

# Handbook on Mushroom Cultivation and Processing (with Dehydration, Preservation and Canning)

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**Format:** Paperback

**ISBN:** 9788178330341

**Code:** NI164

**Pages:** 544

**Price:** Rs. 1,275.00 **US\$** 125.00

**Publisher:** Asia Pacific Business Press Inc.

Usually ships within **5** days

Mushrooms are the health food of the world. These are that fast growing basidiomycetous fungi which produce fleshy fruit bodies. They are rich in proteins, vitamins and minerals, so they are consumed as energy rich food. Mushroom has been attracting attention of mankind since ancient times and use of mushroom, as food is as old as human civilization. Mushrooms are superior to many vegetables and beans in their nutritive value. It is very rich in protein, vitamins and minerals. Fresh mushrooms contain about 85% water and 3.2% protein. But dried mushrooms water content is low and protein level is high as 34 to 44% and the fat content is less than 0.3%. There are about 100 species of edible mushrooms all over the world. But only three of them are cultivated in India which are *Agaricus bisporus*, *Volvariella volvacea* and *pleurotus sajor caju*. Unfortunately, it is realized that mushrooms did not receive universal acceptance over the years since a number of naturally growing mushrooms are poisonous. Now the situation has been changed because the cultivated edible mushrooms are totally safe for human consumption. Mushroom cultivation fits in very well with sustainable farming and has several advantages: it uses agricultural waste products, a high production per surface area can be obtained, after picking; the spent substrate is still a good soil conditioner. They have less carbohydrate so they are believed to be suitable for diabetic patients. Fresh mushrooms have very limited life and hence they need to be consumed within few hours. But processing and canning increases their shelf life to few months. Osmotic dehydration is one of the important methods of processing mushroom which involves drying technology of mushroom. Mushrooms are very popular in most of the developed countries and they are becoming popular in many developing countries like India. Applications and market for mushrooms is growing rapidly in India because of their nice aroma, nutritious values, subtle flavour and many special tastes. Mushroom cultivation has been declared as a major thrust area by Government of India. Mushroom dish is a common item in all the big hotels. Mushroom production has increased many folds during the recent past. Mushrooms have found a definite place in the food consumption habits of common masses and there is a constant demand for it throughout the year.

Some of the fundamentals of the book are nutritive value of edible mushrooms, medicinal value of mushrooms, advantages of mushrooms, symptoms of mushroom poisoning, morphology of common edible mushrooms, classification of fungi a brief survey, chemical composition, anti nutritional factors and shelf life of oyster mushroom, osmotic dehydration characteristics of button mushrooms, mushroom cultivation, cultivation of white button mushroom (*agaricus bisporus*), factors determining the amount of spawn needed, fungicides for mushroom diseases insecticides for mushroom pests etc.

The present book contains cultivation, processing, dehydration, preservation and canning of various species of mushrooms. It is resourceful book for agriculturists, researchers, agriculture universities, consultants etc.

# Contents

## 1. NUTRITIVE VALUE OF EDIBLE MUSHROOMS

## 2. MEDICINAL VALUE OF MUSHROOMS

## 3. ADVANTAGES OF MUSHROOMS

How to Avoid Discomfort While Eating Mushrooms?

## 4. POISONOUS MUSHROOMS

Distinctive Features of Poisonous Mushrooms

Symptoms of Mushroom Poisoning

How to Avoid Mushroom Poisoning

## 5. MORPHOLOGY OF COMMON EDIBLE MUSHROOMS

Agaricus Bisporus

Volvariella Volvacea

Pleurotus Sajor-caju

## 6. COMMON EDIBLE MUSHROOMS OF INDIA

## 7. WHERE AND WHEN TO GO MUSHROOMING

## 8. HOW TO COLLECT AND IDENTIFY FUNGI

Steps in the Description of Macro-and Micro-characteristics of Gill Fungi

(Mode of development)

