



Proceedings of the meeting of the Academic Council,
Gour Mahavidyalaya, Mangalbari Malda held on 01/07/2022
at 4.00 p.m in the Principal's Chamber.

Members Present:

1.  1.7.22
2. Harsh 1.7.22
3. Bijoy Ghosh 01/07/22
4.  01/07/22
5. P. K. Sarmah 1.07.22
6. B. B. 1.7.22
7. A. B. 1.7.22
8. SK Maimuddin 01.07.2022
9. K. K. 01.07.2022
10. P. P. 01/07/2022
11. Dipjyoti Singh 1.7.22
12. Deepa Lata Tamang 1.7.22
13. A. A. 1.7.22
14. T. T. 01.07.22

Dr. Ashim Kumar Sarker, Principal, Gour Mahavidyalaya,
Malda takes the chair and initiates the discussion.

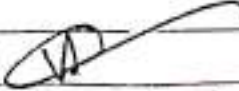
Agenda-I: To confirm the resolutions of the
previous meeting.

1. Resolved that the resolutions of the previous meeting
are readout and confirmed.

Agenda-II: Introduction of ADD-ON-COURSE from
the session 2022-23.

2. Resolved that all the Heads of the 19 departments
are requested to select Paper concerning introduction
of ADD-ON-COURSE from the Session 2022-23 and
inform the Principal and Convenor of the Academic
Council. Resolved also that classes on ADD-ON-COURSE
from August - September, 2022.

Supriya Biswas
Convenor 1/7/2022
Academic Council


Principal
Dr. Ashim Kumar Sarker
Gour Mahavidyalaya, Malda.
GOUR MAHAVIDYALAYA
Mangalbari, Malda.

Notice No-

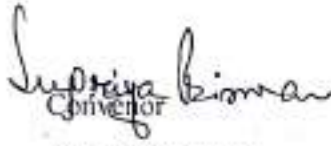
Gour Mahavidyalaya, Mangalbari, Malda

Date-01/07/2022

Academic Council

Notice

All the Heads of the 20 departments are requested to select an ADD-ON COURSE for the session 2022-2023, and the need to inform me through a letter about the name of that course within 10 days. They are also requested to begin classes of 30 hours of the ADD-ON COURSE, and maintain the record properly (students' daily attendance sheet duly signed by the teacher and photo of classes).


Supriya Biswas
Chairman

Academic Council

Gour Mahavidyalaya



Principal

Gour Mahavidyalaya

Malda

Principal
GOUR MAHAVIDYALAYA
Mangalbari, Malda

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA
NOTICE

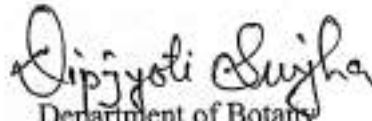
ADD-ON -COURSE
(MUSHROOM CULTURE TECHNIQUE)

NOTICE NO.-

DATE-04.07.2022

Students of Department of Botany are hereby informed that we are going to provide an ADD-ON-COURSE : MUSHROOM CULTURE TECHNIQUE from 7th July 2022. Interested students are requested to enrol at the earliest in the department.


Principal
GOUR MAHAVIDYALAYA
Mangalbari, Malda


Department of Botany
Gour Mahavidyalaya
Mangalbari, Malda

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA

LETTER NO.- GMBD/04/22

DATE-04.07.2022

To,
The Convenor
Academic Council
Gour Mahavidyalaya

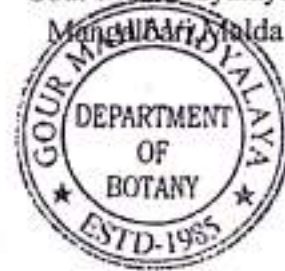
Respected Madam,

As per response to your letter for ADD-ON-COURSE vide dated 1st July 2022 we would like to inform you that we have opted MUSHROOM CULTURE TECHNIQUE as an ADD ON COURSE at our Department. The course will be started from 7th July 2022.

Thanking you.

