

# Potentials of ...

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As a consequence, NIB is working as a focal point to coordinate biotechnological activities in the country, also an affiliated center of International Centre for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy and is the nodal agency in Bangladesh for the Biotechnological issues of the SAARC countries. The Institute has the potential to become the core centre for biotechnology research in Bangladesh as well as a national resource centre for technology transfer and human resource development in new and emerging areas of biotechnology.

In Bangladesh, a biotechnology program on plant was initiated in the late 1970s in the Department of Botany, University of Dhaka with tissue culture of jute. Thereafter within a span of 10-12 years tissue culture research laboratories had been developed in different universities, R&D organisations, and private entrepreneurs. Some NGOs (BRAC, PROSHIKA, Square Agric-tech, DEBTECH, Swiss organisation for Development and Cooperation and others, Institute of Integrated Rural Development, Rural Development Academy, Aman Agro Industries) are also working on plant tissue culture; BRAC & Proshika have already marketed tissue cultured plantlets such as potato, banana and ornamental plants in Bangladesh and neighboring countries. As a result of intensive works on plant tissue culture protocols, plant regeneration and micro-propagation have been developed on different crops, forest, fruit, ornamental, medicinal and commonly important plants as well as vegetables. Currently, several research organisations, public and private universities, private companies (Biotech seeds, Genetic seed, Grameen Krishi Foundation, Rantic Ltd., Lal teer seed company, Matex BD Ltd., Safe Agriculture BD, East West Seed

Company) are involved in promoting environmentally safer agricultural and industrial biotech products. In Bangladesh Atomic Energy Commission, two new mutant lines with high yielding, early mature, relatively fine grain, dwarf and photoperiod insensitive have been developed by using carbon ion beam radiation. Also projects are undertaken for mass in vitro propagation of fast growing, timber yielding plant Paulownia and mul-

ing on varieties capable of fighting natural calamities. Thus, research on transgenic plant development is going on in many laboratories country-wide, which include developing pest/insect resistant varieties, salt-tolerant varieties etc. Commendable progress has been made at the University of Dhaka in producing salt-tolerant rice and cold-tolerant jute varieties using molecular markers. Another impressive headway has been made to evolve disease and

formation of stress tolerant genes into egg plant.

It has been identified that in brinjal, tomato and country bean, pesticide applications are excessive and indiscriminate. To get relief from the pesticide residue problem and to minimise the production loss, The National Committee on Biosafety (NCB), the highest regulatory body for genetically modified (GM) crops in Bangladesh on December 31, 2013

Cry1Ac from soil bacterium, *Bacillus thuringiensis* (Bt), which is resistant to destructive insect pest brinjal, shoot borer. Bt-brinjals are expected to make a significant contribution to pesticide residue problem and to minimise the production loss.

After a decade of research, a team at the Biochemistry and Molecular Biology department of University of Dhaka led by Professor Zeba Islam Seraj made four transgenic rice varieties capable of pro-



Mass propagation of Aloe vera through tissue culture. Courtesy: Plant Biotechnology Division, NIB

PHOTO: COURTESY

tipurpose use plant alovera. Although golden rice can meet the requirement of vitamin A to avoid blindness, it is now confined to field trials. Our poor people also suffer from other nutrient deficiencies and hence some plants and vegetables could be modified genetically to serve as a source of multiple nutrients.

Besides developing better varieties, different organisations are also work-

ing on insect resistant pulse varieties. Also, private venture on plant tissue culture development and commercialisation has been taken at the University of Rajshahi, where they worked on strawberries and some exotic flowers that went on to successful commercialisation. NIB has within its many achievements micropropagation of different fruits and ornamental plants, and the institute is working on trans-

officially approved limited field release of Bt-brinjal developed by researchers of Bangladesh Agricultural Research Institute (BARI) through the technical support of Maharashtra Hybrid Seeds Company (MaHyCo), India. Through this decision, Bangladesh became the first country in south Asia to cultivate the GM food crop. The varieties are genetically modified for an additional gene

duction in high soil salinity, far better than the ones derived from conventional breeding. A particular pea gene 'helicase' was infused into four high yielding rice varieties (HYVs) that helped rice plants have higher salt tolerance and higher yield potential. The team is currently readying these varieties for confined trials in greenhouse and then on controlled field trials.

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