

South Asia Biosafety Program

NEWSLETTER FOR PRIVATE CIRCULATION ONLY – NOT FOR SALE



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BANGLADESH

Workshop on Production and Marketing of Tissue Culture Based Planting Materials of High Value Crops

Dr. Md. Abdus Salam, Chief Scientific Officer (Crops), Bangladesh Agricultural Research Council



Figure 1: Inaugural Session of the Workshop on Production and Marketing of Tissue Culture Based Planting Materials of High Value Crops (March 2, 2020).

A day-long workshop on *Production and Marketing of Tissue Culture Based Planting Materials of High Value Crops* was held on March 2, 2020 at the Bangladesh Agricultural Research Council (BARC), Dhaka. Dr. Md. Aziz Zilani Chowdhury, Member Director (Crops), BARC, chaired the inaugural session and Dr. Shaikh Mohammad Bokhtiar, Executive Chairman, BARC was present as Chief Guest. A keynote paper titled *Research, Development, and Commercialization of Tissue Culture Based Plant Materials of High Value Crops in Bangladesh* was presented by Prof. Dr. Md. Mofazzal Hossain, Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU), Gazipur.

In his keynote presentation, Prof. Md. Mofazzal Hossain elaborated on the present status of plant tissue culture research and development at various public and private universities, research organizations, and business ventures in Bangladesh. He also discussed the importance and market value of these materials. During the latter part of his presentation,

he gave some recommendations and explained the challenges and opportunities of this technology.

Chief Guest, Dr. Shaikh Mohammad Bokhtiar, highlighted the importance of plant tissue culture technology in crop propagation, observing that not only is it a quick method of propagation, it is also able to produce disease-free planting materials. He explained the important contribution of this technology toward higher yields and profits, thus being of considerable significance in Bangladesh's agriculture-based economy. The Chief Guest suggested that the participants have discussions amongst themselves to arrive at recommendations, which will be taken to the relevant people, with the objective of improving agricultural productivity in Bangladesh.

The Chair, Dr. Md. Aziz Zilani Chowdhury, brought to attention the role played by basic research activities and publications in boosting potato cultivation in Bangladesh. He also urged that tissue culture technology be applied to cover more crops, such as its present expansion

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in the flower sector. All these efforts have contributed positively to the agriculture sector and economy of Bangladesh.

At the day-long program, there were two technical sessions, where a total of 22 research papers were presented. Following the technical sessions, a very interactive open discussion was held. The participants from various stakeholder groups raised issues and had discussions relevant to obtaining maximum benefits from this technology. The discussions culminated into a recommendation around the development of supportive policies and strong linkages among researchers and industries, in order to take advantage of tissue culture techniques.

In total, 120 participants from 34 organizations attended the workshop, including public bodies, such as the Bangladesh Agricultural Research Institute (BARI), Bangladesh Rice Research Institute (BRRI), Bangladesh Institute of Nuclear Agriculture (BINA), Bangladesh

Sugarcane Research Institute (BSRI), Bangladesh Jute Research Institute (BJRI), Bangladesh Tea Research Institute (BTRI), Cotton Development Board (CDB), Bangladesh Forest Research Institute (BFRI), Bangladesh Agricultural Development Corporation (BADC), Bangladesh Agricultural Research Council (BARC), Krishi Gobeshona Foundation (KGF), Project Implementing Unit of the Bangladesh Agricultural Research Council (PIU-BARC), National Agricultural Technology Program (NATP), Department of Agriculture Extension (DAE), BSMRAU, Bangladesh Agricultural University (BAU), Sher-e-Bangla Agricultural University (SAU), Rajshahi University (RU), Khulna University (KU), and University of Dhaka (DU), private sector organizations, such as BRAC, Square, ACI, Metal, Supreme Seed, Lal Teer, Ferdous Biotech, TFRD, and Gatco, and professional associations, such as the Association for Plant Tissue Culture and Biotechnology and Association for Applied Plant Tissue Culture in Bangladesh.

