



Dempo Charities Trust's

DHEMPE COLLEGE OF ARTS & SCIENCE
Miramar, Panaji-Goa

Certificate course on Skill development in fungi: Basic techniques in Mycology, Mushroom cultivation and Tempeh preparation

CourseObjective:

- 1) *Techniques in fungi identification and culturing.*
- 2) *Mushroom cultivation.*
- 3) *Tempeh preparation.*

CourseContents:

In our country fungi are viewed with suspicion as a food because of their bizarre morphology. Only a few species of mushrooms are traditionally used. However fungi as food have immense potential in future as they are loaded with nutrients, antioxidants. This is an untapped market needing future entrepreneurs to venture. Course introduces students to wonderful world of 'Mycology and Mycophagy'. Equips them with basic mycology skills needed to start with and further demonstrates two of possible ventures oyster mushroom cultivation and tempeh preparation. Tempeh is Indonesian traditional food gaining popularity due to rich nutrition and unique taste. It is prepared by culturing mould *Rhizopus oligosporus* and controlled fermentation process that binds soybeans into a cake form.

Course outcome:

This certificate course offers hands-on practical training programs at different techniques in fungi to enhance the skills and techniques of students. This will provide the drive for the students to get better opportunities in prospecting fungi as food. Course also aims in getting students interested in mycology as a potential subject.

References: ---

17-03-19
10-05-19
11-05-19
13-05-19
14-05-19
15-05-19
16-05-19
17-05-19

NAME	Roll No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1) Allan Almeida	18051	A	A	A	A	A	A	A	A						
2) Prince Fal Dessai	18009	P	P	P	P	P	P	P	P						
3) Melisa Dias	17321	M	M	M	M	M	M	M	M						
4) Austin Almeida	17320	A	A	A	A	A	A	A	A						
5) Vrunda Gayak	18015	V	V	V	V	V	V	V	V						
6) Veda Dessai	18049	V	V	V	V	V	V	V	V						
7) Kritika Mandolkar	134	K	K	K	K	K	K	K	K						
8) Nikita Kurlkar	132	N	N	N	N	N	N	N	N						
9) Sareeta Koli	131	S	S	S	S	S	S	S	S						
10) Glen Fernandes	127	G	G	G	G	G	G	G	G						
11) Twixel Fernandes	18090	T	T	T	T	T	T	T	T						

Babu
Pratibha Prabhu ganeshi



**Dempo Charities Trust's
Dhempe College of Arts and Science
Panaji, Goa**

Title: Skill development in fungi: Basic techniques in mycology, mushroom cultivation and tempeh preparation

Period: 17/03/2019 and 10/05/2019 to 17/05/2019

Duration: 45 hours

Venue: Department of Botany, Dhempe College of Arts and Science, Miramar, Panaji, Goa

Number of Beneficiaries: 11

Course Co-ordinator: Dr. Pratibha Prabhugaonkar

Report:

Mycology or study of fungi is branch of science touching every sphere of life, from food, medicine, farming etc. Being to deal with micro-organisms the field requires understanding of basic skills in sterilization, media preparation, culturing of fungi and safety practices. Field of study also requires knowledge of different morphological features of fungi and use of microscopy to observe them. This course aimed to equip participants with this required knowledge so that participants can take up further work in the field. Further to demonstrate the utility of this course, techniques related to two fungal foods namely mushroom cultivation and tempeh cultivation were demonstrated to the participants.

The course participants started with a field visit to Cotigao wild life sanctuary on 17 March 2019. In field students were acquainted with diverse life forms of fungi existing around us in the form of litter degrading fungi, soil biota, parasites on plants, insects and animals, as symbiots, Mycorrhiza helping plant growth as both ecto-mycorrhizal and Endo-mycorrhiza. Students also visited farm lands to understand role of fungi in our farmlands. Students also collected some mushroom and soil samples for observing them in laboratory during the field visit.



Field visit to Cotigao on 17th March 2019

Course formally started in Botany Department of Dhempe College of Arts and Science on 10 May 2019.

On 10th may 2019 participants were welcomed for opting to the course and were given an introductory lecture and fungal world touching every sphere of our life. Modern application of fungi in food, medicine and agriculture and future prospects of fungi in providing needs of humanity.

After lecture students started hands on to acquire laboratory skills required for working with fungi. The first day was reserved for media preparation and sterilization skills. In this participants cleaned the glassware's required for the work, prepared media 'malt extract agar' and sterilized it by autoclaving. Participants also prepared moist chambers for growing fungi and incubated samples collected during field visits and other samples which were planned to be observed during the course work.

On 11th May 2019 students began with introduction to laminar air flow and its principle. This was followed by demonstration of preparation of sterile Petriplates for fungal culturing in laminar air flow. Each participant participated in this activity by using laminar airflow to prepare their own set of petri-plates.



Pouring of media plates in laminar air flow chamber

After a break on Sunday, participants started with introduction to mushroom cultivation. This was followed by demonstration of oyster mushroom cultivation using paddy straw as substrate wherein students understood intricacies like moisture content in sterilized paddy straw, spawn handling and requirement of aseptic conditions.



Mushroom cultivation- production of fruiting bodies

On 13/05/2019 students used media petri-plates prepared by them to sample fungi from different habitats. To expose them to diversity and sampling methods for different habitats techniques to isolate fungi growing as endophytes, from plant litter, aero-mycoflora and single spore isolation on malt extract media were demonstrated and were practiced by participants. This equipped participants skills to work with these micro-organisms.



Processing of Samples

On 15/05/2019 participants observed the fungi growing in Petri-plates they used for sampling. Prepared slide mounts and observed different morphological structures of fungi. They tried hands on using taxonomic manuals to identify fungi isolated and to understand cultural characteristics of different groups of fungi. They also learnt methods of preparation of pure cultures and long term storage.



Fungi growing in Petri-plates

On 16/05/2019 participants further practiced skills in preparation of slide mounts and observed more fungal characters useful in identification. Participants were taught how to calibrate a microscope using stage micro-meter and ocular micro-meter and how to measure size of materials in slide mount using later.



Calibration of microscope and observing slides

On 17/05/2019 participants observed demonstration of tempeh production using soybean as substrate for growing the mould Rhizopus.



Demonstration of Tempeh preparation



Fully grown Tempeh



Preparation of Tempeh recipe

Students also learnt how to prepare mushroom spawn and tempeh starter culture using petriplate grown purified fungal colony.

This was followed by lecture on microbial laboratory techniques by Dr. Purnima Ghadi. This included detailed briefing on types of sterilisation, laminar air flow and principals etc.

On last day participants joined hands to understand cleaning requirements of micro-fungi laboratory, decontamination and safety practices. This was followed by feedback session wherein students presented on skills acquired by them and question and answer session.



Presentation and discussion by Students

Outcomes : Participants were trained in basic skills required to work in mycology such as sterilization, aseptic handling, culturing of fungi, fungal morphology and were also demonstrated techniques in using fungi as food.



A handwritten signature in black ink, appearing to read 'Dr. Purnima Ghadi', is located at the bottom left of the page.