## 9. CLASSIFICATION OF FUNGI - A BRIEF SURVEY

Fungi

Ascomycetes

Basidiomycetes

Deuteromycetes-Fungi Imperfecti

## 10. DELICIOUS RECIPES OF MUSHROOM

Mushroom omelette

Stuffed Potatoes

Mushrooms on Toast

Mushroom Soup

Mushroom Pakoras

Mushroom Pulao

Mushroom Pickle 1

Mushroom pickle 2

Mushrooms and Peas

Mushrooms and Paneer

Mushroom Samosa

Liver with Mushroom

## 11. CHEMICAL COMPOSITION, ANTI-NUTRITIONAL FACTORS AND SHELF-LIFE OF OYSTER MUSHROOM (PLEUROTUS OSTREATUS)

Material and Methods

Results and Discussion

Conclusion

## 12. COMPOSITION AND FOOD VALUE OF SCLEROTIUM (OSU) AND EDIBLE MUSHROOM (PLEUROTUS TUBER-REGIUM)

Conclusion

## 13. OSMOTIC DEHYDRATION CHARACTERISTICS OF BUTTON MUSHROOMS

Materials and Methods

Results and Discussion

## 14. EFFECT OF MODIFIED ATMOSPHERE PACKAGING ON LOW MOLECULAR WEIGHT CARBOHYDRATES OF OYSTER MUSHROOMS

Materials and Methods

Results and Discussion

## 15. MUSHROOM CULTIVATION

Advantages of mushroom cultivation

Comparison of nutritive value of mushrooms with other foods

Salient features of mushroom cultivation

Importance of mushroom cultivation for India

Types suitable for cultivation

## 16. CULTIVATION OF WHITE BUTTON MUSHROOM (AGARICUS BISPORUS)

Temperature

Moisture

Ventilation

Good Spawn

Suitable Growing Space

Compost and Methods of Composting

Nature and Quality of the Basic Material

Organic and Inorganic Supplements

Management of the Compost During Composting

Long Method

Short Method

A Compost Fermentation Method by Means of

Forced Air Circulation

Fermentation Chamber for Compost

Formulation of Compost

Process of Composting and Fermentation

Mechanical composting

Loading the Barrel

Composting Cycle

Spawn and Methods of Spawning

Advantages of Grain Spawn

Disadvantages of Grain Spawn

Methods of Preparation of Grain Spawn

*Agaricus bisporus*

*Volvariella volvacea*

Factors Determining the Amount of Spawn Needed

Method of Spawning

Storage of Spawn

Casing

Sterilisation of Casing Soil

Chemical Sterilisation

Time of Casing

Cropping and Harvesting

Diseases

Soft Mildew or Cobweb (*Dactylium dendroides*)

Brown plaster mould (*Papulospora byssina*)

White plaster mould (*Scopulariopsis fumicola*)

Olive green mould (*Chaetomium olivacearum*)

Inky cap (*Coprinus lagopus* and *C. comatus*)

Green Mould (*Trichoderma viride*)

Truffle disease (*Pseudobalsamia microspora*)

Bubble disease (*Mycogone perniciosa*)

Dry Bubble, Brown Spot Disease

(*Verticillium malthousei* or *V. psiallistae*)

Bacterial Blotch (*Pseudomonas tolaassi*)

