

Review on: Nutritional Value and Health Benefits of Edible Mushroom

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ABSTRACT

This review showed the biological properties present in mushrooms have been extensively studied. Besides nutritional properties, mushrooms have attracted market attention because they are a potential source of bioactive compounds able to perform several functions in organisms with benefits for consumer health. Nowadays, mushrooms are popular valuable foods because they are low in calories, carbohydrates, fat, and sodium; also, they are cholesterol-free. Besides, mushrooms provide important nutrients, including selenium, potassium, riboflavin, niacin, vitamin D, proteins, and fiber. All together with a long history as food source, mushrooms are important for their healing capacities and properties in traditional medicine. It has reported beneficial effects for health and treatment of some diseases. Many nutraceutical properties are described in mushrooms, such as prevention or treatment of Parkinson, Alzheimer, hypertension, and high risk of stroke. They are also utilized to reduce the likelihood of cancer invasion and metastasis due to antitumoral attributes. Mushrooms act as antibacterial, immune system enhancer and cholesterol lowering agents; additionally, they are important sources of bioactive compounds. As a result of these properties, some mushroom extracts are used to promote human health and are found as dietary supplements.

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Introduction

Mushroom cultivation has a long tradition mainly in Asian countries where it started centuries ago. Edible mushrooms constitute an element of human diet in many countries all over the world. At least 12000 species of fungi can be considered as mushrooms, and at least 2000 species are identified as edible [1]. According to Sánchez et al, among the 2000 edible mushroom species found in different regions of the world, only 35 are grown on a commercial scale and 20 are cultivated on an industrial scale [2]. Mushrooms could be an alternative source of new antimicrobial compounds, mainly secondary metabolites, such as terpenes, steroids, anthraquinones, benzoic acid derivatives, and quinolones, but also of some primary metabolites like oxalic acid, peptides, and proteins.

Literature review

Nutritional Benefits

Recently, mushrooms have attracted much research interest because among other benefits they are a good source of β -glucans. Some properties such as molecular weight of β -glucans are important sources of food. They are consumed not only for their innate flavor and taste, but also for their important nutritional value. The nutrient content varies from species and depends on their growth requirement. Mushrooms have a high percentage of water 93-95% as compared to lean beef (70%) and fresh vegetables (92%). They also contain valuable minerals such as iron, potassium, phosphorus, calcium and copper, 56% carbohydrate, 30% protein, 2% fat and also 10% ash on dry weight basis. They are also rich in vitamin B and vitamin D. Mushrooms provide a high protein and low caloric diet and can thus be recommended to heart patients. They also contain all the essential amino-acid required by an adult [3]. Mushrooms is reported to be an excellent source of riboflavin

and nicotinic acid; a good source of pantothenic acid and ascorbic acid. The absence of starch in mushrooms makes it an ideal food for diabetic patients and for persons who wants to shed excess fat. Have demonstrated that mushrooms contain antioxidants [4].

Medicinal Benefits

A number of mushroom species are known to possess medicinal properties where Ganoderma, king of medicinal mushrooms, and Lentinula, are the most important genera. Lentinula edodes (shiitake), Grifola frondosa (maitake) have a history of medicinal use spanning millennia in parts of Asia. Medicinal mushroom research has indicated possible cardiovascular, anticancer, antiviral, antibacterial, antiparasitic, antiinflammatory, hepatoprotective, and antidiabetic activities [5]. Amanita muscaria used therapeutically as a powder, tincture for swollen glands, nervous troubles and epilepsy etc.

Antioxidant Activity

Polysaccharopeptides found in mushrooms can benefit general health by inducing enzymes that remove free radicals and reduce the oxidative damage. Many synthetic chemicals, such as synthetic phenolic compounds, are strong radical scavengers, but they usually have side effects. For this reason, natural antioxidants have been preferred for food applications in particular due to the increasing demand of consumer by natural additives and ingredients [6]. The antioxidant activities of ethanolic extract from edible mushroom *Agaricus bisporus* were evaluated by Liu et al. and the results suggested that ethanolic extract of *A. bisporus* had potent antioxidant activity and could be explored as a novel natural antioxidant.

Prebiotics Activity

The interest in the gut microbiome and host interaction is increasing. Initially, prebiotics were defined as nondigestible food ingredient that beneficially affects the host by selectively stimulating the

growth of one or a limited number of bacteria in the colon [8]. In 2004, the concept has been updated as “selectively fermented ingredients that allow specific changes in the composition and/or activity in the gastrointestinal microbiota that confers benefits upon host well-being and health” [9]. The probiotics added to the foods are living microorganisms that must be kept alive and may be killed by heat, stomach acid or simply die with time. However, prebiotics are essentially dietary fibre and are not affected by heat, acid or time.

Enzymes and Secondary Metabolites

Some species of mushrooms synthesize enzymes that may play important functions in the organism. *Pleurotus eryngii* and *Ganoderma lucidum* can produce laccases. In the human body this protein can confer activity against HIV by inhibiting the reverse transcriptase [10]. The lectins produced by the species *Pleurotus ostreatus* and *Ganoderma carpense* have shown anti-proliferative activity on tumour cells [11].

Other Benefits

According to Wikipedia, the free encyclopedia, mushrooms have been used for dyeing wood and other natural fibers [12]. The chromophores of mushroom dyes are organic compound and produce strong and vivid colors, and all colors of the spectrum can be achieved with mushroom dyes. Dyes from them have been the source of many dyes before the synthetic ones (Mussak and Bechtold 2009). Presently, they play a role in the development of new biological remediation techniques and filtration technologies [13].

Conclusions

Nowadays mushrooms are used not only as a source of nutrients, but also as medicinal resources. Polysaccharides from mushrooms were reported to exhibit immunomodulation properties, antitumour, antioxidant, antimicrobial and prebiotic activity due to the greatest potential for structural variability in comparison with other biological active molecules. The benefits of mushrooms are relatively economical because the mushrooms can be grown on a number of inexpensive agricultural or forest wastes such as rice straw, corn cobs and saw dust. The fungal inoculum can also be mass-produced by current simple techniques used to produce fungal spawn. In the quest, for economical and ecologically sound methods for environmental remediation, the use of mushrooms is a very good approach and solution. More intensive research needs to be carried out on the potentials and ecology of a large number of edible mushrooms.

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