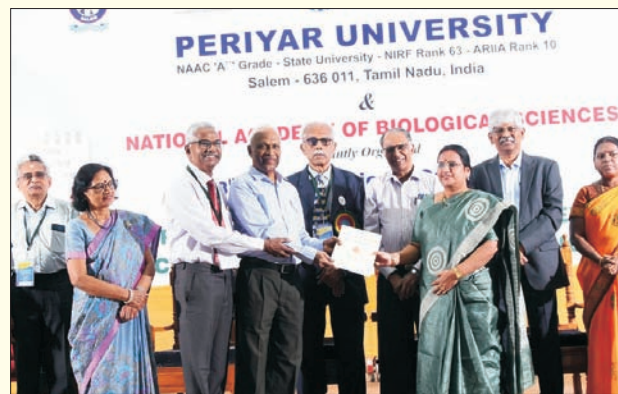


Dr. G. Kandeepan receives Fellowship (EY-2021) under VFS

NABS-Best Woman Scientist Award

Dr. E. K. Janaki Ammal Memorial NABS-Best Woman Scientist Award [Under Agriculture & Forestry Science]

1. Dr. R. Gomathi



Dr. R. Gomathi receives Dr. E.K. Janaki Ammal Memorial NABS-Best Woman Scientist Award (EY-2021) under AFS

NABS-Best Scientist Award

Dr. B.P. Pal Memorial NABS-Best Scientist Award [Under Agriculture & Forestry Sciences]

1. Dr. M. Pandiyan



Dr. M. Pandiyan receives Dr. B.P. Pal Memorial NABS-Best Scientist Award (EY-2021) under AFS

NABS-Best Research Paper Award

Prof. G. Rangaswami Memorial NABS- Best Research Paper Award [Under Agriculture & Forestry Science]

1. Dr. Vikas Gupta

Prof. T. S. Sadasivan Memorial NABS- Best Research Paper Award [Under Basic Science]

1. Dr. Arun Pandi



Dr. Vikas Gupta receives Prof. G. Rangaswami Memorial NABS-Best Research Paper Award (EY-2021) under AFS



Dr. Arun Pandi receives Prof. T. S. Sadasivan Memorial NABS- Best Research Paper Award (EY-2021) under BS

4.2.5. Valedictory function

- **Dr. S. Kannan**, Dean (CDC) & Professor and Head, Department of Zoology, Periyar University, welcomed the delegates.
- **Dr. N. Mathivanan**, Vice President (HQ), NABS & Director & Head, CAS in Botany, University of Madras, Chennai & Dr. S. Venkatesan, Professor, Department of Environmental Science, Periyar University, honoured the guests on the dais.
- **Dr. P. M. Ayyasamy**, Organizing Secretary, presented the Proceedings of the Conference.
- **Dr. V. A. Parthasarathy**, President, NABS presided over the valedictory function and delivered the presidential address.
- **Dr. R. Balagurunathan**, Convener of 13th NABS National Conference & Registrar (FAC) & Professor & Head, Department of Microbiology, Periyar University presented the Best Oral Presentation Awards and felicitated.
- **Dr. D. J. Bagyaraj**, Vice President, NABS presented the Best Poster Presentation Awards and offered his felicitations.
- **Dr. P. Lakshmanaperumalsamy**, Emeritus Professor, Bharathiar University, Coimbatore and the Chief Guest of Valedictory function presented the Carl Linnaeus Award & Prof. M.S. Swaminathan Award to the winners and delivered valedictory function.
- **Dr. A. Naresh Kumar**, Organizing Secretary of 13th NABS National Conference presented the recommendations emanated from the conference.
- **Dr. T. Marimuthu**, Secretary, NABS proposed vote of thanks
- **The conference was concluded with National Anthem**

Photo gallery of Valedictory function



Dr. S. Kannan, Dean (CDC) & Professor & Head, Department of Zoology welcomes the delegates during valedictory function



Students & Scientists during Valedictory function

Students and scientists gracing the valedictory function



Dr. N. Mathivanan, Vice President (HQ) honors organizing Committee members



Dr. P. M. Ayyasamy, Organizing Committee Member presents the proceedings of the conference



