

PROCEEDINGS OF THE 139th MEETING OF THE GENETIC ENGINEERING APPRAISAL COMMITTEE HELD ON 19.05.2020

The 139th meeting of the Genetic Engineering Appraisal Committee (GEAC) was held on May 19, 2020 via video conferencing under the Chairmanship of Smt. B.V. Umadevi, Additional Secretary, MoEFCC and Chairman, GEAC, to consider the agenda items circulated to Members by email on 30.04.2020. The list of participants is placed at **Annex-1**.

At the outset, Mrs. B.V. Umadevi, Chairman, GEAC extended a warm welcome to all the members and thereafter, Ms. Richa Sharma, Vice Chair has informed that this is the first virtual meeting happening in view of pandemic and the agenda items were taken up as under:

Agenda Item No. 1: Leave of absence

Six Members communicated their inability to attend the 139th meeting of GEAC, namely Dr. Geeta Jotwani, Prof. P. Balasubramanian, Dr. Dilip Markandey, Dr. N. Sathyanarayana, Dr. V.G. Somani and Dr. Ashok Bhatnagar.

Decision:

Leave of absence was granted to the members who could not attend the meeting.

Action: GEAC Secretariat

Agenda Item No. 2: Confirmation of minutes of the 138th GEAC meeting

The 138th GEAC meeting minutes were circulated to all the members for comments and the comments received from members were duly incorporated.

Decision:

Members confirmed the proceedings of the 138th GEAC meeting.

Action: GEAC Secretariat

Agenda Item No. 3: Action taken report on the decisions taken in the 138th GEAC meeting

The Member Secretary, GEAC briefed about the action taken on the decisions taken in the 138th meeting of GEAC and stated that letters were issued to all the concerned communicating the decisions taken in 138th meeting.

Decision:

The Committee noted the compliance of actions taken by the Secretariat.

Action: GEAC Secretariat

Agenda Item No. 4: Applications related to Confined Field Trials of GE crops (Event Selection/ BRL-I/ BRL-II Trials)

4.1 Request for additional location permission to conduct Biosafety Research Trials (BRL-II), with two transgenic Bt Brinjal Hybrids namely Janak and BSS-793, containing Bt Cry1Fa1 gene (Event 142) by M/s. Beejsheetal Research Private Limited, Jalna.

The application submitted by M/s. Beejsheetal Research Private Limited, Jalna for additional location permission to conduct Biosafety Research Trials (BRL-II), with two transgenic Bt Brinjal Hybrids namely Janak and BSS-793, containing Bt Cry1Fa1 gene (Event 142) in the States of Madhya Pradesh, Karnataka, Bihar, Chhattisgarh Jharkhand, Tamil Nadu, Odisha and West Bengal was deliberated at length by the Committee.

The applicant has also informed that they have successfully conducted BRL-I at three locations conduct i.e., Jalna, Guntur and Varanasi for two seasons 2009 and 2010. Later stated that they conducted BRL - II trails during 2016-17 in the states of Maharashtra, Gujarat, Punjab, Haryana, Uttar Pradesh, New Delhi and Andhra Pradesh.

Decision:

The Committee has granted the permission to conduct Biosafety Research Trials (BRL-II), with two transgenic Bt Brinjal Hybrids namely Janak and BSS-793, containing Bt Cry1Fa1 gene (Event 142) by M/s. Beejsheetal Research Private Limited, Jalna in the States of Madhya Pradesh, Karnataka, Bihar, Chhattisgarh Jharkhand, Tamil Nadu, Odisha and West Bengal during seasons 2020-23, subject to the following conditions:

- a. NoC from the department of Agriculture of the concerned state
- b. Provide details of trial sites as required under Part G of the Guidelines and SOPs for Confined Field Trials of Regulated GE Plants
- c. Confirmed availability of isolation distance and information on land area
- d. Name of the lead scientist responsible for each trial
- e. Strictly conduct BRL – II Studies in accordance with the guidelines for the monitoring of confined field trials of regulated, GE plants
- f. The findings of the results may also be shared with State Biodiversity Boards and local panchayat Biodiversity Management Committees

Action: GEAC Secretariat

Agenda Item No. 5: Applications related to Commercial/ Environmental release

5.1 Application for environmental approval of clinical trials for Biopharmaceutical drugs (Insulin Glargine) derived from Living Modified Organisms (Recombinant E. coli) by M/s. GeneSys Biologics Pvt. Ltd, Hyderabad.