Dipjyoti Singh 04/7/22

Department of Botany
Gour Mahavidyalaya
Mangalbari, Malda



Received
Supriya Biswas
04/07/2022

ADD ON COURSE
ON

MUSHROOM CULTURE TECHNIQUE

ORGANISED BY
DEPARTMENT OF BOTANY
GOUR MAHAVIDYALAYA
MANGALBARI
MALDA

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA
ADD-ON - COURSE ENROLMENT FORM
(MUSHROOM CULTURE TECHNIQUE)

NAME OF THE STUDENT- APARAJITA MANDAL

SEMESTER/YEAR- 2nd Sem

ROLL NO- 1221BOTH 0188

HONS./GEN.- Hons

DEPARTMENT- Botany

CONTACT NO.- 9064722941

EMAIL ID.- aparajitam951@gmail.com

Aparajita Mandal
SIGNATURE OF THE APPLICANT

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA
ADD-ON - COURSE ENROLMENT FORM
(MUSHROOM CULTURE TECHNIQUE)

NAME OF THE STUDENT- SHUBANKAR DAS

SEMESTER/YEAR- 2nd sem

ROLL NO- 122/BOTH 0196

HONS./ GEN.- HONS

DEPARTMENT- Botany

CONTACT NO.- 8509192981

EMAIL ID.- dasshubankar90@gmail.com.

Shubankar Das
SIGNATURE OF THE APPLICANT

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA
ADD-ON - COURSE ENROLMENT FORM
(MUSHROOM CULTURE TECHNIQUE)

NAME OF THE STUDENT- SOURAV KUMAR DUTTA

SEMESTER/YEAR- 2nd Sem

ROLL NO- 1221BOTH0198

HONS./ GEN.- Hons.

DEPARTMENT- Botany

CONTACT NO.- 7063741873

EMAIL ID.- 1873sd@gmail.com

Sourav Kumar Dutta

SIGNATURE OF THE APPLICANT

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA
ADD-ON - COURSE ENROLMENT FORM
(MUSHROOM CULTURE TECHNIQUE)

NAME OF THE STUDENT- SURAJ SINGHA
SEMESTER/YEAR- 2nd Sem
ROLL NO- 1221BOTH0199
HONS./ GEN.- Hons
DEPARTMENT- Botany
CONTACT NO.- 8436130275
EMAIL ID.- surajsingha843613@gmail.com

Suraj Singha
SIGNATURE OF THE APPLICANT

GOUR MAHAVIDYALAYA
ADD ON COURSE
SYLLABUS
MUSHROOM CULTURE TECHNIQUE

1. **Introduction:** Nutritional and medicinal value of edible mushrooms; Types of edible mushrooms available in India - *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*.
2. **Cultivation Technology :** Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag.
3. **Pure culture:** Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation
4. **Storage and nutrition:** Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins.
5. **Food Preparation:** Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

Suggested Readings

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.
3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications,

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
ADD-ON COURSE CLASS ROUTINE FOR THE SESSION 2022

	10.00-11.00	11.00-12.00	12.00-1.00	1.00-2.00	2.00-3.00	3.00-4.00	4.00-5.00
MONDAY						S.S	
TUESDAY						D.S	
WEDNESDAY						S.S	S.S
THURSDAY						P.D	D.S
FRIDAY						P.D	P.D
SATURDAY						S.S	

D.S –DIPJYOTI SINGHA
P.D-PRAJESH DUTTA
S.S – SANGITA SINGHA

**GOUR MAHAVIDYALAYA
ADD ON COURSE
STUDENTS ATTENDANCE SHEET**

Started - 07/07/22

NAME OF THE STUDENTS	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	DAY 11	DAY 12	DAY 13	DAY 14	DAY 15	DAY 16
Aparajita Mondal	P	A	P	P	P	P	P	P	P	P	P	A	P	P	P	
Sourav Laita	P	P	P	A	P	P	P	P	P	A	P	P	P	P	P	
Surbankar Das	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	
Sumanj Singh	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	


 Principal
 GOUR MAHAVIDYALAYA
 Mangalbari, Malda



STUDY MATERIAL MUSHROOM CULTURE & TECHNIQUES.

