International Conference on

‘Emerging Technologies for Sustainable Agriculture’ on 6th and 7th January 2017

Department of Biotechnology and Microbiology, VPM’s B. N. Bandodkar College of Science, Thane, had organized second International conference on ‘Emerging Technologies for Sustainable Agriculture’ on 6th and 7th January 2017. The conference was held at Thorle Bajirao Peshwe Sabhagruha, VPM Campus, Thane.

Total **360 students and 53 faculty members from B. N. Bandodkar College of Science; and 27 participants from other institutions** participated in the International Conference.

The inaugural event that was compeered by Ms. Sayali Daptardar, Assistant Professor, Department of Biotechnology and Microbiology, began with national anthem depicted in a touching film describing farmers’ condition in India with a ray of hope in terms of biotechnological advancements. The film was conceptualized by Dr. Kalpita Mulye, Organizing secretary, ICONTESA and prepared by Mr. Nikhil Pahelkar, T.Y.B.Sc. student, Department of Biotechnology and Microbiology. Ceremony began by ‘Deepaprajwalana’ by and recitation of ‘Saraswati Vandana’ by Dr. Ashwini Tilak, Assistant Professor, Department of Biotechnology and Microbiology.

Convener of the conference, Honorable Principal Dr. (Mrs.) M. K. Pejaver, in her welcome address, explained the importance of pre-conference workshops for undergraduate students in terms of understanding research work at International level. She mentioned about the custom of B. N. Bandodkar College of Science to announce conference one year in advance and made a formal announcement of third International Conference of the College in January 2018 on ‘Green earth: a panoramic view’ to be organized by botany Department.

Dr. Kalpita Mulye, Organizing Secretary of the conference, in her brief address, highlighted the importance of modern technology for improving the agricultural yield and support Indian farmer. She also gave overview of the focused curricular and co-curricular activities undertaken by the department throughout the year based on the theme of the conference. She informed the gathering about the speakers for the preconference workshops and also about the preconference lecture series.

In his Chief Patron’s address, Dr. V. V. Bedekar, Chairman, VPM, stressed on the importance of ‘sustainability in agriculture’ with respect to Indian scenario. He discussed about overuse of chemical pesticides and fertilizers: a burning issue to be given a thought. He provoked the audience to think about ‘The Problem of Plenty’ that is leading to various health problems.

Chief Patrons address was followed by inauguration of the conference proceedings by Dr. Kai U. Totsche, Professor and Chair of Hydrogeology, Friedrich-Schiller-University, Jena, Germany. He delivered the key note address on the topic 'Biogeochemical Interfaces in Soil: Formation, Properties and Function'. His talk stressed on the role of the aggregate associated biogeochemical interfaces (BGI) for storage and turnover of water, elements, pollutants, and information. It also shed light on natural and artificial soils and studies on properties of BGI using spectro microscopic techniques. He also elaborated on the role of BGI for the fundamental functions of soils, which form the basis for all soil-based ecosystem services including plant productivity, water and air quality.

The key-note address was followed by technical sessions. The first technical session was chaired by Dr. M. A. Deodhar, associate Professor, Vaze kelkar College, Mumbai, India; while Dr. Bela Nabar, Associate professor, CHM College Ulhasnagar, India, was the rapporteur for the session.

The first invited talk during this session was by Dr. P. U. Krishnaraj, Professor and Head, Department of Agricultural Microbiology, College of Agriculture, University of Agricultural Sciences, Dharwad, India, who enlightened the gathering on 'Culturable Microbes and Metagenome of Plant Ecosystem for Sustainable Agriculture'. He discussed various issues in order to attain sustainable agriculture, like role of microbes in organic and inorganic soil, importance of change in rhizospheric flora for good soil health, control of plant pathogens and methods for improving chlorophyll content. He elaborated on the concept of 'soil engineering' to enhance the microbial activity, and in turn improve crop quality. He also highlighted on the development of valuable molecules using metagenomics tools with respect to global scenario.

The second invited talk was by Dr. Kavita Khadke, Warkem Biotech Pvt. Ltd., Mumbai, India. She spoke on topic 'Sustainable farming: Warkem Bioagri Solution for Sustainable Farming'. She highlighted various problems currently faced by farmers, and also gave detailed account of way out in the form of Portable Soil and Petiole Testing Kits, BioStimulant, BioFertilizers, BioPesticides, BioNematicides, Soil conditioners, Adjuvants, Agricultural Diagnostic kits, Insect attractants etc., developed by Warkem Biotech for sustainable agriculture. She elaborated on the importance of NPK value, and the portals that have been developed to inform the farmers about the same. She introduced to the gathering, the concept of 'chemical free products', e.g., to overcome the side effects of pesticides. She also explained the use of fungi to control nematodes.

