

Nutritional Qualities and Host Specificity of Most Common Edible Macrofungi of Hamirpur District, Himachal Pradesh

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ABSTRACT: This paper analyses nutritional qualities and host specificity of most common edible macrofungi of Hamirpur district, Himachal Pradesh. During the ongoing studies on diversity of macrofungi, specimens of edible fungi were randomly collected from twelve localities (*viz.* Chheorin, Doh, Baru, Bohni, Saloni, Bhota, Tikkar-khattriyan, Kohin, Tikkar-sujanpur, Doli-sujanpur, Harson and Fafan) of Hamirpur region and five species of most common edible macrofungi *viz.* *Auricularia auricula-judae*, *Ganoderma applanatum*, *Ganoderma lucidum*, *Pleurotus ostreatus* and *Schizophyllum commune* were identified. The chemical composition of these macrofungi include ash, protein, fats, carbohydrates, glucose, mannose, xylose, galactose, amino acids, fibre, phosphorus, magnesium, calcium, iron, zinc, magnesium, copper and chromium. Among these macrofungi, *Auricularia auricula-judae* is rich in carbohydrates (66.1%) and glucose (15%), *Schizophyllum commune* is rich in fats (4.5%), *Ganoderma lucidum* is rich in fibres (59%) and *Pleurotus ostreatus* is rich in protein (25.91%). These pathogenic macrofungi infect and grow over fifteen tree hosts *viz.* *Acacia catechu*, *Bauhinia variegata*, *Bombax ceiba*, *Citrus pseudolimon*, *Dalbergia sissoo*, *Dendrocalamus sp.*, *Ficus benghalensis*, *Grewia optiva*, *Magnifera indica*, *Melia azedarach*, *Morus alba*, *Pyrus pashia*, *Tamarindus indica*, *Toona ciliata* and *Zizyphus jujube* in the study area. Among these host trees, *Bauhinia variegata* is infected maximum by four species of macrofungi except for *Pleurotus ostreatus* which is host specific and infects only *Melia azedarach*.

Keywords: Diversity; Edible; Hamirpur; Host Specificity; Pathogen and Macrofungi.

INTRODUCTION: Recent researches have proved that macrofungi are most valued dietary product as these contain a unique complex of biologically active compounds, have low calorific value lacking and are cholesterol free.^{1, 2, 3 & 4} An average macrofungus including mushrooms is having about 7.4% crude fibre, 14.6% crude protein, 4.48% (fat and oil) and 16.5% dry matter.⁵

The detailed review of published records on diversity of macrofungi in Hamirpur region reveals that only twenty two species of macrofungi have been reported so far from this area.^{6,7} During the present study, efforts have been made to analyze nutritional qualities and host specificity of five most common wild edible macrofungi of Hamirpur district in Himachal Pradesh (India).

MATERIAL AND METHODS: The specimens of edible macrofungi were randomly collected from twelve localities (*viz.* Chheorin, Doh, Baru, Bohni, Saloni, Bhota, Tikkar-khattriyan, Kohin, Tikkar-

sujanpur, Doli-sujanpur, Harson and Fafan) of study area (Hamirpur region, Himachal Pradesh) during May 2017-March 2018. Specimens were then brought to laboratory for further micro and macro-morphological studies. The fresh specimens were observed for morphological investigations and sun dried at the camping site. The specimens were then brought to the Botany Laboratory of Department of Bio-Sciences, Career Point University, Hamirpur for further taxonomic studies and preservation. The specimens were identified by consulting latest literature and comparing with authenticated specimens. 1-4 dichloro benzene crystals were placed in each herbarium packet containing specimen to avoid insects attack and all the specimens were deposited in CPUH (The Herbarium of Department of Bio-Sciences, Career Point University, Hamirpur).

RESULTS AND DISCUSSION: Research has been conducted to examine the nutritional qualities and host specificity of most common edible macrofungi of Hamirpur region of Himachal Pradesh. Five species of

most common edible macrofungi viz. *Auricularia auricula-judae*, *Ganoderma applanatum*, *Ganoderma lucidum*, *Pleurotus ostreatus* and *Schizophyllum commune* were collected and identified (Plate 1 and Figure 1).

