

**SECOND WORKSHOP ON TISSUE CULTURE OF ECONOMIC PLANTS,
BANGLADESH COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH,
DHAKA (BANGLADESH), OCTOBER 4-7, 1999**

PARTICIPATING COUNTRIES : 10 (INCLUDING 9 MEMBER COUNTRIES OF THE CENTRE)

NUMBER OF PARTICIPANTS : 19

Most of the developing countries are rich in tropical flora, which serves as the foundation for medicinal, pulp and paper, sugar, floriculture and food industry and used for fuel, furniture, etc. With deforestation taking place at a fast pace in developing countries leading to environmental imbalance, extinction of species and genetic erosion, there is a need to use new biotechnological tools like genetic engineering and tissue culture for micro-propagation and conservation. The Governing Council of the Centre has therefore accorded high priority to the subject of the tissue and genetic engineering as part of the Centre's Biotechnology programme.

The NAM S&T Centre had organised a workshop on Tissue Culture of Economic Plants during April 1994 at National Chemical Laboratory, Pune, reported under Item III.5 above, which was attended by the representatives of a number of member countries. The workshop had recommended that another workshop on the subject may be organised by the Centre after a few years to review the latest developments and techniques developed on tissue culture and that a publication on Tissue Culture of Economic Plants including Gene Transfer Technology may also be brought out by the Centre. The Centre in pursuance commissioned and brought out the publication on 'Tissue Culture of Economic Plants including Gene Transfer Techniques', which was released in 1998.

The 2nd International Workshop on Tissue Culture of Economic Plants was organized during October 4-7, 1999 at the Bangladesh Council of Scientific & Industrial Research (BCSIR), Dhaka (Bangladesh) with the support of the Ministry of Science & Technology, Government of Bangladesh and cooperation of the Department of Botany of the University of Dhaka (DU). The Asian and Pacific Centre for Transfer of Technology (APCTT) co-sponsored this workshop.

The 4-day workshop was attended by representatives from Bangladesh (Mr. Hasem Sarkar, Mr. M.A. Quddus and Mr. Maruf Murshed of the Ministry of Science & Technology in Dhaka, Prof. Z.N. Tahmida Begum and Prof. M.M. Haque of the University of Dhaka, Dr. Ferdosi Begum of the Development of Biotechnology and Environmental Conservation Centre in Dhaka, Dr. Ratan Lal Banik of Bangladesh Forest Research Institute in Chittagong and Dr. Rahima

Khatun and Ms. Miskat Ara Akhter Jahan of the Bangladesh Council of Scientific & Industrial Research in Dhaka), Bhutan (Mr. Gem Tshering of Druk Seed Corporation in Paro), Egypt (Dr. Ibrahim Abdel Maksoud of the Genetic Engineering & Biotechnology Research Institute in Cairo), Indonesia (Mrs. Dra Netty Widyastuti Msi of the Centre for the Assessment and Application of Biotechnology Office in Jakarta), India (Dr. Mrs. R.S. Nadgauda of the National Chemical Laboratory in Pune and Dr. Jitendra Prakash of Invitro International Pvt. Ltd. in Bangalore), Mauritius (Mr. Nitish Gopaul of the Ministry of Agriculture / Horticulture in Beav Bassin), Nepal (Dr. Bijaya Pant of Tribhuvan University), Pakistan (Dr. Tayyab Hussain of the Centre for Applied Molecular Biology in Lahore), Sri Lanka (Mr. B.D. Pathinayake of Rice Research and Development Institute in Ibbagamuwa) and Thailand (Dr. Chalernpol Kirdmanee of the National Science and Technology Development Agency in Bangkok). While all others were sponsored by the NAM S&T Centre and the Government of Bangladesh, the participants from Nepal, Sri Lanka and Thailand were supported by APCTT. The nominated participant from Zambia could not attend this workshop.

Prof. Syed Hadiuzzaman, Prof. Rakha Hari Sarker, Prof. Zeba Islam Seraj, Prof. Mofazzal Hossain, Prof. S. K Roy, Dr. S.K Bhadra, Dr. Ratan Lal Banik, Dr. Rahima Khatun, Dr. Asma Khatun and Dr. Ferdosi Begum from Bangladesh and Dr. (Mrs.) R.S. Nadgauda of the National Chemical Laboratory (NCL), Pune, Dr. Jitendra Prakash of Invitro International Pvt. Ltd, and Dr. V. Siva Reddy of the International Centre for Genetic Engineering & Biotechnology (ICGEB) from India constituted the faculty for the workshop.

Prof. N. Shamsul-Huq, former Vice-Chancellor of Dhaka University, inaugurated the Workshop. The function was presided over by Mr. M. Fazlur Rahman, Secretary, Ministry of Science & Technology, Government of Bangladesh. Dr. (Mrs.) R.S. Nadgauda from NCL, Pune, India delivered the Keynote address entitled 'Tissue Culture - From Concept to Discipline' during the inaugural session. She dealt with the technology developed at NCL for micro-propagation in particular of forest species, which has attained a capacity of 1 million plantations per annum and with survival rate in the field being 93%. Prof. Mosihuzzaman, Chairman, Bangladesh Council of Scientific & Industrial Research (BCSIR), Mr. K.N. Johry, Director of the NAM S&T Centre and Mr. N. Srinivasan of APCTT also spoke. The underlying message of the speeches by the distinguished speakers was the concern that developing countries, though having comparatively cheap labour cost in their favour, have not been able to take full advantage of the technology both for internal and international market which is expanding at a fast rate and that there was a need to improve their productivity.

