



30th October to 01st November, 2023



**International Conference on
Biochemical and Biotechnological
Approaches for Crop Improvement**

Venue : Bharat Ratna C. Subramaniam Auditorium,
National Agricultural Science Complex, New Delhi, India

Proceedings of International Conference on Biochemical and Biotechnological Approaches for Crop Improvement



Organizers



**Society for Plant Biochemistry
and Biotechnology**



**ICAR-Indian Agricultural
Research Institute**



**ICAR-National Institute for
Plant Biotechnology**



**CSIR-National Botanical
Research Institute**

PROCEEDINGS

International Conference on Biochemical and Biotechnological Approaches for Crop Improvement

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**International Conference on
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Venue : Bharat Ratna C. Subramaniam Auditorium,
National Agricultural Science Complex, New Delhi, India

Chief Patron

Late. Prof. M. S. Swaminathan

Founder Chairman, MSSRF, Chennai, Tamil Nadu

Legacy Continues.....

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Chair of the Conference

Dr. S. L. Mehta, President, SPBB, New Delhi

Organising Secretary

Dr. Aruna Tyagi, Head & Principal Scientist, ICAR-IARI, New Delhi

Co-organising Secretaries

Dr. R.C. Bhattacharya, Director, ICAR-NIPB, New Delhi

Dr. Ajit Kumar Shasany, Director, CSIR-NBRI, Lucknow

PREFACE

The International Conference on Biochemical and Biotechnological Approaches for Crop Improvement (IBBACI-2023) was held in New Delhi, India during 30th October - 01st November, 2023, organized by Society for Plant Biochemistry and Biotechnology (SPBB) in association with ICAR-Indian Agricultural Research Institute, New Delhi, ICAR-National Institute for Plant Biotechnology, New Delhi and CSIR-National Botanical Research Institute, Lucknow. The conference was co-sponsored by ICAR, DBT, SERB, CSIR, ICARDA, NABARD, INSA, CIMMYT, Bioversity, Biosearch Technologies Pvt. Ltd., Isha Agro Science Pvt. Ltd., Genetix Biotech Asia Pvt. Ltd., JP Scientific Pvt. Ltd., Eppendorf India Pvt. Ltd., IFFCO, HIL, and FSII.

IBBACI-2023 was organized with the aim to bring together a diverse group of researchers and academicians from around the world to address advances in research and present their research experience as well as to give them a forum to discuss new ideas, encourage researchers to exchange and share their experiences, updates and integrate novel crop improvement concepts with the overarching objective of accelerating the achievement to meet SDGs by 2030.

The conference was designed to have 8 themes covering broadly all the possible area of research in the field of biochemistry, biotechnology, life sciences, genetics, microbiology etc. The themes of different concurrent sessions were held in the area of Metabolic Pathway Engineering, Advanced Molecular Tools for Crop Improvement: Genomics and Genome Editing, Abiotic and Biotic Stress Tolerance, Plant Nutrition & Food Quality Enhancement, Millets as Nutraceuticals, Advances in Legumes & Oilseed Research, Functional Genomics and Regulatory Biology, and Microbiome & Nanotechnology for Health. In each concurrent sessions, there were 2-4 lead lectures followed by 2-5 oral presentations were organised. There are 350 abstracts submitted from India, USA, UK, Australia, Uzbekistan etc. under different theme area. After several rounds of review, 32 abstracts were accepted for oral presentations under different theme area. Besides theme wise concurrent session, a session of Dr. N. B. Das Memorial lecture, 4 plenary lectures, a Panel Discussion on Student/Scientist/Industry-Academia Interface, 8 flash talk (3+2 min each) and 15 presentations for SPBB-Springer Young Scientist Award (8+2 min each) was organized. Remaining abstracts submitted were presented as poster presentations.

Sincere appreciations was given to all participants, technical committee members, session chairs/co-chairs, speakers, panelists, rapporteur, moderators for their contribution, active participation, pertinent suggestions, and technical advices to the conference program. In particular, we would like to acknowledge the organizing committee for their valuable inputs in shaping the IBBACI-2023 program.

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TECHNICAL PROGRAMME	
30th October, 2023	
09:30-11:00	INAUGURATION Venue: Bharat Ratna C. Subramaniam Auditorium
11:00-11:45	High Tea
11:45-12:45	Dr. N.B. Das Memorial Lecture Venue: Bharat Ratna C. Subramaniam Auditorium
	Chair Dr. T. Mohapatra, Chairperson, PPV &FRA, NASC, New Delhi
	Co-Chair Dr. Kheya Bhattacharya, Former IFS Officer, New Delhi
	Speaker Prof. Rajeev K Varshney, Murdoch University, Australia Title: Genomic solutions for enhancing global food security and ensuring agriculture sustainability (45 Minutes) (Virtual)
12:45-13:30	Felicitation Programme of Dr. S L Mehta
13:30-14:30	Lunch
CONCURRENT SESSIONS	
14:30-16:30	Venue: Bharat Ratna C. Subramaniam Auditorium
	I: Metabolic Pathway Engineering
	Chair Dr. P. Ananda Kumar, Former Director, ICAR-IIRR, Hyderabad
	Co-Chair Dr. Srinivasan, Former Director, ICAR-NIPB, New Delhi
	Venue: Prithvi Hall
14:30-16:30	II: Advanced Molecular Tools for Crop Improvement: Genomics and Genome Editing
	Chair Dr. Paramjit Khurana, Former Professor, DUSC, New Delhi
	Co-Chair Dr. J C Rana Country Representative & National Project Coordinator UNEP-GEF Biodiversity International (Erstwhile IPGRI)
	Lead Lectures (22 minutes Talk + 3 minutes for Interaction)
	14:30-14:55
14:30-14:55	Dr. Gitanjali Yadav Scientist, NIPGR, New Delhi Title: Deciphering Regulatory Landscapes of Green Algal CCM
14:55-15:20	Dr. Ram Rajasekharan Professor, Central University of Tamil Nadu, Thiruvavur Title: A Novel Soluble Triacylglycerol Biosynthetic Pathway in Yeasts and Oilseeds
14:55-15:20	Dr. Swarup K. Parida Scientist, NIPGR, New Delhi Title: Next-Generation Molecular Breeding for A Food Sufficient Future
15:20-15:45	Dr. Ajit Kumar Shasany Director, CSIR – NBRI, Lucknow Title: Pathway Synteny and metabolite channelling: Engineering towards better stress response
15:20-15:45	Dr. Satendra Kumar Mangrauthia Senior Scientist, IIRR, Hyderabad Title: CRISPR/Cas12a driven multiplex genome editing of a cytokinin regulator improves plant architecture and grain yield in rice
15:45-16:30	Oral Presentations (13 minutes Talk + 2 minutes for Interaction)
15:45-16:00	Dr. Aruna Kilaru Professor, East Tennessee State University, USA Title: Key Avocado Genes Cooperatively Enhance 18:1-TAG in Leaf Tissues
15:45-16:00	Dr. Sachin Teotia Associate Professor, Sharda University, Uttar Pradesh Title: A high-efficiency gene silencing in plants using two-hit asymmetrical artificial microRNAs
16:00-16:15	Dr. Ashutosh Pandey Staff Scientist, NIPGR, New Delhi Title: Pathway engineering in food crops for enhancing nutritional value and food security
16:00-16:15	Dr. Manimekalai Principal Scientist, SBI, Coimbatore Title: Genomic selection in sugarcane: unlocking the potential for sustainable sugarcane agriculture
16:15-16:30	Dr. Yogendra Kalenahalli Scientist, ICRISAT, India Title: Secondary cell wall thickening associated with the deposition of hydroxycinnamic acid amides and lignin to resist aflatoxin accumulation in groundnut
16:15-16:30	Dr. Aniruddha Sane Chief Scientist, CSIR-NBRI, Lucknow Title: A tomato EAR motif repressor controls plant developmental transitions through regulation of the GA pathway

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16:30-17:00	Tea Break		
	Venue: Bharat Ratna C Subramaniam Auditorium		
17:00-18:00	Plenary lectures (25 minutes Talk + 5 minutes for Interaction)		
	Chair Dr. A. K. Tyagi, Senior Professor , University of Delhi, South Campus, New Delhi		
17:00-17:30	Speakers		
	Dr. T. R. Sharma Deputy Director General (Crop Science), ICAR, New Delhi Title: Biotechnological Applications in Agriculture for National Food Security		
17:30-18:00	Dr A. K. Singh Director, ICAR-IARI, New Delhi Title: Molecular breeding for biotic & abiotic stress tolerance and quality improvement in cereals		
18:00-19:00	Poster Session-I		
19:00-20:00	Cultural Programme		
20:00-21:00	Dinner		
	31st October, 2023		
	Venue: Bharat Ratna C. Subramaniam Auditorium		
09:30-10:30	Plenary lectures (25 minutes Talk + 5 minutes for Interaction)		
	Chair Prof. P. K. Gupta Hon'ble Emeritus Profesor, Department of Genetics and Plant Breeding Ch. Charan Singh University, Meerut		
09:30-10:00	Speakers		
	Prof. Nigel George Halford Rothamsted Research, Harpenden, UK Title: Low asparagine, low acrylamide CRISPR wheat: Europe's first field trial of gene edited wheat in the context of rapidly changing regulations		
10:00-10:30	Dr. Vedpal S. Malik Agriculturist/Biotechnologist, Retd. US Department of Agriculture, USA Title: Oil seeds, Biofuels, Diverse crops, and Big Money through Technology		
10:30-11:00	Tea Break		
	CONCURRENT SESSIONS		
	Venue: Bharat Ratna C. Subramaniam Auditorium		Venue: Prithvi Hall
	III: Abiotic And Biotic Stress Tolerance		IV: Plant Nutrition & Food Quality Enhancement
11:00-13:10	Chair Dr. Anil Grover, Senior Professor, Dept. of PMB, DUSC, New Delhi		Chair Prof. Nigel George Halford, Rothamsted Research, UK
	Co-Chair Dr. Kashchandra Raghothama Horticulture and Landscape Architecture, Purdue University, USA		
	Lead Lectures (22 minutes Talk + 3 minutes for Interaction)		
11:00-11:25	Dr. Kashchandra Raghothama Horticulture and Landscape Architecture, Purdue University, USA Title: Phosphate deficiency; a major abiotic stress impacting global agriculture	11:00-11:25	Prof. Avtar K. Handa Professor Purdue University, USA Title: Agriculture Biotechnology and Human Health and Longevity
11:25-11:50	Prof. Manoj Prasad Professor & JC Bose National Fellow, NIPGR, New Delhi Title: Heat shock proteins of foxtail millet (<i>Setaria italica</i>) for imparting climate resilient traits in cereals	11:25-11:50	Dr. Sijo Joseph Research Scientist and Adjunct Professor University of Manitoba, Canada Title: Enhancing the Quality and Nutritional Bioactivity of Canadian Oats (Virtual)
11:50-12:15	Dr. Ranjan Swarup Associate Professor University of Nottingham, UK Title: Designer roots for sustainable agriculture and abiotic stress tolerance	11:50-13:05	Oral Presentations (13 minutes Talk + 2 minutes for Interaction)
		11:50 -12:05	Dr. Ranjeet Ranjan Kumar Senior Scientist, IARI, New Delhi Title: Exploring the Potential Genes Responsible for Off-odour Development in Pearl Millet Flour using De novo Transcriptomic Approach