Virus Diseases  
Control  
Insect Pests  
Sciarids  
Phorids  
Spring tails  
Cecid  
Mites  
Nematodes  
Control  
Fungicides for Mushroom Diseases Insecticides for Mushroom Pests  
Abnormalities of Mushrooms  
Rose comb  
Long stalked mushroom  
Scaly and cracked mushroom  
Open Mushrooms  
Stroma  
Preservation  
Storage in Fresh Conditions  
Controlled Atmosphere  
Preservation by Gamma Radiation  
Freeze Drying  
Steeping preservation  
Dehydration of Mushrooms  
Canning of Mushroom  
Do's and Don'ts of Mushroom Growing  
Mushroom Farm Design  
Construction and Insulation  
Peak Heating Chamber/bulk Chamber/tunnel  
Initial Consideration/Work Plan  
Casing Pasteurization Chamber  
Economically Viable Commercial Button Mushroom Unit  
Economics  
Fixed costs  
Variable Costs  
Economics of Canned Product  
17. CULTIVATION OF AGARICUS BITORQUIS  
Harvesting  
False truffle (*Diehlomyces microspora*)  
Control  
Bacterial Blotch and Pests  
Control  
18. CULTIVATION OF PADDY STRAW MUSHROOM (*VOLVARIELLA* SPP.)  
Diseases and Pests  
Preservation  
Canning  
Economics of Production of Paddy Straw Mushroom  
19. CULTIVATION OF PLEUROTUS SPP.  
Method of Cultivation  
Preparation of Spawn  
Cultivation  
Economics of Pleurotus Cultivation in Hells on a Small Scale  
20. CULTIVATION OF STROPHARIA RUGOSO ANNULATA

Cultivation  
 Layout of Beds  
 Production and Planting of Spawn  
 Cropping  
 Harvesting  
 21. CULTIVATION OF AURICULARIA SPP. (JEWEL'S EAR)  
 Laying of logs  
 Cropping yard  
 Bag method cultivation  
 Harvesting  
 22. CULTIVATION OF FLAMMULINA VELUTIPES  
 Cultivation  
 Spawn  
 Spawning and Cropping  
 23. CULTIVATION OF PHOLIOTA NAMEKO  
 Moisture, light and aeration  
 Japanese Method  
 Spawn  
 Inoculation  
 Laying  
 Raising  
 Cropping  
 Taiwan Method of Cultivation  
 Construction of plastic mushroom growing houses  
 Preparation of sawdust medium  
 Bagging and sterilization of medium  
 Inoculation and incubation  
 Fruiting  
 Cropping  
 Mori  
 Ham  
 Song  
 Royse  
 Difference between bag method and log method of cultivation  
 Important factors  
 24. TYPES OF MUSHROOMS  
 Orange Peel Fungus  
*Aleuria aurantia* (Pers. ex Hook.) Fuckel  
*Otidea Onotica*  
 (Batsch ex S.F. Gray) Fuckel  
*Sarcosphaera crassa*  
 (Santi ex Steudel) Pouz  
*Discina Perlata* (Fr.) Fr  
 Lorchel, Turban Fungus  
*Gyromitra esculenta* (Pers. ex Pers.) Fr  
 Common White Helvella, False Morel  
*Helvella Crispa* (Scop.) ex Fr.  
 Common Morel  
*Morchella esculenta* Pers. ex St. Amans  
*Morchella Elata* Fr  
 Early Morel  
*Verpa bohemica* (Krombh.) Schroet  
*Choiromyces venosus*

(Fr.) Th. Fries  
 Summer Truffle, Common (English) Truffle  
*Tuber aestivum* Vitt  
 Winter Truffle  
*Tuber Brumale* Vitt  
*Elaphomyces Granulatus* Fr  
 Common Earth-ball  
*Scleroderma citrinum* Pers  
*Pisolithus Arrhizus*  
 (Pers.) Rauschert  
*Astraeus hygrometricus*  
 (Pers.) Morg  
*Cyathus Striatus*  
 (Huds.) ex Pers  
*Sphaerobolus Stellatus*  
 Tode ex Pers  
*Bovista Nigrescens*  
 Pers. ex Pers  
 Common Puffball  
*Lycoperdon perlatum* Pers. ex Pers  
 Giant Puffball  
*Langermannia gigantea* (Batsch ex Pers.) Rostk  
*Geastrum triplex* Jungh  
 Wood Witch, Stinking Polecat, Stinkhorn  
*Phallus impudicus* L. ex Pers  
*Hysterangium Graveolens* Velen  
*Anthurus archeri*  
 (Berk.) E. Fischer  
 Blackening Russula  
*Russula nigricans* (Bull. ex Merat) Fr.  
 Common Yellow Russula  
*Russula ochroleuca* (Pers.) ex Fr.  
 Cracked Green Russula  
*Russula Virescens* (Schaeff. ex Zanted.) Fr.  
 Bare-toothed Russula  
*Russula vesca* Fr.  
*Russula Cyanoxantha*  
 (Schaeff. ex Schw.) Fr.  
 Grass Green Russula  
*Russula aeruginea* Lindbl. in Fr.  
*Russula Olivacea*  
 (Schaeff. ex Secr.) Fr.  
*Russula Mustelina* Fr.  
*Russula Xerampelina*  
 (Schaeff) ex. Fr. (S. Str.)  
*Russula integra*  
 (L. ex Hook.) Fr.  
*Russula paludosa* Britz  
 Sickener  
*Russula emetica* (schaeff. ex Fr.) S.F. Gray  
*Russula sanguinea*  
 (Bull. ex St. Amans) Fr.  
*Lactarius piperatus*

