

South Asia Biosafety Program

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BANGLADESH

Insights into the 10th International Plant Tissue Culture & Biotechnology Conference

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Opening ceremony of the 10th International Plant Tissue Culture & Biotechnology Conference 2022 (11 March 2023)

The Bangladesh Association for Plant Tissue Culture and Biotechnology (BAPTC&B) was established in 1989 to enhance plant tissue culture and biotechnological research activities in Bangladesh. Since its founding, BAPTC&B has continually worked to introduce cutting-edge technologies for micro-propagation and the biotechnological improvement of crops in Bangladesh. BAPTC&B has organized several international conferences since its inception in 1989 to promote plant biotechnology regionally and globally and to popularize this science to commercial entrepreneurs and policymakers. In addition, several workshops have been organized that have provided hands-on training in plant tissue culture, plant genetic transformation, and DNA markers for crop improvement. Due to these activities, BAPTC&B acts as a cohesive force to keep scientists aware of current trends in plant biotechnology, enabling them to put technological innovations to good use in crop improvement programs for the country's benefit.

BAPTC&B has also organized many seminars and workshops in biosafety for handling genetically modified organisms in collaboration with the Bangladesh Agricultural Research Council (BARC) and

several other research institutions and organizations. Moreover, this association helped to formulate the *Biosafety Guidelines of Bangladesh*. Several private labs have been formed in Bangladesh for the commercial production of various crops, including potatoes, bananas, strawberries, orchids, and other ornamentals, thanks to this association's efforts to attract the interest of private entrepreneurs. Among other activities, the association has been regularly publishing the scientific journal *Plant Tissue Culture and Biotechnology (PTC&B)* since 1991.

As a part of its many ongoing activities, BAPTC&B organized the 10th International Plant Tissue Culture & Biotechnology Conference in Dhaka on 11-13 March 2023. The University of Dhaka and Bangladesh Climate Change Trust (BCCT) supported the association in the organization of this conference. The theme of this conference was "Innovative Biotechnology for the 4th Industrial Revolution." The three-day international conference, which included several scientific sessions, a poster session, and a business session, was successfully conducted, with 140 registered national and international participants. An overview of the highlights of the conference is summarized on the following page.

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THE INAUGURAL CEREMONY

The Inauguration Ceremony was held at Nabab Nowab Ali Chowdhury Senate Bhaban, University of Dhaka, with the honorable Vice-Chancellor Prof. Dr. Md. Akhtaruzzaman as the Chief Guest. Prof. Dr. M. Imdadul Hoque, honorable Vice-Chancellor of Jagannath University, and Prof. Dr. Golam Kabir, honorable Vice-Chancellor of Sheikh Hasina University, also graced the ceremony with their presence as Special Guests. The Inaugural Ceremony opened with a welcome address by the President of BAPTC&B, Prof. Dr. Rakha Hari Sarker. Following the opening, a plenary lecture on the theme “Reviving the Technology of Muslin Yarn and Fabrics – The Golden Heritage of Bangladesh” was presented by Prof. Dr. Md. Monzur Hossain from the Department of Botany, Rajshahi University. Remarks were provided by the Special Guests and Chief Guest, all aligned with the theme and agenda of the international conference. The ceremony ended with a vote of thanks from the organizing secretary and general secretary of BAPTC&B, Prof. Dr. Mihir Lal Saha.

SCIENTIFIC SESSIONS

The scientific sessions commenced on the opening day, 11 March 2023. There were, in total, seven scientific sessions on different aspects of plant tissue culture and biotechnology that allowed scientists and researchers to present the results of their work. A total of 44 papers were presented throughout the conference, with four keynote speeches.

In the plenary lecture, Prof. Dr. Md. Monzur Hossain discussed their entire investigation into reviving the heritage of ‘Dhakai Muslin,’ which was lost almost 200 years ago. Specifically, he explained how they use both conventional and molecular methods to determine the ideal cotton variety (Phutee Karpas) from the local cotton germplasm to manufacture muslin fiber.