The application submitted by M/s. GeneSys Biologics Pvt. Ltd, Hyderabad for seeking environmental approval for production of Biopharmaceutical drugs (Insulin Glargine) derived from Living Modified Organisms (Recombinant E. coli, which is in the category of low risk group), which involves production above 100 liters, was deliberated at length by the Committee. The applicant has made a presentation on the environment safety to be taken in the plant. The applicant also informed that they have obtained the clearance of RCGM for its pre-clinical toxicology study.

Decision:

The Committee has granted the environmental approval for production of Biopharmaceutical drugs (Insulin Glargine) derived from Living Modified Organisms (Recombinant E. coli) by M/s. GeneSys Biologics Pvt. Ltd, Hyderabad subject to the following conditions:

- a. Submission of Environmental Risk Management and Safety Plan within 3 months to this Ministry
- b. Submission of compliance report on ERMP plan every 6 months to the Regional Office of the

Ministry of Environment, Forest and Climate Change

- c. The project proponent may seek other statutory clearances, as applicable.
- d. Zero Liquid Discharge shall be ensured.
- e. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
- f. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
- g. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

Action: GEAC Secretariat

Agenda Item No. 6: Applications related to Import/ Export

6.1 Application for movement of transgenic cotton seeds within India by BASF India Limited, New Delhi.

The application submitted by BASF India Limited, New Delhi for movement of transgenic cotton seeds from premises of M/s. Bayer Bioscience Pvt. Ltd., Patancheru to M/s. Gubba Cold Storage Facility in Hyderabad was deliberated at length by the Committee. After examination of the application, the Committee considered the request with condition to comply with "Regulations and Guidelines on Biosafety of Recombinant DNA Research & Biocontainment, 2017".

Decision:

The Committee has agreed to permit the movement of transgenic cotton seeds as per the "Regulations and Guidelines on Biosafety of Recombinant DNA Research and Biocontainment, 2017" and requested GEAC Secretariat to copy the letter to the concerned State Government (Agriculture) Department and State Biodiversity Boards for information and with condition that the project proponent while movement of seeds may seek other statutory clearances, as applicable.

Action: GEAC Secretariat

6.2 Application for permission of import cell Associated Live Recombinant Herpes Virus of Turkey Strain HPV360 (Innovax ND IBD) by M/s. Intervet India Pvt. Ltd., Pune.

The application submitted by M/s. Intervet India Pvt. Ltd., Pune seeking corrigendum in permission for import cell Associated Live Recombinant Herpes Virus of Turkey Strain HPV360 (Innovax ND IBD) was deliberated at length by the Committee. The applicant sought change in text issued by GEAC vide letter No. 12013/04/2018 CS-III dated 9th May 2018, wherein the proposed change in text sought was from "generation of laboratory /in vivo efficacy data under Indian conditions" to "initial 3 batches of the subject vaccine to be certified in IVRI before it is marketed in the country". The committee has deliberated on the proposed change proposed by proponent and it was advised that inputs from Indian Veterinary Research Institute (IVRI) must be sought.

Decision:

The committee has advised the GEAC Secretariat to seek the view of the IVRI and take up the matter in the next meeting.

Action: GEAC Secretariat

6.3 Change of name in NOC from Sanofi Synthelabo India Pvt. Ltd. to Boehringer Ingelheim India Pvt. Ltd.

The application submitted by Boehringer Ingelheim India Pvt. Ltd., Mumbai for amendment in NOCs given by GEAC for import of animal vaccines was deliberated at length by the Committee. The applicant sought change in text issued by GEAC vide letter No. 12013/37/2019-CS-III dated 11th February 2020.

The proposed change in text from “generation of laboratory /in vivo efficacy data under Indian conditions” to “initial 3 batches of the subject vaccine to be certified in IVRI before it is marketed in the country”. The committee has deliberated on the proposed change by proponent and it was advised that in inputs from Indian Veterinary Research Institute (IVRI) has to be sought.

Decision:

The committee has advised the GEAC Secretariat to seek the view of the IVRI and take up the matter in the next meeting.

