# Economically important wild mushrooms of Bonai Forest Division, Odisha, India


## Abstract

Bonai Forest Division is rich in flora and faunal species. The fertile forest-dominated areas provide a good platform for growing wild mushrooms. The locals collect them for food, medicine, and economic purposes. Addressing the economic value of wild mushrooms will provide a base for value addition and management of forest & wildlife in Bonai Forest Division, Odisha. Considering the importance of wild mushrooms in the day-to-day lives of tribal communities of the division, an attempt has been made to enumerate the mushrooms having economic values. A survey was carried out during 2021-2022 in 7 ranges. 15 wild mushrooms were identified as having economic value. Rugda mushrooms are the most popular of the 15~~,~~ and can be sold for up to Rs 1800 per kg.The present study brings attention to the urgent need for value additions to these mushrooms for the sustainable development of the local communities.


Comment [WAC1]: It is recommended to use the dollar as the reference currency, for this the conversion must be indicated the rate used and the respective date.


**Keywords:**Communities, Livelihood, ~~Mushroom,~~ Conservation, Sustainability


## Introduction

Non-Timber Forest Produces (NTFPs) provide a significant source of livelihoodto millions of tribalpeople across the globe, particularly the communities inhibited inside the forests and peripheral areas.Hence, now the whole world is paying attention to the value addition and promotion of sustainable uses of NTFPs [1,2]. For the communities attached tothe forest, it is one of the major sources of income, providing food, shelter, medicine, fibers etc[3,4].Some major NTFPs found in the Bonai Forest Division include Mahula (*Madhuca longifolia*), Jhuna (Gum of *Shorea robusta*), Red Weaver Ant (Kurkuti), Tadi (country liquor made from the stem juice of *Phoenix sylvestris*), wild fruits like Kendu (Diospyros melanoxylon), Jamun (*Syzygium cumini*), Khajuri (*Phoenix sylvestris*),some medicinal plants like *Cissampelos pareira*, *Rauvolfia serpentina*,*Andrographis paniculata*,etc, wild mushrooms, leafy vegetables, etc [5]. Among these, mushrooms have long been used as a valuable food source, collected by the tribals during monsoon (Plate 1-2). The edible mushrooms found in the forest of Bonai Forest Division have medicinal, economic, and ecological importance. These wild edible mushrooms are high in protein and play an important role in tribal dietary supplements.They are also used to sell these mushrooms and increase their economy. Diverse mushroom species were seen being sold in different local markets in Bonai Forest Division, contributing a significant aspect toimproving their livelihood. Therefore, an attempt has been made to document the economically important wild edible mushrooms, collected by different communities inBonai Forest Division, Odisha, India for the purpose of promoting the sustainable use of these valuable food resources in the process of economic development of the nation.

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## Methodology

The survey work was carried out from 2021 to 2022 in Bonai Forest Division, Odisha, India. Bonai Forest Division is located between 21° 39' 8"N 85° 30' 23"E towards the North-Western

boundary of Sundargarh district of the state [6]. The authors visited different local markets, state highways, district roads, village roads, and tribal villages to collect information regarding wild edible mushrooms and their economic values from the sellers, villagers, and localcommunities. The mushrooms are identified using the available literature [6-11].

**Results**

A total of 15 mushrooms belonging to 8 families are tabulated as having economic importance in the Bonai Forest Division, Odisha (Plate 3). The most ~~commonly~~found species wea~~a~~re *Amanita caesarea*,*A.~~manita~~ egregia*, *Russula rosea*,*Termitomyces medius*,*T.~~ermitomyces~~ microcarpus*, *Volvariella volvacea*etc. Details are listed in Table 1. Different types of *Russula* spp. ~~are~~ hadb~~s~~een ~~being~~ sold in the local market, commonly known as Patra chatu and sold at 10 rupees per leaf plate, followed by *Termitomyces* species and *Amanita* species. *Astraeus hygrometricus*, commonly known as Rugda mushrooms, are sold at a high price, ranging from 400 rupees to 1800 rupees per kg. It is the most common and highly valuable mushroom found in Sal Forests, witha higher protein content than other mushrooms. It is also rich in vitamins and minerals.It is very beneficial for heart patients, to reduceblood pressure and diabetes (Plate 4; present study). It was also observed that sometimes in free time or on the day of the local nearby weekly market, locals enter the nearby forest and collect the mushrooms for selling purposes (Plate 6). Hence, wild mushrooms in study areas also give quick petty cash.