ANNOUNCEMENT

Regulatory Notifications in India Relevant to the Novel Coronavirus (COVID-19) Outbreak

In view of the Novel Coronavirus (COVID-19) pandemic, extensive efforts have been initiated in India for the development of diagnostics and vaccines using modern biotechnology. Advanced techniques such as reverse genetics, next generation sequencing, etc. are being used to shorten the time taken to develop vaccines as compared to conventional vaccines. Research institutions and private sector companies are actively engaged in using various strategies to ensure expeditious development and testing of vaccines and therapeutics.

To support all such initiatives, the Department of Biotechnology (DBT) and the Central Drugs Standard Control Organisation (CDSCO) have issued notifications to fast track regulatory approvals to deal with the applications for the development of vaccines, diagnostics, prophylactics, and therapeutics for COVID-19.

Rapid Response Regulatory Framework for COVID-19 by the Department of Biotechnology

Taking into account the rapid speed of COVID-19 in various countries and the need for immediate research and product development, it has been decided to fast track the regulatory approval process in consultation with DCG(I) to deal with the applications for development of vaccines, diagnostics, prophylactics, and therapeutics for COVID-19 as follows:

1. *Permission for Import/Exchange:* The Review Committee on Genetic Manipulation (RCGM) will approve an application fulfilling all essential criteria within 7 days from the date of receipt of the application, along with Institutional Biosafety Committee (IBSC) recommendation on the Indian Biosafety Knowledge Portal (IBKP).
2. *Permission for Initiating Research Work:* The RCGM will approve applications fulfilling all essential criteria within 7 days from the date of receipt of the application, along with IBSC recommendation on the IBKP.
3. *Examination of Physico-Chemical & Molecular Characterisation Data and Approval of the Animal Toxicity Protocol:* 10 days after submission of all essential data, PCT protocol and IBSC recommendations on the IBKP.
4. *Recommendation of RCGM for Appropriate Phase of Clinical Trial:* 10 days after submission of all essential Preclinical Toxicity Data.
5. *Approval of Form 29/Test License/NOC to Manufacturer by CDSCO:* within 10 days from the receipt of application.
6. CDSCO shall make a CORONA unit to address queries on development of diagnostics, prophylactics, and therapeutics for COVID-19 and will also provide a link on CDSCO portal in this regard.

For this purpose, an empowered committee of the RCGM and CDSCO has been constituted to examine the applications and to recommend the applications for approvals as per the agreed timeframe.

Notice from the Central Drugs Standard Control Organisation

In order to encourage research and development of drugs or vaccines for prevention or treatment of COVID-19, any application submitted to the CDSCO will be processed on high priority. Details for the guidance and regulatory pathway are as follows:

1. Any firm having an in vitro diagnostic kit under development for COVID-19 can directly approach DCG(I) through the Public Relations Office to seek guidance on the regulatory pathway.
2. Any firm having an in vitro diagnostic kit already approved for COVID-19 in any other country can directly approach DCG(I) through the Public Relations Office regarding expedited review/accelerated approval for marketing in India.
3. Data requirements for clinical performance evaluation, etc. may be abbreviated, deferred, or waived on a case-by-case basis, depending on the type and nature of the diagnostic kit, existing data on the product, and evidence of available clinical performance evaluation data of such a kit.
4. Applications to manufacture or import an in vitro diagnostic kit for testing, evaluation, and further use in performance evaluations may be processed on priority within 7 days.
5. Applications for conducting performance evaluations and applications to import or manufacture in vitro diagnostic kits for sale and distribution would be processed on priority through expedited review/accelerated approval.

