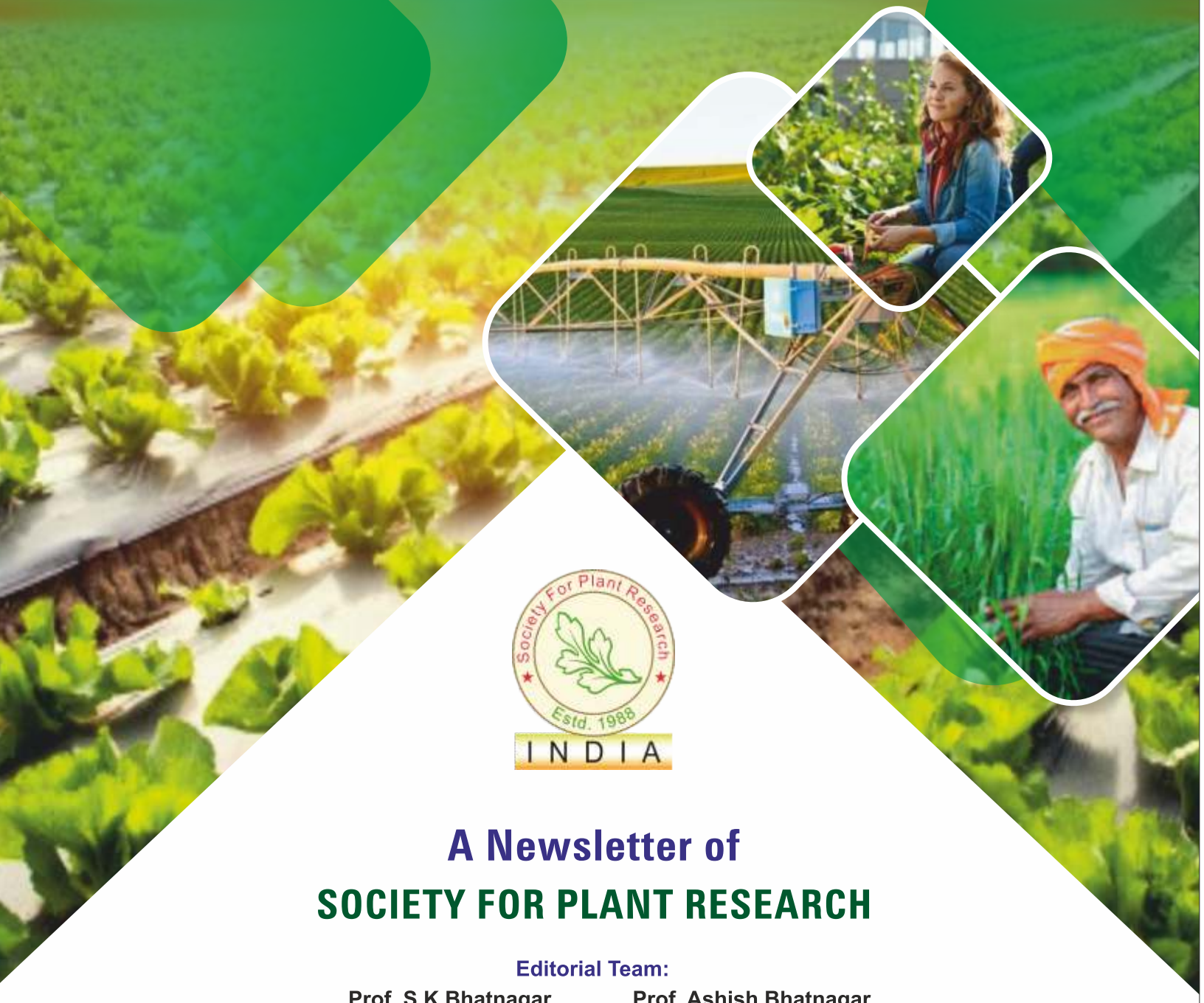
PHYTOPIA

REAP life

(An extended publication of Vegetos)

Volume 1, Number 1, June, 2022



A Newsletter of

SOCIETY FOR PLANT RESEARCH

SPR-PHYTOPIA

SPR PARADOX: *Founder's Report*

In the year 1988 proposal for establishing the SOCIETY FOR PLANT RESEARCH (SPR) was put forward by PROF S K BHATNAGAR who prepared the documents as Founder Secretary General and got it registered as an autonomous Not for Profit organization under Societies Registration Act XXI of 1860 having its own constitution and laws which are amended from time to time by the Executive Council and General Body. The society was established with the view to provide an open platform to the researchers in various disciplines of Botany, Plant Sciences, Environmental Sciences, Plant Biotechnology etc. for publishing their researches in the journal VEGETOS. Besides this, organizing Conferences and Workshops under the aegis of Society for Plant Research (SPR) was an essential activity to facilitate scientific discussions, exchange of view and interaction among scientists.