Mushrooms are being used as food since time immemorial. These have been considered as the delicacy. From the nutrition point of view mushrooms are placed between meat and vegetables. These are rich in protein, carbohydrate and vitamins. Mushrooms are low in caloric value and hence are recommended for heart and diabetic patients. They are rich in proteins as compared to cereals, fruits and vegetables. In addition to proteins (3.7 %), they also contain carbohydrate (2.4 %), fat (0.4%), minerals (0.6 %) and water (91%) on fresh weight basis. Mushrooms contain all the essential nine amino acids required for human growth. Mushrooms are excellent source of thiamine (vitaminB1), riboflavin (B2), niacin, pantothenic acid, biotin, folic acid, vitamin C, D, A and K which are retained even after cooking. Since mushrooms possess low caloric value, high protein, high fibre content and high K: Na ratio, they are ideally suited for diabetic and hypertension patients. They are also reported to possess anticancer activities.

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Mushroom Cultivation techniques

Most of the mushrooms belong to the Sub Division: Basidiomycotina and a few belong to Asco mycotina of Kingdom-Fungi. . It is reported that there are about 50,000 known species of fungi and about 10,000 are considered as edible ones.

MUSHROOM CULTIVATION FOR Oyster mushroom : Oyster Mushrooms (*Pleurotus .sp.*) belongs to .subdivision ascomycotina; known as "Dhingri" in India and has fan or oyster shaped cap [10]. They grow easily on decaying wood or straw. The cap of oyster mushroom is tongue shaped , maturing to a shell shaped form , 50-150 mm in diameter , whitish to grey to blue grey in colour . Flesh is thin and white , margin is occasionally wavy, gills are white, decurrent , broadly spaced, stem attached in an off - centred fashion and is short at first and absent in age . Spores are whitish to lilac grey in mass, mycelium whitish, fast growing rhizomorphic to linear. Basidia tetra poplar, producing 4 haploid spores, heterothallic, clamp connections present . It contains 91% water and 9% dry weight; 30.4 % crude protein and 109 mg niacin/100 g dry weight .Because of the allergic nature of spores, some spore less strains has also been developed.



MUSHROOM SPAWN PRODUCTION:

- a. **Substrate preparation:** It is commonly cultivated on wheat or rice straw, due to their easy availability in large quantities. The straw of 4-6cm size is taken and dipped in cold water for 10-12 hours. Straw can be sterilized by various methods as given below:

Hot water treatment: The soaked straw is dipped in hot water at 80° c for 2 hours. Hot water treatment makes hard substrate soft so that growth of the mycelium takes place very easily. This method is not suitable for large scale commercial cultivation.

Steam pasteurization: In this method pre-wetted straw is pasteurized by passing steam through the straw for 2-3 hours. This method is used for commercial cultivation.

Chemical sterilization technique: In this method 7.5g bavistin and 125 ml formalin are dissolved in 100 litre water and slowly poured on the heap of wheat straw. Soaked straw is covered with a polythene sheet. After about 18 hours the straw is taken out and excess water drained off.

b. Spawning: The process of spawn making is the same as in *Agaricus*. The normal rate of spawning in pasteurized substrate is 1.5-2.0 % of the wet substrate, however it is slightly higher (2.0-2.5%) in unpasteurized material. The spawning is usually done in layers or even in thorough spawning care should be taken that the spawn gets uniformly mixed with the substrate, while in layer method the spawn is mixed after each layer of 3-4 cm thickness of straw. R.H. of mushroom house should be maintained between 80-85%.

Cropping and management: Within 15-18 days of filling and spawning, white cottony growth of the mycelium spreads in these bags which can be noticed easily. These bags are cut open and kept in mushroom house on racks, 25-30cm apart from one another or these may also be hanged on nylon ropes keeping some distance between them. Water is sprayed over them in the morning and evening hours to maintain 80-85 % RH in mushroom house and also temperature between 22-26°C. Pinning starts in next 4-5 days and fruit bodies become fully grown within a week of pinning.