The keynote speeches emphasized the possible applications of plant genetic engineering, genome editing, and other pertinent approaches for improving major crops regionally and globally. Several findings were presented for developing abiotic and biotic stress tolerance in local crop plants. Apart from these, papers were presented that highlighted the present status of biosafety regulations for the release of genetically engineered crop plants.

POSTER SESSION

The poster session was opened by Prof. Dr. Rakha Hari Sarker, President of BAPTC&B, on 11 March 2023. A total of 47 posters were displayed throughout the conference. The three best posters were selected, and a certificate for “Best Presenter” was awarded to the following three winners:

- **1st Prize:** Nuram Mubina, Plant Breeding and Biotechnology Laboratory, Department of Botany, University of Dhaka (Development of Low Erucic Acid Containing Oilseed Brassica through Genome Editing)
- **2nd Prize:** Diptesh Biswas, Plant Biotechnology Laboratory, Post Graduate Department of Botany, Ramakrishna Mission, Vivekananda Centenary College, Rahara, Kolkata, India
- **3rd Prize:** Nazmul Islam, Department of Biotechnology, Bangladesh Agricultural University, Plant Breeding Division, Bangladesh Institute of Nuclear Agriculture (BINA)

BUSINESS SESSION

The scientific session and conference itself concluded with the business session. The session addressed the Annual General Meeting and the election of a new Executive Committee of BAPTC&B for 2023-2025.

BANGLADESH

Visit of the Core Committee Members of the National Technical Committee on Crop Biotechnology (NTCCB) to the National Institute of Biotechnology (NIB)

Md. Nazrul Islam, Scientific Officer, Plant Biotechnology Division, National Institute of Biotechnology



Members of the Core Committee of the NTCCB at the NIB (30 March 2023)

The National Institute of Biotechnology (NIB) is a statutory body under the Ministry of Science & Technology of the People's Republic of Bangladesh. NIB is a specialized institute for biotechnological research, technology transfer, and the creation of awareness about biotechnological products and processes. NIB facilities are outfitted with modern

equipment, as well as physical and research infrastructure. Genome analysis, DNA fingerprinting, gene cloning, fluorescence microscopy, and HPLC are among the capabilities at NIB that support genetic engineering and molecular biology research.

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NTCCB team visiting the NIB's greenhouse facility (30 March 2023).

Moreover, the Plant Biotechnology Division of NIB is involved in research to develop appropriate and sustainable agricultural technology for the country's benefit. This division has a well-equipped laboratory, with a tissue culture growth room, media preparation room, newly constructed automated greenhouse, screen house, hardening house, and experimental plots.

The research activities of this division include plant tissue culture, genetic engineering, gene expression and functional genomics, DNA fingerprinting of plants, marker-assisted selection, and crop management for pests and diseases. The division is also engaged in research using biotechnological tools to develop abiotic and biotic stress tolerance in crops and to innovate plants that are more productive, biofortified, disease-free, and tolerant to other environmental adversities.

The scientists at the Plant Biotechnology Division of NIB plan to research developing transgenic lines of rice and eggplant. Furthermore, the research teams at NIB are also planning to reproduce and conduct a performance test of some of the salt and drought-tolerant rice lines available under an agreement between NIB and the Department of Biochemistry and Molecular Biology, University of Dhaka. NIB has developed properly designed facilities (e.g., greenhouse and nethouse) in compliance with biosafety regulatory guidelines for carrying out contained trials (CT) of available transgenic lines.

