Adusumilli Gopalakrishnaiah & Sugarcane Growers
Siddhartha Degree College of Arts & Science
Vuyyuru – 521165, Krishna District, Andhra Pradesh
(An Autonomous College in the Jurisdiction of Krishna University, Machilipatnam)
Accredited by NAAC with "A" Grade
Phone No: 08676-233267 Email ID: agsgsiddhartha@gmail.com website: http://agsgsc.edu.in

DEPARTMENT OF BOTANY

CERTIFICATE COURSE

MUSHROOM CULTIVATION

2018-19

COURSE CODE:-BOTCCMC02

DATE:-03/12/2018 TO 11/01/2019 & 20/01/2019 TO 06/03/2019

A.G. & S.G. Siddhartha Degree College of Arts & Science
Vuyyuru-521165, Krishna District, Andhra Pradesh
(Managed by: Siddhartha Academy of General & Technical Education, Vijayawada-10)
An Autonomous College in the Jurisdiction of Krishna University
Accredited by NAAC with "A" Grade

DEPARTMENT OF BOTANY

Certificate Course

Title: Mushroom Cultivation

2018-19

Name of the Lecturer	: Ch. Beulah Ranjani
Class	: II BZC (T.M&E.M)
Duration of the Course	: 03.12.2018 to 11.01.2019 & 20. 01.2019 to 06.03.2019.
Course Code	:BOTCCMC- 02

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Objectives:

Mushroom production can play an important role in managing farm organic wastes when agricultural and food processing by-products are used as growing media for edible fungi.

Methodology: Mushroom farming consists of six steps, and although the divisions are somewhat arbitrary, these steps identify what is needed to form a production system. The six steps are Phase I composting, Phase II composting, spawning, casing, pinning, and cropping.

Duration : 30 days (03. 12. 2018 to 11.01.2019 & 20.01.2019 to 06.03.2019)

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Value Added Course / Certificate Course

Student Enrolment Sheet

Class : B.A, B.Sc. B.Sc

S. No	Roll No.	Name of the Student	Signature
1	17-006	Abdul Bhari	Ab. Bhari
2	17-007	K. Muralimohan	K. MuraliMohan.
3	17-051	G. Ashok kumar	G. Ashok kumar
4	17-013	O. Rama krishna	O. Ramakrishna
5	17-026	M. Naga Bhushanam	M. NAGA Bhushanam.
6	17-029	K. Pavan kalyan	K. pawankalyan
7	17-020	K. Prasad	K. prasad
8	17-023	CH. Rahul	CH. Rahul
9	17-030	M. Vinay Babu	M. Vijay Babu
10	17-050	J. Rajesh	J. Rajesh
11	17-021	Md. Imran	Md. Imran
12	17-019	P. Naveen	P. Naveen
13	17-041	Y. Bhavya	Y. Bhavya
14	17-034	P. Madhuri	P. Madhuri
15	17-022	Y. Swapna	Y. Swapna

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Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course / Certificate Course

Student Enrolment Sheet

Class : II B.A. BZC

S. No	Roll No.	Name of the Student	Signature
1	17-434	G. Prudhvi Raja	G Prudhvi Raja
2	17-428	T. Lavanya	T. Lavanya.
3	17-422	K. Siva Rama krishna	K. Siva Rama Krishna
4	17-237	K. Nagarjuna	K. Nagarjuna.
5	17-239	S. Rahetullah	S. Rahetullah.
6	17-231	V. Sai Prathyusha	V. Sai prathyusha
7	17-332	V. Janaki	V. Janaki
8	17-508	V. Bhargavi	V. Bhargavi
9	17-516	CH. Vimala kumari	CH. Vimala kumari
10	17-509	A. Vijaya Rani	A. vijaya Rani
11	17-335	M. Sudhara	M. Sudhara
12	17-331	P. Pooja	P. Pooja
13	17-511	L. Dharani	L. Dharani
14	17-311	K. Usha Rani	K. Usha Rani
15	17-301	K. Sathavathi	K. Sathavathi

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Value Added Course / Certificate Course

Student Enrolment Sheet

Class : II. B.A B.Sc.

S. No	Roll No.	Name of the Student	Signature
1	17-303	V. Dhananjali	V. Dhananjali
2	17-304	P. Keerthana	P. keerthana.
3	17-308	G. Lavanya	G. Lavanya.
4	17-513	D. Deepthi	D. Deepthi
5	17-507	P. Naga Rani	D. Deepthi
6	17-520	D. Deepika	D. Deepika
7	17-502	G. Sandeep	G. Sandeep
8	17-505	K. Tejaswi	K. Tejaswi
9	17-503	K. Mounika	K. Mounika
10	17-514	Y. Rushyanth	Y. Rushyanth
11	17-024	A. Pavan kumar.	A. Pavan kumar
12	17-424	G.Y.S. Pavan	G.Y.S pavan.
13	17-512	Srikanth-B	Srikanth.B.
14	17-515	T. Naga Divya	T. Naga Divya.
15	17-337	D. Haritha	D. Haritha

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Value Added Course / Certificate Course

