

KNOW YOUR MUSHROOMS

MUSHROOMS EVERYDAY KEEPS DOCTOR AWAY



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Introduction:

Mushrooms are lower form of plants which are distinctly different from green plants. It is estimated that there are 140,000 species of mushrooms in nature. Knowledge of about 14,000 species of mushrooms is known. About 7000 mushroom species are known to possess varying degree of edibility and more than 3000 species from 31 genera are regarded as prime edible mushroom. Among these 200 species are experimentally grown, 100 species economically cultivated, approximately 60 are commercially cultivated and 10 have reached an industrial scale. Further 2000 species are medicinal with variety of health attributes. Mushrooms play a very important role in eco-friendly recycling of agricultural wastes. This process leads to the production of highly nutritious and medicinal mushrooms which can be easily grown by anyone at home or scale up to industrial production. The following table gives a brief description of different varieties of mushrooms and their nutritional and medicinal value.

Shiitake mushroom (*Lentinula edodes*)



Cultivation: Excellent culinary medicinal mushroom occupying 22% share of global mushroom market. Extremely popular in Japan, it is grown on steam sterilized, enriched hard wood sawdust. It can be a certified organic crop. It requires 24 - 28°C for vegetative growth and 15 - 25°C (variety dependent) for appearance of mushrooms. Cold water shock treatment is essential for mushrooms to appear. It has a potential of 100% biological efficiency (quantity of fresh mushrooms produced per 100kg dry substrate). It is sold as fresh or in dried forms. Sun dried Shiitake mushrooms can be excellent source of vitamin D. Technology & training is available in ICAR-IIHR for cultivation.

Nutraceutical properties: This mushroom is very low in Saturated Fat, Cholesterol and Sodium. It is also a good source of Dietary Fiber, Vitamin B6, Folate, Magnesium, Potassium, Zinc and Manganese, and a very good source of Riboflavin, Niacin, Pantothenic Acid, Copper and Selenium. Lentinan is a compound extracted from this mushroom which is an approved anti-cancer drug in Japan. It has potent antiviral and immunopotentiating activity. It has excellent cholesterol reducing properties.

Oyster mushroom (*Pleurotus* spp.)

Cultivation: The most gregarious mushroom which can be grown on any agricultural waste. It constitutes 19% share of global mushroom market. It occurs in white, pink, brown, gray, yellow and black colours. Varieties are available which can be grown from 13 to 30°C. It can be grown on a wide scale from home level to industrial scale. It is one of the most hygienic vegetable available and can be grown as certified organic as it is grown only on steam pasteurized or sterilized straw. It requires 24 - 28°C for vegetative growth and 14 - 28°C (variety dependent) for appearance of mushrooms. It has a potential of 100% biological efficiency. It is sold as fresh or in dried forms. Sun dried oyster mushrooms are highest source of vitamin D. Technology & training is available at ICAR-IIHR for cultivation.



Nutraceutical properties: Oyster mushrooms are low in Sodium, hence recommended for hypertension. It is very low in saturated fat and has zero Cholesterol. It is a good source of Protein, Thiamin, Vitamin B6, Folate, Iron, Magnesium, Zinc and Manganese, and a very good source of Dietary Fiber, Riboflavin, Niacin, Pantothenic acid, vitamin D, Phosphorus, Potassium and Copper. Its estimated glycemic load is 3, completeness score 65, Amino acid score 75. Due to its low glycemic load, it is excellent diet for diabetics. Its property to reduce triglycerides and cholesterol makes it a highly recommended food for heart patients. It has excellent anti-inflammatory and anti-oxidant properties. It has anti cancer & excellent immune enhancing properties. It is an excellent variety to grow as kitchen garden.

Wood ear mushroom (*Auricularia polytricha*)



Cultivation: This is the first cultivated mushroom in China and occupies 18% share of global mushroom market. It is highly prized in Asia. It can be grown on sterilized straw or supplemented sawdust. It requires a temperature range of 24-28°C for vegetative growth and mushroom formation. It is usually sold as dried mushroom.

Nutraceutical properties: It contains high levels of fiber and protein. However it is more known for its antioxidant, anti-inflammatory, anti-thrombotic, anti-cholesterol and cardio protective properties.

Button mushroom (*Agaricus bisporus*)



Cultivation: The first industrialized mushroom with 15% share of global mushroom market. It occurs in white and brown forms. It is cultivated on compost made from a mixture of animal dung 60-70% (horse dung or chicken manure), straw, urea, gypsum etc. It requires 24±2°C for vegetative growth and 16±2°C for appearance of mushrooms. It cannot be grown as organic crop as of now. Casing is an essential requirement for mushrooms to appear. It is sold as fresh or in canned forms. It has a maximum potential of 30% biological efficiency. Technology is available in India for cultivation.