(Fr.) S. F. Gray  
 Fleecy Milk Cap  
 Lactarius vellereus (Fr.) Fr.  
 Woolly Milk Cap  
 Lactarius torminosus (Schaeff. ex Fr.) S. F. Gray  
 Saffron Milk Cap  
 Lactarius deliciosus (L. ex Fr.) S. F. Gray  
 Lactarius helvus (Fr.) Fr.  
 Lactarius volemus (Fr.) Fr.  
 Strobilomyces floccopus  
 (Vahl ex Fr.) P. Karst.  
 Porphyrellus pseudoscaber  
 (Sect.) ex Sing.  
 Gyroporus castaneus  
 (Bull. ex Fr.) Quel.  
 Boletus cavipes  
 Klotzsch in Fr.  
 Boletus variegatus  
 Bow. ex. Fr.  
 Gyrodon lividus  
 (Bull. ex Fr.) Sacc  
 Suillus grevillei  
 (Klotzsch) Singer  
 Suillus viscidus Fr.  
 Suillus placidus  
 (Bonorden) Sing.  
 Slippery Jack  
 Suillus luteus (L. ex Fr.) S. F. Gray  
 Suillus fluryi Huijism  
 Suillus granulatus  
 (L. ex Fr.) O. Kuntze  
 Phylloporus rhodoxanthus  
 (Schw.) Bres  
 Xerocomus parasiticus  
 (Bull. ex Fr.) Quel.  
 Xerocomus rubellus  
 (Krombh.) Quel.  
 Bay Boletus  
 Xerocomus badius (Fr.) Gilb.  
 Red-cracked Boletus  
 Xerocomus chrysenteron (Bull ex St. Amans) Quel  
 Xerocomus subtomentosus  
 (L. ex Fr.) Quel.  
 Xerocomus porosporus Imler  
 Chalciporus piperatus  
 (Bull. ex Fr.) Sing  
 Boletus Lupinus Fr. SS. Romagnesi  
 Red-stalked Boletus  
 Boletus erythropus (Fr. ex Fr.) Krombh.  
 Boletus Luridus  
 Schaeff. ex Fr.  
 Devil's Boletus  
 Boletus satanas Lenz