The journal VEGETOS started its publication in 1988 with usual ups and down amidst some dust of hurdles, this journal achieved International recognition and became the most trusted and loved periodical of Plant Sciences and Biotechnology. Since its beginning, many internationally recognized scientists like Prof H S Srivastava, Prof K S Bilgrami, Prof K S Bhargava, Prof C P Mallick, Prof B D Singh, Prof L M S Palni, Prof R B Singh, Prof S K Sopory, Prof T S Kahlon, Prof Manju Sharma, Prof Anupam Varma, Prof M P Yadav, Prof H D Kumar, Prof B R Chaudhary, Prof B M Johri, Prof P K Gupta, Prof R K Gupta, Prof M N Noor and many more renowned signatures of plant sciences, agriculture and biotechnology guided us for further improvement. With an small initiative, it has now become a big banyan tree involving scientists from India and abroad. The prestigious journal VEGETOS is now being processed, published and marketed by the global publisher Springer Nature since January 2019 thus strengthening its global authorship (www.vegetosindia.org / www.springer.com/42535).

Society for Plant Research (SPR) had the most dignified authorities like Prof. Jagdish Saran, Patna; Prof K S Bhargava, FNA, Bhagalpur; Prof B D Singh, BHU, Varanasi; Prof M N Noor, Ranchi; Prof I S Dua, Chandigarh; Prof A S Ahluwalia, Chandigarh; Prof R K Gupta, Jammu and Prof R R Hanchinal, Former Vice Chancellor, US, Dharwad and Chairman, PPV & FRA as the Presidents of SPR for various terms. We are fortunate to have the Patronage of Prof Anupam Varma and Prof M P Yadav who had been our driving force. I feel proud in announcing that Society for Plant Research (SPR) has completed 34 glorious years of service to the scientific community. The Silver Jubilee volume of VEGETOS was formally released by Dr S Ayyappan, the then DG, ICAR in NASC Complex, New Delhi during Vice Chancellor's meet. With the start of Covid-19 Pandemic, our activities were also affected adversely like others but despite all odds, our entire team of scientists and technical faculties remained active and organized various virtual meetings, webinars on potential topics including NAAS rating, UGC-CARE evaluation of

journals, National Education Policy-2022, EC and Editorial review meetings etc. It is appreciable that our editorial team could maintain regular publication of VEGETOS by processing manuscripts within the specified time limit despite tremendous trouble with the reviewing process due to global health issues with many scientists.

Prof. S K Bhatnagar, Founder, Society for Plant Research & Editor-in-Chief Vegetos

INFOCUS-THE EDITORS' PEN

Doing science is easier than explaining it to common man. One major obstacle is language. All traits develop their own semantics, syntax and vocabulary for the ease of those in business. But the product of each business has to reach people in a manner that they can comprehend with. The same is true for science, but unfortunately the scientists have no training in communicating their stories of truth to the people. Feeling this void the SPR has taken a step forward to bridge the gap by beginning an online Newsletter: Phytopia-REAP Life.

Welcome aboard this new flight into the realm of science of flowers, flavours, fragrances and fractals that shade and shape our home-this earth, with ample of greens and umpteen other colours to make the life walk on its legs. Since the plants mean so much to life, the motto of Phytopia is REAP Life- an abbreviation for Reach, Empower, Act and Perpetuate Life.

Unlike a journal that presents findings, discoveries and inventions in a serious and standard manner to maintain the truthfulness and reproducibility of findings, the Phytopia will aim at taking plant science to the people and attract them to take a dip in this holy Ganges. It will

- **bring up issues, threadbare them to reasons,**
- **guide and glide the young minds into perfecting the experimental plans and methods, interpretations and presentations,**
- **generate curiosity along with sensitivity towards the life per se,**
- **encourage creativity amongst the plant scientists and**
- **try to keep it entertaining and light on mind**

Not being experts of such a venture, the editorial team of Phytopia requests a whole hearted support from the members of the SPR for the various columns that have been planned for this new endeavour, details of which may be read at the webpage : www.vegetosindia.org. We also solicit suggestions for improvements and success of this act at our email address: phytopianewsgrp@gmail.com

BISCOPE

1. Fetal Bovine Serum in animal cell culture medium needs replacement

Fetal bovine Serum (FBS) is a common supplement to basal medium in cell and tissue culture. It is extracted from unborn calves at the slaughterhouses. Recent experiments by Barosova et al. (2021) showed that even after identical experimental procedures, cell lines and FBS suppliers, the result varied significantly for which one of the suggested reasons was the batch of the FBS used. Thus, questionable reproducibility at the cost of ethics is forcing to look into better alternative/synthetic supplements than FBS. Barosova H. Meldrum K, Kakakocak BB, Balog S, Doak SH, Petri-Fink A, Clift MJD and Rothen-Rutischauser B. 2021.Inter-laboratory variability of

A549 epithelial cells grown under submerged and air-liquid interface conditions.Toxicol in Vitro 75:105178

Source: Jan Van der Valk 2022. Fetal Bovine Serum- a cell culture dilemma. Science. 375(6577):143-144. DOI: 10.1126/science.abm1317

2. Future of batteries is Organic

When compared to conventional active materials, polymers show fast redox chemistry and their solubility is adjustable. Later is an important factor in the performance of a battery. These are gaining importance as sustainable, renewable source to generate energy. Rohland et al. (2021) have come up with an interesting review article detailing designing of redox-active polymers.