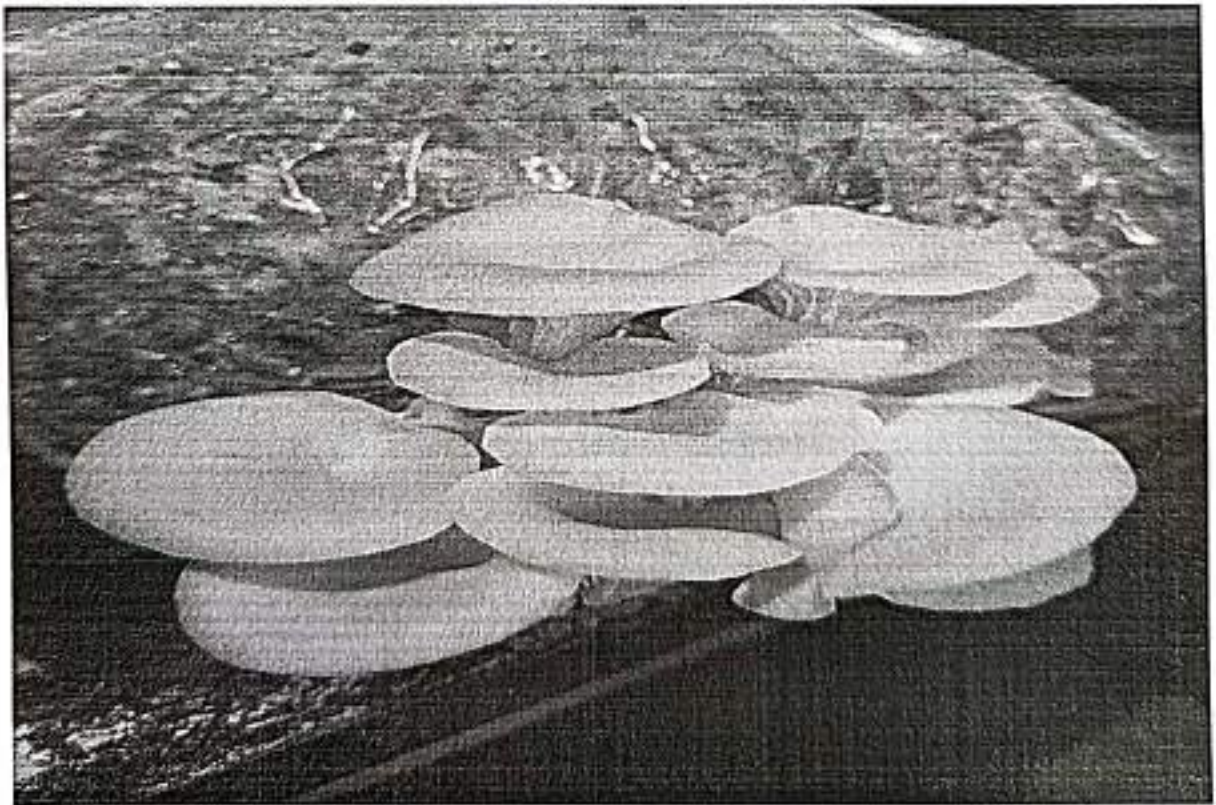
Harvesting: The cropping stage lasts for 30-45 days at 20 – 25°C, 85 – 92 % humidity and less than 600 ppm CO₂. Approximately 4-6 air changes per hour and light 200 Lux / hour to 12 hour per day are most stimulatory. Regular misting is recommended to prevent cracking of caps and resting primordia. The mature mushrooms are harvested individually before incurved margin expands to plane by slightly twisting and lifting the fruit bodies with the help of two fingers and a thumb. The lower root portion is removed with the help of a knife.

Yield: The average yield comes around 100-125 kg mushrooms / 100 kg dry straw or substratum.