Members of the Core Committee of the National Technical Committee on Crop Biotechnology (NTCCB) visited NIB on 30 March 2023 to evaluate the newly created facilities at NIB to conduct proposed contained and confined field trials (CFT) following the biosafety guidelines. For this visit, experts were invited, including Prof. Dr. Lutfur Rahman of the Department of Genetics and Plant Breeding, Bangladesh Agricultural University (BAU), Mymensingh, Dr. Mohammad Shamser Ali, former Director General of the Bangladesh Institute of Nuclear Agriculture (BINA), Mymensingh, and Dr. Md. Aziz Zilani Chowdhury, Member Director (PRL), Crops, Bangladesh Agricultural Research Council (BARC).

The research activities of this division include plant tissue culture, genetic engineering, gene expression and functional genomics, DNA fingerprinting of plants, marker-assisted selection, and crop management for pests and diseases.

The members of NTCCB and the invited specialists visited the newly constructed two-chambered greenhouse. During this time, they observed the transgenic research facilities. At that time, the NIB scientists, including the Director General of NIB, briefed them about their research project and the available facilities to conduct CT experiments.

The team also visited the net house facilities adjacent to the greenhouse. They were informed about soil composition and transplantation facilities for laboratory-grown transgenic plants. The experts had an in-depth discussion with the scientists at NIB about the possible requirements for the trial of transgenic plants. Following their visit to the greenhouse, the NTCCB team also visited the collection of fruit trees, tissue-culture-derived aloe vera, and cardamom fields at the Plant Biotechnology Division.

Following the visit, the members of NTCCB invited specialists, NIB scientists, and the Director General of NIB to hold a discussion and evaluation meeting. The inspection team expressed their satisfaction with the overall facilities in the greenhouse and nethouse, which are built in accordance with biosafety rules and regulatory guidelines.

During the discussion:

- i. It was observed that the laboratory, nethouse, and greenhouse facilities appeared suitable for conducting contained trials at NIB.
- ii. Following the SOPs for developing transgenic plants and for the contained trials was suggested.
- iii. The specialized team emphasized the proper disposal of waste materials from transgenic plants at the end of their trials (live or dead plants) and provided several related suggestions and recommendations. These included incineration or autoclaving of dead transgenic plants, followed by burying them in soil.
- iv. The visiting team also provided relevant suggestions regarding managing future CFTs at NIB.

The NTCCB team supported and encouraged the NIB scientists to perform transgenic research following the *Biosafety Guidelines of Bangladesh*.

CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE
INDIA			
XVI Agricultural Science Congress and ASC Expo	National Academy of Agricultural Sciences (NAAS)	October 10-13, 2023 Kochi	http://www.16asc2023.in
Training Programme on Recent Technological Advancements in Horticulture and Forest Crops	Department of Biotechnology, College of Horticulture, Dr. Yashwant Singh Parmar University of Horticulture and Forestry	December 23-30, 2023 Solani	https://www.yspuniversity.ac.in
INTERNATIONAL			
16 th ISBR Symposium	International Society for Biosafety Research	April 30-May 4, 2023 St Louis, MO, USA	https://isbr.info/symposium
International Conference on Gene-Edited Crops: Enabling Future Commercialisation and International Trade	Murdoch University, ISAAA Inc., and Malaysian Biotechnology Information Centre (MABIC)	April 26-27, 2023 Canberra, Australia	https://bit.ly/ICGED2023
BIO International Convention	Biotechnology Innovation Organization (BIO)	June 5-8, 2023 Boston, MA, USA	https://www.bio.org/events/bio-international-convention
6 th International Rice Congress 2023	International Rice Research Institute and Department of Agriculture, Republic of the Philippines	October 16-19, 2023 Manila, Philippines	https://www.irri.org/IRC2023-teaser.html



The South Asia Biosafety Program (SABP) is an international development program implemented in India and Bangladesh with support from the United States Agency for International Development (USAID). SABP aims to work with national governmental agencies and other public sector partners to facilitate the implementation of transparent, efficient, and responsive regulatory frameworks for products of modern biotechnology that meet national goals as regards the safety of novel foods and feeds, and environmental protection.

SOUTH ASIA
BIOSAFETY PROGRAM

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