

## Utility and Functionality of Mushrooms

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### Summary

Mushrooms are unique microorganisms, which can be served as food and as traditional medicine, especially in Asian countries. The vegetative phase of mushrooms is performed by the growth of dikaryotic mycelium that is produced by mating between two monokaryons with different mating types. When the mycelium encounters optimal conditions for differentiation, it forms the sexual organ, i.e., fruiting-bodies. However, many mushrooms are non-edible or poisonous against human beings. Therefore, the taxonomic identification of mushrooms is very important for avoiding the lethal effect of those mushrooms.

Fruiting-bodies of edible mushrooms have nutritional functions because they contain low molecular weight carbohydrates such as trehalose, mannitol, and arabinitol, with indigestible polysaccharides such as  $\beta$ -glucan, heteroglucan and chitin that are the components of their cell walls. These mushrooms also contain proteins, lipids, minerals, and vitamins which are valuable food ingredients. Moreover, the fruiting-bodies of medicinal mushrooms may contain potential bioactive compounds, some of which are effective as anti-tumor agents, the others are effective to improve various diseases which may occur during ageing of the human body. Recently, the medicinal effects of mushrooms were focused on lifestyle diseases such as high blood pressure, hyperlipemia and diabetes, osteoporosis, allergosis, and dementia. In this review, current progress in research on edible and medicinal mushrooms as functional foods and medicines is introduced.