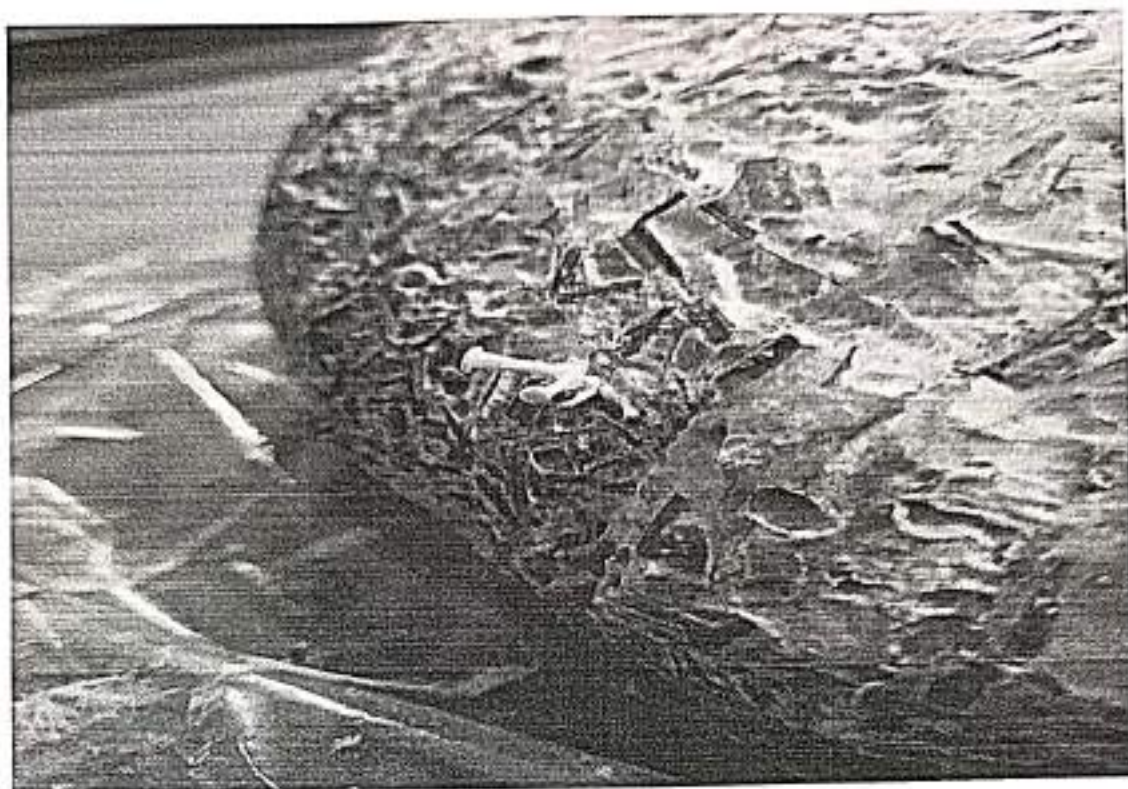




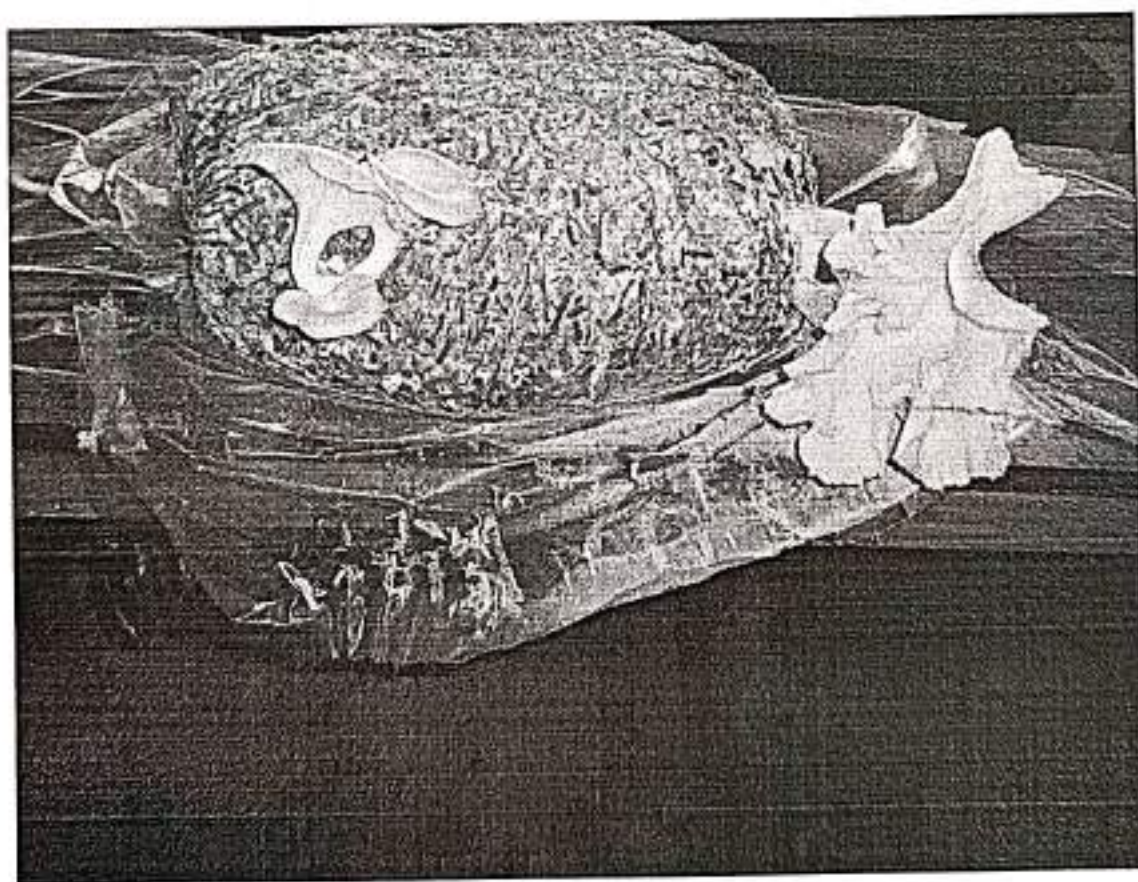