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12:15-12:40	<p>Dr. Sona Pandey Principal Investigator, Donald Danforth Plant Science Center, USA Title: Role of G-protein signaling in regulating plant agronomic traits</p>	12:05 -12:20	<p>Dr. Somnath Mandal Assistant Professor, UBKV, West Bengal Title: In-depth metabolite profiling of Curcuma species from Sub-Himalayan terrain plains of India revealed its anti-diabetic and anti-fungal potential</p>
12:40-13:10	<p>Oral Presentations (13 minutes Talk + 2 minutes for Interaction)</p>		<p>Dr. Veda Krishnan Scientist, IARI, New Delhi Title: Gut taste what we eat: Sorghum proanthocyanidins and their role in gut-brain axis activation inducing satiety</p>
12:40-12:55	<p>Dr. Amolkumar Solanke Senior Scientist, NIPB, New Delhi Title: Development of blast resistance in rice by understanding the interaction between rice and Magnaporthe oryzae</p>	12:20 -12:35	
12:55-13:10	<p>Dr. Sribash Roy Senior Principal Scientist, CSIR-NBRI, Lucknow Title: Methylome Remodeling Under Elevated CO₂ in Two Populations of Arabidopsis Thaliana Originated at High and Low Elevation of West Himalayas</p>	12:35 -12:50	<p>Dr. Venkateswaralu Ronda Senior Scientist, IIMR, Hyderabad Title: Finger millet is ideal for desirable Calcium:Phosphorus ratio in diets</p>
		12:50 -13:05	<p>Dr. Sunil Kumar Principal Scientist, IIWBR, Karnal Title: Celiac antigenicity analysis of Indian wheat varieties using polyclonal antibody against gliadins</p>
13:10-14:00	<p>Lunch</p>		
CONCURRENT SESSIONS			
	Venue: Bharat Ratna C. Subramaniam Auditorium		Venue: Prithvi Hall
	V: Millets as Nutraceuticals		VI: Advances in Legumes & Oilseed Research
14:00-15:50	<p>Chair Dr. C. Tara Satyavathi, Director, ICAR-IIMR, Hyderabad</p>		<p>Chair Dr. Avtar K. Handa, Professor of Molecular Genetics, Purdue University, USA</p>
	<p>Co-Chair Dr. Shelly Praveen Former Head, Division of Biochemistry, ICAR-IARI, New Delhi</p>		<p>Co-Chair Dr. D. K. Yadava Assistant Director General (Seeds) ICAR, New Delhi</p>
	<p>Lead Lectures (22 minutes Talk + 3 minutes for Interaction)</p>		
14:00-14:25	<p>Prof. Rattan Yadav Professor of Plant Genetics, Aberystwyth University, UK Title: What makes millets special in treating type-2 diabetes and the way forward integrating such traits in crops varieties?</p>		<p>Dr. D. K. Yadava Assistant Director General (Seeds) ICAR, New Delhi Title: Biotechnological tools can help achieving self-sufficiency in oilseeds</p>
14:25-14:50	<p>Dr. C. Tara Satyavathi Director, ICAR-IIMR, Hyderabad Title: Transformation of Millets (Shree Anna): From Traditional Foods to Nutraceuticals</p>		<p>Dr. C. Bharadwaj Principal Scientist, IARI, New Delhi Title: Valorization of Genes in Developing Drought Tolerant Chickpeas</p>
14:50-16:00	<p>Oral Presentations (13 minutes Talk + 2 minutes for Interaction)</p>		
14:50-15:05	<p>Dr. Girish Kumar Mittal Assistant Professor, SKN Agriculture University, Jobner, Rajasthan Title: Genetic profiling of lipids and fatty acids in global collection of pearl millet germplasm for improved health benefits</p>		<p>Dr. Vinutha T Senior Scientist, IARI, New Delhi Title: Development of plant protein blends from chickpea-peanut-brown rice for balanced amino acid score and protein quality</p>
15:05-15:20	<p>Dr. Suneha Goswami Senior Scientist, IARI, New Delhi Title: Impact of thermal treatments on pearl millet's rancid behaviour rheological characteristics and nutritional bioaccessibility</p>		<p>Dr. Navin C. Gupta Senior Scientist, NIPB, New Delhi Title: Identification of new sources of resistance for Sclerotinia stem rot disease in oilseed Brassica</p>
15:20-15:35	<p>Dr. Avinash Singode Senior Scientist, ICAR-IIMR, Hyderabad Title: Protein content USP of Proso millet</p>		<p>Dr. Vishwanath R. Yalamalle Senior Scientist, IARI, New Delhi Title: Degradation of unsaturated fatty acids is associated with low storability in onion seed</p>

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15:35-15:50	<p>Dr. Kirankumar P. Suthar Assistant Professor, Navsari Agricultural University, Gujrat Title: Amino Acid Profiling of Little Millet: A Way to Boost Nutritional Quality</p>	<p>Dr. Neeraj Kumar Tiwari Scientist, IARI, New Delhi Title: Siphoning Novel Candidate Gene-Based Markers for Salinity Responsiveness in Chickpea (<i>Cicer arietinum</i> L.)</p>
15:50-16:30	Tea Break	
Venue: Bharat Ratna C. Subramaniam Auditorium		
16:30-17:00	Plenary Lecture	
	<p>Chair Dr. S. L. Mehta, President, SPBB, New Delhi</p>	
	<p>Speaker Dr. Sanjay Kumar, Chairman, ASRB, New Delhi</p>	
17:00-18:10	Student/Scientist/Industry-Academia Interface (Panel Discussions)	
	<p>Chair Dr. Raju Barwale, Chairman, Mahyco</p>	
	<p>Moderator Dr. Vinutha T Senior Scientist, IARI, New Delhi</p>	
	<p>Dr. Suneha Goswami Senior Scientist, IARI, New Delhi</p>	
	<p>Industry Panelists Ms. Shilpa Wadhwa, Nestle Mr. Abhiram Seth, AquaAgri Mr. Prashant Nanargikar, ISHA AGRO</p>	
	<p>Academia Panelists Dr. Sanjay Kumar, Chairman, ASRB, New Delhi Dr. Ajit Shasany, Director, NBRI, Lucknow Dr. Dayakar Rao B, CEO, Centre of excellence, Nutrihub IIMR, Hyderabad</p>	
<p>Student Panelists Mr. Vivek Saurabh (Ph.D.), Division of Food Science & Postharvest Technology, IARI, New Delhi Mr. Tamil Selvan S (Ph.D.), Division of Biochemistry, IARI, New Delhi Mr. Amit Kumar,(Ph.D.), Division of Plant Biotechnology, NIPB, New Delhi Mr. Aditya Thakur (M.Sc.), Department Of Chemistry, IIT, Jammu</p>		
18:10-18:50	Flash Talks	
	<p>Chair Dr. R. C. Bhattacharya, Director, ICAR-NIPB, New Delhi</p>	
	<p>Co-Chair Dr. S Sivakumar, Professor and Head, Department of Millets, TNAU, Coimbatore</p>	
18:10-18:15	<p>Ms. Arpitha, S. R. Ph.D. Scholar, ICAR-IARI, New Delhi Title: Synergy at Work: Probiotic Fermentation and Germination as a strategy to enhance potential functional properties of soymilk</p>	
18:15-18:20	<p>Ms. Varsha Mahadik Research Scholar, CSIR-NCL, Pune Title: RNA-mediated strategy to control Fusarium wilt of tomato</p>	
18:20-18:25	<p>Ms. Deepanyeta Goswami Ph.D. Scholar, ICAR- IARI, New Delhi Title: Carbohydrate Quality Indices in Minor Millets: Key Towards Functional Health Food</p>	
18:25-18:30	<p>Mrs. Antil Jain Project Associate, ICAR-NBPGR New Delhi Title: Developing Robust NIR Prediction Model for Selected Quality Traits in Wheat</p>	
18:30-18:35	<p>Ms. Deepika Singh Ph.D. Scholar, Regional Centre for Biotechnology, Haryana Title: Aliphatic glucosinolates pathway is cross-regulated by O-acetylation on plant cell wall polysaccharides in <i>Arabidopsis thaliana</i></p>	
18:35-18:40	<p>Dr. Deepika Sharma Ph.D. Scholar, Delhi University Title: Characterization of miRNAs regulating flowering time in rice</p>	
18:40-18:45	<p>Mr. Tamil Selvan S Ph.D. Scholar, ICAR- IARI, New Delhi Title: Biochemical and Molecular Insights into Enhanced Phosphorus Use Efficiency and Phytate Accumulation in Seed of Rice on Introgression of Pup1 QTL</p>	