For more information, please visit:

- <http://dbtindia.gov.in/latest-announcement/om-rapid-response-regulatory-framework-covid-19>
- https://cdsco.gov.in/opencms/opencms/system/modules/CDSCO.WEB/elements/download_file_division.jsp?num_id=NTc2OQ==

Training Workshops on Genome Editing

Dr. Vibha Ahuja, Biotech Consortium India Limited

Recognizing the importance of gene editing technologies, particularly CRISPR/Cas9, several institutions are organizing training programs and workshops for early-to-mid-career researchers and postdoctoral scientists in India. Some recent initiatives are highlighted below:

- National Agriculture Biotechnology Institute (NABI), Mohali organized the four-day workshop *Genome Editing Mediated by CRISPR/Cas9: Tools, Experimental Design, and Applications* on November 4-7, 2019. During this workshop, participants were exposed to the basics of CRISPR/Cas9 technology and its application through hands-on experience in designing guide RNA (gRNA), its validation through transection, transfection, and transformation studies in animal cell lines and plant cells. The workshop was a combination of lectures and laboratory work. Lectures were given by senior scientists from NABI and external experts from institutions engaged in research involving gene editing, such as the Indian Institute of Science and the National Institute of Plant Genome Research.

For more details, visit: <https://nabi.res.in/site/news-detail?id=232>

- The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad organized the two-week *Workshop on Gene Editing* on October 14-25, 2019. Twenty crop scientists from Asia and Africa were trained on gene-editing tools during the workshop. Participants were from India, the Philippines, Vietnam,

Taiwan, Thailand, Malaysia, Egypt, Senegal, Kenya, and Rwanda. Specific sessions were conducted on designing strategies for gene editing, basic gene-editing workflows, cloning of gRNA, and their delivery in plant cells. The trainees also had an opportunity to visit the National Institute of Animal Biotechnology (NIAB), Hyderabad, to acquaint themselves with applications of gene editing in livestock improvement. During the two-week training program, a number of national and international experts served as resource persons, discussing various tools, methodologies, and applications of emerging gene-editing technologies in agriculture. The participants learned about workflows with bioinformatics, cloning and genetic transformation, and screening skill sets, to help them prepare to run successful gene-editing applications in their respective programs.

For more details, visit: <https://www.icrisat.org/workshop-on-gene-editing-held-at-icrisat>

- The Institute of Genomics and Integrative Biology, Delhi will be organizing the 4th *CRISPR/Cas9 Based Precision Genome Editing Hands-On Workshop* from April 27-May 1, 2020. At this workshop, participants will be provided with hands-on training on how to use this technology for precisely manipulating their own targets, starting from design to experimentation and subsequent analysis

For more details, visit: <http://crispr.igib.res.in>

ANNOUNCEMENT

Scientists from the National Institute of Plant Genome Research and Indian Institute of Pulses Research Develop a Drought Tolerant Variety of Chickpea



Scientists from Department of Biotechnology's New Delhi-based National Institute of Plant Genome Research, University of Hyderabad and Indian Institute of Pulses Research have developed a genetically modified (GM) chickpea variety that shows high drought tolerance and high iron and zinc content in seeds by reducing the level of a plant growth substance called cytokinin in the root.

Two major plant hormones, auxin and cytokinin, regulate root development. The researchers expressed a gene for an enzyme called cytokinin oxidase 6 (CKX6) that degrades cytokinin under a root-specific promoter (PWRKY31) in chickpea. The gene and the promoter were from chickpea itself.

The study showed that reduction in cytokinin level resulted in increased root length and branching, enabling the plant to acquire water and nutrients from deep in the soil during drought. As the plants were able to acquire more resources from the soil, they lived longer and produced more seeds. GM chickpea lines also showed high iron and zinc in seeds due to low root cytokinin and longer and highly branched roots.

The study demonstrated that enhancing the root network by local manipulation of cytokinin levels might be an effective approach, along with conventional breeding, to alleviate yield loss in chickpea and other indeterminate legume crops in drought conditions.