Action: GEAC Secretariat

6.4 Application for import of processed food/ products derived from {*Bacillus amyloliquefaciens*, *Bacillus licheniformis*, *Bacillus megaterium*, *Bacillus pumilus*, *Bacillus subtilis*} for the purpose of waste-water treatment by M/s. Altima Technologies Pvt Ltd, Kerala.

The application submitted by M/s. Altima Technologies Pvt Ltd, Kerala for import of processed food/ products derived from {*Bacillus amyloliquefaciens*, *Bacillus licheniformis*, *Bacillus megaterium*, *Bacillus pumilus*, *Bacillus subtilis*} for the purpose of waste-water treatment was deliberated at length by the Committee.

The application is related to import of *Bacillicusspp* (which are in Risk group 1) bacterial product for residential waste water treatment. As per the application it is mentioned that there is not inserted gene, therefore it is understood that the imported organism is not a GMO. The committee felt that instead of importing, the *Bacillus spp* available in India may be considered, therefore further clarification may be sought in this regard from the project proponent.

Decision:

The Committee deferred the application submitted by the applicant and advised GEAC Secretariat to seek justification for importing *Bacillicusspp* from USA, when the native Indian *Bacillicusspp* species are available, from the project proponent.

Action: GEAC Secretariat

Agenda Item No. 7: Additional Items for consideration/ information

7.1 Request for NOC to transfer/sale-purchase of GEAC released cotton hybrids containing Bollgard technology from ZuariAgro Chemicals to Senthil Seeds by M/s. Senthil Seeds Pvt. Ltd, Tamilnadu.

7.2 Request for NOC to transfer/sale-purchase of GEAC released cotton hybrids containing Bollgard technology from Namdhari Seeds to Senthil Seeds by M/s. Senthil Seeds Pvt. Ltd, Tamilnadu.

7.3 Request for NOC to transfer/sale-purchase of GEAC released cotton hybrids containing Bollgard technology from Namdhari Seeds to Paras seeds by M/s. Paras Seeds Corporation, Gujarat.

7.4 NOC for transfer of GEAC approved hybrids, ZCH-1101 BGII, ZCH-1102 BGII, ZCH-511 BGII, ZCH-545 BGII, ZCH-547 BGII, & ZCH-502 BGII by M/s. Dhanlaxmi Crop Science Pvt. Ltd, Himatnagar, Gujarat.

7.6 Change the name of Sungro Seeds Private Limited in the approvals for Bollgard II cotton hybrids to name of Sungro Seeds Private Limited in the approvals for Bollgard II cotton hybrids to Mahyco Private Limited, Mumbai.

7.7 Change the name of Maharashtra Hybrid Seeds Company Private Limited in the approvals for Bollgard II cotton hybrids to Mahyco Private Limited (formerly known as Sungro Seeds Private Limited).

Supplementary agenda items:

3.1 Regarding Merger by Absorption of Metahelix Life Sciences Limited with Rallis India Limited with effect from 01.02.2020.

3.2 Approval for change Nomenclature of GEAC approved Western Agri. Seeds commercial Bt. Cotton hybrid in North, Central and South Zones.

The application submitted by above firms were considered in the meeting. GEAC Secretariat informed the members that from 2010 to 2016, the Standing Committee of Event Based Approval committee for Bt. Cotton Hybrids has approved the applications related to Bt Cotton hybrids. From 2017, ICAR has been authorized by GEAC to approve Bt. Cotton Hybrid applications. GEAC's mandate is to recommend environmental release of GMOs after apprising their health and environment impacts. GEAC is not involved in any issues related to transfer/merger/sale-purchase/change in name with reference the firms marketing Bt Cotton Hybrids. The members were of the view that issues related to transfer/merger/sale-purchase/change in name is not the mandate of GEAC.

Decision:

- i. The committee decided that applications seeking NOC for transfer/merger/sale-purchase/Change in name of Bt Cotton Hybrids does not come under the preview of GEAC and requested GEAC Secretariat to write to Joint Secretary, Seeds in Ministry of Agriculture and farmers' Welfare to take necessary action and advise States appropriately in this regard. It was also decided that this Ministry letter No.13/39/2007 dated 24th April 2017 authorizing ICAR for approval of Bt. Cotton Hybrids applications may once again be shared with Joint Secretary (Seeds). GEAC is only concerned with the recommendation of event/Genetic engineered crops after appraisal of their environment and health impacts.
- ii. The GEAC may be kept informed only for record of any such changes after compliance of necessary statutory clearances required for transfer/merger/sale-purchase/change in name with reference to Bt Cotton Hybrids.