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18:45-18:50	Dr. Vikas Mandal Research Associate, Guru Gobind Singh Indraprastha University, Delhi Title: G-protein alpha subunit (RGA1) mediated regulation of nitrogen-sensitivity and nitrogen use efficiency in rice
18:50-19:50	Poster Session-II
19:50-20:30	SPBB Annual General Body Meeting
20:30-21:00	Dinner
1st November, 2023	
Venue: Bharat Ratna C. Subramaniam Auditorium	
09:30-10:30	Plenary lectures (25 minutes Talk + 5 minutes for Interaction)
	Chair Prof. Deepak Pental, Former VC, Delhi University
	Speakers
09:30-10:00	Prof. Yunde Zhao Department of Cell and Developmental Biology, University of California, USA Title: Molecular mechanisms of auxin homeostasis (Virtual)
10:00-10:30	Dr. Balaram P. Former Director, Indian Institute of Science, Bangalore Title: Evolution and the Origins of Biology
10:30-11:00	Tea Break
SPBB - Springer Young Scientist Award presentations	
11:00-13:30	Chair Dr. R. M. Naik, Former Professor, MPKV, Rahuri
	Co-Chair Dr. V. K. Yadav, Former Director (Research) Sri Karan Narendra Agriculture University, Jobner
11:00-11:10	Ms. Simardeep Kaur Ph.D. Scholar, ICAR-Indian Agricultural Research Institute, New Delhi Title: Comparative miRNome and Transcriptome Analysis Reveal the Novel microRNAs Involved in Regulation of Gene Networks Under Terminal Drought Stress in Rice
11:10-11:20	Ms. Gayathri J Ph.D. Scholar, ICAR-Indian Agricultural Research Institute, New Delhi Title: Untargeted metabolomics study under future climatic conditions in Indian mustard pistil
11:20-11:30	Dr. Jafar K. Lone Project Assistant, ICAR-NBPGR, New Delhi Title: Identification of novel sources of drought tolerance in chickpea using morpho-physiological traits and metabolome profiling
11:30-11:40	Dr. Chintha Pradeepika Scientist, ICAR-Central Tuber Crops Research Institute, Kerala Title: Development of Nutrient-Packed Gluten-free Pancakes from Sweet Potato and Finger Millet
11:40-11:50	Mr. Aswin Reddy Chilakala Doctoral Student, National Institute of Plant Genome Research, New Delhi Title: Exploring the use of novel antifungal protein in combating dry root rot disease in chickpeas
11:50-12:00	Dr. Nitish Ranjan Prakash Scientist, ICAR-Central Soil Salinity Research Institute, Regional Research Station, Canning Town Title: Genetics of prolificacy in Sikkim Primitive maize unraveled through targeted QTL mapping and whole-genome resequencing-based DNA polymorphism
12:00-12:10	Mr. Vignesh Ponnuragan Student, TamilNadu Agricultural University, Coimbatore Title: Deciphering the function of OsNH2 gene in enhancing sheath blight disease resistance in rice via CRISPR/Cas9 technology
12:10-12:20	Dr. Shobhit Raj Vimal Dr. D. S. Kothari Postdoctoral Fellow, University of Allahabad, Uttar Pradesh Title: Insight in naturally grown Croton leaves core endophytic microbiota and endophyte Alcaligenes faecalis SSP8 mediated crosstalk between IAA and ACC deaminase in saline stress management in paddy seedlings
12:20-12:30	Dr. Phanikanth Jogam CSIR-Research Associate, Kakatiya University, Telangana Title: Genome engineering using CRISPR/Cas9 in Solanaceae crops to develop Tobamovirus resistance
12:30-12:40	Dr. Kapudeep Karmakar Assistant Professor, UBKV, West Bengal Title: Methylglyoxal produced by plant act as an antimicrobial molecule against non-typhoidal serovars of Salmonella during salinity stress

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12:40-12:50	<p align="center">Mr. Ashwinkumar Katal Ph.D. Scholar (6th year), ICAR-IARI, New Delhi</p> <p>Title: Enrichment of kernel oil through genomics-assisted pyramiding of dgat1-2 and fatb genes in multi-nutrient-rich maize hybrids</p>	
12:50-13:00	<p align="center">Mr. Ikkurti Gopinath PhD Scholar, ICAR-IARI, New Delhi</p> <p>Title: Biofortification of popcorn genotypes with higher lysine and tryptophan in kernels through genomics-assisted breeding for mutant opaque2 and opaque16 genes</p>	
13:00-13:10	<p align="center">Dr. Gouranga Upadhyaya SERB National Post Doctoral Fellow (N-PDF), Indian Institute of Science Education and Research, Kolkata</p> <p>Title: Birth of D-segment: A non-canonical warrior against abiotic stressors in plant dehydrins</p>	
13:10-13:20	<p align="center">Ms. Rubi Jain PhD, JNU, New Delhi</p> <p>Title: Integrated transcriptome and miRNome profiling reveals the regulatory network of seed size and oil content in Brassica juncea</p>	
13:20-13:30	<p align="center">Dr. Konsam Sarika Scientist, ICAR-RC, NEHR, Manipur Centre</p> <p>Title: In-Planta Haploid Induction Potential of CRISPR-CAS9 Edited CENH3 Variant in Tomato</p>	
13:30-14:30	Lunch	
CONCURRENT SESSIONS		
	Venue: Bharat Ratna C. Subramaniam Auditorium	Venue: Prithvi Hall
	VII: Functional Genomics And Regulatory Biology	VIII: Microbiome & Nanotechnology For Health
14:30-16:30	<p>Chair Dr. Swapan Kumar Datta, Former DDG (Crop Science), ICAR</p>	<p>Chair Dr. Balasubramanian Ramakrishnan Principal Scientist, Division of Microbiology, IARI</p>
	<p>Co-Chair Dr. Ramavtar Sharma, Principal Scientist, ICAR-CAZRI, Jodhpur & Vice President, SPBB</p>	<p>Co-Chair Prof. Archana Chugh Kusuma School of Biological Sciences, IIT Delhi, New Delhi</p>
	<p>Lead Lectures (22 minutes Talk + 3 minutes for Interaction)</p>	
14:30-14:55	<p align="center">Dr. N. K. Singh National Professor B.P. Pal Chair ICAR – NIPB, New Delhi</p> <p>Title: Genomics-assisted breeding of climate-resilient high-yielding rice cultivars</p>	<p align="center">Dr. Balasubramanian Ramakrishnan Principal Scientist, Division of Microbiology, IARI</p> <p>Topic: The Microbiome Connections: One Health and Our Planet</p>
14:55-15:20	<p align="center">Prof. Ashwani Pareek Director, NABI, Mohali</p> <p>Title: Learning lessons from a coastal wild rice: dissecting the novel suit of salinity tolerance mechanisms</p>	<p align="center">Prof. Archana Chugh Kusuma School of Biological Sciences, IIT Delhi, New Delhi</p> <p>Title: Peptidic nanocarriers and antimicrobials for crop improvement</p>
15:30-16:30	<p>Oral Presentations (13 minutes Talk + 2 minutes for Interaction)</p>	
15:30-15:45	<p align="center">Dr. Suresh Kumar Principal Scientist, IARI, New Delhi</p> <p>Title: Genomics and Epigenomics of Adaptive Plasticity: Growing Rice by Dry/direct-sowing under Fluctuating Environmental Conditions</p>	<p align="center">Dr. Dilfuza Jabborova Head of Laboratory, Institute of Genetics and Plant Experimental Biology, Kibray, Uzbekistan</p> <p>Title: Promotion of growth physiological properties and yield in turmeric using plant growth-promoting bacteria</p>
15:45-16:00	<p align="center">Dr. Niraj Agarwala Assistant Professor, Gauhati University, Assam</p> <p>Title: LncRNAs responsive to temperature stress conditions in tea plant</p>	<p align="center">Dr. Sandeep Kumar Scientist, National Institute of Secondary Agriculture, Namkum</p> <p>Title: A Journey of Isoflavones from Biosynthesis and Accumulation to Bioavailability</p>
16:00-16:15	<p align="center">Dr. Vidhu Sane Chief Scientist, CSIR-NBRI, Lucknow</p> <p>Title: A tomato heat shock factor alters root architecture by promoting lateral root growth and suppressing primary root through altered auxin sensitivity</p>	<p align="center">Dr. Reetu Mehta Assistant Professor, B.N. University, Udaipur</p> <p>Title: Role of human microbiome in maintaining human health</p>
16:15-16:30	<p align="center">Dr. Subodh Kumar Sinha Principal Scientist, NIPB, New Delhi</p> <p>Title: Functional validation of a high-affinity nitrate transport system of bread wheat (Triticum aestivum L.)</p>	<p align="center">Dr. Aditi Arya Associate Professor, Deenbandhu Chottu Ram University of Science and Technology, Murthal, Sonapat Haryana</p> <p>Title: Profiling of phytochemical attributes synthesis of silver nanoparticles and determination of antimicrobial efficacy from plant extract of Aegle marmelos L.</p>
16:30-18:00	<p>Valedictory Programme Venue: Bharat Ratna C. Subramaniam Auditorium</p>	
18:00 onwards	High Tea	

Proceedings of International Conference on Biochemical and Biotechnological Approaches for Crop Improvement

During 30th October – 1st November, 2023, Society for Plant Biochemistry and Biotechnology (SPBB) in association with ICAR-Indian Agricultural Research Institute, New Delhi, ICAR-National Institute for Plant Biotechnology, New Delhi and CSIR-National Botanical Research Institute, Lucknow organized an International Conference on Biochemical and Biotechnological Approaches for Crop Improvement ” at NASC Complex, New Delhi.

