

Nutritional Quality of Wild Edible Mushrooms of Dakshina Kannada- A Study

1. Introduction

Fungi have been at work since life began on earth and mushrooms are one among them. Mushrooms are the common fungal fruiting bodies growing mostly on variety of organic matter. Some mushrooms are edible while others are poisonous and non-edible. Mushrooms have been used as food and medicine in many parts of the world. They are macro-fungi which belong either to Basidiomycetes or Ascomycetes and are very distinct from plants, animals and bacteria. Cultivation of mushrooms for consumption can help in solving problems of global importance such as protein shortage as well as improving the health and well-being of people, considering that mushrooms are valuable health foods which are low in calories and provide essential minerals. In most parts of rural Indian communities, specifically among tribes indigenous edible mushrooms are highly treasured as they start growing immediately after the first rains. Many studies on nutrient determination have revealed that mushrooms contain substantial amount of essential nutrients like proteins and are ideal food because of fairly high content of protein which contains all of the essential amino acids. Fungal biomass is also a source of dietary fibre, and is virtually free of cholesterol. Detail study on the nutrient contents of edible mushrooms is recent as per the literature available.

Climate and vegetation in Dakshina Kannada, especially in the foot hill regions of Western ghats, certain forest and woodlands, open grassland regions, plantations are ideal spots for wild mushrooms to grow. Some appear immediately after first rains whereas others after much wetting decomposition and softening of soil. Farmers and workers after they complete the agricultural work are free this period and also availability of the fresh vegetables is limited, mushrooms form a great delicacy. Only by knowing the distinguishing characters by experience one can differentiate the edible and poisonous mushrooms. More than 2000 mushroom species exist in nature, but only approximately 22 species are intensively cultivated.

Studies on nutrients and mineral analysis of different mushroom species available globally, but in India are little or no work has been reported in Dakshina Kannada whereas reports on diversity of macro fungi have been recent. As there is growing demand for cultivated mushrooms this study aims survey and determining nutrients in some commonly available wild edible mushrooms in Dakshina Kannada and Udupi districts.

2. Objectives and scope

Fungi are most neglected group of organisms as their occurrence is invisible in general even though they play a very important role in maintaining ecosystem balance as they are the core group organisms of decomposition along with Bacteria. There are numerous gaps in our knowledge about the distribution, diversity, ecology and nutritional aspects of mushrooms.

This study aims at

- Survey and identification of wild edible mushrooms of Dakshina Kannada.
- Record various wild edible mushrooms available the region which may disappear due to the environmental degradation and loss of habitat due to developmental processes as they are habitat specific.
- Study also aims at analysis of their nutritional quality.
- To find if there is any mushroom reported could be commercially exploited.

Methodology

- Extensive field work and local community interaction to survey and record the available edible mushrooms of the region
- Identification of the collected samples.
- Processing for proximate analysis: Cleaning and drying for storage for further analysis.
- Moisture analysis by drying known weight of samples at 100° C till constant weight.
- Ash determination by heating known weight of sample at 550° C for 6 hrs in muffle furnace.
- Determination of Protein and Carbohydrate contents using known methods.
- Analysis of minerals, both macro and trace by using appropriate methodology like ASA, spectrophotometry and Flame photometry.

Result and Conclusion

- A total of twelve wild edible mushrooms were identified and recorded. They are *Agaricus sp.*, *Astraeus hygrometricus*, *Auricularia auricular*, *Clitocybe infundibuliformis*, *Lentinus squarrosulus*, *Leucocoprinus sp.*, *Pleurotus sp.*, *Termitomyces microcarpus*, *Termitomyces schimperi*, *Termitomyces sp.*, *Tricholoma sp.*, *Volvariella volvacea*.
- Of these three *Termitomyces* species are mutualistic and *Astraeus hygrometricus* is mycorrhizal and others are saprophytic as lignicolous on wood and decomposing matter.
- Six common species analysed for moisture, ash, protein, and carbohydrate shown high moisture content and protein content. Macromineral Contents like Potassium is high and Sodium is low.
- Trace elements of two species (*Astraeus hygrometricus*, *Termitomyces schimperi*) studied reveal a good profile where essential elements like Fe, Zn, and Cu are at higher concentration whereas toxic elements like Ni and Cr are at lower concentration.
- Mushrooms are a good source of protein and carbohydrates and their nutritional contents are nearly similar to most legumes and meat can be used in low caloric diets. The investigated mushroom species are a good food source with high quality nutritional values.
- There is also a great scope for study of such locally available edible mushrooms which may be of greater value as there is no data available.
- It is also noted from the literature that the stage of growth and the substratum on which they grow also plays a role in the nutrient content.
- There is a need for protein rich food these can be of much use as vegetarian substitute for proteins. Hence these can be exploited for cultivation and commercial growing as industry as there is greater demand for mushroom varieties as a good valuable diet.
- Species of *Termitomyces* are well known edible mushrooms and a rural delicacy which plays a vital role in food security especially in monsoon when availability of vegetables is scarce. But commercial cultivation of these may be challenging as they are mutualistic and depend on termite association.
- The recorded data will assist the better management and conservation policies of this important natural resource.
- It is also important to study the toxicity, teratogenic effects and other parameters of these mushrooms which may lead to better understanding of the consumption efficiency and health benefits.

- In conclusion, these wild edible mushroom species can be regarded as healthy foods in well-balanced diets due to their contents of functional minerals and nutrient. Hence any kind of work on mushrooms, be it diversity study, ecological study, nutrient study or the study of secondary metabolites, plays a key role in understanding the importance of this heterotrophic group of organisms much neglected.



Termitomyces schimperi



Astraeus hygrometricus



Termitomyces microcarpus



Termitomyces sp.



Lentinus squarrosullus



Leucocoprinus sp

Species of Wild Edible mushrooms Collected