

**Report on Value Added Program
(An IQAC Initiative)
Under DBT Star**

“Applications and Advantages of Plant Tissue Culture Research”

IQAC Initiative, under DBT Star, Department of Biotechnology/Genetics had organized value added program for duration of 60 hours for B.Sc. Biotechnology/Microbiology/Genetic students of V Semester, as per the syllabus designed according to Prof. Pushpa H, DBT Star, Co-ordinator & Vice Principal.

The Value Added Program was inaugurated on Friday, 4 August 2023, on “**Applications and Advantages of Plant Tissue Culture Research**”, with traditional of MSRCASC by lighting the lamp, college anthem, invocation , welcome speech. Dr. Vatsala G, Principal, Prof. Puspa H, Vice Principal and Dr. Lakshmikanth RN, HOD. addressed to students on techniques & developments in science for a susceptible agro & encouraged them to grow more greens.

The resource person and guest speaker for the day was **Dr, Madhusudhan R.V.** Manager Production (Ornamentals)Indo-American Hybrid Seeds, Bangaluru, Karnataka. Sir spoke on basic concepts of Plant Tissue Culture. The company is mainly involved in the development and production of hybrid seeds of vegetables, flowering plants, field crops, and the production of ornamental plants. Students were also, informed about Start-up programs entrepreneurship, internship and project facilities provided by the company.



Inauguration Function: Friday, 4 August 2023

Lightening of the Lamp

Welcome by Principal with sapling

**Dr. Vatsala G
(Principal)**

**Dr. Madhusudhan RV
(Resource Person)**

**Dr. LakshmiKanth RN
(HOD)**



Students at Inaugural Function



Dr. Madhusudhan RV: Guest Lecture

Plant Tissue Culture (PTC) is a practice used to propagate plants under sterile conditions, often to produce clones of a plant. Different techniques in plant tissue culture may offer advantages over traditional methods of propagation. The program is designed to provide the same through theory sessions and lab exercises. Topics included in the value added program are Principles applications and advantages in fields of various facets of Plant Tissue Culture.

Time table was framed according to the syllabus-module. The classes were conducted for B.Sc., V semester Biotechnology and Genetic students (NEP batch) after their class hours and free hours vice-versa with teaching faculties/ convener Prof. Jayashree DR and Dr. Vijayalakshmi RN of the program. Both theory and practical classes was for 60 hours, from 1/12/2023 to 25/06/24 completing with the duration of 6 months.

The main objective of the workshop was intended to learn basic tissue culture techniques, principles, applications and hardening of the plants. Industrial visit aimed in creating mass production knowledge and methodology in bulk It also aimed at creating an awareness in young minds on sustainable agriculture for future food. Totally 42 students participated in the program.

Students were introduced with video clips on Indo-American Hybrids Seeds company. Tissue culture laboratory and documentaion chamber were viewed. Field visits on hardening of tissue cultured plants and interaction session both for theory and field visit with green house sections were assisted by Dr, Madhusudhan RV. Some of the endangered species were also

introduced to the students with their medicinal values, which are Tissue Culture for balancing the biodiversity and conservation of various wild species.

Manmohan Attavar (12 July 1932 - 12 December 2017) was an Indian horticulturist, plant breeder, writer and the founder of Indo American Hybrid Seeds (IAHS), an organization engaged in scientific plant breeding and horticulture.

Indo-American Hybrid Seeds was established in 1965, Bangalore Sy No 13/4 & 14, 7th Km, Banashankari-Kengeri Link Road, Channasandra, Rajeshwarinagar, Bangalore, India 560098. As a unique company in hybrid seeds of vegetable crops, field crops and flower seeds, ornamental plants and seed quality, they strive to provide the best products and services. Their highly qualified team are dedicated to enhance the customers satisfaction, implementing efficient internal systems and developing new marketing strategies to engage customers across India.

Students upgraded with the knowledge of entrepreneurship and startup practical applications, on growing plants through cell from lab to field, as well as how to deal with customers in a profiled principles and manner profiting the business and also, an eco-friendly sustainable practice on greeneries with socio-economic values. Students were complemented with Syngonium plants with Company bags.