The IBBACI - 2023 objectives were to bring together a diverse group of researchers and academicians from around the world to address advances in research and present their research experience, as well as to provide a forum for them to discuss new ideas, encourage researchers to exchange and share their experiences, updates, and integrate novel crop improvement concepts, with the overarching goal of accelerating progress towards meeting the SDGs by 2030.

The IBBACI-2023 was inaugurated at Bharat Ratna C. Subramaniam auditorium, NASC Complex, New Delhi. Dr. Himanshu Pathak, Secretary, DARE & Director General, ICAR, presided as a chief guest of the inaugural session. Dr. T.R. Sharma, Deputy Director General (Crop Science), ICAR, New Delhi and Dr. A. K. Singh, Director, ICAR_IARI, New Delhi were present as guest of honors. The welcome address was given by Dr. Aruna Tyagi, Organizing Secretary & Head, Division of Biochemistry, IARI, New Delhi. The Presidential Address was given by Dr. S.L. Mehta, President, SPBB and Chair of the Conference. Brief address about IBBACI- 2023 was given by Dr. Ajit Kumar Shasany, Director, CSIR – NBRI Lucknow & Co-organizing Secretary and Vote of Thanks given by Dr. R.C. Bhattacharya, Director, ICAR-NIPB, New Delhi & Co-organising Secretary.

The inaugural session was followed by Dr. N.B. Das Memorial Lecture delivered by Prof. Rajeev K. Varshney (Murdoch University, Australia) in virtual mode. The session was chaired by Dr. T. Mohapatra, Chairperson, PPV &FRA, NASC, New Delhi and co-chaired by Dr. Kheya Bhattacharya, Former IFS Officer, New Delhi.

Prof. Rajeev K. Varshney talked on “Genomic solutions for enhancing global food security and ensuring agriculture sustainability”. He presented genomic discoveries and their applications for genetic analysis and breeding for developing high yielding, climate resilient and nutrition dense crop varieties in tropical legumes crops such as chickpea, pigeonpea and groundnut.

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He also discussed about the establishment of comprehensive genomic resources, draft genome assemblies, genetic and physical map, millions of molecular markers and efficient marker genotyping platforms in tropical legume crops. Dr. N.B. Das Memorial Lecture was followed by felicitation programme of Dr. S. L. Mehta, to honour his contributions in the field of biochemistry on his 70th Birthday.

This Proceedings of a IBBACI- 2023—in brief summarizes the key points made by the rapporteurs during the presentations in 8 different concurrent sessions, flash talk, panel discussion and SPBB-Springer Young Scientist Award presentation and discussions with chaired persons during each session.

The key points made by the rapporteurs during the presentations in IBBACI- 2023 has been summarized session wise as given below

Concurrent Session-I: Metabolic Pathway Engineering

The session was chaired by Dr. P. Anand Kumar and co-chaired by Dr. R. Srinivasan, commenced at 2:30 pm on the first day (30th October 2023) of the IBBACI-2023. The session included talks on the topics like metabolic engineering approaches to enhance the protein, oil and flavanol content in cereals and oilseeds for nutritional security. These approaches were discussed in detail to understand the regulatory mechanism involved in the biosynthesis of various biomolecules. In this session, two Lead lectures were delivered by Prof. Subhra Chakraborty (Director, NIPGR, New Delhi) and Dr. Ram Rajasekharan (Professor, Central University of Tamil Nadu, Thiruvarur).

Prof. Subhra talked on “Mining multi-omes to dissect the seed gene regulation and nutrient dynamics in cereal towards protein improvement”. She informed the house that 70% of PEM of Asia is in India and plants can play important role in alleviating the protein malnutrition. Since around 57% of dietary proteins are obtained from cereals, improving cereal proteins is required. She discussed about the protein dynamics during rice seed germination, metabolite distribution during seed development and how organellar cross-talk determines the protein/metabolite dynamics. She focussed on engineering AmA1 in rice and integrated proteo-metabolome analysis in rice seeds. She concluded that targeted proteins might work in coordinated fashion and attribute to increased protein synthesis and storage reserve accumulation that might have global implications for food and nutritional security.

Prof. Rajasekharan talked on “A novel soluble triacylglycerol biosynthetic pathway in yeasts and oilseeds”. He informed the house that his group has reported an alternative soluble pathway for TAG synthesis in oilseeds for the 1st time. Monoacylglycerol is an intermediate in triacylglycerol biosynthesis and is present both in cytosolic and membrane fractions.

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He also proposed that structural protein oleosin has functional role in the synthesis of membranous monoacylglycerols. He also gave a hint on the involvement of protein kinase in plant lipid metabolism. The metabolic engineering of oilseed crops will greatly increase our understanding of the regulatory mechanism involved in oil biosynthesis and assembly that would help in breeding for high oil yield in oilseed crops.

The lead lectures were followed by three oral presentations. Dr. Aruna Kilaru (Professor, East Tennessee State University, USA) talked on “Key Avocado Genes Cooperatively Enhance 18:1-TAG in Leaf Tissues”. Key genes involved in non-seed oil biosynthesis in avocado were identified by comparative transcriptomics. WRINKLED1 is the master regulator of seed oil biosynthesis. She informed the house that in avocado, both WRINKLED1 & 2 are active and induce the plastidial glycolysis and fatty acid biosynthesis genes. This study provides mechanistic differences in the transcriptional regulation of lipid biosynthesis among different plant species and also between seed and non-seed.

Dr. Ashutosh Pandey (Staff Scientist, NIPGR, New Delhi) talked on “Pathway engineering in food crops for enhancing nutritional value and food security”. He discussed the expression of CaMYB39 and its target gene CaFLS2 and the characterization of flavanols in trichomes. He informed that CaMYB39 activates the promoters of flavanol biosynthesis genes in chickpea protoplasts and the stable transgenic lines overexpressing CaMYB39 had distinct phenotype. CaMYB39 overexpression lines accumulate higher metabolite content than the control plants. A working model for the genetic manipulation of flavonoid biosynthesis in chickpea was also proposed which can be utilized for genetic manipulation for enhanced flavonoid biosynthesis in crops like tomato, chickpea and banana.

Dr. Yogendra Kalenahalli (Scientist, ICRISAT, India) talked on “Secondary cell wall thickening associated with the deposition of hydroxycinnamic acid amides and lignin to resist aflatoxin accumulation in groundnut”. The molecular and biochemical mechanisms underlying the resistance to aflatoxins are poorly understood. In this direction, he discussed on metabolomic studies to understand the biochemical mechanism of aflatoxin resistance in groundnut. The key resistance-related metabolites belonging to phenylpropanoids, flavonoids, fatty acids, alkaloids and terpenoid biosynthetic pathways were determined. Hydroxycinnamic acid amides and lignins showed the highest fold change in the resistance-related induced metabolites. These two metabolites strengthen and thicken the secondary cell walls and act as barrier to pathogen entry as proved by histochemical staining. Thus his talk was informative and this work will certainly help in minimizing aflatoxin contamination leading to food safety and better human health.

Concurrent Session-II: Advanced Molecular Tools for Crop Improvement: Genomics and Genome Editing

The session on "Advanced Molecular Tools for Crop Improvement: Genomics and Genome" chaired by Dr. Paramjit Khurana (Former Professor, DUSC, New Delhi) and co-chaired by Dr. J C Rana (Country Representative & National Project Coordinator UNEP-GEF Biodiversity International (Erstwhile IPGRI)), commenced at 2:30 pm on the first day (30th October 2023) of the IBBACI-2023. Both the chair and co-chair provided an insightful introduction to the session, emphasizing the significance of Advanced Molecular Tools for Crop Improvement: Genomics and Genome in Agriculture and Crop Improvement. The chair of the session introduced all the speakers of this session. There were three lead lectures and three oral presentations by the eminent scientists and researchers of India. In this session, two Lead lectures were delivered by Dr. Gitanjali Yadav (Scientist, NIPGR, New Delhi) and Dr. Swarup K. Parida (Scientist, NIPGR, New Delhi).

Dr. Gitanjali Yadav (Scientist, NIPGR, New Delhi) talked on "Deciphering Regulatory Landscapes of Green Algal CCM". She discussed how microalgae's responses to varying light and CO₂ levels, crucial for photosynthesis. She explored how microalgae activate defences against excessive light (photoprotection) and cope with low CO₂ (CCM) but lacked knowledge of specific gene regulators. Using extensive genetic data from *Chlamydomonas reinhardtii*, she constructed a gene network, revealing regulatory relationships. Her focus was identifying transcriptional regulators controlling photoprotection, aiming to improve understanding of potential applications in biofuel production.

Dr. Swarup K. Parida (Scientist, NIPGR, New Delhi) talked on "Next-Generation Molecular Breeding for A Food-Sufficient Future". Dr. Parida's research focuses on sequencing the genomes of food crops. This sequencing is crucial for understanding crop genetics and using that knowledge to enhance crop yield and productivity. His work aims to identify genes responsible for desirable traits, aiding in the development of improved crop varieties resilient to environmental stresses and with higher nutritional value.

Dr. Satendra Kumar Mangrauthia (Senior Scientist, IIRR, Hyderabad) talked on "CRISPR/Cas12a driven multiplex genome editing of a cytokinin regulator improves plant architecture and grain yield in rice". He discussed about climate change affects rice crops and how building resilience against stress becomes vital for sustainable production. Dr. Satendra employs CRISPR/Cas9 genome editing, offering a rapid alternative to time-consuming traditional breeding. This technique precisely targets genes, potentially securing our food supply by creating stress-resistant crop varieties.