**Table 1: Enumerated mushrooms having economic values from the Bonai Forest Division, Odisha, India.**

| Mushrooms | Family | Local name | Price (Per leaf plate) |
|---|---|---|---|
| *Amanita caesarea*(Plate 5) | Amanitaceae | Bhanu chatu | Rs. 20/- |
| *A.~~manita~~egregia* | Amanitaceae | Manda chatu | Rs.20/- |
| *Astraeus hygrometricus* | Diplocystaceae | Rugda | Rs. 30/- to Rs 40/- Rs.400 – 1800/-Per Kg. |
| *Boletus edulis* | Boletaceae | Jamu chatu | Rs.20/- |
| *Gomphus* spp. | Gomphaceae | Genda phul | Rs.20/- |
| *Macrolepiota procera* | Agaricaceae | Khadada chatu | Rs.10/- |
| *Russula brevipes* | Russulaceae | Patra chatu | Rs.10/- |
| *R.~~ussula~~ rosea* | Russulaceae | Patra chatu | Rs.10/- |
| *R.~~ussula~~ vesca* | Russulaceae | Patra chatu | Rs.10/- |
| *R.~~ussula~~ virescens* | Russulaceae | Patra chatu | Rs.10/- |
| *R.~~ussula~~ xerampelina* | Russulaceae | Patra chatu | Rs.10/- |
| *Termitomyces heimii* | Lyophyllaceae | Benua chatu/ Srabana chatu | Rs.20/- |

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| *T. ~~ermitomyces~~ medius* | Lyophyllaceae | Bali chatu | Rs.20/- |
| *T. ~~ermitomyces~~ microcarpus* | Lyophyllaceae | Bali chatu | Rs.20/- |
| *Volvariellavolvacea* | Pluteaceae | Pala chatu | Rs.10/- |

**Discussion**

Very fewer works have been ~~worked~~done on economically important mushrooms, but there are some reports available on wild edible mushrooms, their food and nutritional properties. Sachan et al. (2013) reported some indigenous knowledge of ethnic tribes forutilization of wild mushrooms as food and medicine in Similipal Biosphere Reserve.A total of 14 species of fleshy mushrooms belonging to 8genera and 6 families were reported. Some reported mushrooms are like*Russula emetic, R. ~~ussula~~ delica,Termitomyces eurrhizus*, etc [7].Panda et al. (2018) reported about 14 wild edible mushroom species belonging to 5 families from different locations and local markets of Mayurbhanj district, Odisha, like*Termitomyces eurhizus, Volvorella volvacea, Termitomyces heimi, Russula rosea, R. ~~ussula~~albonigra, R. ~~ussula~~ brevipes, Amanita egergia,*and *Astraeus hygrometricus*,regularly collected by the local people during the rainy season [8]. ~~In 2019,~~ Panda et al. (2019) 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 numberof species and the genus *Russula* exhibited the maximum number of speciesfollowed by *Termitomyces* and *Amanita* [9]. Rout et al. (2020) studied the mushroom diversity in Dhenkanal district of Odisha and reported about 60 species of wild mushrooms belonging to 33 genera and 25 families among which 10 species are edible and consumed by local communities [10].~~In 2021,~~ Mishra et al. (2021) studied the wild mushroom diversity of Rairangpur ForestDivision, 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 [11]. Kumar et al. (2022) reported 10 economically important mushrooms from the Mayurbhanj district, Odisha. The most common enumerated species were*Amanita caesarea, A. ~~manita~~egregia, Russula rosea, Termitomyces microcarpus, Volvariellavolvacea,*etc. These mushrooms are sold from Rs. 10 to Rs. 30 per leaf plate or bowl [12]. ~~In 2013,~~ Manna and Roy (2013) 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 and10.29 % of total annual income of a Santal family of theChoupahari and Gonpur forests [13]. Soni and Soni (2017) studied the diversity and economic value of medicinal mushrooms ofChattishgarh and recorded medicinally important mushrooms, edible, nonedible, and poisonous mushrooms [14]. ~~In 2019,~~ Verma (2019) reported some information on wild edible mushrooms collected from Sal forests of Dindori district, Madhya Pradeshby personal interviewing of rural folk or tribal people and found commonly collected mushrooms from Sal forests like*Astraeus hygrometricus, Russula congoana, Termitimyces clypeatus, T. eurhizus, T. microcarpus,*and *Termitomyces* sp.[15]. Kakraliya (2020) reports the economic importance, medicinal, pharmacological, nutritional,and ecological values of some mushrooms [16].~~In 2022,~~ Sharma et al. (2022) studied the ethnomycology of wild