Student Enrolment Sheet

Class : _____

S. No	Roll No.	Name of the Student	Signature
1	17-525	B. Chandana	Chandana
2	17-641	T. Kalyan Guru Datta	T. Kalyan Guru Datta
3	17-650	D. N. Mallikaisu	D.N. Mallikaisu
4	17-637	P. V. V. Chinnana Rao	P.V.V Chinnana Rao.
5	17-643	M. Tarun Sai.	M. Tarun Sai
6			
7			
8			
9			
10			
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14			
15			

C. B. Ranjani

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Title: Mushroom Cultivation

Date: (03. 12. 2018 to 11.01.2019 &20.01.2019 to 06.03.2019)

Date	Content	Module No.
	1. Mushroom Cultivation- Introduction, Uses, Types of mushrooms (6hr). 2. Preparation of Mother Spawn in Saline bottle, sterilization. 3. Cultivation of milky mushrooms.	**UNIT-1**
	(8 hrs) 4. Soil PH, Water, Soil sterilization, dark room, light room. 5. Controled room temperature, culture caring. 6. Diseases and their controlling methods.	**UNIT-2**
	(8 hrs) 7. Storage and nutritional value. 8. Industrial edible mushrooms, poisonous mushrooms. 9. Importance and Medicinal value of mushrooms.	**UNIT-3**
	10. Types of food prepared from mushrooms (6hr) 11. Marketing in India. Export value.	**UNIT-4**

INTRODUCTION

Mushrooms are one of the most loved food not only for its exotic taste but also for the benefits with which it comes. It can be consumed in various forms like fresh, pickled, dried, powdered, canned etc. Its farming has picked up a fast pace among contemporary entrepreneurs owing to its nutritional and medicinal benefits and low cost input with high output. Mushrooms are a fleshy fungi (Basidiomycota, Agaricomycetes) having a stem, cap and gills underneath the cap. They can be edible, wild and some of them can be toxic too. It contains more than 90% water and less than 1% fat, loaded with Vitamin B, copper and selenium and low in sodium. Usually vegetables, milk and other food products are fortified with Vitamin D by irradiation or direct addition but mushrooms are unique in this sense because they are naturally a rich source of Vitamin D which otherwise is procured from animals or poultry . The reason being that it contains copious amount of plant sterol "Ergo sterol". It is a precursor of Vitamin D which when stimulated by sunlight or artificial lightening source converts to Vitamin D.

Uses of mushrooms

- Decrease the risk of cancer
- Lower sodium intake
- Promote lower cholesterol
- Protect brain health
- Provide a source of vitamin D
- Stimulate a healthier gut
- Support a healthy immune system.

TYPES OF MUSHROOMS:

A good test for edibility however is the taste test, if a tiny amount is placed on the tongue and chewed a burn like chilli means the mushroom is poisonous, a pleasant mushroomy taste means it is edible.

Mushrooms are easily cultivable in hilly regions due to abundant moisture but can also be grown in artificial environment with proper temperature and humidity control. Varieties must be identified thoroughly as some of them might cause food poisoning or allergy upon consumption.

Some of the major varieties consumed in India are as follows: Button Mushroom Button mushroom (Agaricus bisporus) belongs to Class Basidio mycetes and Family Agaricaceae. It is of two types white and brown, out of which white button mushrooms commonly grown in India.

Shiitake Mushroom Shiitake Mushrooms are native to East Asia and are highly consumed in Asian countries. They readily grow on wood of deciduous and hard wood trees such as Oak, Chestnut, and Maple etc. and require moist and warm climate. In rare cases they may cause allergic reaction like itching but can be eliminated by thorough cooking. These are used in Asian cuisines and traditional medicines.

Oyster Mushroom Oyster Mushrooms (Pleurotus ostreatus) belongs to Pleurotus species. It is known as “Dhingri” in India and has fan or oyster shaped cap. They grow easily on decaying wood or straw. Paddy Straw Mushroom Volvariella volvacea belongs to division Basidiomycota. It is usually grown on Rice straw bed and is used extensively in Asian Cuisines .

Spawn preparation:

Fill the grains in saline bottles up to 3/4th height (approximately 300-330 g / bottle), insert a PVC ring , bold the edges of the bag down and plug the mouth tightly with non-absorbent cotton wool. Cover the cotton plug with a piece of waste paper and tie tightly around the neck with a jute thread.

A small tissue from a well-grown mushroom is aseptically transferred to agar medium in a test tube in a culture room. The test tubes are incubated under room temperature for 10 days for full white growth of fungal culture. This is further used for preparation of mother spawn.

In the spawn-production process, mycelium from a mushroom culture is placed onto steam-sterilized grain, and in time the mycelium completely grows through the grain. This grain/mycelium mixture is called spawn, and spawn is used to "seed" mushroom compost.

Milky mushroom, otherwise known as summer mushroom, is a long sized, white and attractive mushroom of India. This is a tropical mushroom like paddy straw mushroom. Artificial cultivation started as early as 1976 in the state of West Bengal. Now, this mushroom has gained popularity in the states of Karnatak, Tamilnadu, Kerala and Andhra Prodesh. The climatic condition of these states including Odisha is suitable for milky mushroom cultivation from March to October. However, in some states this has not been commercialized yet because of the preference of paddy straw mushroom by the people. At present efforts are on to popularize milky mushroom in India like paddy straw and oyster mushroom.