Dr. V.A. Parthasarathy, President, NABS delivers Presidential address



Dr. R. Balagurunathan, Convener presents the Best Oral Presentation Award



Dr. D. J. Bagyaraj, Vice President, NABS presents the Best Poster Presentation Awards



Dr. P. Lakshmanaperumalsamy, Emeritus Professor, BU, Coimbatore & the Chief Guest delivers valedictory address



Dr. A. Naresh Kumar, Organizing Secretary presents the Recommendations emanated from the deliberations of the conference

Recommendations

- Development of Sustainable Agriculture and Food Systems to mitigate climate change
- Adoption of ecofriendly and biological control management practices for the management of pests and diseases of crop plants.
- Popularization of micro propagation for production of virus free planting materials of high valued crops.
- Harnessing the commercial potential of cyanobacteria and actinobacteria for improving plant and human health.
- Popularization of swine industry and eliminating the use of antibiotics in the livestock production.
- Popularization of vertical farming in urban and semi-urban areas to empower employment security.
- Harnessing the potential of biomolecules from novel biospheres towards the drug discovery for the management of pests of crop plants.
- Application of artificial intelligence towards the Sustainable agriculture.
- Encouraging multidisciplinary approach among agriculture scientists to develop technologies that warrants public private partnership.



Dr. T. Marimuthu, Secretary, NABS proposes vote of thanks

Cultural Program :

The Students of Periyar University, Salem presented the cultural program on the second day of the conference and the delegates enjoyed the same with lot of enthusiasm and spirit. Dr. V. A. Parthasarathy, President, NABS appreciated the talents of the students. Every event was exhibited with greater enthusiasm by the students.



Cultural Program performed by the Students of Periyar University & President, NABS appreciating their performances.

Organizing Committee Members from Periyar University

Under the leadership of Dr. R. Balagurunathan, Register (FAC) & Dr. S. Kannan, Dean (CDC), the Conveners of the Conference, the Coordinators- Dr. K.Selvam, Professor & Head, Department of Botany, Dr. K. Murugesan, Professor & Head, Department of Environmental Sciences, Dr. T. Palvannan, Professor & Head, Department of Biochemistry and Dr. R. Kavitha, Professor & Head, Department of Biotechnology; the Organizing Secretaries- Dr. P. M. Ayyasamy, Associate Professor, Department of Microbiology, Dr. P. Thangavel, Assistant Professor, Department of Environmental Sciences, Dr. A. Naresh Kumar, Assistant Professor, Department of Zoology; the Joint Organizing Secretaries- Dr. V. Manju, Associate Professor, Department of Biochemistry, Dr. P. Indira Arutselvi, Assistant Professor, Department of Biotechnology and Dr. P. Maruthupandian, Assistant Professor, Department of Botany; Treasurer, Dr. S. Venkatesan, Professor, Department of Environmental Sciences ably helped NABS in organizing the 13th NABS-National Conference in a fitting manner. All the members deserve appreciation and the members of NABS convey their love, affection and gratitude to them.



Group photo of Organizing Committee Members with office bearers of NABS

5. Research Highlights

5.1. Abstract of Award winning paper presented for Carl Linnaeus Award

[Presented for the award competition-13th NABS- National Conference held at Periyar University, Salem, Tamil Nadu from 23 to 25 January, 2023]

Bacillus velezensis* (YE666) promote plant growth and reprograms the defense genes transcript in banana leading to the suppression of *Fusarium oxysporum* f.sp. *cubense

Fungicides play an immense role in quenching the infection of Panama wilt of banana. However, the use of fungicides and monoculture of banana cultivars have resulted in the development of new races like Race 4 which challenges scientists across the globe to identify new candidates for biological suppression of *Fusarium oxysporum* f.sp. *cubense* (Foc). Hence, attempts were made to dissect the endophytes from resistant banana cultivar YKM5 (Yengambi AAA) to suppress Foc KP (Race 4) infecting cv. Karpooravalli (ABB; Pisang Awak). Among the various endophytes, *Bacillus velezensis* YE666 inhibited the mycelial growth up to 63% over control and hyper parasitized the mycelium of Foc KP. Scanning electron microscopic analysis revealed the ramification by *B. velezensis* over the hyphae of Foc KP leading to lysis. Analysis of VOCs/NVOCs compounds from the zone of inhibition, confirmed the presence of unique biomolecules including linoelaidic acid, nonanol, acetylvaleryl, 5-hydroxyl methyl furfural, clindamycin, allobarbitol, 3-thiazolidine carboxamide, azulene, aminomorpholine, procyclidine, campholic acid, 3-amino-4-hydroxy phenyl sulfone, 3-deoxy mannoic lactone, hexadecanoic acid, oleic acid and dihydroacridine of antifungal cum antimicrobial nature.