Source: Rohland P, Schroter E, Nolte O, Newkome R, Hager MD, Schubert US. 2022 Redox-active polymers: The magic key towards energy storage – a polymer design guideline progress in polymer science. Prog. Pol. Sci. 125: 101474. DOI:https://doi.org/10.1016/j. progpolymsci.2021.101474

3. MicroRNA is also a signal in plant-to-plant communication

Betti et al. (2021) showed that micro-RNAs (miRNAs) produced by plants act as inter- and intra-specific signaling molecules affecting gene expression in other, nearby plants and trigger RNAi mechanism. But it is not known if plants use RNAs themselves as signaling molecules.

Source: Betti, F, Ladera-Carmona MJ,Weits DA, Ferri G, Lacopino S, Novi G, Syezia B, Kunkowska AB, Santaniello A, Piaggesi A, Loreti E and Perata P. 2021. Exogenous miRNAs induce post-transcriptional gene silencing in plants.Nature Pl 7:1379–1388

4. Gut bacteria modulate availability and efficacy of therapeutic drugs

Human gut flora can change drug disposition by biotransformations, of which more than half of such activity is due to bioaccumulation. Later is a process in which bacteria accumulatemoleculesinside the cell without chemically modifying them or experiencing any change in growth (Klünemann et al.2021). This affects composition of microflora, pharmacokinetics, side effects and responses of the drugs and probably the response varies from person-to-person.

Source: Klünemann, M., Andrejev, S., Blasche, S. et al. 2021 Bioaccumulation of therapeutic drugs by human gut bacteria. Nature 597:533–538. https://doi.org/10.1038/s41586-021-03891-8.

5. Genomic-profile based models show better predictability of radiation dose for cancer therapy

A study by Scott et al. (2021) showed that survival and recurrence were significantly associated with the genomic-adjusted radiation dose (GARD) and not with the physical radiation dose. Using the predicted radiation dose effect may result in a better outcome The researchers developed a novel algorithm on the basis of a personalized GARD model using individual tumor genomic parameters rather than the commonly administered dosages based on the cancer diagnosis. The model derived from an individual patient's genomic profile gave better predictability proving that dosages of radiotherapy cannot have a uniform prescription for all patients.

Source: Scott JG, Sedor G, Ellsworth P, Scarborough JA, Ahmed KA, Oliver DE, Eschrich SA, Kattan MW, Torres-Roca JF. Pan-cancer prediction of radiotherapy benefit using genomic-adjusted radiation dose (GARD): a cohort-based pooled analysis. Lancet Oncol. 2021 Sep;22(9):1221-1229. doi: 10.1016/S1470-2045(21)00347-8.

6. The Vanishing Act: Is the sixth mass extinction already underway?

Earth has undergone five Mass Extinction episodes by sudden but natural phenomena. Looking at the IUCN Red List, it appears that the rate of species loss does not differ from the background rate. However, the Red List is heavily biased towards birds and mammals. In a thought provoking review Cowie et al. (2022) argue that that the rate of extinctions vastly exceeds the background rate of invertebrates extinction and that we may indeed be witnessing the start of the Sixth Mass Extinction. As an example, they cite molluscs, the second most biodiverse phylum, in which the species loss over the base data of ~AD 1500, is possibly 7.5–13% (150,000–260,000 of ~2 million known species) as compared to 882 (0.04%) on the Red List. The grand scale manipulation of the Earth by the humans is the prime cause of the current crisis.

Source: Cowie RH, Bouchet P and Fontaine B 2022. The Sixth Mass Extinction: fact, fiction or speculation? Biol. Rev. (2022) doi: 10.1111/brv.12816

7. More than 9200 novel tree species estimated to exist

The world's largest forest data base was unveiled by scientists, which comprises of > 44 million individual trees estimated at > 100,000 sites in 90 countrie . The study reveals that earth hosts roughly 73,300 tree species which is about is about 14% higher than previous estimates of 64,100 known tree species. Of that not yet been identified by science about 9,200 are estimated to exist based on statistical modelling, with a large proportion of these growing in South America's biodiversity hot spots, such as the Amazon and tropical Andes, according to Roberto Cazzolla Gattiand his colleagues. To know the extent of diversity of tree species which is under threat due to climate change will help to protect future generations.