Attributes:

- The mushroom is bright white in colour and attractive.
- Different types of cellulosic wastes can be used as basal substrate.
- The cultivation procedure is simple and easy
- Productivity is higher – 80 to 100 %
- Milky mushroom has good self life. Fruit bodies can be stored for 3-4 days in ambient condition.
- Fresh mushroom can be exported.

CLIMATIC REQUIREMENT

Temperature: Milky Mushroom can be grown in the temperature range of 25^0 - 40^0C. However, for best yields, 25^0 - 35^0C is necessary. Hence, this mushroom can be cultivated from the month of March to October in major states of India. During summer months, it may be necessary to bring down the temperature and to improve the relative humidity for obtaining higher yields.

Relative humidity: Atmospheric relative humidity should be in the range of 80 – 85 %. Under low humidity, young fruit bodies dry up or the upper surface of the mushroom becomes rough.

Light: During fruiting, low light (200 lux) is necessary. However during the mycelium growth period, light requirement is still minimal.

Ventilation: During fruiting stage, more oxygen is required and therefore, bags are kept in a well-ventilated room.

MATERIAL REQUIREMENT

Substrate: Different types of cellulosic agricultural residues such as **paddy straw, wheat straw, barley straw, maize, jowar and bajra stalkm groundnut haulms, sugarcane bagasse, wheat bran and cotton waste** can be used as basal substrate. However, **paddy straw** is the best substrate for cultivation of Milky Mushroom. About one kilogram of dry straw is necessary for raising a single bag.

Mushroom Spawn: Three weeks to one month old 100 grams of good quality seeds (10 % of dry weight of straw) is necessary for raising a bag. The spawn should be procured from a recognized spawn laboratory.

Organic Supplement: For improving productivity one may use pasteurized maize meal, wheat bran, paddy husk or boiled wheat grain at 100-150 gm per bag during spawning.

Polythene Bag: Polythene tube of dimension **60 cm x 40 cm** with 100 gauge thickness and open at both sides is required for milky mushroom cultivation.

CULTIVATION PROCEDURE

Substrate Processing: Good quality paddy straw is chopped to 4-5 cm size with chaff cutter. The chopped straw is soaked in clean and cold water for six hours. However, the soaking period is varied with nature of substrate. Excess water is drained from the straw and it is subjected to physical and chemical means of pasteurization as in the case of oyster mushroom. Straw should contain **50-55%** moisture at the end for giving better productivity.

Raising of Bags: One end of the polythene tube is tied with rubber band and the moistened and pasteurized substrate is put inside to a height of **7.5 cm**. Substrate is then gently pressed and **one third each** of spawn and supplement (35 gm) spread at the **periphery** close to polythene. Likewise, **three such layers** are made and the bag is closed at the upper end after pressing the substrate. **15 to 20 small holes** (0.5 cm to 1.0 cm dia) should be made on all sides to facilitate gas exchange. Instead of layer spawning, mixed spawning may also be followed where the required quantity of spawn is mixed with the prepared substrate (soaked and pasteurized straw) and incorporated into the bag. The bags are then incubated in a dark room where a temperature of **25-35^{0}C** and a relative humidity of **80%** are maintained. It takes about **20 days** when substrate is fully colonized

and bags are ready for casing. Bags are shifted to cropping room for casing and cropping.

Casing and after care : Casing means covering the top surface of bags after spawn run is over, with pasteurized casing material in about **2-3 cm** thickness. Casing provides physical support, moisture and allows gases to escape from the substrate. **Casing material(soil 50% + Compost 50%)** with pH adjusted to 7.8 to 7.9 with **chalk powder** is pasteurized in autoclave at 15 psi for one hour or chemically treated with **4 % formaldehyde** solution about a week in advance of casing. It is covered with polythene sheet to avoid escape of chemical and turned at 2 days interval so that at the time of casing, soil is free from formalin smell. Top of the bag is opened, polythene is folded and casing material is uniformly spread in 2-3 cm thickness.

Cropping : It takes about 10 days for the mycelium to reach the top of the casing layer when fresh air is introduced along with appropriate temperature and humidity. The changes thus made in the environment, result in the initiation of fruit bodies within 3-5 days which may mature in about a week.

Mushroom of **7-10 cm** diameter are harvested by twisting, cleaned and packed in perforated polythene/polypropylene bags for marketing. In a **40 days** duration crop, around 800-1000 g of mushroom may be harvested per bag. Hence, the biological efficiency of milk mushroom is 80-100%.

Average Yield per bag: 1 Kg

SOIL PH:

One of the most comprehensive studies of the influence of pH on mushroom mycelial growth in nutrient solutions was that by Treschow (6). Values of pH between pH 6.0 and pH 7.0 have been reported as optimum values for mycelial growth on liquid and semisolid media.