Program Schedule: 1/12/2023 To 25/06/2024 for 6 months durations

Modules For Theory (Two hours for 10 days)

20 hours

1. Introduction, History, Scope, advantages, limitations and applications of Plant tissue culture
2. Laboratory organization, tools and techniques, methods of sterilization, laboratory contaminants and control of contamination
3. Media and Culture Preparation- Role of Micro and macro nutrients, vitamins, carbon source, plant growth regulators, solidifying agents, pH, temperature, preparation of media- MS, B5, Vaccine and Went medium
4. Concepts in plant tissue culture- Totipotency, polarity, differentiation, dedifferentiation, dedifferentiation.
5. Culture Techniques: Explant selection, sterilization and inoculation, callus and cell suspension culture.
6. Micropropagation through various explants (Leaf, Stem, Axillary bud, Tuber, Corms and Bulbills).
7. Artificial seed propagation
8. Hardening Factors affecting plant tissue culture- Hardening stages, Role of Poly house, Net House, Compost, Chemical fertilizer, Coco pit, Soil in hardening.
9. Meristem culture for the production of virus free plants.
10. Transgenic plants for crop improvement (dicot and Monocot including Maize, Rice, Wheat, Cotton, Brinjal etc. Resistance to herbicide, insecticide, virus and other diseases, Flavour save tomato etc. barnase and barstar). Transgenic plants for molecular farming.
11. Plant transformation: Methods of gene transfer in plants. Agrobacterium and CaMV mediated gene transfer; direct gene transfer using PEG, micro injection,

electroporation, microprojectile (biolistics) method, liposome mediated DNA delivery; Transposons as vectors.

12. Application of Plant tissue culture- Micropropagation- Types, Stages, Establishment of propagated plants, micropropagation for large scale multiplication of crop plants, forest trees, horticulture, floriculture, medicinal plants and ornamentals.

Modules For Practicals (Four hours for 10 days)

40 Hours

1. Instrumentation of Plant Tissue Culture
2. Aseptic techniques- Washing of Glass wares and sterilization techniques
3. Preparation of stock solution and preparation of media
4. Monocot and Dicot Seed cultures for the establishment of organ cultures
5. Establishment of organ cultures for the induction of callus
6. Establishment of organ cultures for induction of multiple shoots
7. Single cell culture
8. Shoot tip culture, axillary bud, meristem culture
9. Propagation of horticultural, floricultural, medicinal and aromatic plants
10. Hardening methods and utility of plants
11. Agrobacterium mediated gene transfer
12. Protoplast fusion by PEG
13. Preparation of artificial seeds.

Dissertation and Industrial Visits and Guest Lecture

The Course Outline included the following aspects:

- ❖ Principles & applications of Plant Tissue Culture
- ❖ Preparation of Tissue Culture media, sterilization
- ❖ Update advanced techniques/development
- ❖ Hands-On training for various culture techniques
- ❖ Hardening of the Plant with “Biofertilizers”

The Course contents were:

- ❖ Workshop materials, Lecture by trained faculties
- ❖ Individual Hands-On Training
- ❖ Certificate of participation issued by the Institutio

Images of Technical Sessions



Theory Sessions

Principles, Applications Biochemical Calculations & Advantages of PTC



Students at Technical Sessions

Images of Practical Sessions



Practical Sessions: On Hands Training

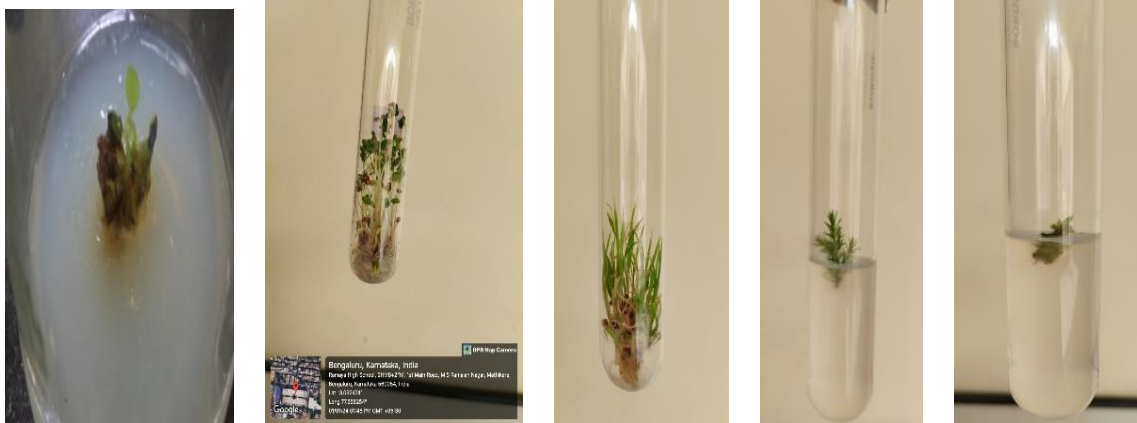


Students Training on Sterilization Techniques, Inoculation of Explants and Organs