Source: Gatti R.C. et al. The number of tree species on Earth. Proc. of the Natl. Acad. of Sci. Vol. 119, February 8, 2022. doi: 10.1073/pnas.2115329119

8. Green biosynthesis of nano-materials utilizing microbes

Global challenges in various sectors like agriculture, pharmaceutical, food, medical, environment etc require novel solutions in which nanotechnology plays immense role. Requirement of eco-friendly nanomaterial of biological origin is need of an hour in which microbes are potential candidates. Yue Yang et al (2022) have documented recent developments in synthesis of bionanomaterial utilizing various processes and /or derivatives of microorganisms as well as their appilactions, bottlenecks and hurdles in the development of microfactories for the biosynthesis of diverse nanomaterials at scale under controlled conditions.

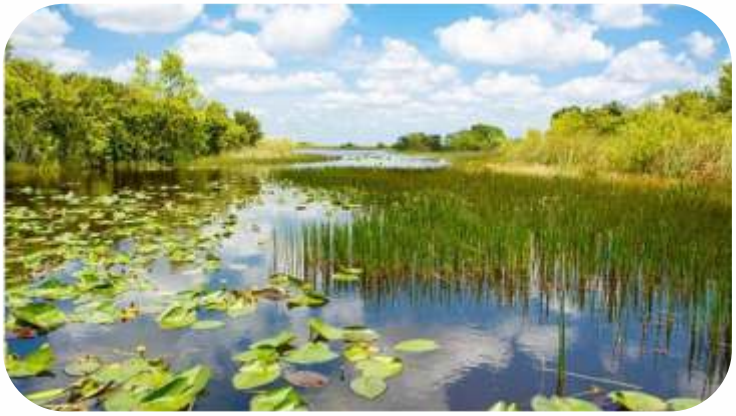
Source: Yue Yang, et al (2022) Microbial-enabled green biosynthesis of nanomaterials: Current status and future prospects, Biotechnology Advances, Volume 55, 107914, https://doi.org/10.1016/j. biotechadv.2022.107914.

FOOTPRINTS – SCIENCE IN INDIA

I. Two More Wetlands of International Importance

On the occasion of World Wetlands Day, two new Ramasar sites are anounced by the Union Ministry of Environment, Forest and Climate Change. These are Khijadia Wildlife Sanctuary (Gujarat) and Bakhira Wildlife Sanctuary (Uttar Pradesh). With this, there are currently 49

Ramsar sites in India. They cover an area of more than 10,93,636 hectares, the highest in SouthAsia. Bakhira wildlife sanctuary provides a safe wintering and staging ground for a large number of species of the Central Asian Flyway while Khijadia wildlife sanctuary is a coastal wetland with rich avifaunal diversity providing a safe habitat to endangered and vulnerable species.



"National Wetland Decadal Change Atlas" prepared by the Space Application Centre (SAC) Ahmedabad was also released highlighting the changes in wetlands locations across the country. The changed Atlas is available on the wetlands of India portal http://indianwetlands.in/ resources-and -e-learning/library/website

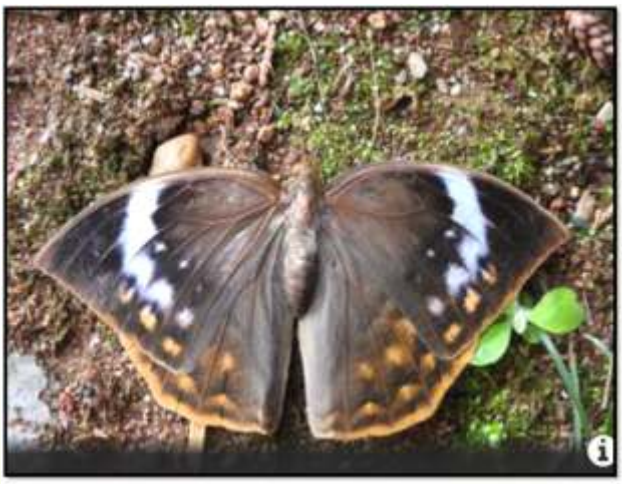
World Wetlands Day is observed every year on February 2nd all over the world. It is celebrated to raise global awareness about the vital role of wetlands for people and our planet.

This year's theme of World Wetlands Day is "Wetlands Action for People and Nature" highlighting the importance of actions to ensure the conservation and sustainable use of wetlands for humans and planetary health.

Source: https://www.pib.gov.in

II. Southern Duffer Butterfly Recorded In Upper Nilgiris

A rarely seen species of butterfly Discophoralepida, also known as the Southern Duffer, was recorded in the higher elevations of the Nilgiris, after more than three decades. Its first record in the Nilgiris was in 1888 followed by records in 1935, 1944 and 1987. The rare butterfly is endemic to the Western Ghats and Sri Lanka. It is protected under the Wildlife Protection Act.



The record of the butterfly was published in the Journal of the Bombay Natural History Society.