These research findings are extremely relevant for India as the highest chickpea producing country in the world. It is grown mainly in semi-arid regions during the post-monsoon season and face drought during flowering, leading to huge drops in yield. There is a serious need to develop high-yielding chickpea varieties that can tolerate periodic water-deficit conditions and possess higher seed mineral content for nutritional benefit.

Source : <https://vigyanprasar.gov.in/isw/Scientists-develop-new-drought-tolerant-chickpea-variety.html>

CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE
INDIA			
Hands On Training in Tissue Culture in Banana	Business Entrepreneurship & Start-Up Support through Technology in Horticulture (BESST-HORT), a Technology Business Incubator of ICAR-Indian Institute of Horticultural Research	April 21-25, 2020 Bengaluru	https://iihr.res.in/five-days-training-programme-%E2%80%9Ctraining-tissue-culture-banana-21st-25th-april-2020-icar-iihr?
International Symposium on Spices as Flavours, Fragrances & Functional Foods	Indian Society of Spices, Indian Society of Seed Spices, and Spice Board, in collaboration with ICAR and ICAR Institutions	May 6-9, 2020 Kerala	https://icar.org.in/sites/default/files/SYMSAC-X-Brochure-min.pdf
6 th Agricultural Graduate Students' Conference (AGSC 2020)	Tamil Nadu Agricultural University	May 7-8, 2020 Coimbatore	https://sites.google.com/tnau.ac.in/agsc2020/
INTERNATIONAL			
14 th Meeting of the Liaison Group on the Cartagena Protocol on Biosafety	Secretariat of the Convention on Biological Diversity	April 20-23, 2020 Online	https://www.cbd.int/meetings/?thm=CPB
24 th Meeting of the Subsidiary Body on Scientific, Technical, and Technological Advice	Secretariat of the Convention on Biological Diversity	August 17-22, 2020 Montreal, Canada	https://www.cbd.int/meetings/?thm=CPB
3 rd Meeting of the Subsidiary Body on Implementation	Secretariat of the Convention on Biological Diversity	August 24-29, 2020 Montreal, Canada	https://www.cbd.int/meetings/?thm=CPB
7 th Plant Genomics and Gene Editing Congress: Asia	Global Engage Ltd.	September 14-15, 2020 Bangkok, Thailand	http://www.global-engage.com/event/plant-genomics-asia/
10 th Meeting of the Conference of the Parties Serving as the Meeting of the Parties to the Cartagena Protocol on Biosafety	Secretariat of the Convention on Biological Diversity	October TBD, 2020 Kunming, China	https://www.cbd.int/meetings/?thm=CPB
The 3 rd Asian Horticultural Congress 2020 (AHC 2020)	Horticultural Science Society of Thailand, International Society for Horticultural Science, Department of Agriculture, Department of Agricultural Extension, Ministry of Agriculture, Kasetsart University, and VNU Exhibitions Asia Pacific	December 15-17, 2020 Bangkok, Thailand	http://ahc2020.org/



SOUTH ASIA
BIOSAFETY PROGRAM

The South Asia Biosafety Program (SABP) is an international developmental program implemented in India and Bangladesh with support from the United States Agency for International Development. 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.



CONTACT SABP

BANGLADESH

Dr. Aparna Islam
Country Manager
South Asia Biosafety Program
c/o CIMMYT
House-10/B, Road-53, Gulshan-2
Dhaka-1212, Bangladesh
Email: aparnaislam@southasiabiosafety.org

UNITED STATES

Ms. Layla Tarar
Communications Manager
ILSI Research Foundation
740 Fifteenth Street NW, Suite 600
Washington, DC 20005, USA
Email: ltarar@ilsr.org
Twitter: @ILSIRF

INDIA

Dr. Vibha Ahuja
Chief General Manager
Biotech Consortium India Limited
Anuvrat Bhawan, 5th Floor
210, Deendayal Upadhyaya Marg
New Delhi 110 002, India
Email: vibhaahuja.bcil@nic.in

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