Hervesting



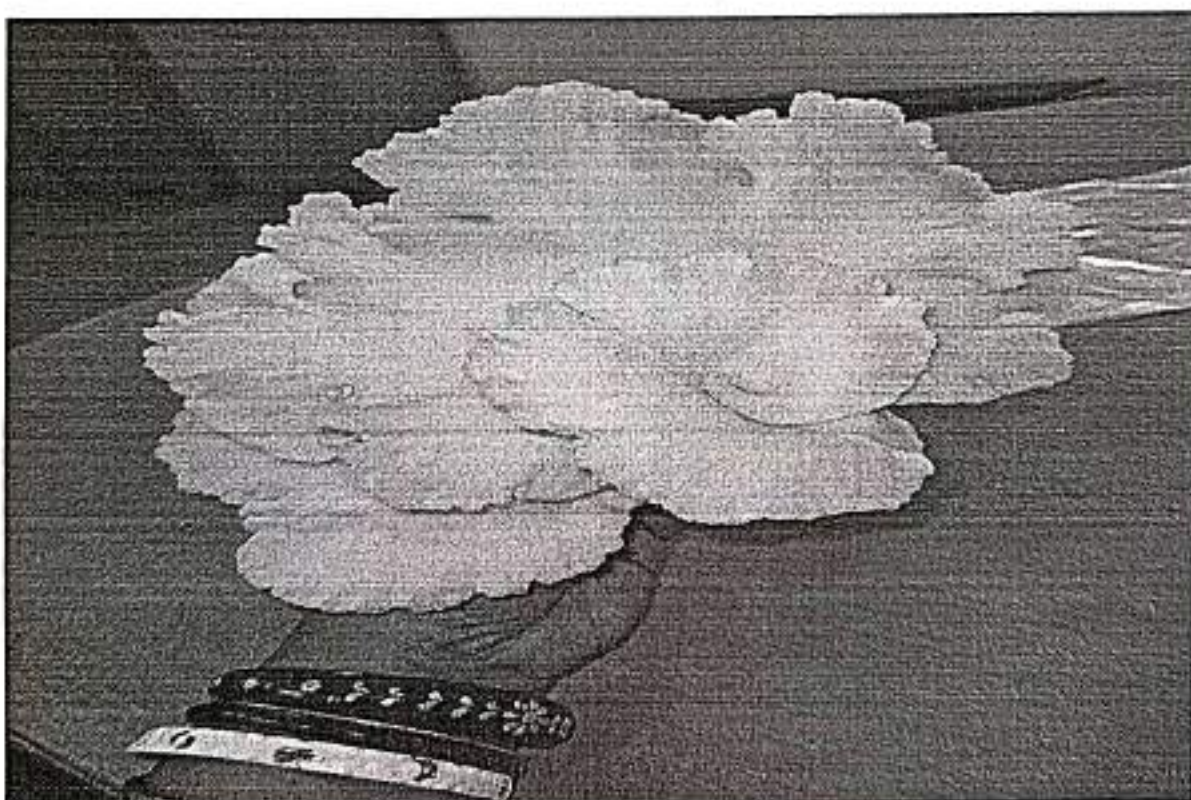