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The lead lectures were followed by three oral presentations. Dr. Sachin Teotia (Associate Professor, Sharda University, Uttar Pradesh) presented on “A high-efficiency gene silencing in plants using two-hit asymmetrical artificial microRNAs”. He discussed the improved artificial microRNAs (amiRNAs) called "two-hit" amiRNAs and these redesigned molecules show better gene silencing than traditional amiRNAs. Dr. Sachin Teotia compares “two-hit” amiRNA technology with CRISPR/Cas9 and provides a web-based amiRNA designer for easy design and wide application in plants.

Dr. Manimekalai (Principal Scientist, SBI, Coimbatore) talked on “Genomic selection in sugarcane: unlocking the potential for sustainable sugarcane agriculture”. She emphasized the transformative impact of genomic selection on sugarcane farming. Through harnessing genetic data, this method facilitates precise breeding, enhancing yield, disease resistance, and adaptability to the environment. Ultimately, it fosters a more robust and efficient sugarcane production system, contributing to sustainability in agriculture.

Dr. Aniruddha Sane (Chief Scientist, CSIR-NBRI, Lucknow) talked on “A tomato EAR motif repressor controls plant developmental transitions through regulation of the GA pathway”. He focused on EAR motif repressor in tomatoes plays a crucial role in controlling plant developmental changes by regulating the Gibberellic Acid (GA) pathway. This regulation influences various transitions within the plant growth stages. His research manipulating these regulatory mechanisms could have implications for improving crop yield, fruit quality, and overall plant performance in agriculture.

All the topics including three lead lectures and three oral presentations were highly informative, shedding light on different functional genomics approaches to crop improvement and climate resilience in the face of global climate change.

Plenary Lectures- Day I

The session was chaired by Dr. A. K. Tyagi (Senior Professor , University of Delhi, South Campus, New Delhi) and commenced at 5.00 pm on the first day of the IBBACI-2023. The chair provided an insightful introduction to the session, and introduced the speakers of this session. There were two speakers Dr. T. R. Sharma (Deputy Director General (Crop Science), ICAR, New Delhi and Dr A. K. Singh (Director, ICAR-IARI, New Delhi).

Dr. T. R. Sharma (Deputy Director General (Crop Science), ICAR, New Delhi talked on “Biotechnological Applications in Agriculture for National Food Security”. He discussed the application of scientific methods in the growth and development of humanity throughout the world. He emphasises on the non-GM approaches for improving crop varieties including genomics and marker assisted selections. He also mentioned the application of pre-breeding, genomic selection, speed breeding and genome editing technologies for genetic enhancement of crops.

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Dr A. K. Singh (Director, ICAR-IARI, New Delhi) talked on “Molecular breeding for biotic & abiotic stress tolerance and quality improvement in cereals”. He presented about aroma, unique cooking quality and genetic improvement program of Basmati rice. He also discussed the incorporation of resistance gene/QTLs governing major biotic stresses such as bacterial blight, blast, bakanae and brown plant hoppers in the genetic background of popular Basmati rice varieties through marker assisted backcross breeding.

Plenary Lectures- Day II

The session was chaired by Prof. P. K. Gupta (Hon'ble Emeritus Profesor, Department of Genetics and Plant Breeding Ch. Charan Singh University, Meerut) and commenced at 9.30 am on the second day (31st October 2023) of the IBBACI-2023. The chair provided an insightful introduction to the session, and introduced the speakers. There were two speakers: Prof. Nigel George Halford (Rothamsted Research, Harpenden, UK) and Dr. Vedpal S. Malik (Agriculturist/Biotechnologist, Retd. US Department of Agriculture, USA).

Prof. Nigel George Halford (Rothamsted Research, Harpenden, UK) talked on “Low asparagine, low acrylamide CRISPR wheat: Europe’s first field trial of gene edited wheat in the context of rapidly changing regulations”. He discussed the knock out of the asparagine synthase-1 and 2 (TaASN1 and TaASN2) gene of bread wheat through CRISPR/Cas9 and concomitant decrease in acrylamide formation in edited lines under high temperature cooking.

Dr. Vedpal S. Malik (Agriculturist/Biotechnologist, Retd. US Department of Agriculture, USA) talked on “Oil seeds, Biofuels, Diverse crops, and Big Money through Technology”. He discussed various possibilities for enhancing cooking oil yields in Brassica and industrial oils in castor and also various possibilities for enhancing farmers income through the use of hydroponics in green houses and crop diversification.

Concurrent Session-III: Abiotic And Biotic Stress Tolerance

The session on "Abiotic and Biotic stress tolerance" chaired by Dr. Anil Grover (Senior Professor, Department of PMB, DUSC, New Delhi) and co-chaired by Dr. Kashchandra Raghothama (Purdue University, USA), commenced at 11.00 am on the second day (31st October 2023) of the IBBACI-2023. Both the chair and co-chair provided an insightful introduction to the session, emphasizing the importance and challenges of abiotic and biotic stress in agriculture and crop improvement. Chair of the session introduced all the speakers. There were four lead lectures and two oral presentations by the eminent scientists and researchers of India, UK and USA.

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Dr. Kashchandra Raghothama (Purdue University, USA) talked on “Phosphate Deficiency: A Major Abiotic Stress Impacting Global Agriculture”. Initially, he outlined the global scenario of phosphate deficiency and its consequential limitations in agriculture. Dr. Raghothama elaborated on the mechanisms for enhancing phosphate uptake through mycobacteria and phosphate-solubilizing bacteria, underscoring the significance of this approach. He also highlighted that the expression of the LePT1 transporter increases under deprived conditions, making it a potential target for improving phosphate availability. Additionally, Dr. Raghothama provided insights into the impact of high CO₂ levels and elevated temperatures on phosphate availability in tomatoes, demonstrating the broader implications of these environmental factors.

Dr. Manoj Prasad (Professor and JC Bose National Fellow, NIPGR) talked on “Hsp in Foxtail Millet for Imparting Climate Change Resilience in Cereals”. Dr. Prasad initiated his presentation by addressing global population trends in the context of the upcoming years and the 17 Sustainable Development Goals (SDGs) outlined by the United Nations. He emphasized the role of millet in promoting human health and explored the potential of replacing traditional cereals with millet. Dr. Prasad then delved into the diverse functions of Heat Shock Proteins (Hsp) in cereals and elucidated how the expression of Hsp from foxtail millet could contribute to enhance the resilience of cereals to climate change. He particularly highlighted the pivotal role of Hsp27, which is exclusive to C₄ plants and is localized in the chloroplast. By expressing Hsp27 in cereals, Dr. Prasad discussed its potential to confer resilience and adaptability in the face of changing climatic conditions.

Dr. Ranjan Swarup (Associate Professor, University of Nottingham, UK) talked on “Designer Root for Sustainable Agriculture and Abiotic Stress Tolerance”. Dr. Swarup showcased innovative strategies for engineering plant roots to enhance abiotic stress tolerance and optimize yield efficiency in agriculture. He illustrated the role of the AXR4 transporter in auxin transport, emphasizing its significance in conferring stress tolerance. Dr. Swarup provided insights into the subcellular localization of AXR4 in the endoplasmic reticulum (ER), showcasing its alpha and beta folded domains. This specific localization and structural configuration of AXR4 were highlighted as critical factors contributing to abiotic stress tolerance in plants. The presentation underscored the potential of designing roots to create resilient and stress-tolerant crops for sustainable agriculture.

Dr. Sona Pandey (Principal Investigator, Donald Danforth Plant Science Center, USA) talked on “Role of G Protein Signalling in Regulating Plant Agronomic Traits”. She provided an overview of the fundamental structure of the complete G protein and its individual components along with their specific functions. Dr. Pandey then delved into the role of G γ 1 and G γ 2 in conferring biotic stress tolerance in rice plants. She also elucidated the

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significance of the C-terminal domain of this protein. She highlighted the diverse functions of G proteins in plants, emphasizing their regulatory role in various developmental mechanisms. The presentation shed light on the intricate involvement of G protein signalling in shaping plant agronomic traits, offering valuable insights into potential strategies for enhancing crop resilience and productivity.

The lead lectures were followed by two oral presentations. Dr. Amol Solanki (Principal Scientist, ICAR-NIPB, New Delhi) presented on “Development of Blast Resistance in Rice by Understanding the Interaction between Rice and *Magnaporthe Oryzae*”. Dr. Solanki presented insights into the interaction between various defense genes and blast pathogens, shedding light on the mechanisms involved. He particularly focused on the Willebrand factor A gene family in rice and elucidated their crucial role in responding to biotic stress. The presentation contributed to a better understanding of the molecular interactions between rice plants and *Magnaporthe Oryzae*, offering valuable information for the development of blast-resistant rice varieties.

Dr. Sribash Roy (Senior Principal Scientist, CSIR-NBRI, Lucknow) talked on “Elevated CO₂ Methylome Remodeling in *Arabidopsis thaliana* at High and Low Elevation”. Dr. Roy discussed various methylation mechanisms and presented findings on the global DNA methylation status, highlighting its distribution across different regions of the genome. The talk provided insights into how elevated CO₂ levels impact the methylome of *Arabidopsis thaliana*, offering a comprehensive understanding of epigenetic modifications in response to environmental changes.

All the topics including four lead lectures and two oral presentations were highly informative, shedding light on different abiotic and biotic stress tolerance approaches to crop improvement and climate resilience in the face of global climate change.