SOIL STERILIZATION:

Substrate is filled in polypropylene bags (x45cm, holding 2-3 kg wet substrate) and sterilized at 15 lb psi for 1 hour. Once pasteurization/sterilization is over straw is shifted to spawning room for cooling, bag filling and spawning.

DARK ROOM:

It's more related to the increased humidity as a result of less direct sunlight that produces more favorable conditions. Sunlight, as well as more open areas tend to

dry out much more quickly. Mushrooms do not need light to grow, as they do not photosynthesize their nutrients but pull them in from their substrate.

LIGHT ROOM:

Light: During fruiting, low light (200 lux) is necessary. However during the mycelium growth period, light requirement is still minimal.

Ventilation: During fruiting stage, more oxygen is required and therefore, bags are kept in a well-ventilated room.

Controlled room temperature:

Optimum temperature requirement for spawn running 30-32°C. Spawn running period 25-30 days. Cropping requires an optimum temperature of 30- 32°C, humidity of 80-85%, light and ventilation. Mushrooms can be harvested in 2-3 flushes after which the entire cycle is repeated.

Diseases and their control:

Maintain the surroundings of the mushroom farm in good condition, avoiding the accumulation of organic matter (compost, casing soil, mushroom stalks) which can act as a reservoir and refuge for spore-laden debris and flies. Inspect mushroom beds regularly for disease, especially prior to watering and picking.

Fungicides are pesticides that kill or prevent the growth of fungi and their spores. They can be used to control fungi that damage plants, including rusts, mildews and blights. They might also be used to control mold and mildew in other settings.

UNIT - 3

Storage and nutritional value:

Canning is the most common process for preserving mushrooms. For this, cleaned mushrooms are placed in cans containing 2.5 % sodium chloride and 0.25–0.5 % citric acid. The cans are then sealed and sterilized in autoclave for one hour at 100-120ºC. It is one of the best long term storage.

Nutritive value of milky mushroom is comparable with other mushrooms. Mature fruit body of C. indica contains highest protein (17.2% on dry weight basis), while young pin heads contain the lowest proteins (15% on dry weight basis), 4.1% fat, 3.4% crude fibre and 64.26% carbohydrate on dry wt basis.

Industrial edible mushroom:

Milky mushroom is gaining popularity among the edible mushrooms because of its white attractive robust sporo caps, highest protein content, long shelf life and taste. ProductionThe milky mushroom (Calocybe indica) is a potentially new species to the world mushroom growers.

The most cultivated edible mushroom worldwide is Agaricus bisporus (common mushroom) followed by Lentinus edodes (shiitake mushroom), Pleurotus spp. (in particular oyster mushroom), and Flammulina velutipes .

1) Cantharellus It is the wild species of edible mushrooms. The fruiting body varied from orange, yellow to white colored. The shape was found funnel shaped. The fruiting body has shown rounded to forked folds all the way down the stipe. The folds are more wrinkled or rounded and randomly forked. The fruiting body emitted a peculiar fruity aroma and peppery taste .The gills were found more

2) Calvatia It is commonly called as Puffballs .It produce clouds of brown dust-like spores from fruiting body. The fruiting body do not have distinct stalk or stem. They do not have spore-bearing gills. The fruiting body produced mass of spores. The spores are produced to the basidia. The fruiting body has distinct colour and texture.

3) Coprinus It is known as shaggy mane or shaggy ink cap or lawyer's wig or shaggy mane. It is found on lawn waste areas. The fruiting body turns black and dissolves itself after picked. The fruiting body remains shaggy and with cylindrical ink cap. The cap of fruiting body is white and covered with scales. The gills beneath the cap are white to pink or black. It secretes a black liquid containing mass of spores.

4) Pleurotus It is commonly known as oyster mushroom .It was found on decomposed wood. The fruiting body is broad fan shaped or oyster-shaped. It may be white to gray or tan to dark-brown. The margin of fruiting body is in rolled. It becomes smooth and somewhat lobed or wavy. It fruiting body is white and fleshy .The stipe is short and thick .The gills are white to cream and descend on the stalk or stipe of fruiting body.

5) Laetiporus It is known as Sulphurz shelf or chicken of the woods or chicken mushroom or chicken fungus. Its texture is same as flesh of chicken .The fruiting body constitute of shelves which are made up of tiny tubular filaments or hyphae. The fruiting body forms large brackets .The young fruiting bodies are characterized by moist, rubbery and sulphur-yellow to orange colored body. The brackets may become pale and brittle with increase in age.

Poisonous mushrooms:

Poisonous mushrooms contain a variety of different toxins that can differ markedly in toxicity. Symptoms of mushroom poisoning may vary from gastric upset to organ failure resulting in death. Serious symptoms do not always occur immediately after eating, often not until the toxin attacks the kidney or liver, sometimes days or weeks later.

Poisonous mushrooms, such as Amanita sp and others can cause acute fatal liver necrosis. Intoxication by Amanita phalloides, known as the death cap, is caused by a group of toxins termed toxic cyclopeptides.