Considering the diverse antimicrobial property, biohardening of micropropagated banana cv. Karpooravalli (ABB) with liquid formulation of *B. velezensis* YE666 (8×10^8 cfu/ml) and challenge inoculation with Foc KP promoted plant growth compared to un-inoculated control. Besides, incidence of *Fusarium* wilt was reduced by 100% over inoculated control in greenhouse condition. Further, the expression of transcription factors and defense genes WRKY, MAPK, CERK1, LOX and PAL have increased by several folds compared to inoculated and healthy control and thus, suppressed *Fusarium* wilt of banana cv. Karpooravalli (ABB). Furthermore, cytoscape analysis of defense genes indicated the coordinated expression of various other genes associated with it. Hence, our study confirmed the scope for exploring *B. velezensis* on a commercial scale for the management of *Fusarium* wilt Race 4 causing wilt - across genomes of banana.

Saravanan R, Nakkeeran S¹, and Malathy V G.

Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.

Email: sravanankavi010@gmail.com

5.2. Abstract of Award winning paper presented for Prof. M. S. Swaminathan Award

[Presented for the award competition-13th NABS- National Conference held at Periyar University, Salem, Tamil Nadu from 23 to 25 January, 2023]

Evaluation of Resistance Behaviour of Ty-Gene(s) Containing Donor Lines of Tomato and Indexing of Naturally Occurring Begomoviruses Infecting Them

Tomato leaf curl disease (ToLCD) is caused by a number of begomoviruses. Resistance sources with different Ty-resistance genes have been identified in different wild relatives of *Solanum lycopersicum*. In this study, seventeen Ty-gene donor lines of tomato, along with a susceptible check cv. Pusa Ruby were evaluated for understanding their response against ToLCD under field condition. A quantitative scoring system was developed combining both individual plant level (disease severity) as well as population level (disease incidence) parameters of ToLCD based on different grades of symptom phenotypes and their impact in disease development. Based on such scale, highly resistance (HR) response was observed in five lines containing both Ty-2 and Ty-3 genes. Resistance of three best HR lines was further confirmed challenged viruliferous whitefly inoculation with tomato leaf curl New Delhi virus, the most prevalent tomato infecting begomovirus in India. PCR based indexing of the begomoviruses in all these genotypes using seven begomovirus species-specific primers and one genus-specific primer indicated the probable occurrence of mixed infection of two to six different begomoviruses. Majority of the lines (thirteen) showed association of croton yellow vein mosaic virus (CYVMV), alone or in combination with other begomoviruses. In one tomato line (ToLCD Tol-1), we could not identify the

begomovirus species due to lack of specific primers. Complete genome of the begomoviruses, from this sample and an only CYVMV containing sample, were isolated, cloned and sequenced. Sequence analysis of the CYVMV infected sample revealed it as a new species of begomovirus, while the begomovirus from the other sample was an isolate of tomato leaf curl Karnataka virus. The name *Tomato leaf curl Ty Pusa virus* (ToLCTyPV) was proposed for the new species, which was probably evolved due to an interspecific recombination between CYVMV as major parent and tobacco curly shoot virus (TbCSV) as minor parent. The study thus clearly showed the resistance response of the tomato genotypes used as parental donor lines in breeding programme and the scenario of the occurrence of the begomoviruses in them.