Concurrent Session-IV: Plant Nutrition & Food Quality Enhancement

The session on " Plant Nutrition and Food Quality Enhancement," chaired by Prof. Nigel George Halford (Rothamsted Research, UK) and co-chaired by Prof. Rajesh Mehrotra (Department of Biological Sciences, BITS Pilani, Goa), commenced at 11:00 am on the second day (31st October 2023) of the IBBACI-2023. The co-chair and chair gave a perceptive opening to the session, highlighting the importance of improving food quality and plant nutrition. Chair of the session introduced all the speakers of this session. There were two lead lectures and five oral presentations by the eminent scientists and researchers of India, UK, Canada and USA.

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Prof. Avtar K. Handa (Professor, Purdue University, USA) talked on "Agriculture Biotechnology and Human Health and Longevity". Prof. Avtar K. Handa discussed that agriculture biotechnology, if used responsibly has a high potential to increase crop productivity and to develop methods of sustainable agriculture to ensure food security. He also addressed about the importance of phytonutrients and predominant method to develop cultivars with higher levels of phytonutrients.

Dr. Sijo Joseph (Research Scientist and Adjunct Professor, University of Manitoba, Canada) talked on "Enhancing the Quality and Nutritional Bioactivity of Canadian Oats". Dr. Sijo Joseph pointed out towards the potential bioactives present in oats including β -glucan, avenanthramides and significance of cultivar selection for achieving nutrition targets. He also highlighted that content and physicochemical properties of bioactives in oats can be enhanced through genotype X environment, milling and blending different fractions and processing.

The lead lectures were followed by five oral presentations. Dr. Ranjeet Ranjan Kumar (Senior Scientist, ICAR-IARI, New Delhi) presented on "Exploring the Potential Genes Responsible for Off-Odour Development in Pearlmillet Flour using De novo Transcriptomic Approach". Dr. Ranjeet discussed the reasons behind high rancidity, poor shelf life, less processed products and low remuneration of Pearl millet. His talk was focussed on the research carried out for identification of putative genes and proteins linked with rancidity via transcriptomic and proteomic approach. He highlighted the hydrothermal and near infra red rays treatment for reduction in rancidity in pearl millet flour to enhance the shelf life upto 6 months.

Dr. Somnath Mandal (Assistant Professor, UBKV, West Bengal) presented on "In depth Metabolite Profiling of Curcuma Species from Sub- Himalyan Terrain Plains of India Revealed its anti-diabetic and anti-fungal Potential". Dr. Somnath Mandal discussed about the role of curcumin in various biological functions. He also put forward the research carried out by him including estimation of various biochemical parameters such as curcuminoid content, total phenol and flavanoid content, iron content and antioxidant assay. He showcased turmeric extracts as a potential botanical fungicide for the agri-food industry. At the end he also shared a business model for turmeric cultivation/entrepreneurship in a cluster approach.

Dr. Veda Krishnan (Scientist, ICAR-IARI, New Delhi) presented on "Gut taste what we eat: Sorghum Proanthocyanidins and their Role In Gut-Brain Axis Activation Inducing Satiety". Dr. Veda presentation focused on identification of suitable flavanoids with amylase inhibitory effect as well as starch binding ability to delay digestion distally. Her research also highlighted the need for food scientists to focus on creating meals that help with weight management by providing the body with prolonged energy through a slow and steady release of glucose.

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Dr. Venkateswaralu Ronda (Senior Scientist, IIMR, Hyderabad) presented on "Finger millet is Ideal for Desirable Calcium:Phosphorus Ratio in Diets". Dr. Venkateswaralu Ronda focused on the significance of finger millet because of its high calcium content, low lipase activity, good grain storability, and flour stability. His studies concentrated on increasing bone metabolism through adequate calcium intake and the Ca:P ratio.

Dr. Sunil Kumar (Principal Scientist, IIWBR, Karnal) presented on "Celiac Antigenicity Analysis of Indian Wheat Varieties Using Polyclonal Antibody Against Gliadins". Dr. Sunil presentation stressed out that gliadin content was the major factor causing celiac disease and celiac disease causing potential of wheat is not different among varieties developed across different periods. He also focussed on development of wheat varieties with reduced antigenicity.

The lead lectures and the five oral presentations covered a wide range of subjects, all of which provided insightful information on various tools and strategies for enhancing plant nutrition and food quality.

Concurrent Session-V: Millets as Nutraceuticals

The session on " Millets as Nutraceuticals," chaired by Dr. C. Tara Satyavathi (Director, ICAR-IIMR, Hyderabad) and co-chaired by Dr. Shelly Praveen (Former Head, Division of Biochemistry, ICAR-IARI, New Delhi), commenced at 2:00 pm on the second day (31st October 2023) of the IBBACI-2023. Both the chair and co-chair provided an insightful introduction to the session, emphasizing the significance of millets as crop for future for providing food and nutritional security. Chair of the session introduced all the speakers. There were two lead lectures and four oral presentations by the eminent scientists and researchers of India and UK.

Prof. Ratan Yadav (Professor of Plant Genetics, Aberystwyth University, UK) talked on "What makes millets special in treating type-2 diabetes and the way forward integrating such traits in crop varieties". He discussed about the global issue facing the mankind due to type-2 diabetes (T2D). He presented data on how the phenotypic and genotypic data generated on the PMiGAP entries are being used in GWAS to identify SNPs associated with genetic variation for health benefitting traits and how such genetic variations are being bred in delivering novel pearl millet hybrids.

Dr. C. Tara Satyavathi talked on "Transformation of millets (Shree Anna): From traditional foods to nutraceuticals". She discussed about the climate resilient behaviour and adaptability of millets to variety of climatic conditions, millets use in traditional medicine, its potential defence against numerous lifestyle disorders such as obesity, constipation, impaired colon health, CVD etc. She also informed about the value addition and processing methods to open the path for young entrepreneurs.

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The lead lectures were followed by four oral presentations. Dr. Girish Kumar (Assistant Professor, SKN agriculture University, Jobner, Rajasthan) talked on “Genetic profiling of lipids and fatty acids in global collection of pearl millet germplasm for improved health benefits”. He told about the significant role of millet lipids in improving the hypoglycemic properties. He presented fatty acid profiling of 165 diverse pearl millet genotypes, where total lipid content ranged from 3.5 to 12.2%.

Dr Suneha Goswami (Senior Scientist, Division of Biochemistry, ICAR-IARI, New Delhi) presented “Impact of thermal treatment on pearl millet rancid behaviour, rheological characteristics and nutritional bioaccessibility. She discussed the effect of different thermal treatments such as hydrothermal, microwave and infrared treatment on pearl millet flour shelf life, rheological properties, digestibility and bioaccessibility of starch, phenolics, iron and zinc.

Dr. Avinash Singode (Senior Scientist, ICAR-IIMR, Hyderabad) talked on “Protein content USP of Proso millet”. He discussed about climate resilient behaviour and nutritional importance of Proso millet. He also talked protein content in proso millet varied from 11.6 to 21% and identify genomic loci associated with high protein and high yield.

Dr. Kirankumar P. Suthar (Assistant Professor, Navsari Agricultural University, Gujrat) discussed on “Amino Acid Profiling of Little Millet: A Way to Boost Nutritional Quality”. He presented amino acid profiling of 16 diverse little millet genotypes, showing higher amount of essential amino acids such as histidine, methionine, tryptophan, lysine, tyrosine and cysteine.

Concurrent Session-VI: Advances in Legumes & Oilseed Research

The session on “Advances in Legumes & Oilseed Research,” chaired by Dr. Avtar K. Handa (Professor of Molecular Genetics, Purdue University, USA) and co-chaired by Dr. G. P. Singh, (Director, ICAR-NBPGR, New Delhi), commenced at 2:00 pm on the second day (31st October 2023) of the IBBACI-2023. Both the chair and co-chair provided an insightful introduction to the session, emphasizing the importance of legumes and oilseed crops. Chair of the session introduced all the speakers of this session. There were two lead lectures and four oral presentations by the eminent scientists and researchers of India and USA.

Dr. D. K. Yadava (Assistant Director General (Seeds), ICAR, New Delhi) talked on "Biotechnological tools can help achieving self-sufficiency in oilseeds". He discussed about the advanced molecular biology and breeding techniques, different approaches of omics including genomics, transcriptomics, proteomics etc. and its application for increasing the yield oilseed crops.

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Dr. C. Bharadwaj (Principal Scientist, IARI, New Delh) talked on “Valorization of Genes in Developing Drought Tolerant Chickpeas”. He discussed about chickpea genotypes such as Pusa 1103, Pusa 362, and ICC 4958, which are the most promising genotypes for drought tolerance. He also emphasised on the developed tools and technology helpful for providing large scale genomic resources to the researches.

The lead lectures were followed by four oral presentations. Dr. Vinutha T (Senior Scientist, Division of Biochemistry, ICAR-IARI, New Delhi) talked on “Development of plant protein blends from chickpea-peanut-brown rice for balanced amino acid score and protein quality”. She told about the significant high quality plant proteins for vegan population. She presented the incorporation of steam infused protein blends (SIPB) in various food formulations owing to its better functional properties and enhanced protein quality.

Dr Navin C. Gupta (Senior Scientist, NIPB, New Delhi) presented “Identification of new sources of resistance for Sclerotinia stem rot disease in oilseed Brassica”. He discussed about the non-injury method of *S sclerotiorum* infection in Brassica, which cause stem rot (SR), a major fungal disease. The SR resistant Brassica cultivars identified in the study are being utilized for resistance gene mapping and its introgression into susceptible cultivars for developing SR resistance oilseed Brassica.

Dr. Vishwanath R. Yalamalle (Senior Scientist, IARI, New Delhi) talked on “Degradation of unsaturated fatty acids is associated with low storability in onion seed”. He presented fatty acid methyl esters (FAME) composition analysis of onion seeds, which revealed that onion seeds are rich in unsaturated fatty acid (92-99%) and saturated FA ranged only 1-7%.