Images of Inoculation Chamber



Explants In The MS Media Culture Vials



Saplings on MS Media in culture vials

Plantlets From Explants : Node, Internode, Axillary Buds. Leaves



Students' observation outside the Inoculation Chamber

Images of Industrial Visit



Students and staff travelling towards Industrial Visit

Group Photo at Entrance of Indo-Americans



Front View of Indo-American Hybrid Seeds Pvt. Ltd. At Garden Centre With Ornamental Plantations

Images of Industrial Visit: Technical Sessions



Manmohan Attavar
Founder
With Company Logo



Dr. Madhusuhan
Manager Production
(Ornamental)

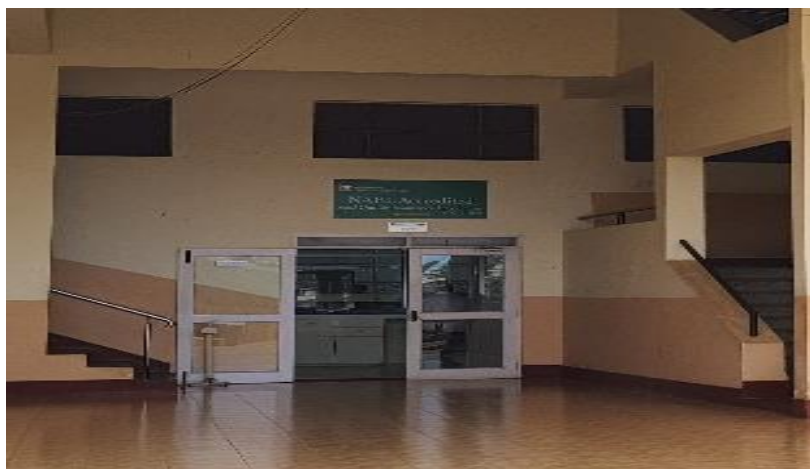


Theory Session At Indo-Americans
By Dr. Madhusuhan

Images of Industrial Visit: Technical Sessions



Plant Tissue Culture Laboratory and Documentary Room



NABL Accredited: Seed Quality Assurance Technology Room

Images of Industrial Field Visit



Interaction With Students Dr. Madhusudhan Explains About The Hardening of Plants Outside and Inside The Green House



Succulent Plants Inside The Green House



Overview of Green House

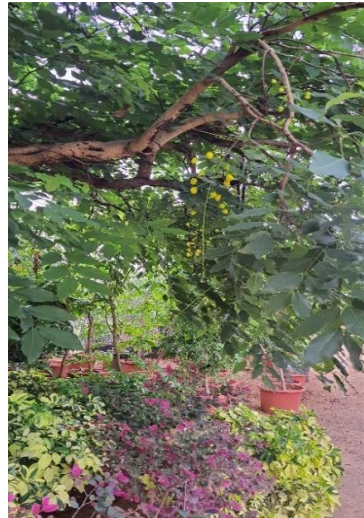


Overview of the Company Garden and Vehicles Used for Transportation of Sapling and Other Requirement

Images of Wild, Ornamental, Hybrid and Endangered Species



Wild Species: Asparagus racemosus



Wild Species: Cassia fistula



Endangered Species: Elaeocarpus ganitrus Tree (Rudhaksa)



Wild Species: Agave



Ornamental Floras: Bougainvillea without Thorns (Hybrid Varieties)



Ornamental Floras: Marigold, Zinnia, Gazania, Celosia, Red Sage (Normal Varieties)



Hanging Varieties: Monstera, Pilea, Ivy



*Hybrid Fruiting Saplings
(Butter fruit, Mango, Gauva, Star fruit, ,Goose berries etc.,)*



Company Outlet: Floras with Fancy Potteri



Group Photos of Faculties and Students of B.Sc., Biotechnology & Genetics V Semester