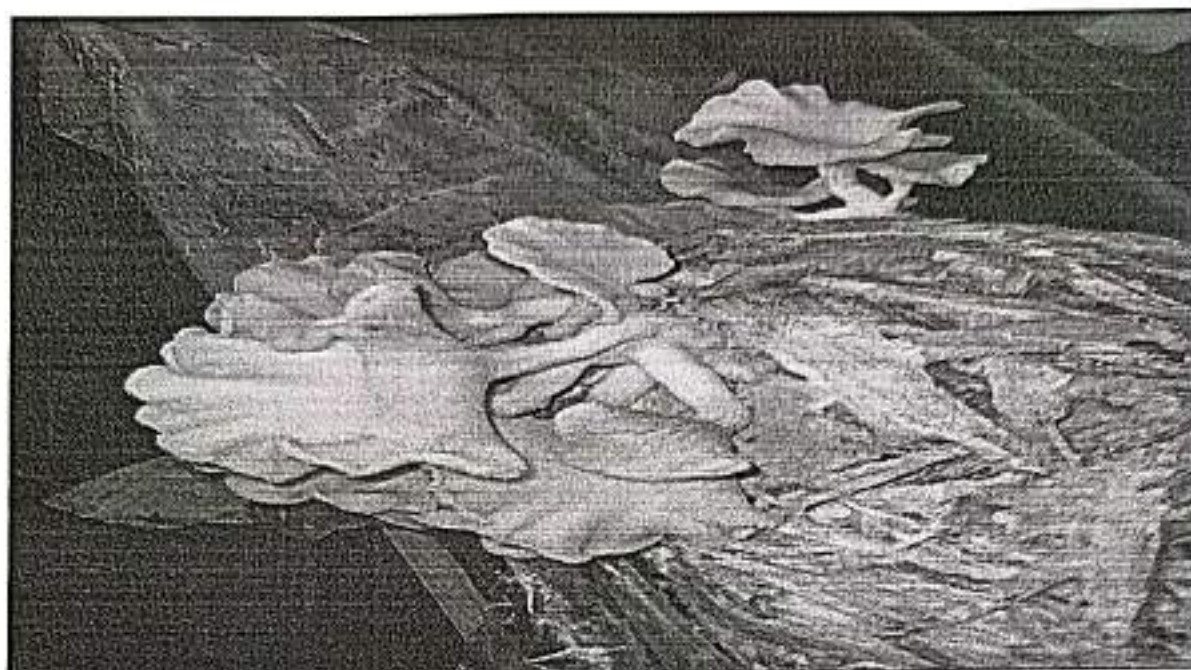
Mature fruit body