Dr. Neeraj Kumar Tiwari (Senior Scientist, IARI, New Delhi) discussed on “Siphoning Novel Candidate Gene-Based Markers for Salinity Responsiveness in Chickpea (*Cicer arietinum* L.)”. He presented 20 SSR markers identified from salt responsive candidate genes in chickpea. He also discussed the potential of Cg-SSRs markers identified for varying responses to salt stress in chickpea genotypes.

Plenary Lectures- Day II

The session on " Plenary Lecture" chaired by Dr. S L Mehta (President, SPBB, New Delhi) and Speaker Dr. Sanjay Kumar (Chairman, ASRB, New Delhi), commenced at 4:30 pm on the second day (31st October 2023) of the IBBACI-2023. Dr. S L Mehta provided an insightful introduction to the session. Dr. Sanjay Kumar's plenary lecture provided a comprehensive overview of the agricultural landscape in India, encompassing various essential facets of this crucial sector. Moreover, Dr. Sanjay Kumar delved into recent advancements, shedding light on the transformative changes within Indian agriculture. He highlighted the integration of cutting-edge technologies, sustainable agricultural methodologies, and the current state of Indian agriculture and its potential future pathways

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Panel Discussions: Student/Scientist/Industry-Academia Interface

The session on "Student/Scientist/Industry-Academia Interface (Panel Discussions)" chaired by Dr. Raju Barwale (Chairman, Mahyco), commenced at 5:00 pm on the second day (31st October 2023) of the IBBACI-2023. Panel discussion sessions focused on the interface between students, scientists, and the industry-academia collaboration were highly enriching and informative. From Industry Ms. Shilpa Wadhwa (Nestle), Mr. Abhiram Seth (AquaAgri) and Mr. Prashant Nanargikar (ISHA AGRO), From Academia Dr. Sanjay Kumar (Chairman, ASRB, New Delhi), Dr. Ajit Shasany (Director, NBRI, Lucknow) and Dr. Dayaker Rao (CEO, Centre of Excellence, Nutrihub, IIMR, Hyderabad) and from students Mr. Vivek Saurabh (Ph.D, Division of Food Science & Post harvest Technology, IARI, New Delhi, Mr Tamil Selvan S (Ph.D, Division of Biochemistry, IARI, New Delhi, Mr. Amit Kumar (Ph.D, Division of Plant Biotechnology, NIPB, New Delhi and Mr. Aditya Thakur (M.Sc., Department of Chemistry, IIT, Jammu) were participated as panellist. Involvement of recent graduates who shared their perspectives on how academia prepares them for industry roles, what they seek from industry-academia collaborations, and their expectations regarding skill development and career pathways. Scientists discussed their experiences in collaborating with industry, challenges faced, and successful partnerships, and highlighted the need for translational research and interdisciplinary collaborations. Representatives from various industries discussed about how industry-academia collaborations benefit both sectors and also discussed funding opportunities for research initiatives.

Flash Talks

The "Flash Talks" session, held on the second day (31st October 2023) of the IBBACI-2023 at 6.10 pm, provided a platform for concise and informative presentations by ongoing PhD students from various institutions. The session was chaired by Dr. R.C. Bhattacharya (Director, ICAR-NIPB, New Delhi) and co-chaired by Dr. S. Sivakumar, (Professor and Head, Department of Millets at TNAU, Coimbatore). Each presentation was limited to 3 minutes, with pre-recorded videos showcasing the ongoing research work of Ph.D. students. The session featured a total of 7 flash talks, each delivering condensed yet substantial research insights.

Miss Arpitha S R (Ph.D. Scholar, ICAR-IARI, New Delhi) discussed her research, which focuses on enhancing the functional properties of soymilk through probiotic fermentation and germination, demonstrating the synergy of these approaches.

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Miss Varsha Mahadik (Research Scholar, CSIR-NCL, Pune) presented her work on a novel RNA-mediated strategy to control Fusarium wilt in tomato plants, highlighting the potential for disease management.

Mrs. Antil Jain (Project Associate, ICAR-NBPGR, New Delhi) discussed her research involving the development of a robust Near-Infrared (NIR) prediction model for specific quality traits in wheat, aiding in quality assessment.

Miss Deepika (Ph.D. Scholar, Regional Centre for Biotechnology, Haryana) presented her findings on the cross-regulation of the aliphatic glucosinolates pathway by O-acetylation on plant cell wall polysaccharides in *Arabidopsis thaliana*.

Dr. Deepika Sharma (Ph.D. Scholar, Delhi University) discussed her research focused on the characterization of miRNAs that play a role in regulating the flowering time in rice.

Mr. Tamil Selvan (Ph.D. Scholar, ICAR-IARI, New Delhi) highlighted his work on biochemical and molecular insights into improved phosphorus use efficiency and phytate accumulation in rice seeds through the introgression of *Pup1QTL*.

Dr. Vikas Mandal (Research Associate, Guru Gobind Singh Indraprastha University, Delhi) provided insights into the regulation of nitrogen sensitivity and nitrogen use efficiency in rice through the G-protein subunit (RGA1).

Plenary Lectures-Day III

The session was chaired by Dr. P V Sane FNA (Former Director, National Botanical Research Institute, Lucknow) and commenced at 9:30 am on the third day (1st November 2023) of the IBBACI-2023. The chair provided an insightful introduction to the session, and introduced the speakers. There were two speakers Professor Yunde Zhao from Department of cell and developmental Biology, University of California, USA and Dr Balaram P., Former Director, Indian Institute of Science, Bangalore.

Professor Yunde Zhao (Department of cell and developmental Biology, University of California, USA) talked on "Molecular mechanisms of Auxin homeostasis". Presentation was held in virtual mode. Dr. Zhao discussed the role of auxin inactivation pathways for plant developmental biology. He highlighted the function of PIN-1 and PID kinase in organogenesis of plants. He also elaborate on the gene editing technologies his lab has developed like, ribozyme- based gRNA production, transgene- killer CRISPR, RUBY reporter etc. At the end he concluded that the decreasing the number of functional PIN1 copies is sufficient to suppress the PID mutant phenotypes.

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Dr Balaram P. (Former Director, Indian Institute of Science, Bangalore) presented on "Evolution and the origins of Biology". He explains splendidly on the evolution and origin of biology. His presentation focussed the work on evolutionary biology from the perspective of all the great scientist of the field like Mendel, Darwin, and Monad etc. He also connects the link between the chemistry and cell biology by demonstrating various examples. He concluded his lecture on the three major pillars of modern biology which are, genetics, chemistry and evolution. He closed the session on a note for all scientific community to think about "Low Input, High throughput, no output" Biology.

SPBB - Springer Young Scientist Award presentations

The " SPBB - Springer Young Scientist Award presentations" session, held on the third day (1st November 2023) of the IBBACI-2023 at 11.00 am, provided a platform for concise and informative presentations by PhD students/Young Scientist/Research Associates from various institutions. The session was chaired by Dr. Ranjan Swaroop (Associate Professor, School of Biosciences, University of Nottingham, UK) and co-chaired by Dr. R. M. Naik, (Former Professor, MPKV, Rahuri). Each presentation was limited to 10 minutes. The session featured a total of 15 presentations, each delivering condensed yet substantial research insights.

Ms. Simardeep Kaur (Ph.D. Scholar, ICAR-IARI, New Delhi) presented on "Comparative miRNome and Transcriptome Analysis Reveal the Novel microRNAs Involved in Regulation of Gene Networks Under Terminal Drought Stress in Rice". She discussed her research, which focuses on the identification of novel miRNAs, which enrich the miRbase and useful for genetic improvement of rice for drought tolerance

Ms. Gayathri J (Ph.D. Scholar, ICAR-Indian Agricultural Research Institute, New Delhi) presented on "Untargeted metabolomics study under future climatic conditions in Indian mustard pistil". She emphasised that the future changing climate crucially impacted the pistil by altering the composition of metabolites, which are responsible for the emission of BVOCs .

Dr. Jafar K. Lone (Project Assistant, ICAR-NBPGR, New Delhi) presented on "Identification of novel sources of drought tolerance in chickpea using morpho-physiological traits and metabolome profiling". He discussed about the phenotyping of drought responsive morphological characteristic in chickpea.

Dr. Chintha Pradeepika (Scientist, ICAR-Central Tuber Crops Research Institute, Kerala) presented on "Biological elicitors to enhance wound healing responses in cut potato tubers". She discussed safe and effective postharvest treatment strategy to enhance wound healing response and mitigate wound induced potato tuber losses.

SPBB - Springer Young Scientist Award presentations

Mr. Aswin Reddy Chilakala (Doctoral Student, National Institute of Plant Genome Research, New Delhi) presented on “Exploring the use of novel antifungal protein in combating dry root rot (DRR) disease in chickpeas”. He presented the efficiency of eBg_9562 protein against DRR disease both in in-vitro and in-planta study and confer resistance to DRR infection in in-planta expression studies.

Dr. Nitish Ranjan Prakash (Scientist, ICAR-Central Soil Salinity Research Institute, Regional Research Station, Canning Town) presented on “Genetics of prolificacy in Sikkim Primitive maize unravelled through targeted QTL mapping and whole-genome resequencing-based”. He disused generation mean analysis (GMA) approach for major locus governing prolificacy in an inbred maize from Sikkim Primitive.

Mr. Vignesh Ponnurangan (Ph.D student, Student, TamilNadu Agricultural University, Coimbatore) presented on “Deciphering the function of OsNH2 gene in enhancing sheath blight disease resistance in rice via CRISPR/Cas9 technology”. He presented the role of OsNH2 gene in imparting sheath blight disease resistance in rice.

Dr. Shobhit Raj Vimal (Dr. D. S. Kothari Postdoctoral Fellow, University of Allahabad, Uttar Pradesh) presented on “Insight in naturally grown Croton leaves core endophytic microbiota and endophyte *Alcaligenes faecalis* SSP8 mediated crosstalk between IAA and ACC deaminase in saline stress management in paddy seedlings”. He discussed the core -endophytic microbial communities of naturally stressed plants role in developing microbiome assisted crop management by microbiome reengineering.