Boletus Impolitus Fr.  
 Boletus aereus Bull. ex Fr.  
 Boletus Aestivalis  
 (Paulet) ex Fr.  
 Edible Boletus, Cepe  
 Boletus edulis Bull. ex Fr.  
 Bitter Boletus  
 Tylopilus felleus (Bull. ex Fr.) P. Karst.  
 Krombholziella Aurantiaca  
 (Bull. ex St. Amans) R. Maire  
 Krombholziella Rufescens  
 (Konr.) Sut.  
 Krombholziella Oxydabilis (Sing.) Sut.  
 Brown Birch Boletus  
 Krombholziella Scabra (Bull. ex Fr.) R. Maire  
 Paxillus involutus  
 (Batsch ex Fr.) Fr.  
 Paxillus Atrotomentosus  
 (Batsch ex Fr.) Fr.  
 False Chanterelle  
 Hygrophoropsis aurantiaca (Wulf. ex Fr.) R. Maire  
 Omphalotus Olearius  
 (DC. ex Fr.) Sing.  
 Gomphidius Roseus  
 (Fr.) P. Karst.  
 Gomphidius Glutinosus  
 (Schaeff. ex Fr.) Fr.  
 Chroogomphus Rutilus  
 (Schaeff. ex Fr.) O.K. Miller  
 Ivory Wax Cap  
 Hygrophorus eburneus (Bull. ex Fr.) Fr.  
 Goat Moth Wax Cap  
 Hygrophorus Cossus (Sow. ex Fr.) Fr.  
 Pinewood Wax Cap  
 Hygrophorus Hypothejus (Fr.) Fr.  
 Hygrophorus marzuolus  
 (Fr.) Bres.  
 Camarophyllus Pratensis  
 (Pers. ex Fr.) Kumm.  
 Hygrocybe nigrescens  
 (Quel.) Kuhner  
 Hygrocybe punicea  
 (Fr.) Kumm.  
 Omphalina epichysium  
 (Pres. ex Fr.) Quel.  
 Gerronema chrysophyllum  
 (Fr. ) Sing.  
 Laccaria amethystina  
 (Huds. ex Hook) Cooke  
 Laccaria laccata  
 (Scop. ex Fr.) Cooke  
 Clitocybe odora  
 (Bull. ex Fr.) Kumm.



*Clitocybe clavipes*  
 (Pers. ex Fr.) Kumm.  
*Clitocybe geotropa*  
 (Bull. ex St. Amans) Quel.  
*Clitocybe maxima*  
 (F. Wett. ex Fr.) Kumm.  
 Common Funnel Cap  
*Clitocybe gibba* (Pers. ex Fr.) Kumm.  
*Clitocybe cerussata*  
 (Fr.) Kumm.  
*Clitocybe candicans*  
 (Pers. ex Fr.) Kumm.  
*Clitocybe brumalis*  
 (Fr. ex Fr.) Kumm.  
*Lepista nebularis*  
 (Batsch ex Fr.) Harmaja  
 Wood Blewitt, Bluettes, Blue Leg  
*Lepista nuda* (Bull. ex Fr.) W. G. Smith  
 Blewitt, Bluettes, Blue Leg  
*Lepista saeva* (Fr.) P. D. Orton  
*Tricholomopsis rutilans*  
 (Schaeff. ex Fr.) Sing.  
*Tricholoma caligatum*  
 (Viv.) Ricken  
*Tricholoma colossus*  
 (Fr.) Quel.  
*Tricholoma Fulvum*  
 (DC. ex Fr.) Sacc.  
*Tricholoma Vaccinum*  
 (Pers. ex Fr.) Kumm.  
*Tricholoma Portentosum*  
 (Fr.) Quel.  
*Tricholoma flavovirens*  
 (Pers. ex Fr.) Lund.  
*Tricholoma sejunctum*  
 (Sow. ex Fr.) Quel.  
 Sulphurous *Tricholoma*  
*Tricholoma Sulphureum* (Bull. ex Fr.) Kumm.  
*Tricholoma Columbetta*  
 (Fr.) Kumm.  
*Tricholoma Terreum*  
 (Schaeff. ex Fr.) Kumm.  
 Honey Fungus, Honey Agaric, Shoestring Mushroom  
*Armillaria mellea* (Vahl. ex Fr.) Kumm.  
*Lyophyllum connatum*  
 (Schum. ex Fr.) Sing.  
*Lyophyllum fumosum*  
 (Pers. ex Fr.) Orton  
*Tephrocybe atrata*  
 (Fr. ex Fr.) Donk  
 St. George's Mushroom  
*Calocybe gambosa* (Fr.) Donk  
 Giant *Clitocybe*

