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A NUTRITIOUS AND ECO-FRIENDLY CROP: MUSHROOMS

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Abstract

Mushrooms are an extremely nutritious and environmentally friendly crop with several medical benefits. Mushrooms have less protein than mammals, while plants have far more. Except for iron, it has a greater concentration of fibre, vital amino acids, and minerals. It is not only a nutrient-rich vegetable high in vitamin D, but it can also prevent cancer, HIV-1, AIDS (a terrible human disease), and other illnesses. It is a crop that requires minimal resources and area to develop and is cultivated worldwide at a low cost throughout the year. Growing mushrooms from agricultural waste substrates is a cost-effective and environmentally friendly method for producing nutritious and delicious food. Lignocellulosic waste can also be converted into food, feed, and fertilizers through cultivation. Mushroom consumption and production are low compared to other crops, resulting in limited investment in the business.

Keywords: *Edible Mushrooms, Food Industry, Medicinal Properties, Nutritive Value.*

Introduction

Mushrooms have long been farmed for their nutritional benefits and flavour, particularly in eastern nations. Edible mushroom farming is crucial in today's world, especially with a growing population and environmental challenges. This research highlighted key mushroom species farmed in India, their nutritional and medicinal benefits, and environmentally sustainable production practices. Cultivated mushrooms are a very nutritious food that may be cultivated from biological, agricultural, or agro-industrial waste (Sánchez, 2010; Atila, 2017). Researchers found nutritional differences between mushrooms grown on various substrates. Hoa et al. (2015) found that formulas containing 100% sugar bagasse and 100% corncob had higher levels of protein, fiber, ash, and mineral content (Ca, K, and Mg) compared to 100% sawdust. Supplementing Agaricus bisporus mushroom substrates with trace elements has been shown to produce fruiting bodies rich in micronutrients like selenium, copper, and zinc, which are often lacking in human diets. Bird et al. (2017); Rzymski et al. (2017); Werner and Beelman (2002). Mushrooms are used to make a variety of nutritional goods. Mushrooms are valued for their antiviral, anti-cancerous, and antioxidant effects, leading to increased interest in their production and processing. Edible mushrooms are widely consumed due to their high protein, vitamins, minerals, fiber, microelements, and low-calorie content (Naeem et al., 2020).Universal cultivated mushrooms. Commercial cultivation of mushrooms is limited to a few kinds of fungi. Many of the 300 genera of mushrooms and associated fleshy basidiomycetes do not sporulate without a host due to mycorrhizal conditions. However, many saprophytic plants are cultivable.

Nutritional Value of Mushrooms

Edible mushrooms provide a nutrient-dense and readily digested diet. Mushrooms are used for their nutritional benefits, flavour, and taste. According to Aremu et al. (2009), mushrooms have more protein

content than fruits and vegetables. Mushrooms have a similar dry weight to yeast and are heavier than dried beans and peas. Nutritional requirements vary among species and substrates. According to Koyyalamudi et al. (2009), mushrooms are beneficial for heart patients due to their high protein and low-calorie content, as well as their ability to provide all essential amino acids. Tryptophan and lysine have higher concentrations than cysteine and methionine. Edible mushrooms are low in carbohydrates and fat. Mushrooms are an ideal meal for diabetics and people looking to lose weight, owing to their low starch content.

According to Haas and James (2009), edible mushrooms can also be considered a vegetable meat. This versatile ingredient may enhance the flavour of other recipes. Some vegetarians augment their diet with mushrooms instead of meat (Abulude, 2005).

Researchers Kattawan et al. (2011) and Naeem et al. (2020) found that mushrooms contain antioxidants. Mushrooms have potential medical advantages, including anticancer properties, in addition to their nutritional value. Several scholars (Abulude, 2005; Kuforiji and Fasidi, 2008; Kattawan et al., 2011) have discussed the therapeutic properties of Pleurotus tuber-regium.

Mushrooms may be used with medicinal herbs to treat a variety of ailments, including chest discomfort, headache, dropsy, fever, smallpox, and stomach pain (Change, 2012). Mushrooms have several nutritional benefits, similar to those found in cereals, legumes, and meat. According to Patel and Goyal (2013), mushrooms are low in calories, fat, salt, and cholesterol.

Mushrooms have anti-cancer properties, acting as an immediate anti-mitotic, oxygen species inducer, mitotic kinase inhibitor, topoisomerase inhibitor, and angiogenesis inhibitor. This leads to apoptosis and cancer dispersal.

Medicinal value

Mushrooms contain a variety of chemical substances that may have medicinal properties. Grifola's lipid fraction has antioxidant properties and inhibits enzymes linked to chronic illnesses, including cancer (Inoue et al., 2002). According to Chang (1996), mushroom ingredients not only use direct cytotoxicity against tumour cells to prevent disease progression, but also block non-immune processes.