PLATE- I

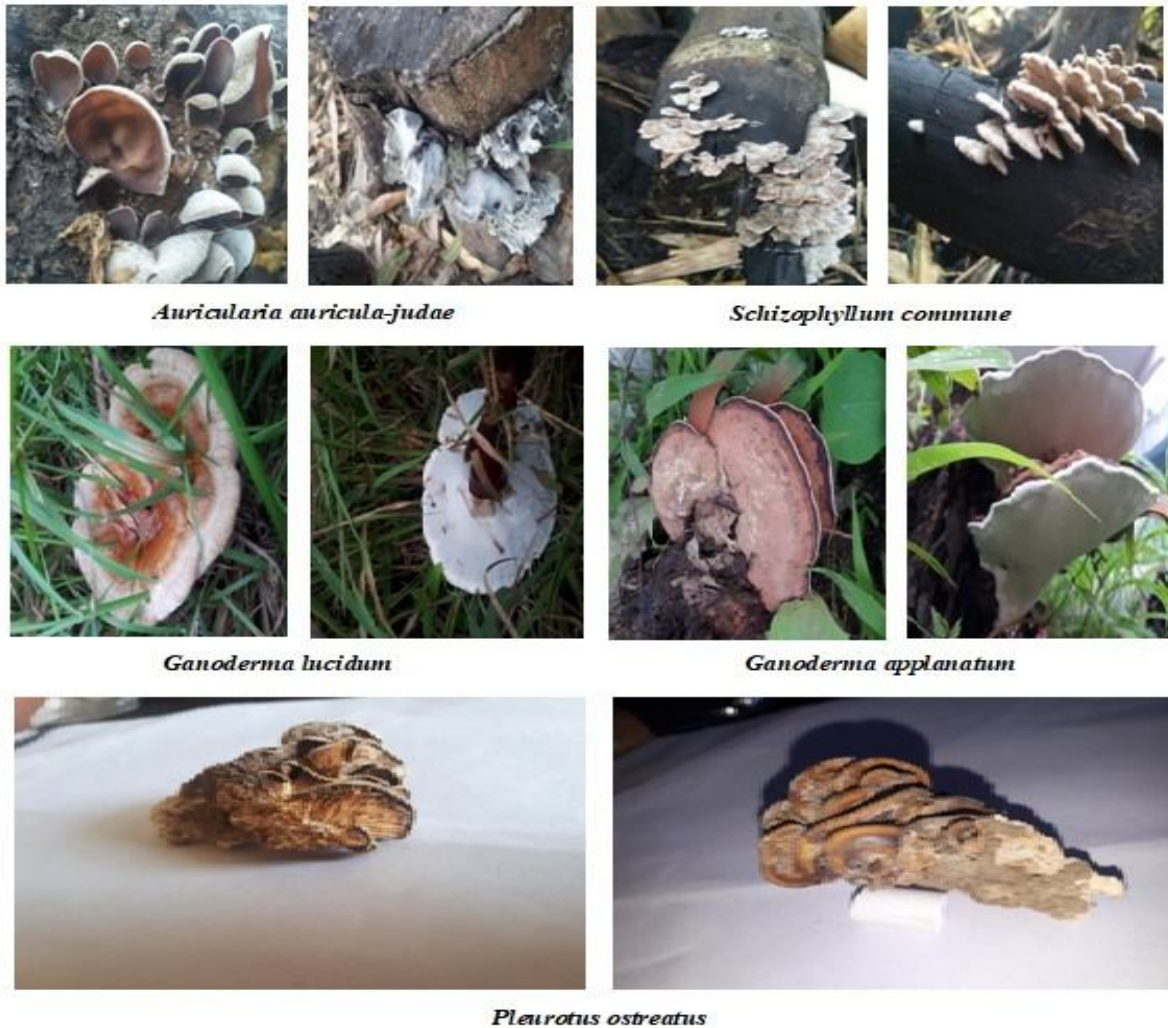


Plate 1: Upper and lower surface of macrofungal species *Auricularia auricula-judae*, *Schizophyllum commune*, *G. applanatum*, *G. lucidum* and *Pleurotus ostreatus*.