The most common consequence of mushroom poisoning is simply gastrointestinal upset. Most "poisonous" mushrooms contain gastrointestinal irritants that cause vomiting and diarrhea (sometimes requiring hospitalization), but usually no long-term damage. However, there are a number of recognized mushroom toxins with specific, and sometimes deadly, effects.

Importance and medicinal value of mushroom:

Mushrooms contain macronutrients that support a healthy immune system. According to the Mushroom Council, your immune system will benefit from mushrooms whose nutrients include: Selenium, which helps your body make antioxidant enzymes to prevent cell damage. Choose cremini or portabella mushrooms for the most benefit.

Medicinal value of mushroom:

More than 100 medicinal functions are produced by mushrooms and fungi and the key medicinal uses are antioxidant, anticancer, antidiabetic, antiallergic, immunomodulating, cardiovascular protector, anticholesterolemic, antiviral, antibacterial, antiparasitic, antifungal, detoxification, and hepatoprotective effects.

UNIT – 4:

Types of food prepared from mushroom:

Mushroom dishes and foods.
Cream of mushroom soup prepared with wild, edible mushrooms.
Duxelles.
Mushroom gravy atop French fries.
Mushroom ketchup in a plastic tub.
Filet mignon with a chunky, cream-based mushroom sauce.

Sautéed mushrooms.
Stuffed mushroom cap.

Marketing in india, export value:

The total mushroom exported around the world was 0.69 million tons. Globally India's share in total exports is insignificant. India exported 6167 tons of mushrooms in 2019. Mushroom is either processed or sold fresh.

With proper management and marketing, a farmer can generate a profit of Rs. 50,000-1,00,000 per 1000 bags annually. This Will vary according to Mushroom type and material used for production. If you start growing it in 100-500 square feet, you can make between Rs 1 lakh and Rs 5 lakh annually.

The value of goods exported to a foreign country by residents according to international trade statistics.

The global mushroom market is witnessing a significant growth in the demand for mushrooms with each passing year. They are a healthy and nutritious food that can be used in many different dishes. They are also relatively easy to grow, so they are becoming more popular with farmers and home gardeners alike.

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A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Title: Mushroom Cultivation

Text Exercise:

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1. _____is known as temperature tolerant white button mushroom.

a. Agaricus b. Pleurotus c. Voveriella d. Agaricus bitorquis

2. Agaricus bisporus belongs to family_____.

a. Agaricaceae b. Malvaceae c. Rubiaceae d. Solanaceae

3. Basidiospores are_____spores.

a. exogenous b. endogenous c. Both a and b d. None of these

4. _____toxin is present in Amanita muscaria.

a. Ibotenic acid b. Lactic acid c. Acidic acid d. All of the above

5. _____ is known as 'king oyster mushroom'.

a. Pleurotus eryngii b. Volveriella c. Agaricus d. None of the above

6. Formaldehyde is used as_____in mushroom cultivation.

a. Disinfectant b. Fertilizer c. Insect repellant d. Food material

7. Short method of button mushroom compost preparation requires_____ days.

a. 14-18 days b. 10 days c. 20 days d. 30 days

8 .What is the other name of Mushroom?

a. Funaria b. Dryopteris c. Agaricus d. Ferus

9. To which division does it belong?

a. Basidiomycetes b. Pteridophyta c. Thallophyta d. Mollusca

10. Mushroom is:

a. Saprophytic fungus b. Autotrophic Algae c. Heterotrophic fungus d. None of the above

11. Mycelium produces white or colored umbrella shaped fruiting bodies called:

a. Haphae b. Basidiocarp c. Annalus d seta

12. Basidiocarp consist of a fleshy stalk called _____ and umbrella like head borne on its top called _____

a. Hyphae and Seta b. Seta and Annulus c. Annulus and Antheridia

d. Stipe and Pileus

13. When young fruiting body is completely enveloped by a thin membrane, it is called

a. Mycelium b. Rhizoids c. Velum(veil) d. Septate

14. With the growth of _____ velum gets ruptured, while a part of it remained attached to stipe in the form of ring or_____.

a. Basidiocarp and Slender b. Pileus and Annalus c. Pyrenoid and Conjugation d. Hyaline and Pyrenoid

15. On the lower side of Pileus number of vertical plates like structure is present called_____

a. Spores b. Organelles c. Mushroom Dryopteris d. Gills

16. The gills on either side bear club shaped basidia which produce_____

a. Basidiocarp b. Chloroplasts c. funaria d. None of these

17. It grows during _____

a. Summer season b. winters c. Rainy season d. In all seasons

18. An edible mushroom is a mushroom that can potentially be safely eaten.

a .True b. .False

19. Mushrooms are fruit. Do you know what kind of fruit they are?

a. Mold b. Fungus c. Blackberry d. Cherry

20. What kind of equipment do you need to go mushrooming?

a. flat-bottomed basket or box b. A roll of waxed paper

c. A digging tool d. All of the Above

21. Two common poisonous mushrooms are the jack-o'lantern and the green-spored Lepiota.

a. A. True b. B. False

22. Every mushroom hunter should be familiar with the three most dangerous groups of fungi.

a. A. True b. B. False

23. To avoid mushroom poisoning, you should follow one rule.

a. A. True b. B. False

24. Is it true that one cap of a Destroying Angel (Amanita virosa) can kill a man.

a. A. True b. B. False

25. The shaggy mane mushroom is edible and easy to identify.

a. A. True b. B. False

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Key:

1. d. Agaricus bitorquis
2. a. Agaricaceae
3 a. exogenous
4. a. Ibotenic acid
5. a. Pleurotus eryngii
6. a. Disinfectant
7. a. 14-18 days
8. c. Agaricus
9. a. Basidiomycetes
10 a. Saprophytic fungus
11. b. Basidiocarp
12. d. Stipe and Pileus
13. c. Velum(veil)
14. b. Pileus and Annalus
15. d. Gills
16. a. Basidiocarp
17. c. Rainy season
18. a .True
19. b. Fungus
20. d. All of the Above
21. a. True
22. b. False
23. a. True
24 a. True
25. a. True

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Department of Botany

Value Added Course / Certificate Course

Title: Mushroom cultivation

Marks List

Class: II BZC

S. No	Roll No.	Name of the Student	Marks
1	17-006	Abdul Bhari	34
2	17 007	K. muralimohan	30
3	17-051	G. Ashok kumar	31
4	17-013	O. Rama krishna	35
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5	17-239	S. Rahethullah	21
6	17-231	V. Sai prathyusha	28
7	17-332	V. Janaki	40
8	17-508	V. Bhargavi	31
9	17-516	CH. Vimala kumari	34
10	17-509	A. Vijaya Rani	34
11	17-335	M. Sundhuza	28
12	17-331	P. Pooja	27
13	17-511	L. Dharani	30
14	17-311	K. Usha Rani	29
15	17-301	K. Sathavathi	25

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Department of Botany

Value Added Course / Certificate Course

Title: Mushroom cultivation

Marks List

Class: II BZC

S. No	Roll No.	Name of the Student	Marks
1	17-303	V. Dhananjali	32
2	17-304	p. Keerthana	29
3	17-308	G. Lavanya	33
4	17-513	D. Deepthi	34
5	17-507	P. Naga Rani	25
6	17-520	D. Deepika	31
7	17-502	G. Sandeep	27
8	17-505	K. Tejaswi	44
9	17-503	K. mounika	40
10	17-514	Y. Rushyanth	26
11	17-024	A. pavan kumar	25
12	17-424	G.Y.S. pavan	20
13	17-512	Srikanth. B	27
14	17-515	T. Naga Divya	31
15	17-337	D. Haritha	36

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Department of Botany

Value Added Course / Certificate Course

Title: Mushroom cultivation

Marks List

Class: II BZC

S. No	Roll No.	Name of the Student	Marks
1	17-525	B. chandana	33
2	17-641	T. kalyan Guru Datta	30
3	17-650	D.N mallikaisu	29
4	17-637	P.V.V. chinnana Rao	29
5	17-643	M. Tarun Sai	31
6			
7			
8			
9			
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11			
12			
13			
14			
15			

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Title: Mushroom cultivation

Feed Back Form

1. Is the programme interested to you (Yes/No)
2. Have you attended all the session (Yes/No)
3. Is the content of the program is adequate (Yes/No)
4. Have the teacher covered the entire syllabus? (Yes/No)
5. Is the number of hours adequate? (Yes/No)
6. Do you have any suggestions for enhancing or reducing the number of weeks designed for the program? (Yes/No)
7. On the whole, is the program useful in terms of enriching your knowledge? (Yes/No)
8. Do you have any suggestions on the program? (Yes/No)

CH. Beulah Ranjani

18-19

18-19

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course / Certificate Course - Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1	17-006	Abdul Bhari		P	A	P	P	P	A	P	P	A	P	A	P	P	A	P	10
2	17-007	K. Muralimohan		P	P	A	P	P	A	P	P	P	A	P	P	A	P	P	11
3	17-051	G. Ashok kumar		P	A	P	P	A	P	P	P	A	P	P	P	A	P	A	10
4	17-013	O. Rama krishna		P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	10
5	17-026	M. Naga Bhushanam		A	P	P	A	P	P	P	A	P	P	P	A	P	P	P	11
6	17-029	K. pavan kalyan		P	P	A	P	P	A	P	P	A	P	P	A	P	P	P	11
7	17-020	K. prasad		P	P	P	P	A	P	P	P	A	P	P	A	P	P	P	12
8	17-023	CH. Rahul		P	A	P	A	P	P	P	P	P	P	A	P	P	A	P	11
9	17-030	M. vinay Babu		P	P	P	A	P	P	A	P	P	A	P	P	P	P	P	12
10	17-050	J. Rajesh		P	P	A	P	P	P	P	P	P	A	P	P	A	P	P	13
11	17-021	md. Imran		P	A	P	A	P	A	P	A	P	P	P	A	P	P	P	10
12	17-019	P. Naveen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	15
13	17-041	Y. Bhavya		A	P	A	P	A	P	A	P	A	P	P	A	P	P	P	9
14	17-034	P. madhuri		P	A	P	A	A	P	A	P	P	A	P	A	P	P	P	9
15	17-022	Y. Swapna		P	P	A	P	A	P	P	A	P	P	A	P	A	P	P	10