Third speaker of the session, Dr. S. R. Torane, Deputy Director of Research and I/C PME cell, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth,, Dapoli, Maharashtra, India, enlightened the gathering on 'Role of Intellectual Property Rights (IPR) in Biotechnology'. Giving practical examples, he elaborated on different types of Intellectual Property Rights including Patents, Copyrights, Trademarks, Industrial designs, Integrated Circuits layout design, Geographical indications of goods, Biological diversity, Plant varieties and farmers rights, and trade secrets. He not only explained prerequisites for each of these IPRs, but also explained advantages and

drawbacks of each of them. He also discussed, in detail, different steps like patent application, specification, licencing etc. during patenting process.

The second technical session of the conference was chaired by Dr. P. U. Krishnaraj, Professor and Head, University of Agricultural Sciences, Dharwad, India. Dr. Lolly Jain, Assistant Professor, K. J. Somaiya College of Science and Commerce, Mumbai, India, was the rapporteur for the session. Ms. Vanita Gadagkar, Assistant Professor, Department of Biotechnology and Microbiology, compeered the session. The session comprised of two invited talks and four oral paper presentations by participants. The oral presentations were judged by Dr. Malali Gowda and Dr. Subhankar Roy Barman.

In his invited talk during the session, Dr. Subhankar Roy Barman, Associate Dean, Department of Biotechnology, National Institute of Technology, Durgapur, India, elaborated on 'Functional Analyses of G-Protein Coupled Receptors (GPCRS) in Rice Blast Fungus'. He gave in depth information on the rice blast disease caused by *M. oryyzae* and its use as a 'pathosystem'. He explained his state of art work that involved elucidation of Conserved Fungal extracellular Domain (CFED) and use of bioinformatics tools for 3D structure determination. He mentioned the significance of WISH gene of *M. oryyzae* in fungal pathogenicity, and also elaborated on extensive study of this gene using gene knockouts, targeted deletions, antisense RNA and RNAi technologies. He also threw light on the assays to investigate co-localization of WISH protein using confocal scanning laser microscopy.

The next brain storming speech was by Dr. Sukesh Zamwar, CEO, Buldana Urban Credit Co-op Society, Maharashtra, India. He spoke on the topic 'Buldana Urban: Social Banking Model'. Taking example of Buldana urban, the largest co-operative credit society in Asia Pacific region, and recipient of the prestigious CUMI award and NCUI award, he explained the importance of the social banking model. He elucidated the role of three innovative strategies, namely, 'four pillar system', 'closed loop economic system' and 'social banking', in making Buldana Urban Credit Co-op Society a success story. While explaining the Principle behind social banking: "people's money should be utilized for well being of people", he elaborated on various social activities undertaken by the society, like dam excavation to solve the water problem of Buldhana city and nearby villages and starting school at various places under Buldana Urban Charitable Trust. He mentioned innovative strategies like low cost spinning mill, water ATM etc. that have been developed. The audience was spellbound to know about various activities undertaken by the cooperative society, like, educating the children, ambulance facility, low cost housing, setting of agricultural laboratories, agricultural instruments' bank, introducing the concept of collective farming, creating jobs for youth and developing entrepreneurship.

The second day of the international conference began with Poster presentations by the participants. Fifteen participants presented their work in the form of posters displayed outside the auditorium, which were judged by Dr. Kai Totsche. Poster presentations were followed by recitation of the College song by Mr. Ashutosh Joshi, Assistant Professor, B. N. Bandodkar

College of Science, Thane. The third technical session of the conference was chaired by Dr. Subhankar Roy Barman, Associate Dean, Department of Biotechnology, National Institute of Technology, Durgapur, India. Dr. Minal Dukhande, Assistant Professor, G. N. Khalsa College of Arts, Science and Commerce, Mumbai, India, was the rapporteur for the session. Ms. Rucha Kulkarni, Assistant Professor, Department of Biotechnology and Microbiology, compeered the session.

The first talk of this session was by Dr. Asaph Aharoni, Department of Plant & Environmental Sciences, Faculty of Biochemistry, Weizmann Institute of Science, Israel, who spoke on 'Unravelling Plant Metabolism Through The Integration of Heterogeneous Data From Metabolomics, Genetics and Informatics'. His talk highlighted several advanced technologies and genetic research tools and the invaluable knowledge on core metabolic traits obtained through combining them in a single study. He mentioned that most of these could be applied in the coming years to the study of key traits in other, less studied plant species.

The next speech was by Dr. N. B. Gokhale, In-charge, Plant Biotechnology Centre, College of Agriculture Dapoli Dr. B. S. Konkan Krishi Vidyapeeth, Dapoli, on 'Molecular Markers and its Utilization for Enhancing Breeding Technologies'. He elaborated on different types of genetic markers. He explained in detail, various uses of molecular markers in diversity analysis, hybrid purity testing, sex determination in Kokam, virus detection in tissue culture developed banana plantlets using ELISA, development of salt tolerant rice variety through marker assisted selection, use of irradiation technique for creation of variability in nagli, and assessment of mutants through molecular markers.DNA fingerprinting of coconut varieties through ISSR markers.