Firoz Mondal^{1#}, Shipra Saxena¹, Zakir Hussain², Sunil Kumar Mukherjee¹, Bikash Mandal¹, Basavaraj Y. B.¹, and Anirban Roy^{1*}

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1.3. Antimicrobial activity of indigenous lactic acid bacteria isolated from goat milk

Goat (*Capra hircus*) milk is a superior nutritional source for human beings. It possesses probiotic, prebiotic, and immunomodulatory actions and inhibits the adherence of pathogenic bacteria. The microbiota of raw goat milk is thought to be a rich source of novel bacteriocinogenic lactic acid bacteria (LAB) strains which might be employed as an alternative to biopreservatives in food. Studies that look into these strains' antibacterial capabilities are justified by the ongoing need for such alternative tools. The lactic acid bacteria (LAB) were isolated from goat milk on MRS media and their antimicrobial activity was evaluated using agar well diffusion assay against four of the most common bacterial pathogens including *Escherichia coli*, *Bacillus cereus*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Bacterial pathogens were isolated from goat milk samples using Liofilchem Food System, Italy and further confirmed by 16S rRNA sequencing. LAB displayed zone of inhibition against *Pseudomonas aeruginosa* and *Staphylococcus aureus*, demonstrating their ability to produce bioactive compounds while *Bacillus cereus* and *Escherichia coli* were found to be resistant. The antimicrobial activity of LAB against other pathogens is currently the subject of additional research. The possible bioactive substance may have numerous applications in a multitude of sectors, including food preservation and the treatment of diseases like cancer and Alzheimer's.

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Namita.singh@mlsu.ac.in*

6. Awards, Recognitions, Honors received by members of NABS

- Amit Baran Sharangi** ■ Featured in the World Scientist and University Rankings- 2023 (www.adscientificindex.com)
- Bishwanath Chakraborty** ■ Indian Phytopathological Society, New Delhi conferred IPS Recognition Award 2022 during Platinum Jubilee Conference at University of Mysore, February 2, 2023.
- Chetan Keswani** ■ Received The "Order OF MERIT" from the Russian Academy of Natural Sciences, Moscow, Russia (2023).
■ Conferred with the Fellow of the Society for Plant Research, India (2023)
- Kalyan K. Mondal** ■ Conferred with Fellow NAAS by National Academy of Agricultural Sciences (2023)
- Mathivanan, N.** ■ Received NAAS Fellowship (2023) during the Foundation Day & AGM of NAAS, 3-5, June 2023

- Mohan, S.**
- Secured the 1st POSITION in Video Making Competition of "TECHNEEV@75" by Ministry of Science and Technology, Government of India
- Pathipati Usha Rani**
- Received Life Time Achievement Award from Gurukul Academy for 2022.
- Prakashkumar, R.**
- Superannuated from the post of Director, JNTBGRI, Palode, Thiruvananthapuram & Joined as Chief Project Officer, (Chief General Manager grade), Santhigiri Ashram, Pothencode, Thiruvananthapuram, Kerala, 695 589, www.santhigiriashram.org
- Renu Agrawal**
- Bharat Shiksha Gaurav Puraskar, November 2021, KTK foundation with Ministry of commerce, GoI.
 - Nomination to National Export Committee by APEDA
 - Agricultural and Processed Foods Products) February, 2022.
 - Felicitated by Mysuru Corporator for good work. 20th March, 2022.
 - Interview taken by 'Chamber for advancement of small and medium Industries' for magazine Purnabrahma released by Dr. Mashelkar ex. DG CSIR. 15, April, 2022.
 - Interviewed by BioTalk Magazine "You are an Inspiration". 8th April, 2022.
 - Nomination by DST, Govt. of India to chair national panel of GATI, Gender advancement for transforming institutions, 17 January, 2023.
- Srikanth, J.**
- Best oral presentation Award for the paper 'Mahesh, P., Singaravelu, B., Srikanth, J., Hari, K., Salin, K.P., Appunu, C., Suresha, G., Sankaranarayanan, C. and Nirmala, R. A 2023. low-cost technology for mass production of Bacillus thuringiensis on agro-industry by-products against white grub Holotrichia serrata during 13th NABS National Conference, January 23-25, 2023
 - Conferred with Fellow of Royal Entomological Society (FRES) The Royal Entomological Society, United Kingdom (2022)
 - Conferred with Fellow of Society for Sugar Research & Promotion (FSSRP) by The Society for Sugar Research & Promotion, New Delhi, India (2022)
 - Awarded Thomas Bainbrige Fletcher Memorial Award-2022 by Dr. B. Vasantharaj David Foundation, Chennai, Tamil Nadu State, India (2022)
- Thajuddin, N.**
- Life Time Achievement Award for 2022 conferred by Society of Chemical and Synthetic Biology during the International Conference on Microbiome and Synthetic Biology on 27 September, 2022
 - Conferred with Fellow of The Linnean Society of London during its meeting on 24 May, 2022

7. Publications

a. Books

Renu Agrawal, 2021. Traditional Foods and Nutritional Security ' NIPA (New India Publishing Agency), New Delhi.