Action: GEAC Secretariat

7.5 Intimation of change of address of Monsanto Holdings Pvt. Ltd.

The application submitted by M/s. Monsanto Holdings Pvt. Ltd. for change of address of Registered office as well as Delhi office was considered by the Committee. The new address of both the locations as given below:

Registered office address, Mumbai:

Monsanto Holdings Private Limited, Bayer House, Central Avenue, Hiranandani Estate, Thane (West), Thane, Maharashtra, India – 400607

Delhi office address:

Bayer CropScience Ltd., Cowrks India Private, 1st Floor, Tower A, PS 14 and 15, Worldmark 1, Indira Gandhi International Airport, Aerocity Hospitality District, New Delhi - 110037

Decision:

The Committee has noted the information and requested GEAC Secretariat to update the addresses of the company in its database for future correspondence.

Action: GEAC Secretariat

7.8 Regulatory Reforms to improve Drug Development in India and Draft Document on Genome Edited Organisms: Regulatory Framework and Guidelines for Risk Assessment, 2019.

Dr. Nitin K. Jain, Member Secretary, RCGM made a brief presentation before the committee on "Regulatory Reforms to improve Drug Development in India" and "Draft Document on "Genome Edited Organisms: Regulatory Framework and Guidelines for Risk Assessment".

The Committee took note of the proposal on "Regulatory Reforms to improve Drug Development in India", wherein in IBSCs are authorized to consider and approve the applications for exchange, import

or export of regulated biological materials up to prescribed small quantities for research in Drug Development in India.

With reference to the Draft Document on Genome Edited Organisms: Regulatory Framework and Guidelines for Risk Assessment, 2019, it was informed by Member Secretary, RCGM that the Document on Genome Edited Organisms: Regulatory Framework and Guidelines for Risk Assessment, 2019 was developed under the Chairmanship of Prof. K. Veluthambi, Co-Chairman of GEAC and Retd. Prof. Madurai Kamaraj University and the document was put on the Department of Biotechnology website and widely circulated for comments for 45 days. 90 comments including comments from International Bodies, Agriculture Associations and National Academy of Agriculture Sciences were received. These were summarized and discussed in the Stakeholder meeting held on 12.03.2020. Later, in the first phase the "Drafting committee" was constituted to finalize the draft guidelines for Genome Edited Plants under the Chairmanship of Dr. K.V. Prabhu, Chairman PPV&FRA. The draft guidelines for Genome Edited Plants prepared by the "Drafting Committee" has recommended that, as the cases of SDN1 and SDN2 categories does not carry exogenous DNA and are comparable to naturally occurring variance, they should be exempted under the Rules 1989 of EP, Act, 1986, under Rule 20.

It is also informed that the said guidelines were discussed and recommended by Recombinant DNA Advisory Committee (RDAC) in its first meeting held on 14th May 2020 through Video Conference under the Chair of Secretary, DBT for further consideration of GEAC/MoEF&CC. The GEAC Secretariat informed that the MoEFCC also received inputs from some stakeholders on draft guidelines for Genome Edited Organisms. In this regard, it was decided that the comments received by both DBT and MOEFCC would be shared for further examination.

Decision:

- a. The committee noted the simplified procedure for Regulatory Reforms to improve Drug Development in India.
- b. The Committee has requested the GEAC Secretariat and Department of Biotechnology to share the comments received from stakeholders on draft guidelines for Genome Edited Organisms for further examination.
- c. The GEAC members would send their comments to GEAC secretariat and the said agenda would be discussed in the next meeting.

Action: GEAC Secretariat

7.9 Revision of Rules for Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/ Genetically Engineered Organisms or Cells (1989).

The committee considered the requirement of revision of Rules for Manufacture, Use/Import/Export and Storage of Hazardous Micro Organisms/ Genetically Engineered Organisms or Cells (1989).