The fourth technical session of the conference was chaired by Dr. Aruna K., Professor, Department of Microbiology, Wilson College, Mumabi, India. Dr. Tara Menon, In-charge, Department of Biotechnology, SIES College of Arts, Science and Commerce, Mumbai, India, was the rapporteur for the session. The session comprised of two invited talks and five oral paper presentations by participants. The oral presentations were judged by Dr. Malali Gowda and Dr. Subhankar Roy Barman. The session was compeered by Dr. Ashwini Tilak, Assistant Professor, Department of Biotechnology and Microbiology.

Dr. G. Archana, Department of Microbiology, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara Gujarat, India, elaborated on Modulation of Plant-Metal Interactions by Rhizosphere Bacteria. She threw light on the issue of high accumulation of metals, which in turn limits plant growth. Starting with basic concept of what heavy metals are, in her lucid speech, she explained the significant role played by plant growth promoting microorganisms in metal polluted environments, leading to minimum or no accumulation of the heavy metal in edible parts. She also elaborated on the attachment of Enterobacteria and Rhizobacteria to roots to give a synergistic effect in reducing Cd pollution and increasing the PGPR activity which is speculated to be due to modulation of phytohormones by the bacteria.

The next speaker of the session, Dr. Ashok P. Giri, Sr. Scientist, Plant Molecular Biology Unit, Division of Biochemical Sciences, CSIR-National Chemical Laboratory, India, addressed the gathering on the topic 'Crop protection from lepidopteran insect pests: Scope and challenges'. He explained the two- way interaction that occurs between the plant and pest, wherein the plant produces proteases to combat the pest, while the pest having different systems to combat the host. He explained the studies in his laboratory, for identifying several wound-inducible Pin-II proteinase inhibitors (PIs) with role in plant protection from insect attack. He shed light on studies on the structural and functional diversity of these, and their significance in designing crop protection strategies. He also explained advancement in formulating bioinsecticides using nano- or micro-based formulations to enhance activity, achieve greater stability and biodegradability. He also elaborated on the significance of characteristics like ionic strength, change in pH, surface charge, temperature, and particle aggregation in designing of PI-based bicontinuous microemulsions and silica-nanospheres. He also elaborated on his work on 'dietary pesticides' and their effects on *H. armigera* larvae.

The valedictory session was compeered by Dr. Ashwini Tilak. In his valedictory address, Dr. Malali Gowda, Professor, Transdisciplinary University (TDU), Foundation of Revitalization of Local Health Traditions (FRLHT), Bangalore, India, delivered lecture on the topic 'Genomics accelerated plant research in India'. He highlighted the point that though traditionally plant research plants are being used as such as food, medicine or cloth, over 98% of the Indian plant varieties has not been studied at the molecular level. Many plant species have got extinct from the wild and many are red listed due to large-scale deforestation. He explained the use of various present day technologies, including next generation sequencing (NGS) which have pushed the plant research from laboratory to land. He brought to notice the reduced cost of NGS technology and the improved speed of DNA sequencing over a million fold. He also mentioned that genomics and bioinformatics would help to understand the mechanisms behind disease resistance, drought, yield etc. and help produce designer plants with the help of genome-assisted molecular breeding.

Following the valedictory address by Dr. Gowda, winners of poster and oral presentations were announced. Ms. Zahera Momin and Ms. Vanita Gadagkar, Assistant Professors from B. N. Bandodkar College of Science, bagged prizes in oral presentation, while Ms. Chitra Nair, Assistant Professor, B. N. Bandodkar College of Science and Mr. Farhan Suraliwala, Department of Botany, SVKM'S Mithibai College, Mumbai, won the first and second prize in poster presentation.

Two participants of the conference, Ms. Vaishali Kamath, research student, Plant Biotechnology Department, R.J. College of Arts, Science and Commerce, Mumbai, India; and Ms. Ashwini Deshpande, Assist. Professor, Department Of Botany, SIES College of ASC, Mumbai-India, and Dr. P.U. Krushnaraj, invited speaker for the conference, expressed their views regarding the conference. They appreciated the organization of the conference with a special mention of enthusiastic and disciplined student volunteers.

In his concluding address, Dr. V. V. Bedekar, Chairman, VPM, congratulated the organizers for well planned organization of the conference. He pointed out the serious issue of wastage of food during gatherings and urged the students to avoid doing the same and be responsible citizens.

Dr. Jayashree Pawar, organizing Secretary of the conference, gave the vote of thanks. She precisely mentioned that identity of authors was not revealed while selecting papers for publication in proceedings, as well as judging process.

The workshop was concluded with the recitation of ‘Vande Mataram’. Feedback of the participants was collected. The event has been captured by recording the same.


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