Dr. Phanikanth Jogam (CSIR-Research Associate, Kakatiya University, Telangana) presented on “Genome engineering using CRISPR/Cas9 in Solanaceae crops to develop Tobamovirus resistance”. He discussed the genotypic evaluation of TOM1 mutant lines having stable inheritance of the mutations in the subsequent generation of tobacco and tomato plants. The TOM1 edited tobacco lines conferred resistance to *tobacco mosaic virus*.

Dr. Kapudeep Karmakar (Assistant Professor, UBKV, West Bengal) presented on “Methylglyoxal (MG) produced by plant act as an antimicrobial molecule against non-typhoidal serovars of *Salmonella* during salinity stress”. He showed the implication of salinity-driven MG , prevent the entry of disease causing organisms into the food chain.

Mr. Ashwinkumar Katral (Ph.D. Scholar, ICAR-IARI, New Delhi) presented on “Enrichment of kernel oil through genomics-assisted pyramiding of *dgat1-2* and *fatb* genes in multi-nutrient-rich maize hybrids”. He discussed the development of high oil maize hybrid with multi-nutrients in kernels.

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Mr. Ikkurti Gopinath (PhD Scholar, ICAR-IARI, New Delhi) presented on "Biofortification of popcorn genotypes with higher lysine and tryptophan in kernels through genomics-assisted breeding for mutant opaque2 and opaque16 genes". He discussed the genomic assisted enhancement of protein quality in elite parental inbreds of superior popcorn hybrids viz Pusa popcorn hybrid-1 and 2 and two backcross generation marker assisted backcross breeding for introgression of recessive opaque 2 and 16 genes.

Dr. Gouranga Upadhyaya (SERB National Post Doctoral Fellow (N-PDF), Indian Institute of Science Education and Research, Kolkata) presented on "Birth of D-segment: A non-canonical warrior against abiotic stressors in plant dehydrins". He discussed how D-segment contribute in PpDHNA's protective aura in the cell interior to prevent stress induced aggregation.

Ms. Rubi Jain (PhD, JNU, New Delhi) presented on "Integrated transcriptome and miRNome profiling reveals the regulatory network of seed size and oil content in *Brassica juncea*". She discussed transcriptional and miRNA dynamics for the determination of seed size in *B juncea*.

Dr. Konsam Sarika (Scientist, ICAR-RC, NEHR, Manipur Centre) presented on "In-Planta Haploid Induction Potential of CRISPR-CAS9 Edited CENH3 Variant in Tomato". She discussed development of novel haploid induction system in tomato by targeting CENH3(+) gene through CRISPR-Cas9.

Concurrent Session-VII: Functional Genomics and Regulatory Biology

The session on "Functional Genomics and Regulatory Biology," chaired by Dr. Swapan Kumar Datta (Former DDG, Crop Science, ICAR) and co-chaired by Dr. Ramavtar Sharma (Principal Scientist, ICAR-CAZRI, Jodhpur & Vice President, SPBB), commenced at 2:30 pm on the third day (1st November 2023) of the IBBACI-2023. Both the chair and co-chair provided an insightful introduction to the session, emphasizing the significance of genomics and regulatory biology in agriculture and crop improvement. Chair of the session introduced all the speakers of this session. There were two lead lectures and four oral presentations by the eminent scientists and researchers of India.

Dr. N. K. Singh (National Professor, B. P. Pal Chair, ICAR-NIPB) talked on "Genomics Assisted Breeding of Climate Resilient High Yielding Rice Cultivars". He discussed the application of genomics in developing climate-resilient, high-yielding rice cultivars. His presentation emphasized the importance of genomics in addressing the pressing need for rice varieties that can thrive in changing environmental conditions.

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Professor Ashwani Pareek (Director, NABI, Mohali) talked on "Learning Lessons from a Coastal Wild Rice: Dissecting the Novel Suit of Salinity Tolerance Mechanisms". Professor Pareek shared insights from his research on salinity tolerance mechanisms in coastal wild rice. He highlighted functional genomics related technologies that can be applied to develop crops capable of thriving in saline environments, crucial for areas with salinity issues.

The lead lectures were followed by four oral presentations. Dr. Suresh Kumar (Principal Scientist, ICAR-IARI) talked on "Genomics and Epigenomics of Adaptive Plasticity: Growing Rice by Dry/Direct-Sowing Under Fluctuating Environmental Conditions". He discussed the genomics and epigenomics of rice growth under changing environmental conditions, particularly focusing on adaptability to dry/direct-sowing methods. His research provides insights into sustainable rice cultivation practices.

Dr. Niraj Agarwala (Assistant Professor, Gauhati University, Assam) talked on "lncRNAs Responsive to Temperature Stress Conditions in Tea Plant". Dr. Niraj discussed about the role of long non-coding RNAs (lncRNAs) in tea plants' responses to temperature stress conditions. His research sheds light on the molecular mechanisms underlying temperature stress responses and their implications for tea cultivation.

Dr. Vidhu Sane (Chief Scientist, CSIR-NBRI, Lucknow) talked on "A Tomato Heat Shock Factor Alters Root Architecture by Promoting Lateral Root Growth and Suppressing Primary Root Through Altered Auxin Sensitivity". Dr. Vidhu presentation focused on the influence of a tomato heat shock factor on root architecture. He highlighted how this factor promoted lateral root growth while suppressing primary root growth through altered auxin sensitivity, with potential applications in crop improvement.

Dr. Subodh Kumar Sinha (Principal Scientist, NIPB, New Delhi) talked on "Functional Validation of a High Affinity Nitrate Transport System of Bread Wheat". Dr. Subodh Kumar Sinha discussed the functional validation of a high-affinity nitrate transport system in bread wheat. His research has significant implications for improving nitrogen uptake, a critical factor in crop yield and nutrient efficiency in wheat cultivation.

Concurrent Session-VIII: Microbiome & Nanotechnology For Health

The session on "Microbiome and Nanotechnology For Health" chaired by Dr. Balasubramanian Ramakrishnan (Principal Scientist, ICAR-IARI, New Delhi) and co-chaired by Prof. Archan Chugh (Kusuma School of Biological Sciences, IIT Delhi, New Delhi), commenced at 2:30 pm on the third day (1st November 2023) of the IBBACI-2023. Both the chair and co-chair provided an insightful introduction to the session, emphasizing the importance of Microbiome and Nanotechnology in the field of agriculture and crop improvement.

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Chair of the session introduced all the speakers of this session. There were two lead lectures and four oral presentations by the eminent scientists and researchers of India and Uzbekistan.

Dr. Balasubramanian Ramakrishnan (Principal Scientist, ICAR-IARI, New Delhi) talked on “The Microbiome Connections: One Health and Our Planet”. He provided a definition of the microbiome and emphasized its significance in human health. Describing microbiomes as superorganisms, he underscored their role in enhancing both human health and agricultural productivity. Dr. Ramakrishnan highlighted the effectiveness of the apple microbiome in promoting good health and addressed their role in mitigating climate change-induced stress in plants.

Dr. Archana Chugh (Kusuma School of Biological Sciences, IIT Delhi, New Delhi) talked on “Peptide Nanocarriers and Antimicrobials for Human Health”. Dr. Chugh elucidated the features of peptides and their crucial functions in biotechnology. She emphasized the necessity of peptides for crop improvement and outlined various strategies for their application. Dr. Chugh also discussed how peptides can serve as nano carriers for enhancing crop improvement, showcasing their potential in agricultural biotechnology.

The lead lectures were followed by four oral presentations. Dr. Dilfuza Jabborova (Haed, Institute of Genetics and Plant Experimental Biology, Kibray, Uzbekistan) talked on “Promotion of Growth Physiological Properties and Yield in Turmeric Using Plant Growth-Promoting Bacteria”. Dr. Jabborova detailed the role of growth-promoting bacteria in enhancing the yield of turmeric. She highlighted how these bacteria contribute not only to increased yield but also to improved physiological properties of turmeric plants.

Dr. Sandeep Kumar (Scientist, ICAR-NISA, Ranchi) talked on “A Journey of Isoflavones: From Biosynthesis and Accumulation to Bioavailability”. Dr. Kumar provided a comprehensive explanation of the entire journey of isoflavones, encompassing their synthesis and accumulation in plants. He delved into the intricacies of isoflavone bioavailability, elucidating how various factors contribute to enhancing the bioavailability of these compounds. Dr. Kumar's presentation provided valuable insights into the multifaceted aspects of isoflavones, from their origin to their potential impact on health.

Dr. Reetu Mehta (Assistant Professor, B.N. University, Udaipur) talked on “Role of Human Microbiome in Maintaining Human Health”. Dr. Mehta eloquently presented the concept of the microbiome and its crucial role in human health. She highlighted the microbiome as a critical component in the human body, playing a significant role in determining overall health. Dr. Mehta emphasized that different bodies have their own unique microbiomes, influenced by the surrounding environment. The talk shed light on the importance of understanding and maintaining a balanced and healthy human microbiome for overall well-being.

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Dr. Aditi Arya (Assistant Professor, DCRUST, Sonipat) talked on “Profiling of Phytochemical Attributes, Synthesis of Silver Nanoparticles, and Determination of Antimicrobial Efficacy from Plant Extract of *Aegle marmelos* L.". Dr. Arya effectively explained the antimicrobial efficacy of the plant extract using various substrates. She conducted a comprehensive profiling of different phytochemicals present in the *Aegle marmelos* L. plant extract and demonstrated various activities associated with these compounds. The talk provided valuable insights into the potential applications of plant-derived compounds for synthesizing silver nanoparticles and their antimicrobial properties.



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