The species relies on bamboo species as their host plant. The Upper Nilgiris are not abundant in bamboo species, exept for few species like Bambusa bambos, Dendrocalamuss trictus and the Bambusa vulgaris. The record of this butterfly at such high altitude was rare. The reasons for record of this burtterfly at such altitude could be: Establishment of the host plants in these areas and Climate change

Source: https://www.thehindu.com

THE OPEN DOOR

1. 27TH ISCB INTERNATIONAL CONFERENCE (ISCBC-2022)

Theme	Research and Innovation in Chemical, Pharmaceutical and Biological Sciences
Venue	Birla Institute of Technology, Mesra, Ranchi, India
For Registration Click at	http://www.iscbconference.com/registration.htm
Dates	16th - 19th November, 2022
Email	iscbconference@gmail.com

2. The 9th international conference on –AGRICULTURE 2022

Theme	Sustainable Utilization Of Resources In Agriculture: Way Of Food Security And Safety
Venue	Virtual conference
For Registration Click at	https://agroconference.com/online-registration/
Dates	11th-12th August, 2022

3. International conference (AAFS-2022)

Theme	Advances In Agriculture And Food System Towards Sustainable Development Goals
Venue	Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan
For Registration Click at	www.aafs2022.org.in
Dates	7th-9th July, 2022

4. Applications are invited from bright postgraduates for full-time research positions in Somaiya Vidhyavihar University-Mumbai. For more details log on to the site https://www.somaiya.edu/en/view-career/145

5. Applications are invited for the senior scientists- biological sciences. For details log on to www.mssrf.org

SPR Tidings

I. **Prof. Subodh Bhatnagar,** former Dean, College of Biotechnology, SAU, Meerut was conferred the most prestigious **Prof K G Mukherjee Memorial Lifetime Achievement Award-2022** on March 25, 2022 at Madurai, Tamil Nadu. Ex-students of Prof. K G Mukherjee, Delhi University instituted this award in the honour of their revered teacher and Mentor. Professor Bhatnagar's nomination was based on his 40 years of accomplishments and international contributions in plant science and biotechnology. The Screening Committee unanimously endorsed his name, recognising his efforts. Professor V.P. Singh, Prof Rupam Kapoor, Prof K.G. Saxena and R.R. Hanchinal complimented him on this great achievement.

II. An online workshop **"CONSERVATION OF ORNAMENTAL, MEDICINAL AND WILD FRUIT BEARING PLANTS FROM HIMALAYAN REGIONS"** was jointly organized by the Society for Plant Research (SPR) and Department of Ecology & Environmental Science, Assam University, Silchar from 10th-11th March 2022. The welcome address was offered

by Dr. Panna Deb, Joint Co-ordinator. A total of 85 participants registered for the workshop representing 24 Institutes/Universities across India. Prof. Rajive Mohan Pant, Honourable Vice Chancellor, Assam University was the Chief Guest of the inaugural programme. Prof. R. R. Hanchinal, President SPR, Prof. S. K. Bhatnagar, Founder and Secretary General, Prof. D. K. Srivastava, Vice President, SPR, Prof. Anjuli Agarwal, Secretary, SPR, North Zone, Prof. Jayashree Rout, Dean, E P Odum School of Environmental Sciences, Assam University, Silchar and Prof. Ajit Kr. Das, HoD, Ecology & Environmental Science, Assam University also shared their remarks.

The programme was organized in two technical sessions spread over two days (10-11 March 2022). Besides the participants, several other members of the Society and the University departments attended the workshop and there were lively interactions with the speakers.

Some important talks delivered during the conference included on the "Efficient micropropagation strategies for conservation of Picrorhiza kurroa Royle ex Benth. & Gloriosa superb L.: an endangered medicinal herbs of Indian Himalayan region" by Dr. Ashok Kumar Khandel, SAGE University, Bhopal; "Orchid Science to Orchid Mania" by Prof. Promila Pathak, Panjab University, Chandigarh; "Conservation of endangered medicinal plants of North Western Himalayas" by Dr. Pankaj Kumar from Dr. Yashwant Singh Parmar University of Horticulture & Forestry, Solan, Himachal Pradesh and " Tissue culture for conservation and sustainable utilization of endangered and medicinal orchids" by Prof. Suman Khatri Kumaria from North-Eastern Hill University, Shillong, Meghalaya . In the valedictory session on the 2nd day (11 March 2022) chaired by Prof. S. K. Bhatnagar, Founder and Secretary General, members and participants present deliberated on several issues pertaining to the theme of the workshop. The issues of conservation of high value plants of Himalayan region got priority. The need for more such activity and action oriented approach to augment the conservation efforts of rich biodiversity of the region was stressed. Discussion was made to cover the fruit bearing plants of the region adequately. Feedback were obtained from all the participants for each technical sessions and e-certificates of participation shall be provided by organisers.

AGRICULTURE BIOTECHNOLOGY SUCCESS STORIES

Department's support has led to the development of improved varieties of crop plants through marker assisted backcross breeding. In cereals fourteen varieties have been released (Maize-2, Rice- 8 and Wheat-4) with enhanced nutritional content, resistance to pathogens and tolerance to abiotic stresses. Of these 14 varieties, 6 have reached farmers field (Maize- 1, Rice-4 and Wheat-1). In addition, one variety of soybean and two rose varieties have been released.