*Leucopaxillus giganteus* (Sibth. ex Fr.) Sing.  
*Melanoleuca brevipes*  
 (Bull. ex Fr.) Pat.  
*Catathelasma imperiale*  
 (Fr.) Sing.  
 Wood Woolly-foot  
*Collybia Peronata* (Bolt. ex Fr.) Kumm.  
 Russet Shank  
*Collybia Dryophila* (Bull. ex Fr.) Quel.  
 Greasy Tough Shank  
*Collybia butyracea* (Bull. ex Fr.) Quel.  
 Spotted Tough Shank  
*Collybia maculata* (Alb. et Schw. ex Fr.) Kumm.  
*Hohenbuehelia Petaloides*  
 (Bull. ex Fr.) Schulz.  
*Megacollybia Platyphylla*  
 (Pers. ex Fr.) Kotl. et Pouz.  
 Slimy Beech Tuft  
*Oudemansiella mucida* (Schrad ex Fr.) Hoehn.  
 Rooting Shank  
*Oudemansiella radicata* (Relhan ex Fr.) Sing.  
*Strobilurus Esculentus*  
 (Wulf. ex Fr.) Sing.  
 Little Wheel Toadstool  
*Marasmius rotula* (Scop. ex Fr.) Fr.  
*Marasmius scorodoni* (Fr.) Fr.  
 Fairy Ring Fungus, Fairy Ring Champignon, Scotch Bonnet  
*Marasmius oreades* (Bolt. ex Fr.) Fr.  
 Lilac *Mycena*  
*Mycena pura* (Pers. ex Fr.) Kumm.  
*Mycena rosea*  
 (Bull.) ex Sacc. et Dalla Costa  
*Mycena fagetorum*  
 (Fr.) Gill.  
*Xeromphalina campanella*  
 (Batsch ex Fr.) R. Maire  
 Velvet Shank, Winter Fungus  
*Flammulina velutipes* (Curt. ex Fr.) Sing.  
 The Miller  
*Clitopilus prunulus* (Scop. ex Fr.) Kumm.  
*Nolanea verna*  
 (Lundell) Kotl. et Pouz.  
 Livid *Entoloma*  
*Entoloma lividum* (Bull. ex St. Amans) Quel.  
*Entoloma nidorosum*  
 (Fr.) Quel.  
*Entoloma hirtipes*  
 (Schum. ex Fr.) Moser  
*Volvariella speciosa*  
 (Fr.) Sing.  
*Pluteus cervinus*  
 (Schaeff. ex Fr.) Kumm.  
 Grisette

*Amanita vaginata* (Bull. ex Fr.) Vitt  
*Amanita umbrinolutea* Secr.  
 Fly Agaric  
*Amanita muscaria* (L. ex Fr.) Hook  
*Amanita regalis*  
 (Fr.) Michael  
 Caesarâ€™s Mushroom, Imperial Mushroom  
*Amanita caesarea* (Scop. ex Fr.) Grev.  
 Panther Cap  
*Amanita pantherina* (DC. ex Fr.) Krombh.  
*Amanita gemmata*  
 (Fr.) Gill.  
 Death Cap  
*Amanita phalloides* (Fr.) Link  
 Destroying Angel  
*Amanita virosa* (Fr.) Bertillon  
 False Death Cap  
*Amanita citrina* (Schaeff) ex Roques  
*Amanita porphyrea*  
 (Alb. et Schw. ex Fr.) Schummel  
*Amanita spissa* (Fr.) Opiz  
 Blusher  
*Amanita rubescens* (Pers. ex Fr.) S. F. Gray  
*Agaricus brunnescens* Peck  
 Red-staining Agaric Wood Mushroom  
*Agaricus silvaticus* (Schaeff. ex Krombh) Kumm.  
 Common Field Agaric, Meadow Mushroom  
*Agaricus campestris* L. ex Fr.  
*Agaricus augustus* Fr.  
*Agaricus abruptibulbus* Peck  
 Horse Agaric, Horse Mushroom  
*Agaricus arvensis* Schaeff. ex Fr.  
 Yellow Stainer  
*Agaricus xanthoderma* Genev.  
*Lepiota cristata*  
 (Alb. et Schw. ex Fr.) Kumm.  
*Lepiota clypeolaria*  
 (Bull. ex Fr.) Kumm.  
 Parasol Mushroom  
*Macrolepiota procera* (Scop ex Fr.) Sing.  
 Shaggy Parasol  
*Macrolepiota rhacodes* (Vitt.) Sing  
*Macrolepiota excoriata*  
 (Schaeff. ex Fr.) Acker-Sch.  
*Cystoderma amianthinum*  
 (Scop. ex Fr.) Maubl  
*Cystoderma cinnabarinum*  
 (Alb. et Schw. ex Fr.) Maubl  
 Shaggy Mane, Shaggy Cap, Lawyerâ€™s Wig  
*Coprinus Comatus* (Mull. ex Fr.) S. F. Gray  
 Common Ink Cap  
*Coprinus atramentarius* (Bull. ex Fr.) Fr.  
 Glistening Ink Cap

