



## BEST PRACTICE 2

**Title:** - Botany Department and botany association give training programme to other students on plant tissue culture techniques

- **Objectives**

1) To provide instructional resources, conceptual background information and hands-on laboratory experiences to facilitate the incorporation of **plant tissue culture** (micropropagation) into classroom curricula in the most cost efficient manner.

2) One of the main objectives of tissue culture studies is to **obtain high-frequency shoot regeneration**, which is also a prerequisite for an efficient transformation system and a colonel propagation of plants with attractive flowers and fruits in large scale for ornamental purposes.

3) Club provides students with opportunities to expand their education outside the classroom. It is group of dedicated students from multiple background and disciplines that share common interest in botany, such as trip, laboratory visit and botanical excursion.

4) The purpose is to increase the academic and practical knowledge of participant.

5) To provide forum for discussion and care for all manners of plants and horticulture needs and to understand the importance of sterile techniques.

- **Botany Association :**

1) It is club is an active academic club that provides students with opportunities to expand their education outside the classroom.

2) Each semester members of this association participate in green house plant propagation and botany related projects.

3) It is group of dedicated students from multiple background and disciplines that share common interest in botany such as trip, laboratory visit and botanical excursion.

4) Goal is to share wonders of plant life.

5) The purpose is to increase the academic and practical knowledge of participant with regards to all forms of botanical life.

6) To provide forum for discussion and care for all manners of plants and horticulture needs. We organize the institute lecture series featuring eminent personalities from various walks of life to share with us their educational values, Inoculate the moral ethics and values.

Through this initiative we want our students and faculty to develop broader perspective of their responsibilities to society and give them an opportunity to listen the remarkable life stories of esteemed panel of speakers. The institute lecture series also provide opportunities to gain inside from of ideologist what path we should take in the future as an institution of excellence in management education. It reminds our student successful human being and remarkable figure in society. In this endeavors we hosted eminent personalities.

**The context:**

- The Science combinations of B.Sc. do not get good enrolment due to the demand for professional courses. The challenge is to attract and retain the students in science combinations.
- Due to more attraction and scope of plant tissue culture 6 month certificate course is run by department of botany.

**The practice:**

- Tissue culture is very important in biology due to its wide range of applications.
- Plant tissue culture may be used for genetic modification of a plant or simply increase its yield. The cells of the plants can be genetically altered to produce plants with desirable characteristics.
- This technique utilizes the plant's ability to rejuvenate the tissues rapidly. It produces exact copies of itself known as clones.
- It is a technique of quickly producing plants without any tubers, seeds or bulbs.

- It also helps in the conservation of plant biodiversity by the production of endangered plants.

### **Programmes/ courses**

1) Involving lectures, laboratory work, field work or project is floated for students with the intention of grooming them for their overall development. 20 or more Students from B. Sc. Botany (UG) are selected for 6 month course of plant tissue culture.

2) The course will be comprises of series of lectures and “hands on training sessions” covering following contents:

3) Overview of Plant Tissue Culture and its Applications

- Equipment and Media used
- Explants Selection
- Sterilization
- Initiation, Multiplication, Shooting and Rooting

### **TECHNIQUES OF PLANT TISSUE CULTURE**

Preparation of plant tissue for tissue culture is performed under aseptic conditions under HEPA filtered air provided by a Laminar Air Flow Cabinet. Thereafter, the tissue is grown in sterile containers, such as Bottles flasks in a growth room with controlled temperature and light intensity. Living plant materials from the environment are naturally contaminated on their surfaces (and sometimes interiors) with Microorganism, so their surfaces are sterilized in chemical solutions before suitable samples (Explants) are taken. The sterile explants are then usually placed on the surface of a sterile solid culture medium but are sometimes placed directly into a sterile liquid medium, particularly when cell suspension cultures are desired. Solid and liquid media are generally composed of inorganic salts plus a few organic nutrients, vitamins and plant hormones. Solid media are prepared from liquid media with the addition of a gelling agent, usually purified agar.

The composition of the medium, particularly the plant hormones and the nitrogen source (nitrate versus ammonium salts or amino acids) have profound effects on the morphology of the tissues that grow from the initial Explants. As cultures grow, pieces are typically sliced off and sub-cultured onto new media to allow for growth or to alter the morphology of the culture.

The skill and experience of the tissue culturist are important in judging which pieces to culture and which to discard. Our student becomes so expert in identification of results.

As shoots emerge from a culture, they may be sliced off and rooted with Auxin to produce plantlets which, when mature, can be transferred to potting soil for further growth in the greenhouse as normal plants.