- **Impact of the Varieties released:**

  Rice varieties which have reached farmers field are resistant to bacterial blight and currently being cultivated in Punjab, Haryana, West UP. Samba Mahsuri rice variety resistant to bacterial blight developed through Marker Assisted Selection and backcross breeding is being cultivated in Tamilnadu, Karnataka, Telangana and Andhra Pradesh.

Wheat variety which is resistant to stripe and leaf rust is the 3rd most popular variety in Punjab.

Maize (HQPM1) pro-vitamin A rich hybrid with 5 times more pro-vitamin A than normal maize is being grown under hybrid cultivation. Soybean variety NRC 127 developed through financial support by the Department has been commercialized through company.

➢ Wheat Genome Sequencing

Department of Biotechnology partnered in The International Wheat Genome Sequencing Consortium (IWGSC) and supported the Indian researchers to decode the complex wheat genome. The genome of bread wheat variety 'Chinese Spring' was published in the international journal Science. An insurmountable task of deciphering Bread wheat genome which is heaxaploid and five times larger than the human genome and 40 times larger than rice was realised. Indian effort in decoding the wheat genome by a team of eighteen scientists was spearheaded by Dr. Kuldeep Singh at Punjab Agricultural University Ludhiana (Now Director, ICAR-National Bureau of Plant Genetic Resources), Professor Nagendra Singh at ICAR-National Research Centre on Plant Biotechnology, New Delhi and Professor JP Khurana at the University of Delhi South Campus.

With the reference genome sequence now completed, breeders have at their disposal new tools to address these challenges. They will be able to identify more rapidly genes and regulatory elements underlying complex agronomic traits such as yield, grain quality, resistance to fungal diseases, and tolerance to abiotic stress and produce hardier wheat varieties.

BIOSCOPE

Dr. M S SWAMINATHAN: THE SCIENTIST AND HUMANIST AND FATHER OF GREEN REVOUTION IN INDIA

I had the privilege to work on plant type (Mostly leafess) of field pea when I was Geneticist (Pulses) at IARI and Dr. Swaminathan was DG, ICAR and visiting IRRI, Philippines when I was ADG (Food crops) at ICAR and he was DG, IRRI. Brief summary of his biography and his contributions in agriculture are given below:

Ancestral History

M.S. Swaminathn (Monkombu Sambasivam Swaminathan) was born on 7th August, 1925 at Kumbakonam in Tamil Nadu. Swaminathan has two brothers (Krishnamurthy and Ram Das) and one sister (Laxshmi). He was second child of his father K.M.Sambasivam and mother Parvathi Thangammal. His father hailed from village Monkombu in Alleppy district of Kerala and belonged to well known agricultural family of Kerala, pioneer in rice cultivation and coffee plantation. Dr. Sambasivam was an eminent civil surgeon who settled in Kumbakonam after graduation from Madras Medical College.

Educational Career

Swaminathan had his early school education at the Native High School and later at the Catholic Little Flower High School in Kumbakonam from which he graduated at the age of 15 years. When his father expired in 1936, Swaminathan was 36 years old and his two brothers and sister moved to his uncle's place. In 1940 Swaminthan and his elder brother moved

Trivandrum to study at the university college under the guardianship of his elder uncle Mr. M.K. Nilkantalyer who was chief Secretary of Travancore state. After taking his B.Sc. in Zoology in 1944 Swaminathan obtained B.Sc.(Ag.) in 1947 from Agricultural College, Coimbatore (now Tamil Nadu Agricultural University), winning many gold medals for proficiency in studies. In 1949 he took his Associate ship from Indian Agricultural Research Institute, New Delhi. This degree was equivalent to Master's degree. He got distinction in Genetics and Plant breeding. His dissertation was on 'Non-tuber bearing Solanum' under the guidance of Har Bhajan Singh. In 1949, he was selected for the Indian Police Service. He was almost had become police officer. But he had changed the idea of becoming police officer and accepted the UNESCO-Netherlands Govt. Research Fellowship to continue his research work on potato at the Department of the Netherlands Agricultural University in Wageningen. After an year in Netherlands Swamnathan moved to England to work at Plant Breeding Institute of Cambridge University's School of Agriculture in Trumpington. Here, he obtained his Ph.D. degree in 1952 working under Dr. H. W. H. Howard with the thesis entitled “Species differentiation and the nature of polyploidy in certain species of the genus Solanum-Section Tuberosum”. Based on the quality of scientific papers published during 1950-53, Swaminathan was offered a post Doctorate Research Associate ship to work at the Department of Genetics in the University of Wisconsin of Madison and Sturgen Bay in U.S.A. Here he worked till January 1954 and then finally returned to India. He could have stayed there as he was offered a regular teaching-cum-research Professorship at the University of Wisconsin. Swaminathan asked himself as why he studied Genetics, whether it was to produce more food in India so he should returned back to India. Agricultural University at Wagenngen conferred on him the honorary Doctorate Degree in 1988.