Nutritional values of edible macrofungi are attributed to its chemical composition. Macrofungus chemical composition depends upon the species as well as on the substrate, age and fructifications.⁸ These five macrofungi contain ash, protein, fats, carbohydrates, glucose, mannose, xylose, galactose, amino acids, fibre, phosphorus, magnesium, calcium, iron, zinc, magnesium, copper and chromium. *A. auricula-judae* contains 3.6% ash content, 12.5% protein content, 1.7% fat, 66.1% carbohydrates content and 15% glucose.⁹ In many countries, *S. commune* is commonly eaten fresh or dried. *S. commune* have 2% of ash content, total protein content is 6.1 %, fat content 4.5%, carbohydrates content is 35.39% and fibre are only 0.02%.¹⁰ *G. lucidum* is an oriental fungus having

a long history of food source. *G. lucidum* contains 1.8% ash, 7-8% proteins, 3-5% fats, 26-28% carbohydrates and 59% fibres.¹¹ *G. applanatum* contains 7.7% of crude protein and 11.1% glucose.¹² *Pleurotus* is the third most produced edible mushroom due to its ability to colonize a large variety of lignocellulosic substrates and the average value of ash, protein, fats, carbohydrates and fibre is 10.91%, 25.91%, 2.18%, 42.14% and 10.41%.^{13,14} Among these five macrofungi, *A. auricula-judae* is rich in carbohydrates (66.1%) and glucose (15%), *S. commune* is rich in fats (4.5%), *G. lucidum* is rich in fibres (59%) and *P. ostreatus* is rich in protein (25.91%) as shown in Figure 2.

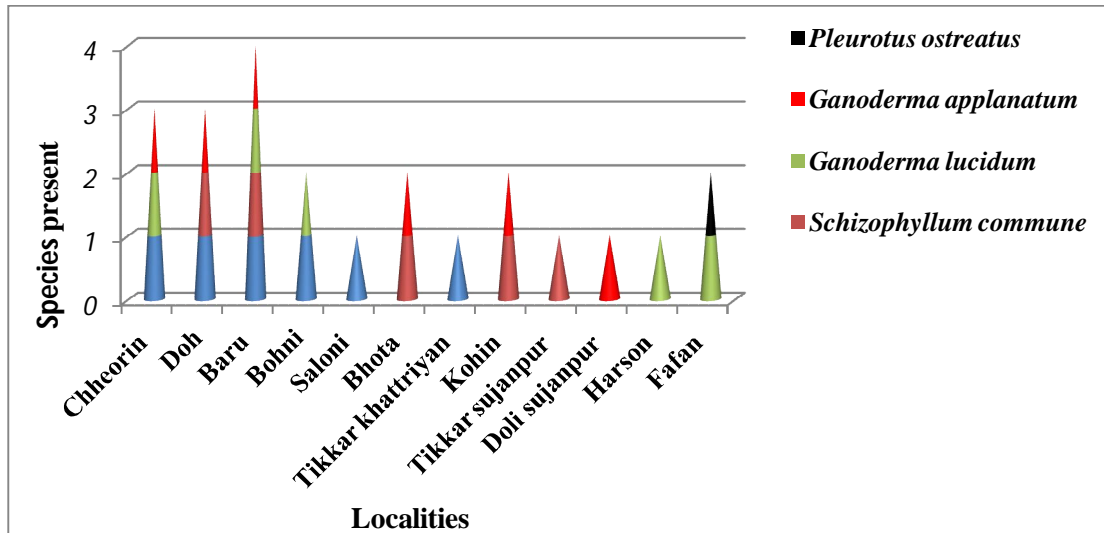


Figure 1: Macrofungal species collected from different localities.