### **Resources required**

Laminar Air flow, Autoclave, HPLC, UV spectroscopy, well equipped Plant tissue culture lab and required chemicals are available and well trained teaching staff is available and previous students give training to other students .

### **Evidence of Success:-**

1. The Guest lectures and various workshops have significantly contributed to the knowledge and skill enhancement of the students.
2. After completing this training programmes students improved their confidence level, presentation skill in front of other trainee students of our MOU colleges etc.
3. The plant tissue culture seminars and workshops have enriched the students with necessary competencies, skills and attitudes which have facilitated in their facing of the global challenges more effectively.
4. Those students who have been the part of our competitive exams/ trainings/ workshops have appreciated and given us a positive feedback with respect to their knowledge enhancement and skill improvement.
5. It was elaborated during the national level workshop that the Botany department had a sustainable plant tissue culture unit to support teaching, research and extension, and an Organic Farming Centre and extension services to the farming community. Empowering Youth through Education and Skill (EYES), Teaching, Research, Extension through Alternate Techniques (TREAT) continuity, adaption, and innovation.
6. During the Covid-19 pandemic lockdown were the highlights of their best practices presentation at Shri Shivaji College Barshi delivered by Dr. S. B. Bhosale.

7. These trainings and workshops have significantly contributed to the growth, grooming and development of students, motivating them to aspire for better career opportunities.
8. This has also showed its positive feedback in the recruitment of students in good companies.
9. Department of botany and students organized a farmer workshop on Hi-tech farming using plant tissue culture in 2019.
10. **National level plant tissue culture workshop conducted by students:** It is a forum for the teachers and students for the exchange of ideas with experts and the professionals with a view of acquiring additional knowledge acquainting each other with new research work, new methods and techniques of investigation or production. Lectures by experts, presentation of papers on selected themes in the area chosen for the Seminar, demonstration of new techniques and their discussion constitute the main activities of the Seminar/conference. 135 students from various colleges are participated in workshop and training given by expert students.
11. The students who are trained in the above programme have yielded good results. Many students have taken up jobs in the field of plant tissue culture. The above said practices brought positive results. The college is making an effort, to start job oriented certificate courses so as make the students self employability in their interested fields. These make the students self-employability in the society.
12. Apart from creating new knowledge through innovation and research, The department of Botany add social responsibility to impact and enhance the quality of life of all sections of the society
13. It was elaborated during the session that the Botany Department had a sustainable plant tissue culture unit to support teaching, research and extension, and an Organic Farming Centre and extension services to the farming community. Empowering Youth through Education and Skill (EYES), Teaching, Research, Extension through Alternate Techniques (TREAT) continuity, adaption, and innovation during the Covid-19 pandemic lockdown were the highlights of their best practices presentation at Shri Shivaji College Barshi delivered by Dr.S.B.Bhosale.

**Problems encountered.** Implementing the Student plant tissue culture techniques has not encountered any obstacle. On the contrary, it is highly noticeable and welcomed

by the student and their parents as well. All are groomed from the experienced and prominent personalities from different segments/fields interacted with the students and conveyed many life lessons and teaches life skills. Such a demand has arisen mainly because of the success of this unique practice. The only challenge is to make this accessible to more and more students without compromising on a day to day teaching and learning activities and regular classroom activities of the department.

### **Committee for plant tissue culture**

<b>Sr. No</b>	<b>Name of teacher</b>
1	Dr. S. B. Bhosale
2	MS. A. R. Mukhedkar
3	Dr. V. R. Mhaske
4	Students of Botany Association







YouCam



Feb.17,2019





YouCam



Feb.17,2019





**Students performing plant tissue culture Techniques**

Activities conducted by Botany association: plant tissue culture training to

**National workshop on recent trends in life sciences. (plant tissue culture (Botany).**

<https://mohekarcollege.org/wp-content/uploads/2022/11/National-workshop-on-Recent-trends-in-life-science.pdf>

**Dnyanodoyog junior college, Yermala**

<https://mohekarcollege.org/wp-content/uploads/2023/01/yermala.pdf>

**Vasant Mahavidyalaya, Kaij.**

<https://mohekarcollege.org/wp-content/uploads/2023/01/Mou-Vasant-Mahavidyalaya-kaij.pdf>

**MoU With Global Parali.**

<https://mohekarcollege.org/wp-content/uploads/2023/01/MOU.Global-parli.pdf>

**One day workshop on hi-tech farming on mango gava and custard apple and fruit crops, organic farming and application on tissue culture .**

<https://mohekarcollege.org/wp-content/uploads/2022/11/Farmers-workshop-on-Hi-tech-farming-and-organic-farming-tissue-culture.pdf>