Ganoderma species produce compounds with antibacterial properties (Smania et al., 1999; Mothana et al., 2000), inhibiting the development of bacteria such as Staphylococcus. Kuznetsov et al. (2005) found that steroid isolates had antimicrobial properties. Mushrooms have been shown to have nutritional and therapeutic benefits for ages, with increasing experimental data supporting these claims.

Medicinal mushroom experiments for HIV/AIDS patients in Africa have shown good results (Chang, 2006), increasing their worth. According to Badalyan (2004), mycelial extracts of Lentinula have antiprotozoal properties against Paramecium. Mushrooms exhibit antiviral capabilities, with isolated components from Ganoderma being effective against HIV-1 (El-Mekkawy et al., 1998; Ichimura et al., 1998). They also have antiviral effects against the influenza virus type 1.

Mushroom extracts are utilized for medical purposes and as therapies. Lentinula edodes (shiitake), Grifola frondosa (maitake), and Ganoderma lucidum (reishi) have been used medicinally for millennia in Asia. Medicinal mushrooms have been studied for their antiparasitic, cardiovascular, anticancer, antibacterial, antiviral, anti-inflammatory, antidiabetic, and hepatoprotective effects (Lentinan, 2009). According to Akpaja (2005) and Smith et al. (2002), mushrooms have medical, nutritional, and mythical functions. Mushroom genetic resources are widely used in various industries, including agriculture, agronomy, animal feed, and human food. They can also be used to produce, develop, and detect high-value constituents in industries such as pharmaceuticals and chemicals. Mushroom compounds, such as polysaccharides, proteoglycans, and glycoproteins, can regulate immune responses and inhibit tumour development. Extracts are often used in China, Japan, and Korea to supplement chemotherapy and radiation treatments (Smith et al., 2002; Borchers et al., 2008).

Mushrooms containing psychoactive chemicals have been utilized for therapeutic purposes, both mental and physical (Huder 2000). Sarfaraz et al. (2009) suggest that some mushrooms, particularly polypores like Reishi, can assist a number of health conditions. A study by Ogbe et al. (2008) found that using Ganoderma sp. improved avian egg laying capability and illness resistance. Okhuoya et al. (2010) discovered that a diet based on Betaglucan from Ganoderma lucidum (Leyss.) can effectively treat buruli ulcers caused by Mycobacterium in Nigeria.

Other Uses of Mushrooms

Mushrooms are used to colour wood and other natural fibers. Mushroom dyes organic chromosphores generate brilliant and solid hues, allowing for a wide range of colours. According to Mussak and Bechtold (2009), natural dyes were formerly used as a source for many colours. In industrialized nations, mushrooms have been utilized as a fire starter. Evocative Device LLC uses them for biodegradable packaging. They contribute significantly to the advancement of innovative biological filtration and remediation methods. Wikipedia (accessed in 2011). According to Akpaja et al. (2005), mushrooms may also be used as cannon powder.

Environment-friendly crop

The use of an expensive substrate for growing oyster mushrooms increases their cost of production. There is a need to search for definite substitute materials that should exist in sufficient amounts at a relatively low price (Arya and Arya, 2003). Pleurotus has been reported to grow readily on many non-conventional substrates (Das et al., 2000; Mukherjee and Nandi, 2002; Nageswaran et al., 2003). In West Bengal, India, water hyacinth (Eicchornia crassipes Solms.), a low-cost supplement for oyster mushroom (Pleurotus florida) cultivation. Bandopadhyay et al. (2009). In India, Pleurotus sajor-caju has been successfully cultivated on banana pseudo-stem and paddy straw (Jandaik, 1974; Jandaik and Kapoor, 1975).

Jandaik and Kapoor (1975) conducted experiments on rice straw, wheat straw, ragi straw, hulled maize cab, and waste paper. Unused garbage and rubbish may be used to grow protein-rich mushrooms and reduce environmental pollution.(Medda 2001). Biotechnological processes may recycle large amounts of organic waste through mushroom culture, producing food, fuel, and fertilizers. Using spent mushroom cultivation leftovers as a biologically pre-treated substrate might improve biogas production. Agro waste is recycled through mushroom growing (Madan, 1994).

Conclusion

As the world's population grows, the supply of food and medical services decreases, particularly for people in developing nations. Mushrooms are a cost-effective and environmentally friendly source of nourishment and medicine, with several species available.

Mushrooms may grow on many waste materials from agriculture and industry, such as paper, sawdust, cardboard, and wood. Mushroom substrates, after harvesting, are utilized in agricultural cultivation as compost. Mushroom growing is a cost-effective, nutritious, therapeutic, and environmentally friendly crop that also recycles waste materials.

Conflict of Interest

There is no conflict of interest

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