



## **Economic Importance of Wild Mushrooms in Mayurbhanj District, Odisha, India**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

In forest-dominated areas, the local communities depend on forests for their food, medicine, and livelihood. Seasonal livelihoods are observed mostly in these areas. Wild edible mushrooms are a seasonal source of livelihood and food for tribal communities. Keeping the importance of wild mushrooms in providing livelihood opportunities, an attempt has been made to document the economically important wild edible mushrooms of Mayurbhanj, Odisha, India. Results revealed that about 10 species are collected from the forest which are used to sell in weekly markets and roadsides of the study areas. Among the enumerated wild mushrooms, the highest price was observed with "Rugda/Phutka" mushrooms (*Astraeus hygrometricus*). It was noticed that *Termitomyces microcarpus* is the first choice of the sellers and buyers too. The *Amanita egregia* is also very much popular among the buyers due to good yield and palatability. The paper highlights the importance of wild mushrooms as Non-Timber Forest Produces and recommends that there is need of value addition of economically important wild mushrooms for sustainable livelihood opportunities.

**Keywords:** *Timber; mushrooms; livelihood; forest products; making strategies.*

## 1. INTRODUCTION

Communities depend on forests and forests depend on communities. In most forest dominant districts of Odisha, the local communities depend on forests and their products for day-to-day needs. The communities in these areas collect food, medicine and Non-Timber Forest Products to get a livelihood. Day by day, we are losing our forests due to over-extraction, climate change, deforestation, and other anthropogenic activities. These problems lead to the migration of communities and the extinction of indigenous traditional practices. Therefore, there is a need to document economically important forest products to improve their livelihood opportunities. Mayurbhanj is a forest and tribal-dominated district of Odisha. The local tribal people of Mayurbhanj collect various forest products and use them in day-to-day life and also used to sell them in local markets to get a livelihood [1,2]. They used to sell honey, resin of *Shorea robusta* (Jhuna), kendu (*Diospyros melanoxylon*), jamun (Fruit of *Syzygium cumini*), rope made up from stem bark of siali (*Phanera vahlii*), wild mushrooms, red weaver ant, the root of mudika (*Cissampelos pareira*) and plant parts of some locally available medicinal plants. Among them, wild mushrooms are collected during the rainy season and used to sell as seasonal products (Plate 3-4). They are also consumed as food. These mushrooms play an important role in providing food and livelihood. Therefore, an attempt has been made to document the economically important wild edible mushroom,

collected by the local communities of Mayurbhanj district, Odisha, India. The study provides basic knowledge about them for future research works and making strategies for their commercialization for commercial utilization and sustainable development [3,4].

## 2. METHODOLOGY

The survey works are carried out from 2020 to 2022 in Mayurbhanj district of Odisha, India. The weekly markets are selected and visited during the rainy season, including state highways, district roads, village roads and tribal villages. Information was collected from tribal sellers and collectors of wild mushrooms and tabulated. The mushrooms are identified using the available literature [3-5] and morphological characters.

## 3. RESULTS

A total of 10 most common economically important mushroom species have been tabulated, belonging to 8 families. These mushrooms are sold in the local markets and on roadsides (Plate 1). These mushrooms are highly nutritious and complete healthy food for all age groups as per the opinions and information (Plate 2). They are rich in protein, dietary fibre, vitamins and minerals. Most common enumerated species are *Amanita caesarea*, *Amanita egregia*, *Russula rosea*, *Termitomyces microcarpus*, *Volvariella volvacea* etc. These mushrooms are sold for Rs. 10 to Rs. 30 per leaf plate or bowl (Plate 4).



Plate 1. Mushrooms sold in the local markets

**Table 1. Enumerated mushrooms having economic values from the study areas**

<b>Mushrooms</b>	<b>Family</b>	<b>Local name</b>	<b>Price (Per leaf plate)</b>
<i>Amanita caesarea</i>	Amanitaceae	Bhanu chatu	Rs. 20/-
<i>Amanita egregia</i>	Amanitaceae	Manda chatu	Rs.20/-
<i>Astraeus hygrometricus</i>	Diplocystaceae	Phutka/ Rugda	Rs.30/-
<i>Boletus edulis</i>	Boletaceae	Jamu chatu	Rs.20/-
<i>Gomphus</i> Spp.	Gomphaceae	Genda phul	Rs.20/-
<i>Macrolepiota procera</i>	Agaricaceae	Khadada chatu	Rs.10/-
<i>Russula rosea</i>	Russulaceae	Patra chatu	Rs.10/-
<i>Termitomyces heimii</i>	Lyophyllaceae	Benua chatu	Rs.20/-
<i>Termitomyces microcarpus</i>	Lyophyllaceae	Bali chatu	Rs.20/-
<i>Volvariella volvacea</i>	Pluteaceae	Pala chatu	Rs.10/-



**Plate 2. Wild mushrooms in study areas**



Plate 3. Wild mushrooms collected in rainy season and used to sell as seasonal products