Amit Baran Sharangi, 2023. Uncertainty and Chaos in Indian Farming. The New India Publishing Agency, New Delhi-110034, India; ISBN: 978-81-90022-45-3.

Amit Baran Sharangi, 2023. Production Technology of Plantation, Spices, Medicinal & Aromatic Crops. Elite Publishing House, New Delhi-110089, India; ISBN: 978-93-95185-82-0.

b. Book Chapters

Krishnamoorthy, A., Upadhyay, T.K. and **Sharangi, A.B.** 2023. Biofuels from chitinous sources. In: *Biofuels: The History and Future of the Most Promising Energy Alternative* (Ed. Bagchi, Debashis), CRC Press (Taylor & Francis), Inc. 9 Spinnaker Way, Waretown, New Jersey 08758 USA.

Sharangi, A. B., Prasada Rao, G.S.L.H.V., Das, Suddhasuchi; Krishnamurthy, K.S., Upadhyay, T.K., Gopakumar, C.S., Acharya, S.K. 2023. Brunt of climate change and spice crops. In: *Handbook of Indian Spices @ 75 years* (Eds. Ravindran, P.N.), Chap-13, Springer Nature, Switzerland, Cham.

Upadhyay, T.K., Das, S., Mathur, M., Alam, M., Bhardwaj, R., Joshi, N. and **Sharangi A. B.** 2023. Medicinal plants and their bioactive components with anti-diabetic potentials. In: *Anti-diabetic Medicinal plants-- Applications and opportunities* (Eds. Naeem, M. and Aftab, T.), Chapter 10, Elsevier Publisher of Scientific Books & Journals. 6th Floor, 360 Park Ave New York NY, 10010. United States.

8. Activities of Members

8.1. Dr. Renu Agrawal

- Delivered an invited guest lecture on 'Opportunities in food science and technology for the empowerment of women' organized by Indian science congress, Nagpur, 5, January, 2023.
- Participated as Chief Guest at 'World Earth Day' organized by Mahajana Public school, 28 January, 2023.
- Webinar on 'Skills and Job Prospects in Food Industries' for life scientists, Association of Microbiologists of India, 18 February, 2023.
- Delivered a talk on 'Hazardous critical points and standard operating procedure in food industries', Microbiologists Society, India, 2 March, 2023.
- As Chief Guest delivered a talk on 'Digital literacy: Innovation and Technology for gender equality', University of Mysore, 8 March, 2023.
- Served as one of the Panelists in 'Anemia Mukh' Karnataka organized by Chief Secretary, Govt. of Karnataka, 7 March, 2023.
- Delivered a talk as Chief Guest on "Embrace Equity" organized by The Institution of Engineers, India, Mysore, 8 March, 2023.

8.2. Dr. Kalyan K. Mondal

Delivered Special/invited lectures

- Mondal KK 2023. T3SS-effector of *Xanthomonas oryzae* pv. *oryzae* subverts rice immune system through interacting rice key proteins during bacterial blight development. In National Conference on "Plant & Soil Health Management: Issues and Innovations" at University of Mysore, Mysuru, India, Feb 2-4, 2023 (Keynote speaker).
- Mondal KK 2023. Bacterial T3SS-effectors vs Plant Immunity: Insight & Scope for disease resistance. In 10 days ICAR funded short training course on "Application of Molecular and Conventional Approaches in Plant Disease Management" held at College of Agriculture, CSK HPKV, Palampur w.e.f. 13th - 22nd February, 2023. (CAFT Training talk).
- Organizing Conference:
Organized, as Co-convener, Indian Phytopathological Society's Platinum Jubilee Conference on "Plant and Soil Health Management: Issues and Innovations" at University of Mysore, Mysuru, Karnataka, India from 2-4 Feb., 2023.