The workshop dealt with various aspects of tissue culture and genetic

engineering of economic plants and included presentations on application of genetic engineering for crop improvement, role of DNA markers in crop improvement, propagation of banana plantlets: problems and prospects, potato micro-tuber production and its commercial exploitation, improvement of vegetables in vitro culture, micro-propagation of vegetables, micro-propagation of bamboos: its problems and prospects, use of in vitro techniques for the propagation and conservation of medicinal plants, tissue culture of Neem trees, tissue culture of Jute, problems and prospects in orchid by tissue culture and commercialisation of orchid by tissue culture. The programme also included laboratory demonstrations at the Bangladesh Council of Scientific & Industrial Research (BCSIR) and Botany Department of the University of Dhaka, apart from the field visit to the commercial farms. Country Papers were presented on the state of tissue culture development in participating countries by Mr. Gem Tshering (Bhutan), Mrs. Dr. Netty Widyastuti (Indonesia), Dr. Ibrahim Abdel Maksoud (Egypt), Mr. Nitish Gopaul (Mauritius), Dr. Bijaya Pant (Nepal), Dr. Tayyab Hussain (Pakistan), Mr. B.D. Pathinayake (Sri Lanka) and Dr. Chalermopol Kirdmanee (Thailand). The Country Reports from India by Dr. Vibha Dhawan and Zambia by Ms. Shirley Handia Ng' Andu were also circulated.

At the concluding session Mr. M. Fazlur Rahman, Vice-President of the Centre and Secretary to the Government of Bangladesh in the Ministry of Science & Technology delivered the valedictory address and awarded certificates to the participants.

A set of recommendations were adopted as below at the concluding session:

- i. All participating members and other developing countries are urged to develop appropriate technological base to acquire, absorb, develop and disseminate knowledge in biotechnology for a sustainable and self-reliant economy.
- ii. National biotechnological policy, guidelines and strategies may be formulated by the government of the respective member countries for providing a planned, meaningful and sustained R&D on biotechnology that contributes to their food, health and environmental security.
- iii. The member countries are urged to prioritise biotechnological research and identify thrust areas in accordance with their own national priorities. The priority in biotechnological research may include the agenda for meeting the basic needs of the people.
- iv. Plans may be drawn up for use of biotechnology for sustainable agriculture conservation of biodiversity, and germ plasm, conservation of different ecosystems, containment of deforestation and land degradation

- and such other issues confounded by the developing countries. The developing countries may undertake special programmes for protection, preservation and expansion of their threatened precious medicinal plants.
- v. Specific national programmes may be drawn up for replenishing fossil fuel by a programme of speedy creation of biomass through biotechnology.
 - vi. The R&D laboratories and Universities may be encouraged to go for transfer of technology and commercialisation of their R&D efforts and appropriate policy guidelines elucidating modalities for such transfer of technology and commercialisation and incorporating incentives thereto may be framed up at the national level.
 - vii. International, regional and sub-regional cooperation programmes in Biotechnology may be undertaken by the NAM S&T Centre and APCTT, in consultation and cooperation with respective member countries. Collaborative research, transfer of technology and sharing of experience in Biotechnology amongst the member countries particularly in the areas of common interest may be identified and strengthened.
 - viii. Training programmes may be arranged for young scientists of the developing countries to acquaint themselves with the modern tools and techniques of biotechnological research.
 - ix. A directory of scientists and researchers in' Biotechnology of the member countries may be compiled by the APCTT and NAM S&T Centre.
 - x. A network of National laboratories and Universities involved in biotech research may be created for exchange of ideas and research programmes. Electronic media may be utilized to facilitate this networking.
 - xi. In order to utilise the full potential of tissue culture technology, programme should be formulated for bringing out booklets, media coverage, series of public lectures and other relevant techniques on species of commercial importance for wider acceptance as a professional and occupational area by the respective countries.
 - xii. The developing countries should have their own *sui-generis* system for Intellectual Property Rights (IPR) related to biotechnology, biodiversity, biospecting and community knowledge in consonance with provisions of the new IPR regime.
 - xiii. The member countries are urged to develop with the assistance of APCTT and NAM S&T Centre, pilot projects and programmes for development of entrepreneurship and commercialisation of the laboratory findings. With this end in view, establishment of national Biotech Parks and pilot plants sites as created in some of the developing countries may be encouraged.

- xiv. To encourage research in biotechnology, governments of the respective countries may be urged to exempt or impose nominal duty for the import of equipment and chemicals. Further, institutional arrangements for expeditious transportation and customs clearance should be developed.
- xv. Follow-up programmes of the present workshop on tissue culture may be organised by the NAM S&T Centre and APCTT in cooperation with relevant national agencies.