Pin head structure



Fruit body formation



Aparajita Mandal

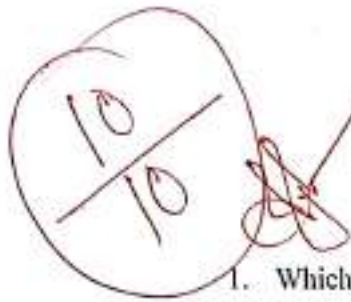
Roll - 1221 BOTI NO - 0288

Gour Mahavidyalaya

Department of Botany

Add-on course

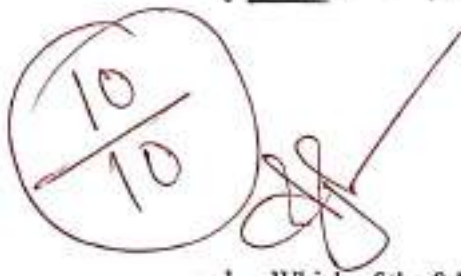
Mushroom Culture techniques



- Which of the following is not an edible mushroom?
 - Agaricus bisporus*
 - Pleurotus ostreatus*
 - Lentinula edodes*
 - Amanita phalloides*
- Mushroom is:
 - Saprophytic fungus
 - Autotrophic Algae
 - Heterotrophic fungus
 - None of the above
- Formaldehyde is used as _____ in mushroom cultivation
 - Disinfectant
 - Fertilizer
 - Insect repellent
 - Food material
- Mushrooms are good source of _____
 - Protein
 - Carbohydrates
 - Fats
 - None of these
- Preservation methods of mushrooms are _____
 - Pickling
 - Canning
 - Both
 - None of the above
- During spawning temperature should be maintained between.
 - 20-30
 - 55-70
 - 80-100
 - 0-10
- Mushroom has _____
 - Anticancer property
 - Anti aging property
 - Antibiotic property
 - All of the above
- Paddy straw mushroom is _____
 - Agaricus bisporus*
 - Volvariella volvacea*
 - Pleurotus sajor-caju*
 - Auricularia species*

Gourav Kumar Dutta

Roll No:— 1221BOTH 0198

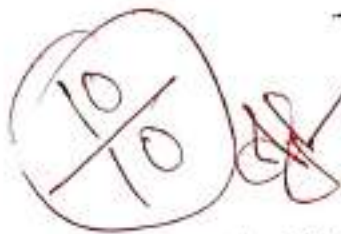


Gour Mahavidyalaya
Department of Botany
Add-on course
Mushroom Culture techniques

1. Which of the following is not an edible mushroom?
 - a) *Agaricus bisporus*
 - b) *Pleurotus ostreatus*
 - c) *Lentinula edodes*
 - d) *Amanita phalloides*
2. Mushroom is:
 - a) Saprophytic fungus
 - b) Autotrophic Algae
 - c) Heterotrophic fungus
 - d) None of the above
3. Formaldehyde is used as _____ in mushroom cultivation
 - a) Disinfectant
 - b) Fertilizer
 - c) Insect repellent
 - d) Food material
4. Mushrooms are good source of _____
 - a) Protein
 - b) Carbohydrates
 - c) Fats
 - d) None of these
5. Preservation methods of mushrooms are _____
 - a) Pickling
 - b) Canning
 - c) Both
 - d) None of the above
6. During spawning temperature should be maintained between.
 - a) 20-30
 - b) 55-70
 - c) 80-100
 - d) 0-10
7. Mushroom has _____
 - a) Anticancer property
 - b) Anti aging property
 - c) Antibiotic property
 - d) All of the above
8. Paddy straw mushroom is _____
 - a) *Agaricus bisporus*
 - b) *Volvariella volvacea*
 - c) *Pleurotus sajor-caju*
 - d) *Auricularia species*

Name = shubankar Das

Roll = 1221BotH No. = 0196

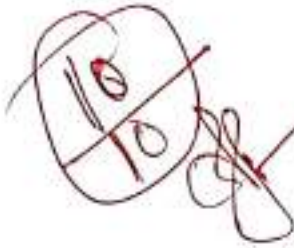


Gour Mahavidyalaya
Department of Botany
Add-on course
Mushroom Culture techniques

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 - Pleurotus sajor-caju*
 - Auricularia species*

Sury Singh

Roll No : 1221BOT/10199



Gour Mahavidyalaya
Department of Botany
Add-on course
Mushroom Culture techniques

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 - Pleurotus sajor-caju*
 - Auricularia species*

GOUR MAHAVIDYALAYA
DEPARTMENT OF BOTANY
MANGALBARI, MALDA
ADD-ON -COURSE
(MUSHROOM CULTURE TECHNIQUE)

CERTIFICATE ISSUED TO THE STUDENTS:

1. Aparagita Mandal
2. Suzaj Singha
3. Shubankar Das
4. Souvik Kumar Dutta
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

COURSE COORDINATOR SIGNATURE

**CERTIFICATE OF COMPLETION
ADD ON COURSE
MUSHROOM CULTURE TECHNIQUE**

Recipient Name.....

**ORGANISED BY
DEPARTMENT OF BOTANY
GOUR MAHAVIDYALAYA
MANGALBARI
MALDA
WEST BENGAL**


COURSE COORDINATOR


QAC COORDINATOR


PRINCIPAL
Principal
GOUR MAHAVIDYALAYA
Mangalbari, Malda