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E-Content for of B.Sc. Ist sem Botany (Microbiology & Plant Pathology Course Code: B040101T Unit-V Mushroom Cultivation) on

"Mushroom Cultivation" developed by

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A. Temperate Mushrooms

1. Button mushroom

The button mushroom is most popular variety both for domestic and export market. At global level it ranks first. The major production is from Hitech Projects. However, Hitech projects faced several problems in successful production resulting in high cost of production. The main problems are quality of raw materials particularly, wheat/paddy straw, chicken manure and sometimes gypsum resulting in poor quality of compost and poor yield. Besides, high cost of imported cultures/spawn, machineries and casing material are other impediments. In recent years even increasing cost of electricity has given severe blow to the mushroom industry. Several medium scale projects have started growing mushroom targeting big city markets utilizing indigenous machinery and equipment. However, during winter season hundreds of seasonal growers undertake button mushroom production particularly in Northern States targeting big cities like Delhi, Chandigarh, etc. Advantages There are good opportunities in India both for domestic and export market for button mushroom.

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i. Seasonal production is possible in big way in Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Uttaranchal, Bihar, West Bengal, North Eastern Region, Madhya Pradesh and other areas where temperature remains below 20^0C during winter season. In this situation cost of production is low.

ii. Raw materials are easily and cheaply available for compost and casing material.

iii. Awareness about food and medicinal values is increasing in the country thus creating better domestic market.

iv. Transport facilities are available both by land and air.

v. There is increasing market for postharvest products like pickle and soup powder.

Limitations

i. High cost of energy for year round production.

ii. Un-organized production and sale particularly by seasonal farmers.

iii. Lack of facilities to produce quality compost, casing material, spawn and processed products.

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2. Oyster mushroom

This mushroom has species suitable for both temperate and sub-tropical regions. For temperate region *Pleurotus ostreatus*, *P. florida* (winter strain) and *P. fossulatus* (Kabul dhingri), *P. eryngii* (King oyster) are ideal. The areas suitable for button mushroom are equally suitable for the cultivation of these species. Winter oyster mushroom can be exported.

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Advantages

i. It grows on wide range of agricultural wastes.
ii. It can grow in wide range of temperatures.
iii. Its conversion rate i. e. fresh mushroom production from the dry substrate is high (BE upto 100%).
iv. It is less prone to diseases and competitor moulds than other mushrooms.
v. Faster growth rate and easy cropping.
vi. Low cost of production.
vii. Most suitable for rural areas and can create self-employment.
viii. Easy post harvest processing particularly dehydration/sun drying.

Limitations

i. Spore allergy to certain people.
ii. Lack of sporeless commercial strain.
iii. Limited consumer demand in some parts of the country.

3. Shiitake

This is one of the most popular mushrooms both as food and medicine. At global level it has second position and contributes 24% to total mushroom production. In India, its cultivation is negligible. However, experiments show that this variety can be successfully grown on saw dust when temperature is about 20^0C. There is good scope for the cultivation in the country. This may become a popular variety in domestic market and has good potential for export.

4. Flammulina velutipes

Flammulina velutipes, commonly referred as winter mushroom, is popular in East Asian countries and is known for its nutritional and medicinal value. It can be cultivated on saw dust of broad leaves supplemented with 10% wheat bran. This is a temperate mushroom fruiting in the temperature range of 10-14^0C. This mushroom can be grown in variety of containers. The complete technology for its cultivation has been standardized at the Directorate.

B. Subtropical Mushrooms

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1. Summer white button mushroom

This variety also belongs to genus Agaricus - *A. bitorquis*. Since it grows well in temperature upto 24^0C it is suitable for cultivation in subtropical region. However it is sensitive to false truffle due to its production at higher temperature and thus the perfect pasteurization of compost and casing material is a must.

2. Oyster mushroom

Most of the oyster mushroom species are subtropical in nature and grow well in temperature range of 20-32^0C. The most popular ones are *P. sajor-caju, P. flordia, P. flabellatus, P. eous*. These varieties particularly *P. florida and P.sajor-caju* are most popular in the country

3. Shiitake

There are strains of Lentinula edodes which can be grown in temperature range upto 24-25^0C. Hence ideal in subtropical areas. *Pleurotus sajor-caju*. *Pleurotus eous*

4. Black ear mushroom

This mushroom (Auricularia spp.) is fourth most popular mushroom in the world. Unfortunately not a single farm has been noticed growing this mushrooms in India even though cultivation technology for this mushroom was standardized at this Directorate in 1986. At present, this mushroom is collected and consumed in many North East states of our country and thus demand is already there. There is tremendous scope for its cultivation in temperature range of 20- 32^0C. It needs high RH (90-95%).

i. It grows on wide range of temperature and substrates

ii. High biological efficiency (100-150%)

iii. Very good keeping quality

iv. Good for health particularly for stomach and used as medicine in China

5. Agrocybe aegerita

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Agrocybe aegerita, commonly called as black poplar mushroom, grows on willow wood. Its cultivation on wheat straw has been standardized at the Directorate. It fruits at temperature around 25^0C.

C. Tropical Mushrooms

1. Paddy straw mushroom (*Volvariella* spp.)

This variety is most popular for its taste and flavour in South East and far East Asian countries. Its flavour is excellent and cropping cycle is short. However, this variety has low yield and poor keeping quality. In India, its cultivation is restricted to Orissa.

2. Milky mushroom (*Calocybe indica*)

This is indigenous tropical mushroom most suitable for tropical regions. At present this variety is being commercially cultivated in South India (Tamil Nadu, A.P. and Karnataka). Recently its production has started in North India.

i. It can be grown on wide range of agricultural wastes.

ii. It grows on higher temperature range hence suitable for tropical region.

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iii. Attractive white mushroom with excellent keeping quality.

iv. Its conversion rate (BE) is very high (about 100%).

v. It is suitable for pickling and chutney

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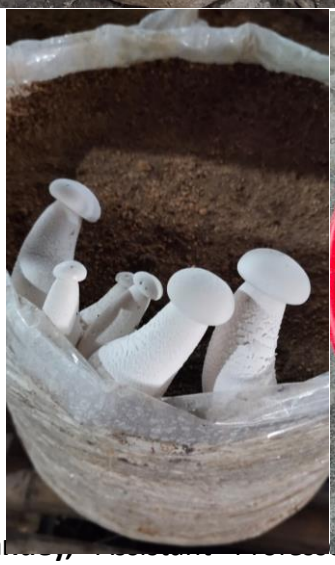

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3. Reishi mushroom (*Ganoderma lucidum*)

This is also a tropical mushroom growing in temperature range of 30-35^{0}C with high humid climate. The world production is estimated to be 6000 tonnes and share of China is 4000 tonnes/annum. Its cultivation technology has been standardized at the Directorate. There is good scope of this mushroom both in domestic and export market. Caution, however, is required in disposal of spent substrate as the fungus is a phytoparasite. It may be ensured that filters are in place in cropping rooms and substrate is disposed after heat kill or is burnt after drying.

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D. Future Prospects

India has tremendous potential for mushroom production and all commercial edible and medicinal mushrooms can be grown. There is increasing demand for quality products at competitive rate both in domestic and export market. Though growth of mushroom will depend on increasing and widening domestic market in coming years, export market will be equally attractive. To be successful in both domestic and export. Reishi mushroom market it is essential to produce quality fresh mushrooms and processed products devoid of pesticide residues and at competitive rate. It is also important to commercially utilise the compost left after cultivation for making manure, vermi compost, briquettes, etc. for additional income and total recycling of agrowastes.

Further Readings

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