Plate 4. Mushrooms are sold in leaf plate or bowl

#### 4. DISCUSSION

Other researchers are also reported on the wild mushrooms. In 2013, Sachan et al. [5] reported some Indigenous knowledge of ethnic tribes for utilization of wild mushrooms as food and medicine in Similipal Biosphere Reserve. A total of 14 species of fleshy mushrooms belonging to 8 genera and 6 families were reported. Some mushrooms are like *Russula emetic*, *Russula delicata*, *Termitomyces eurhizus*, *Agaricus silvaticus*, *Pleurotus ostreatus* etc. In 2018, Panda et al. [6] reported about 14 wild edible mushroom species belonging to 5 families from different locations and local markets of Mayurbhanj district, Odisha. Some reported wild edible mushrooms are like *Termitomyces eurhizus*, *Volvorella volvacea*, *Termitomyces heimii*, *Russula rosea*, *Russulaalbbonigra*, *Russula brevipes*, *Amanita egergia* and *Astraeus hygrometricus*, regularly collected by the local people during the rainy season. In 2019, Panda et al. [7] reported a total of 20 wild edible mushroom species belonging under nine families from ten different places in three districts Mayurbhanj, Keonjhar and Balasore of Northern Odisha, India. Among them the order Agaricales was dominant, showing maximum number of species and the genus *Russula* exhibited maximum number of species followed by *Termitomyces* and *Amanita*. In 2020, Rout et al. [4] studied the mushroom diversity in Dhenkanal district of Odisha and reported about 60 species of wild mushrooms belonging to 33 genus and 25 families among which 10 species are edible and consumed by local communities. In 2021, Mishra et al. [3] studied the wild mushroom diversity of Rairangpur Forest Division, Odisha, India and its medicinal uses and recorded 99 wild mushroom species belonging to 56 genera of 37 families. Among these 41 species were edible and 15 mushrooms were consumed by local and tribal communities in that study area. Family Agaricaceae and Polyphoraceae were reported the most dominant. In 2013, Manna and Roy [8] reported on the economic contribution of wild edible mushrooms to a forest fringe ethnic community in some eastern lateritic parts of India that the net value of revenue from wild edible mushrooms was estimated to be contributing 9.83 and 10.29 % of total annual income of a Santal family of the Choupahari and Gonpur forests. Diversity and economic values of medicinal mushrooms of Chattishgarh are recorded and discussed on medicinally important mushrooms, edible, nonedible and poisonous mushrooms [9]. In 2019, Verma [10] reported

some information on wild edible mushrooms collected from Sal forests of Dindori district, Madhya Pradesh by personal interviewing of rural folk or tribal people and found commonly collected mushrooms from sal forests like *Astraeus hygrometricus*, *Russula congoana*, *Termitomyces clypeatus*, *T. eurhizus*, *T. microcarpus* and *Termitomyces* sp. In 2022, Sharma et al. [11] studied the ethnomycology of wild edible and medicinal mushrooms in district Jammu, J&K (UT), India and reported 14 edible fleshy mushrooms with medicinal values. Some culturally important and frequently consumed species are *Termitomyces heimii*, *Termitomyces clypeatus*, and *Termitomyces striatus* var. *annulatus*. In 2021, Qwarse et al. [12] reported some wild mushroom species used by the local communities in the Selous-Niassa corridor in Namtumbo district, Ruvuma region, Tanzania, and documented a total of 32 edible and inedible wild mushroom species belonging to thirteen genera and eleven families. Among these wild mushrooms, 34.38% were edible, 25% were medicinal and edible, 31.25% did not have known uses, 6.25% were medicinal only and 3.12% were poisonous.

From the above discussion, it is observed that survey of the diversity of wild mushrooms has been carried out in different locations throughout the globe, but there is very less or no documentation of the economic importance of these wild edible mushrooms. Also, many reports are available on the medicinal properties of wild edible mushrooms. As these mushrooms are one of the major livelihood options for the tribal communities near forests, hence need more surveys and value addition of them to improve the lifestyle of the tribals in the aspect of health and financial support.

#### 5. FUTURE RECOMMENDATION

The present study recommends the following activities:

1. Extensive exploration works are needed to document all possible economically important wild mushrooms of the Mayurbhanj district, Odisha, India.
2. Analysis of food values is needed.
3. Analysis of pharmacological values should be carried out.
4. Short-term and long-term impacts should be analysed to avoid negative effects on health.

5. Need study on ecological association ship with landscapes of enumerated wild mushrooms.
6. Value addition of enumerated wild mushrooms should be carried out.

## 6. CONCLUSION

Wild mushrooms are the important part of tribal people. They collect them during rainy seasons, consume as a day-to-day meal and sell to get livelihood support. Deforestation and other negative impacts of anthropogenic activities on forest are increasing lead to reduce the quantity of wild mushrooms. Therefore, for achieving the sustainable food need and livelihood, need to conserve the forest and have to develop the farming techniques of enumerated species from the present study. It will be helpful to mitigate food problems and related health issues in tribal areas.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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