Decision:

The matter was discussed and GEAC Secretariat was asked to undertake background work in the matter.

Action: GEAC Secretariat

7.10 Proposal for Establishment of Notified Field Trial Sites (NFTS) to conduct Confined Field Trials of GE Crops.

DBT letter dated 19th February 2020 received in MoEFCC has enclosed the proposal on Establishment of Notified Field Trial Sites for GE Crops for consideration of GEAC. In the letter, it is informed that the proposal on Establishment of Notified Filed Trail sites for GE Crops was recommended by Technical Expert Committee constituted by Hon'ble Supreme Court and also recommended in the meeting taken by Principal Secretary to Hon'ble Prime Minister on 24th November 2015. In this regard, DBT, vide its OM dated 03.03.2016 has constituted a Working Group under the Chairmanship of Prof. Baldev Singh

Dhillon, Vice Chancellor, Punjab Agricultural University, Ludhiana with members from ICAR and MoA. Its is also stated that the draft report was discussed in the 130th GEAC meeting held on 11th September 2016.

In this background, Prof. Baldev Singh Dhillon, Vice Chancellor, Punjab Agricultural University, Ludhiana made a detailed presentation before the GEAC members on the Proposal for Establishment of Notified Field Trial Sites (NFTS) to conduct Confined Field Trials of GE Crops. The report also has estimated budget of Rs. 96.20 lakhs for each site excluding land cost.

Decision:

The committee requested the GEAC Secretariat to examine the proposal which will be discussed in the next meeting of GEAC for taking appropriate decision. In the meantime, the members are also requested to provide written comments on the above proposal.

Action: GEAC Secretariat

Supplementary Agenda Item No. 1: Applications related to Confined Field Trials of GE crops (Event Selection/ BRL-I/ BRL-II Trials)

1.1 Genetically modified Rubber Plant developed by The Rubber Board – permission for confined field trials.

The Executive Director, Rubber Board has submitted an application to GEAC vide letter dated 20th April 2020 seeking GEAC permission for conduct of confined field trials of genetically modified rubber plant. The Rubber Board in the application stated that GEAC gave clearance for conduct of confined field trials (CFT) of GM Rubber in 2010. The Government of Assam gave NOC to Rubber Board only during October 2016 for conducting CFT, however the GEAC clearance obtained in 2010 got lapsed. Then a fresh application was again submitted to RCGM and RCGM informed that the application may be forwarded to GEAC for consideration and final approval.

GEAC after examining the application requested the Executive Director, Rubber Board to share additional documents for further consideration. Dr. James Jacob, Executive Director, Rubber Board, Kerala made a brief presentation on the application during the meeting and informed that the additional documents were sent to Ministry by post.

Decision:

The committee noted that complete application with documents is yet to be received by GEAC Secretariat and therefore, the case would be considered in the next meeting once all the documents are received.

Action: GEAC Secretariat

Supplementary Agenda Item No. 2: Applications related to Import/ Export

2.1 Application for Environmental approval of Clinical Trial/Pharmaceutical Drug derived from LMO {Marek's disease vaccine (Marek's Disease Vaccine, Serotype 1, Live Herpesvirus Chimera)} (The RN1250 virus was obtained by in vitro recombination after co-transfection of whole genomic DNA from parental CVI988V vaccine strain and DNA from a cosmid vector designated B40-RM1Pac.) for (The purpose is to make serotype 1 strains safe by inserting long terminal repeat (LTR) taken from serotype 3 which is completely safe.) by (Boehringer Ingelheim India Pvt Ltd).

An application has been submitted by Boehringer Ingelheim India Pvt. Ltd., Mumbai for import of LMO {Marek's disease vaccine (Marek's Disease Vaccine, Serotype 1, Live Herpesvirus Chimera)} from USA

for vaccination of healthy one-day old chicken in India against Marek's Disease. The proponent has made a presentation before the committee. The present application fall under the Mashelkar committee Protocol III -Drugs import and marketing of pharma products in finished formulations where the end product is live modified organism (LMO). The committee was of view that the Live Herpesvirus is an attenuatedvirus wherein its virulent nature is very less.

Decision:

The committee has agreed for import of Marek's disease vaccine from USA. Further the committee has also suggested that the experiments for generating data for Indian conditions may be conducted with the support of IVRI and the cost for such activity has to be borne by the applicant.