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1	17-434	G. Pavdhvi Raju		P	P	P	P	P	P	A	P	P	P	A	P	P	P	P	13
2	17-428	T. Lavanya		P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	14
3	17-422	K. Siva Rama Krishna.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	15
4	17-237	K. Nagarjuna		P	A	P	P	P	P	P	P	P	A	P	A	P	A	P	11
5	17-239	S. Rahethullah		P	P	P	A	P	P	A	P	P	P	A	P	P	A	P	11
6	17-231	V. Sai poathysha		P	P	P	A	P	P	P	A	P	P	A	P	P	A	P	11
7	17-332	V. Janaki		P	P	P	P	A	P	P	A	P	P	P	P	P	P	P	13
8	17-508	V. Bhargavi		P	P	P	A	P	P	P	P	P	P	A	P	P	P	P	13
9	17-516	CH. Vimala kumari		P	P	P	P	P	P	A	P	P	A	P	P	P	P	P	13
10	17-509	A. Vijaya Rani		P	P	P	P	A	P	P	A	P	P	P	A	P	P	P	12
11	17-335	M. Sandhya		P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	13
12	17-331	P. Pooja		P	P	A	P	P	P	A	P	P	P	P	A	P	P	P	12
13	17-511	L. Dharani		P	P	P	A	P	P	P	A	P	P	P	A	P	P	P	12
14	17-311	K. Usha Rani		P	P	P	P	P	A	P	P	P	A	P	P	P	P	P	13
15	17-301	K. Sathavathi		P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	14

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1	17-303	V. Dhananjali																	
2	17-304	P. Keerthana		P	P	A	A	P	A	A	A	P	P	P	P	P	P	P	10
3	17-308	G. Lavanya		P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	14
4	17-513	D. Deepthi		P	P	P	P	P	P	P	A	P	P	A	P	P	P	P	13
5	17-507	P. Naga Rani		P	P	P	P	P	P	A	P	A	P	P	A	P	P	P	12
6	17-520	D. Deepika		P	P	P	P	A	P	P	P	A	P	P	A	P	A	P	11
7	17-502	G. Sandeep		P	P	P	A	P	P	P	A	P	P	A	P	P	P	P	12
8	17-505	K. Tejaswi		P	P	P	P	A	P	P	P	A	P	P	P	P	P	P	13
9	17-503	K. Mounika		P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	14
10	17-514	Y. Rushyanth		P	P	P	P	P	P	A	P	P	P	A	P	A	P	P	12
11	17-024	A. Pavan kumar		P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	12
12	17-424	G. Y. S. Pavan		P	P	P	P	A	P	P	P	P	P	A	P	A	P	P	12
13	17-512	Srikanth. B		P	P	P	P	A	P	P	P	A	P	A	P	P	P	P	12
14	17-515	T. Naga Divya		P	P	P	P	P	P	A	P	P	A	P	P	P	P	P	13
15	17-337	D. Haritha		P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	14

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course / Certificate Course - Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
1	17-525	B. chandana		P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	14
2	17-641	T. kalyan Guru Datta		P	P	P	A	P	P	P	P	A	P	P	P	P	P	P	13
3	17-650	D.N. mallikaisu		P	P	P	P	A	P	P	A	P	P	A	P	P	P	P	12
4	17-637	P.V.V. chinnana Rao		P	A	P	P	P	P	P	A	P	P	P	P	P	P	P	13
5	17-643	M. Tarun Sai		P	P	P	A	P	P	P	P	P	P	P	A	P	P	P	13
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Attendance Register

Class / Section: II year B.A, B.Sc, B.Z.C Year : 2018-19 Department of: Botany Paper: mushroom cultivation Lecturer: CH. B

Sl. No	Roll No	Student Name	Category	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
1	17-006	Abdul Bhasi		P	P	P	P	A	A	P	P	P	P	P	P	P	P	P	13
2	17-007	K. muralimohan		P	P	P	A	A	A	A	P	P	P	P	P	P	P	P	11
3	17-051	G. Ashok kumar		P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	14
4	17-013	O. Rama krishna		P	P	P	A	A	P	P	A	P	P	P	P	P	P	P	12
5	17-026	m. Naga Bhushanam		P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	13
6	17-029	K. pavan kalyan		P	A	A	A	A	A	P	P	P	P	P	P	P	P	P	10
7	17-020	K. Prasad		A	P	P	P	A	P	P	P	P	P	P	P	P	P	P	13
8	17-023	CH. Rahul		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	15
9	17-030	M. Vinay Babu		P	A	A	A	P	P	P	P	P	P	P	P	P	P	A	11
10	17-050	J. Rajesh		P	P	P	P	A	A	P	P	P	P	P	P	P	P	P	13
11	17-021	Md. Imran		A	P	P	P	A	A	A	P	A	P	P	P	P	P	P	10
12	17-019	P. Naveen		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	15
13	17-041	Y. Bhavya		P	P	P	P	P	P	P	P	A	A	P	P	P	P	P	13
14	17-034	P. madhuri		P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	14
15	17-022	Y. Swapna		P	A	P	A	P	A	A	P	P	P	P	P	P	P	P	11