Service Career

At that time, the jobs in agricultural research were few and far between. Dr. Swaminathan could get first temporary position of Assistant Botanist at the Central Rice Research Institute, Cuttack under FAO sponsored scheme on Indica-japonica rice hybridization to breed fertilizer responsive hybrid rice. In 1954, Swaminathan joined on the post of Assistant Cytogeneticist at the Botany Division of IARI, New Delhi. In 1956, he succeeded P.N. Bahaduri on the post of Cytogeneticist at IARI, New Delhi. In 1961, he occupied the position of Head of Botany in IARI, New Delhi. Finally, in 1966, he chaired highest post of Directorship of IARI, New Delhi on which he continued for six years up-to 1972. In January 1972, Swaminathan succeeded his teacher and mentor, Dr. B.P. Pal as Director General of ICAR and Secretary, DARE and continued on this position till 1979. Subsequently, he was elevated to the rank of Principal Secretary to Govt. of India, Ministry of Agriculture and Irrigation which was equivalent to ICS and IAS. Dr. Swaminathan also served in the Union Planning Commission from 1980 to 1982, first the Deputy Chairman and latter as the Member-in-charge of Agriculture, Rural Development, Science and Technology, Health, Education and employment. In April 1982, Swaminathan took over as D.G. of International Rice Research Institute, Los Banos, Philippines. In 1988, Dr. Swaminathan established M.S. Swaminathan Research Foundation (MSSRF) at Chennai.

Details of family

In April, 1955 Swaminathan married Mina Bhoothalingam, a daughter of S. Bhothalingam, who belonged to ICS service. Mina graduated in Economics from Cambridge University where she had met Dr. Swaminathan. Mina had opted for career in teaching. Dr. Swaminathan has three daughters (Soumya,

Madhura and Nithya). Dr. Soumya is a Pediatrician and works at Tuberculosis Research Centre at Chennai. DrMadhura is Ph.D. in Economics from Oxford University and is professor at Indian Stastical Institute, Kokatta. Dr D. Nithya did her Ph. D. from East Angila, U.K. and works in the field of gender and Rural Development and adult literacy. Dr. Swaminathan says that his daughters helped him to remain young in his thinking and also helped him as bridge the generation gap in terms of values and aspirations.

Contributions

Right from Science, agricultural development, resources conservation and utilization and reforms he contributed a lot, some of them are listed here.

Wheat improvement: Under the guidance of Dr. B.P. Pal, Swaminathan started rust resistance breeding work in wheat. He has been successful in introducing dwaring genes (Norin 10) in tall Indian wheat which has been helpful in the development of fertilizer and irrigation responsive varieties. Getting seeds of Mexican what, he organized demonstration in one hectare plot in the fields of hundred farmers. The yields were found fantastically very high. With GOI offering Rs. 500/ha towards the cost of seed and essential inputs the demonstrations were organized throughout the wheat belt. This led to the hunger of new seeds Indian Govt. with the help of Swaminathan imported 250 metric tons of Mexican seeds. For making Mexican seeds acceptable to the Indian farmers, he changed the seed colour from red to umber. With all these efforts he has been successful in wheat revolution in India and neighboring countries, for which he got several awards.

Potato improvement: Swaminathan began his post-graduation research on potato bearing tubers both in India and outside, developed golden nematode resistant varieties by, transferring genes from wild species, species differentiation, polyploidy, cytology and cytogenetics. Bridging of mismatch between production and post harvest technologies, developed of seed production technology (TPS), precision farming for sustained potato production, G.M. potato, etc. were different areas where he made the potato a viable crop.

Rice: By introducing dwarfing genes Dee-gee-woo-gen from China, he has been successful in developing dwarf rice varieties Taichung Native-1, IR-8 and Jaya which are fertilizer and irrigation responsive. During his tenure at IRRI, he helped establishment of chain of national rice research institute in 14 countries & established at IRRI rice gene bank, having accessions exceeding 100000, representing 70% of world's variability in rice. Besides, the above areas, he also worked on rice production in abiotic and biotic stresses, gene pyramiding, use of biofertilizers, rice biotechnology, hybrid rice, reduction of methane production in rice fields, rice biomass utilization.

Resources conservation: The major objectives of MSSRF are research on Mangrove Ecosystem, Biodiversity conservation, Farmer's Right, forest genetic resources, microbial resources, Animal resources and marine genetic resources conservation, protection of biosphere reserves and silent valley.

Awards, Honorary Doctorates, Recognitions by Scientific Academies/Societies, Honorary positions held and Assignments:

Dr Swaminathan was conferred 24 international and 29 national awards besides the conferment of 33 Honorary doctorates by Agricultural and Multi faculty Universities of India and 11 from abroad. His contributions to agriculture, Science and improvement of human life were duly recognized by Scientific Academies/Societies. He served the community on 19 Honorary positions in International committees and organizations besides 19 honorary position in the organizations devoted to Natural conservation and sustainable development. Dr Swaminathan chaired a large number of National committees.