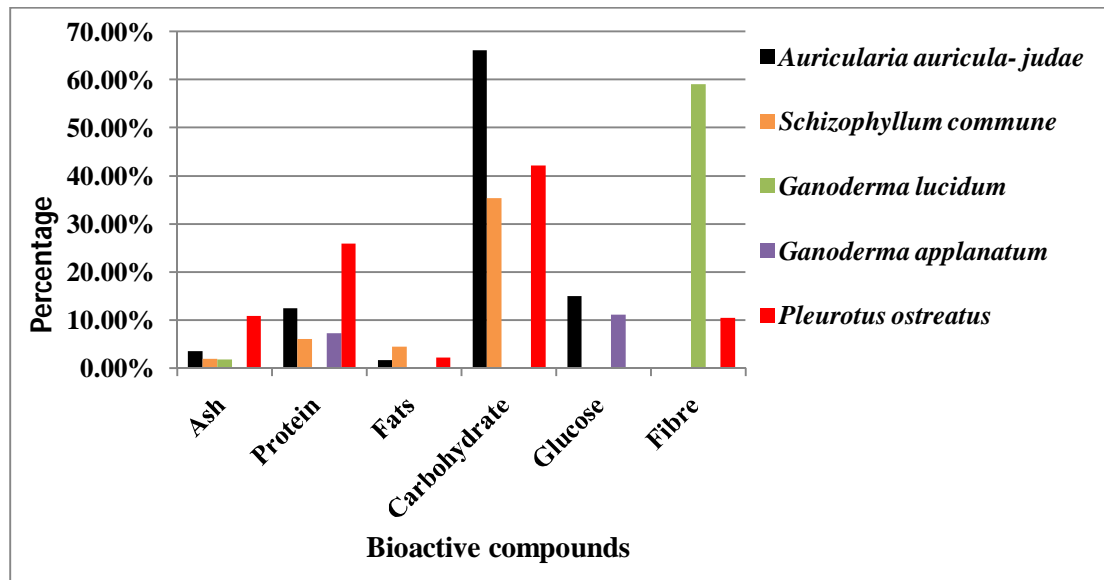


Figure 2: Nutritional content of macrofungal species.

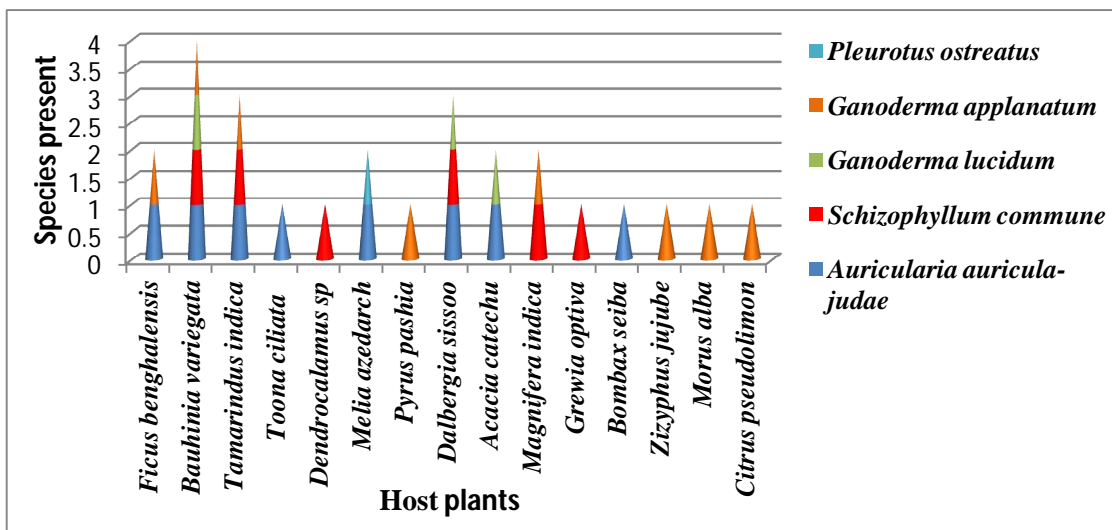


Figure 3: Macrofungal species infesting different hosts.

These pathogenic macrofungi infect and grow over fifteen tree hosts viz. *Acacia catechu*, *Bauhinia variegata*, *Bombax ceiba*, *Citrus pseudolimon*, *Dalbergia sissoo*, *Dendrocalamus* sp., *Ficus benghalensis*, *Grewia optiva*, *Mangifera indica*, *Melia azedarach*, *Morus alba*, *Pyrus pashia*, *Tamarindus indica*, *Toona ciliata* and *Zizyphus jujube* in the study area. Among these host trees, *Bauhinia variegata* is infected maximum by four species of macrofungi except for *Pleurotus ostreatus* which is host specific and infects only *Melia azedarach* as in Fig 3.

CONCLUSION: Five species of most common edible macrofungi have been described from Hamirpur district of Himachal Pradesh. These macrofungi are having high nutritional value and are potential alternate to traditional food crops. All of these are plant pathogenic and infest various hosts. *B. variegata* is infected maximum by four species of macrofungi except for *P. ostreatus* which is host specific and infects only *M. azedarach*.

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