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course / Certificate Course - Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
1	17-434	G. prudhvi Raja		P	P	A	P	P	A	P	P	A	P	P	P	P	P	P	12
2	17-428	T. Lavanya		P	A	P	P	A	P	P	A	P	P	A	P	P	P	P	11
3	17-422	k. Siva Rama krishna		P	A	P	P	P	A	P	P	A	P	P	A	P	P	P	11
4	17-237	K. Nagarjuna		P	A	P	P	P	P	A	P	P	P	P	P	P	P	P	13
5	17-239	S. Rahethullah		P	P	A	P	P	P	P	P	P	A	P	P	A	P	P	12
6	17-231	V. Sai prathysha		P	A	P	P	P	A	P	P	P	P	P	A	P	P	P	12
7	17-332	V. Janaki		P	P	P	A	P	P	P	A	P	P	P	P	A	P	A	11
8	17-508	V. Bhargavi		A	P	P	P	A	P	P	A	P	P	A	P	P	A	P	10
9	17-516	CH. Vimala kumari		P	A	P	P	P	A	P	P	P	A	P	P	A	P	A	10
10	17-509	A. Vijaya Rani		P	P	A	P	P	P	A	P	A	P	P	A	P	A	P	10
11	17-335	M. Sundhuza		P	A	P	P	P	A	P	P	A	P	A	P	P	P	P	11
12	17-331	P. pooja		P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	14
13	17-511	L. Dharani		P	A	P	P	P	P	P	A	P	P	P	P	P	P	P	13
14	17-311	K. Usha Rani		P	A	P	P	P	P	P	P	P	P	A	P	P	P	P	13
15	17-301	K. Sathavathi		P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	14

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Value Added Course / Certificate Course - Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
1	17-303	V. Dhananjali		P	P	A	P	P	A	P	P	A	P	P	P	P	P	A	11
2	17-304	P. Keerthana		P	A	P	A	P	P	P	P	P	A	P	P	A	A	P	10
3	17-308	G. Lavanya		P	P	A	P	P	P	P	P	P	P	P	A	P	P	P	13
4	17-513	D. Deepthi		A	P	P	P	A	P	P	A	P	P	A	P	P	P	P	11
5	17-507	P. Naga Rani		P	P	A	P	P	A	P	P	A	P	P	A	P	P	P	11
6	17-520	D. Deepika		P	P	A	P	P	P	P	A	P	P	P	P	P	P	P	13
7	17-502	G. Sandeep		P	A	P	A	P	A	P	P	P	P	A	P	A	P	P	10
8	17-505	K. Tejaswi		P	P	P	P	A	P	P	A	P	P	P	A	P	P	P	12
9	17-503	K. mounika		P	P	A	P	P	A	P	P	P	A	P	P	P	P	P	12
10	17-514	Y. Rushyanth		P	A	P	P	P	P	P	A	P	P	P	A	P	P	P	12
11	17-024	A. pavan kumar		A	P	P	A	P	P	P	P	A	P	P	P	P	P	P	12
12	17-424	G. y.s. pavan		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	15
13	17-512	Srikanth. B		P	A	P	P	P	A	P	P	A	P	P	P	P	P	P	12
14	17-515	T. Naga Divya		P	P	A	P	P	P	P	A	P	P	P	P	P	P	P	13
15	17-337	D. Haritha		P	A	P	P	P	P	P	P	P	P	A	P	P	A	P	12

A.G. & S.G. Siddhartha Degree College of Arts & Science

Vuyyuru-521165, Krishna District, Andhra Pradesh

Certificate Course

Attendance Register

Class / Section: Year : Department of: Paper: Lecturer:

Sl. No	Roll No	Student Name	Category	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
1	17-525	B. Chandana		P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	14
2	17-641	T. Kalyan Guru Datta		P	A	A	P	A	A	P	P	P	P	P	P	P	P	P	11
3	17-650	O.N. Mallikarjun		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	15
4	17-637	P.V.V. Chinnana Rao		P	P	P	A	P	P	P	P	P	P	P	P	A	A	P	13
5	17-643	M. Tarun Sai		P	P	P	A	A	P	P	P	P	P	P	P	P	P	P	13
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12																			
13																			

CH. Beulah Ranjani

AG & SG Siddhartha ...
Arts&Science (Autonomous), Vuyyuru

A.G. & S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

(AUTONOMUS)

Re Accredited with Grade 'A' by NAAC, Bangalore

VUYYURU - 521 165, Krishna Dist., A.P

Certificate

This is to certify that ..... P.Naveen ..... of ..... II B.A ..... has successfully completed the certficate course in Mushroom Cultivation organized by the department of Botany during the year 20 18 - 20 19 , in association with IQAC and passed the examination in grade ..... A .....

C. B. Ranjani
Course Coordinator

PRINCIPAL
AG & SG Siddhartha Degree College of Arts&Science (Autonomous), Vuyyuru