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Mushrooms-The Edible Fungus

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Abstract

Is fungi only a disease? Or Can we eat fungi? The only fungi which we can eat is Mushroom. But are all Mushrooms edible? A mushroom is neither a fruit nor a vegetable; technically mushrooms aren't even plants. A mushroom or toadstool is the fleshy, spore- bearing fruiting body of a fungus, typically produced above ground, on soil, or on its food source. Mushrooms are special type of fungus which is Edible, with great addition of nutrition and good for healthy diet. **Mushrooms** are not **plants** and require different conditions for optimal growth. This ares Plants which develop through photosynthesis, a process that converts atmospheric **carbondioxide** into **carbohydrates**, especially **cellulose.** While **sunlight** provides an **energy** source for plants, mushrooms derive all of their energy and growth materials from their growth medium, through biochemical **decomposition** processes. This does not mean that **light** is an irrelevant requirement, since some fungi use light as a signal for fruiting. However, all the materials for growth must already be present in the growth medium.

Keywords: Mushrooms, Photosynthesis, Atmospheric, Carbondioxide

Introduction

Where can Mushrooms be grown?

Mushrooms grow well at relative humidity levels of around 85-95%, and substrate moisture levels of 60 to 75%, optimum temperature 29-35ºc [1].

Method of Multiplication

Instead of seeds, mushrooms reproduce asexually through spores. Spores can be contaminated with airborne microorganisms, which will interfere with mushroom growth and prevent a healthy crop. Mycelium, or actively growing mushroom culture, is placed on a substrate-usually sterilized grains such as paddy straw, wheat, rye or millet-and induced to grow into those grains. This is called inoculation. Inoculated grains are referred to as spawn [2]. Spores are another inoculation option, but are less developed than established mycelium. Since they are also contaminated easily, they are only manipulated in laboratory conditions with a **laminar flow cabinet**. 2000 of these are safely edible. Around 1000 are poisonous, Commercially 30 species are grown worldwide In India 4 species are grown worldwide. Yet there are still many undiscovered mushroom species and the effects of some mushrooms on human health remain unknown [3].

Why mushroom food value

- Protein - Most mushrooms have high protein content, usually around 20-30% by dry weight.
- Fiber - Helps lower cholesterol and is important for the digestive system.
- Vitamin D - Essential for the absorption of calcium.
- Copper - Aids in helping the body absorb oxygen and create red blood cells.
- Selenium - An antioxidant that helps neutralize free radicals, thus preventing cell damage and reducing the risk of cancer and other diseases.
- Mushrooms contain more selenium than any other form of produce.
- Potassium - An extremely important mineral that regulates blood pressure and keeps cells functioning properly Other important minerals - Such as phosphorous, zinc, and magnesium.
- Low levels of fat, calories, and sodium. No cholesterol

Edible mushrooms

Sci Name	Common Name
Agaricus compestris	The field mushroom
Boletus edulis	Cep
Cantharellus cibarius	Chanterelle
Coprinus comatus	Shaggy inkcap
Cratarellus cornuopiodes	Horn of Plenty

Hydnum respondum	Hedgehog fungus
Laetiporus sulphureus	Chicken of woods
Lepiota procera	Parasol mushroom

Some poisonous mushroom

- Amanita phalloides
- Amanita virosa
- Amanita pantherina
- Inocybe patouillardii
- Cortinarius speciosissimus
- Cortinarius orellanus
- Gyromitra esculenta

Important medicinal mushrooms

- Auricularia auricula
- Trametes (Coriolus) versicolor
- Flammulina velutipes
- Ganoderma lucidum
- Grifola frondosa
- Hericium erinaceous

Commercially cultivated mushrooms in India

Paddy straw Mushroom	Volvariella spp
Milky Mushroom	Calocybe spp.
Oyster Mushroom	Pleurotus spp.
Button Mushroom	Agaricus spp.

Strain selection and maintenance

The first stage in any mushroom cultivation process is to obtain a pure mycelial culture of the specific mushroom strain [4]. Such cultures are now readily purchased from mushroom specialists, mushroom enterprises or mushroom institutes. Such cultures have originally been derived from single or multispore cultures or by tissue culture from a mushroom of a high yielding and vigorous strain. Many strains have been developed by considerable genetic breeding programmes. Each type of mushroom culture generally requires unique substrate formulation for propagation and maintenance of purity. Most growers will obtain spawn cultures from reputable production centres ensuring purity, vigour and supply when required [5].

Method of cultivation

Substrate preparation

- Chopping of Straw to 4-5 cm size by chaff cutter soaking of straw in Chalk powder mixed water for 6-8 hr @ I kg/100lit. Water for pasteurization.
- Soaking in hot water (65-700C)
- Drain excess water and maintain moisture content of 60%
- Substrate is devided into 4 lots after drying Raising of bag: end of polythene is tied with rubber band and 1part of substrate is put to a height of 15cm.
- Substrate is then gently pressed and 1 part each of spawn and supplement is spread at the periphery close to the polythene.
- Like wise 4 such layers are made and bag is closed at the upper end after pressing the substrate.
- 10-15 holes are made on all sides to facilitate gas exchange.
- Instead of layer spawning, mixed spawning may also be followed
- The bags are then kept in dark place at 250C for 15-20 days. During mycelial growth bags should not be opened.
- Remove the polythene after full spreading of fungus.
- It is ready for fruiting.
- Bundles are then hanged or kept in shelves water is sprinkled 2 times daily.
- In next 15-20 days 3 flush of crop can be harvested.
- Biological efficiency is 100%
- There are many benefits for mushroom cultivation, few are the following,
- Importance of Mushrooms
- Good taste and unique flavour
- Easy to Cultivate with short crop duration
- Medicinal appeal
- Less investment and high return
- Self employment
- Less time and labour intensive
- Utilization of agricultural waste
- High nutritional value
- Suitable for small and landless farmers
- High market demand
- Suitable for woman
- Probiotic in nature
- Spent mushroom substrate can be used for vermicomposting
- Water productivity can be scaled up
- Mushroom don’ t compete with other crops for planting space
- Much of Asia’ s climate suitable for mushroom cultivation
- Significant role in forest economy – decomposes dead plants, animals, etc

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