Nutraceutical properties: This mushroom is low in saturated fat and sodium, and very low in Cholesterol. It is fairly good source of Vitamin D, Thiamin, Riboflavin, Niacin, Vitamin B6, Pantothenic Acid, Phosphorus, Potassium, Copper. It is a good source of Dietary Fiber, Protein, Vitamin C, Folate, Iron, Zinc and Manganese. Its estimated glycemic load is 3, inflammation factor -5, completeness score 67, Amino acid score 86. This mushroom has anti-cancer properties but contains a substance called agiritin which is carcinogenic in high quantities. Its consumption is decreasing globally due to the availability of other more nutritious mushrooms which can be easily grown.

Enoki mushroom (*Flammulina velutipes*)



Cultivation: Commonly called as winter mushroom, it is very delicate and a prized mushroom in Japan. It can be grown on sterilized supplemented sawdust. It requires a temperature range of 21-24°C for vegetative growth and 8-10°C mushroom formation. This variety has the potential to become certified organic. It has a potential of 80-100% biological efficiency. Technology under investigation in India for cultivation.

Nutraceutical properties: This mushroom is very low in Cholesterol and Sodium. It is also a good source of Iron and Copper, and a very good source of Dietary Fiber, Thiamin, Riboflavin, Niacin, Folate, Pantothenic Acid, Phosphorus and Potassium. It contains flammulin which is anti-cancer.

Paddy straw mushroom (*Vovariella volvaceae*)

Cultivation: Tropical mushroom which requires temperatures between 30-38°C for growing. It can be grown on paddy straw and cotton waste from ginning mills. Easy to grow, this variety has the potential to become certified organic. It has a potential of maximum 30% biological efficiency. The shelf life of this mushroom is less than 24 hours and undergoes autolysis at low temperature hence cannot be stored in refrigerator. It is sold as fresh, dry or in canned form. Technology available in India for cultivation.

Nutraceutical properties: A very good source of protein, fiber, vitamin B, C, mineral and assorted amino acids.

Paddy straw mushroom (*Vovariella volvaceae*)



Milky mushroom (*Calocybe indica*)



Cultivation: The first Indian mushroom to be commercialized by Indian institute of horticultural Research, Bangalore. It requires temperatures between 30-38°C for growing. Casing is a must for mushrooms to appear. It can be grown on wheat or paddy straw. This variety has the potential to become certified organic. It has a potential of 100% biological efficiency. It has excellent shelf life and does not brown. It can be sold as fresh or in canned forms. It is good for pickling. Technology available at ICAR-IIHR for cultivation.

Nutraceutical properties: High in fiber hence useful in stomach disorders. It is low on protein and high in ergosterol which can be converted to vitamin D.

Black poplar mushroom (*Agrocybe aegerita*)

Cultivation: A very tasty mushroom which can be grown on sterilized straw or supplemented sawdust. It requires a temperature range of 24-28°C for vegetative growth and mushroom formation. It has good shelf life and can be sold as fresh or dried mushrooms. This variety has the potential to become certified organic. It has a potential of 30-50% biological efficiency. It can be sold as fresh or in dried forms. Technology available in India for cultivation.

Black poplar mushroom (*Agrocybe aegerita*)



Nutraceutical properties: This mushroom is particularly rich in Copper and Pantothenic acid which is Vitamin B5. It also contains Folate, Biotin, Niacin or Vitamin B3, Selenium, Potassium and Riboflavin or Vitamin B2. It has anti-inflammatory, antifungal, antibiotic and anti-tumor properties. This mushroom has excellent ant-oxidant activity.

Maitake mushroom (*Grifola frondosa*)



Cultivation: It is an excellent culinary mushroom very popular in Japan and Korea. It is grown on sterilized supplemented sawdust substrate. It requires a temperature range of 21-24°C for vegetative growth and 13-18°C mushroom formation. It is sold as both fresh and dry forms. Technology not yet available in India.

Nutraceutical properties: This mushroom is very low in Saturated Fat, Cholesterol and Sodium. It is also a good source of Folate, Phosphorus, Potassium and Zinc, and a very good source of Dietary Fiber, Thiamin, Riboflavin, Niacin and Copper. It shows anti tumor (breast cancer) and anti HIV properties.

Shimeji mushroom (*Hypsizygus tessulatus*)

Cultivation: A delicious species very popular in Japan. It is grown on sterilized supplemented sawdust substrate. It requires a temperature range of 21-24°C for vegetative growth and 13-18°C mushroom formation. Technology under investigation in India for cultivation.

Nutraceutical properties: It is a good source of protein, vitamin D&B. Shimeji mushrooms can also help diabetes, asthma and certain allergies by enhancing the immune system and boosting its healing capabilities.



Lion's mane mushroom (*Hericium erinaceus*)



Cultivation: A mushroom with a very different shape than usual cap and stalk. It can be cultivated on sterilized supplemented sawdust. Attempts are underway for its production on paddy straw as well. It requires a temperature range of 22-26°C for vegetative growth and mushroom formation. Technology under investigation in India. It is sold as fresh, dried or in tablet forms.

Nutraceutical properties: High in protein, fiber, Vitamin B, iron, Vitamin D and low in sodium. It is effective in ulcers, inflammations and cancer. It has erinacines which show stimulation of nerve growth factor synthesis. It is helpful in treating cognitive disorders. It has excellent antitumor and immunomodulatory properties through macrophage activity

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