Coprinus micaceus (Bull. ex Fr.) Fr.  
Panaeolus papilionaceus  
(Bull. ex Fr.) Quel.  
Psathyrella candolleana  
(Fr. ex Fr.) R. Maire  
Psathyrella velutina  
(Pers. ex S. F. Gray) Sing.  
Yellow Cow-pat Toadstool  
Bolbitius vitellinus (Pers. ex Fr.) Fr.  
Agrocybe dura  
(Bolt. ex Fr.) Sing.  
Agrocybe praecox  
(Pers. ex Fr.) Sing.  
Stropharia rugosoannulata  
Farlow in Murrill  
Verdigris Agaric  
Stropharia aeruginosa (Curt. ex Fr.) Quel.  
Stropharia albonitens  
(Fr.) P. Karst.  
Brick Red Hypholoma, Bricktop, Bricktop Mushroom  
Hypholoma sublateritium (Fr.) Quel.  
Sulphur Tuft  
Hypholoma fasciculare (Huds. ex Fr.) Kumm.  
Hypholoma capnoides  
(Fr. ex Fr.) Kumm.  
Psilocybe semilanceata  
(Fr. ex Weinm) Kumm.  
Pholiota destruens  
(Brond) Gill.  
Shaggy Pholiota  
Pholiota squarrosa (Pers. ex Fr.) Kumm.  
Pholiota carbonaria  
(Fr.) Sing.

Gymnopilus spectabilis  
(Fr.) Sing  
Gymnopilus sapineus  
(Fr.) R. Maire  
Kuehneromyces mutabilis  
(Schaeff. ex Fr.) Sing. et Smith  
Tubaria conspersa  
(Pers. ex Fr.) Fayod  
Crepidotus variabilis  
(Pers. ex Fr.) Kumm.  
Inocybe patouillardii Bres  
Inocybe fastigiata  
(Schaeff. ex Fr.) Quel.  
Inocybe argillacea  
(Pers. ex Pers.) Sing.  
Inocybe lacera  
(Fr.) Kumm.  
Hebeloma radicosum  
(Bull. ex Fr.) Ricken

Jewâ€™s Ear, Judasâ€™ Ear  
Hirneola auricula-judae (Bull. ex St. Amans) Berk.  
Yellow Brain Fungus, Witches Butter  
Tremella mesenterica Retz. ex Hook.  
Yellow Chanterelle Pixie Stool  
Cantharellus cibarius Fr. ex Fr.  
Cantharellus tubaeformis  
Bull. ex Fr.  
Oyster Fungus, Oyster-cap Fungus, Oyster Mushroom  
Pleurotus ostreatus (Jacq. ex Fr.) Kumm.  
Lentinus Lepideus  
(Fr. ex Fr.) Fr.

## 25. GLOSSARY OF BASIC MYCOLOGICAL TERMS

## About NIIR

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Fri, 19 Jan 2018 20:52:50 +0530