Dr. Shanker Lal

Ex-ADG (Food Crops), ICAR, New Delhi;

Ex-Director, IIPR, Kanpur;

Former National Consultant (Seeds), GOI, New Delhi

Condolement

Deep Condolences to a "Great Educationist"

Dr. Ichha Purak, former Professor of Botany, Ranchi Women's College, University of Ranchi, Ranchi and vice-president of the session 2021-24 of the Society for Plant Research (SPR), passed away on 22 Februray, 2022. Entire Botanical Science community and SPR members offered their condolences and remembered her as a great Educationist. She was 72 years old She obtained her post graduate and Ph. D. degree in Botany from Ranchi University and joined as Assistant Professor in 1981 in the Department of Botany, Ranchi Women College, Ranchi. She became Professor in November 1998 and retired in 2010. Dr Ichha published 26 papers in reputed journals and delivered few lectures in various conferences. She was the Organizing Secretary of National Conference on Recent Advances in Environmental Biotechnology for Forest and Bio-diversity Management (NCEB-2006) and Chief Organizing Secretary of National Seminar on Environmental and Biotechnological prospects and issues in India (NSEB 2017 held at Ranchi Women College. Professor Ichha Purak had been associated with the Society since beginning and had been instrumental in organizing many events of SPR and VEGETOS. Dr Ichha is the Fellow of SOCIETY FOR PLANT RESEARCH (SPR), recipient of the Award of Excellence, HRD, Jharkhand Government; Excellence Award and Prof YSRK Sarma Memorial Award by SOCIETY FOR PLANT RESEARCH (SPR). As the Zonal Secretary (East) SPR during 2016-2017 and recently as Vice-president of SPR (2021-27), she organized National events and a Webinar. May her noble soul rest in peace.

THE ART PART

गौरय्या तू चुप सी क्यों है,
कुछ बोल जरा, गुनगुना जरा ।
ना दिल पर ले, ना प्रीत जगा,
अपनी सुर लहरी सुना जरा ।

आत्ममुग्ध है मानव प्राणी
स्वार्थ भरा, और मद में चूर ।
सांसों के स्रोत उजाड़ रहा
फिर कैसे होगी इसकी भोर।

तुझको क्या रोष नहीं आता
इन उजड़े हुए दरखतों पर।
और ऊंचे ऊंचे महलों में,
बिराज रहे कम्बख्तों पर।

यह धरती, अम्बर सबका है,
क्या केवल मानव भोगेगा।
जो नष्ट कर रहा जल थल को
वह खून के आंसू रोवेगा।

मानव तू खूब तरक्की कर,
तुझको तो किसने रोका है।
जीवों के रैन बसेरों पर,
ऐ दुष्ट रहम कर, मौका है।

प्रो डॉ सुबोध भटनागर
पूर्व अधिष्ठाता,
संस्थापक, सोसायटी फॉर प्लांट रिसर्च,
नोएडा

कोरोना

पसंद नहीं उसे
मंदिर की भीड़ भरी आरती
चिढ़ता है वो
भीड़ की अरदास से
रास नहीं आती उसे
एक साथ की गई नमाज
या इकट्ठे
गिरजे में लगाने जाना मोमबत्तियाँ

होता है कभी
यहीं
आसपास कहीं
हवा में

दरवाजे के हैंडल पर
मिल जाता है
घूमता साथ–साथ
किसी यात्रा में

या यूं ही
बैठा हुआ
किसी कुर्सी के हत्थे पर

छिपा है
घुप अंधेरे में जैसे
छप कर हाथों की लकीर

खोजता हूँ पर मिलता नहीं कई बार
मगर फिर भी
उठा लाता है तूफान
हर दिन की खबर में

5, 50, 500 फिर 5000
जैसे बांबियों में
दीमकों के
अचानक निकल आए हों पर

खबर–दर–खबर
आता है

बे–आहट
कुछ कहता नहीं आने पर
और फिर
बोलने ही नहीं देता

सड़क पर
गश्त की आवाज है.
बूटों से कुचलने पर
चीखता है सन्नाटा,
मौन वो पूछता है नाम.

उसके पूछने में
एक अबोला प्रश्न है या कटाक्ष ?

"पुषार्थ तू कहाँ है?"
और है चुनौती
तप को, श्रम को।

टूटती साँसों में
भयभीत आँखों में
सिर्फ याचना है
"कुछ करो"
'कुछ करो'
'करोना'!

शाम के धुंधलके में
क्षितिज से कहीं
एस. डी. बर्मन की आवाज आ रही है:
"कहते हैं ज्ञानी,
दुनिया है फानी,
पानी पर लिखी
लिखाई"

व्हाटस्सेप पर, फेसबुक पर
चल रहा है
शमशान वैराग्य का
शाश्वत ज्ञान

– **प्रो. आशीष भटनागर**
एम.डी.एस. विश्वविद्यालय, अजमेर