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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*, *T.~~ermitomyces~~ clypeatus*, and *T.~~ermitomyces~~ striatus* var. *annulatus*[17]. Imtiaj and Rahman (2008)documented a note on the economic viability of mushrooms cultivation to povertyreduction in Bangladesh [18]. ~~In 2021,~~ Qwarse et al. (2021) reported some wild mushroom species used by the local communitiesin the Selous-Niassa corridor in Namtumbo district, Ruvuma region, Tanzania, and documented a total of 32 edibleand inedible wild mushroom species belonging to thirteen genera and eleven families. Among these wild mushrooms, 34.38% were edible, 25% were medicinal andedible, 31.25% did not have known uses, 6.25% were medicinal only and 3.12% were poisonous [19].

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**Conclusion**

The present study concluded~~s~~ that about 15 wild mushrooms are available in Bonai Forest Division, Odisha having economic value. These enumerated mushrooms should be taken for their value addition and further research works. They could provide a livelihood to the local communities in a sustainable manner. They might be helpful to improve their lifestyle and health. Therefore, a long-term plan is needed to acheive the balanced activities of NTFP collection and biodiversity conservation in Bonai Forest Division, Odisha, India.

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Plate 1: Some common mushroom of Bonai Forest Division, A) *Amanita egregia*, B) *A. ~~manita~~ caesarea*, C) *Termitomyces microcarpus*, D) *Astraeus hygrometricus*, E) *Russula rosea*

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Plate 2: Some common mushrooms of Bonai Forest Division, F) *Termitomyces heimii,* G) *Gomphus* spp., H) *Boletus edulis*

Plate 3: Wild mushrooms as a source of livelihood in Bonai Forest Division, Odisha, India

Plate 4: Survey works and collection of information on food, medicinal, and economic values in Bonai Forest Division, Odisha, India.

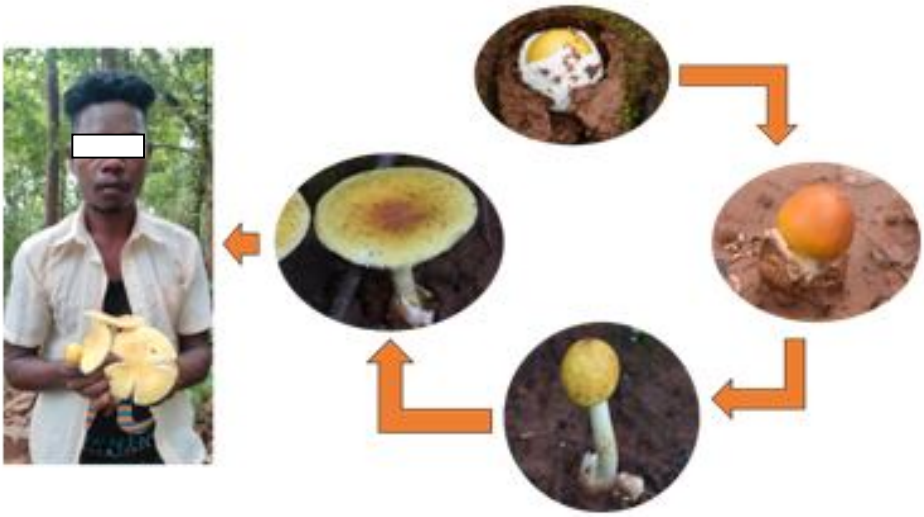

Plate 5: Life cycle of Amanita caesarea and collected by forest watchers.

Plate 6: Collected wild mushrooms by local for selling purposes