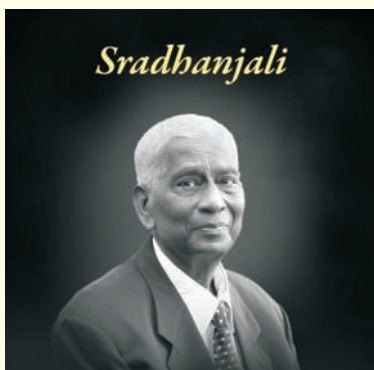
8.3. Amit Baran Sharangi

- Delivered invited Lecture on “Entrepreneurship through horticulture: The destination and destiny”. Delivered during the INTERNATIONAL CONFERENCE (Virtual) BioTrendz, 24th-25th, March 2023 at Noida Institute of Engineering & Technology (NIET), Greater Noida, India

8.4. Bishwanath Chakraborty

- Delivered Key note Lecture on 'Plant and Soil health management: Issues and Innovation' during Platinum Jubilee Conference of Indian Phytopathological Society, February 2-4, 2023
- Delivered a talk on 'Edible Mushroom: Key to Nutritional food for Human health care and Entrepreneurship development' during the Technical Session 7, Industry, academia and farmers' interface
- Chaired a Technical session 3: Eco-friendly plant and soil health management towards natural farming, Platinum Jubilee Conference of Indian Phytopathological Society : Plant and Soil health management : Issues and Innovation February 2-4, 2023
- Chaired the Session 1: Cryptogamic World, Ist Botanical Congress, organized by Botanical Society of Bengal in collaboration with Department of Botany, University of Calcutta, March 23-25, 2023

Obituary Note



Prof. Debi Prasad Ray (1949-2023), Former Vice Chancellor, Odisha University of Agriculture and Technology and a distinguished Fellow of National Academy of Biological Sciences, Chennai passed away on April 29, 2023.

The President, Vice President, Secretary, Treasurer, Editor and all the members of National Academy of Biological Sciences deeply mourn the demise of Prof. Debi Prasad Ray. We pray the ALMIGHTY to give all the strength to his family members to bear the great loss.

MAY HIS NOBLE SOUL REST IN PEACE.



Padma Shri Dr. Brahma Singh, one of the active members of National Academy of Biological Sciences, Chennai and the recipient Dr. APJ Abdul Kalam Memorial NABS-Life Time Achievement Award (2018) passed away on 09-07-2023 after a brief illness at his residence in Mumbai.

The President, Vice President, Secretary, Treasurer, Editor and all the members of National Academy of Biological Sciences deeply mourn the demise of Padma Shri Dr. Brahma Singh. We pray the ALMIGHTY to give all the strength to his wife, daughters and other family members to bear the great loss.

MAY HIS NOBLE SOUL REST IN PEACE.

9. Enroll yourself as a member and be a part of NABS

Types of Membership available (one time payment)

A. Life Member	: ₹ 5,000/- or US\$ 200/-
b. Provisional Life Membership	: ₹ 5,000/- or US\$ 200/-
c. Corporate Life Member	: ₹ 10,000/- or US\$ 400/-
D. Corporate Fellow	: ₹ 1,00,000/- or US\$ 4000/-

- Duly filled membership form shall be sent as Secretary NABS in WORD format by E-mail to secretarynabs@gmail.com
- The prescribed membership fee shall be transferred on line

9.1. Account details of National Academy of Biological Sciences

Name of the account holder : National Academy of Biological Sciences
Account number : **10496978637**
Type of account : Savings Account
Name of Bank : State Bank of India, Valmikinagar Branch,
Thiruvanmiyur, Chennai - 600 041
Branch code / IFSC code : Branch code: 11721 - IFSC code: SBIN0011721

Down load your application from www.nabsindia.org

Address for all correspondences

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Disclaimer

The authors are responsible for the information related to Research notes and short communications of this issue

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On behalf of National Academy of Biological Sciences

An appeal to members of NABS

Kindly inform change of address including phone numbers and
E-mail to the Secretary, NABS by
E-mail (secretarynabs@gmail.com)

Circulated to members as E-copy on 03.08.2023