Action: GEAC Secretariat

The meeting ended with a vote of thanks to the Chair.

List of Participants

| Official Members who participated | | | |
|--|--|------------|---|
| 1. | Mrs. B. V. Umadevi Chairman, GEAC & Additional Secretary, Ministry of Environment, Forest & Climate Change, JorBagh, Aliganj, New Delhi. | 3. | ShriTarunKathula Scientist-F, and Member Secretary (GEAC), Ministry of Environment, Forests & Climate Change, JorBagh, Aliganj ,New Delhi. |
| 2. | Mrs. Richa Sharma, Joint Secretary & Vice-Chairperson, GEAC Ministry of Environment, Forest & Climate Change, JorBagh, Aliganj, New Delhi. | | |
| Expert members | | | |
| 1. | Dr. K. Veluthambi Co-Chairman, GEAC and Professor (retd) & Head, School of Biotechnology, Madurai Kamaraj University, Madurai | 9. | Dr. Madhu Dikshit Former Director CSIR-Central Drug Research Institute, Lucknow. |
| 2. | Dr. B. Venkateswarlu Former Vice-Chancellor Vasantrya Naik Marathwada Krishi Vidyapeeth, Parbani (Maharashtra). | 10. | Dr. Nitin K.Jain Scientist –F and Member Secretary, RCGM Department of Biotechnology, C. G. O, Complex, Lodhi Road, New Delhi-110003. |
| 3. | Dr. Dinesh K Agarwal, Principal Scientist, In charge, Plant Breeding & Genetics, ICAR-Indian Institute of Seed Science, Mau, U.P | 11. | Shri. Sunil Kumar Bakshi Advisor (Codex/ regulations)Food Safety and Standards Authority of India (FSSAI), FDA Bhawan, Kotla Road, New Delhi |
| 4. | Dr. A.K. Singh, Head, Division of Genetics, IARI, New Delhi. | 12. | Dr. P. Suprasanna Scientific Officer H (level 14) Biosciences Group, BARC, Mumbai. |
| 5. | Dr. S. C. Khurana Food Safety and Standards Authority of India (FSSAI), FDA Bhawan, Kotla Road, New Delhi | 13. | Dr. SushilGupta, FormerChairman, Central Ground Water Board, New Delhi |
| 6. | Dr. S. J. Rahman, Principal Scientist & Univ. Head of Entomology, AICRP on Biological Control Agricultural Research Institute (ARI), Prof. Jayashankar Telangana State Agri. University, Rajendranagar, Hyderabad. | 14. | Dr. S De Principal Scientist Animal Biotechnology Centre, National Dairy Research Institute, Karnal. |
| 7. | Dr. Lalitha Gowda, Former Chief Scientist, CSIR-CFTRI Mysore, Karnataka-570 020, India | 15. | Dr. Usha Rao Assistant Controller of Patents & Designs, Patent Office, New Delhi, India |

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| 8. | Dr. S. K. Barik Director CSIR- National Botanical Research Institute, Lucknow | | |
| Special Invitees | | | |
| 1. | Dr. S. R. Rao, Retd. Sr. Advisor/Scientist 'H' Department of Biotechnology | 2. | Dr. Baldev Singh Dhillon Vice Chancellor, Punjab Agricultural University, Ludhiana - 141004, India |
| Member who did not participate | | | |
| 1. | Dr. Geeta Jotwani Scientist F Indian Council of Medical Research, New Delhi. | 4. | Dr. V.G. Somani Joint Drugs Controller – India Central Drugs Standard Control Organizations, FDA Bhawan, Kotla Road, New Delhi-110002. |
| 2. | Dr. Dilip Markandey Central Pollution Control Board Parviesh Bhawan, CBD cum office complex, East Arjun Nagar, New Delhi- 110032 | 5. | Dr. N. Sathyanarayana Joint Director Plant Protection Quarantine & storage, NH-IV, Faridabad, Haryana. |
| 3. | Dr. Ashok Bhatnagar, Former Professor, Department of Botany, University of Delhi, New Delhi | 6. | Prof. P. Balasubramanian Former Director, Centre for Plant Molecular Biology, TNAU, Coimbatore |