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SHORT COMMUNICATION

***Termitomyces heimii* (Bharnda): A wild edible mushroom of Rourkela Forest Division for value addition & sustainability**

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Abstract

*The largest challenge is to ensure adequate food and a means of subsistence while maintaining a healthy environment. The answer is within the forest's wealth, like wild edible and medicinal mushrooms. *Termitomyces heimii*, locally known as Bharnda Chatu, is a wild edible mushroom often associated with termites. The authors studied about it in Rourkela Forest Division, Odisha, India, and presented here its food, medicinal, ecological, and economic values to highlight the importance of wild mushrooms for improving the health and livelihood of tribals dependent on forests, along with providing organic food to urban food tables.*

Wild mushrooms are among the most important stuffs in the world known for their food, medicinal, ecological, and economic values. They are also used in various pharmaceutical industries. They play a significant role in curing various degenerative diseases and food

processing by their chemical composition, nutritional value, and therapeutic properties (Mishra et al. 2021; Kumar 2023). The wild mushrooms have also pharmacological properties like antioxidant, anticancer, antidiabetic, antitumor, anti-inflammatory, antiallergic, immunomodulating, cardiovascular protector, anticholesterolemic, antiviral, antibacterial, antiparasitic, antifungal, detoxification, and hepatoprotective effects etc. (Panda et al. 2019). They have been collected and consumed by different communities throughout the world for thousands of years. Around 2000 species of mushrooms are considered safe for human consumption and about 650 of these possess medicinal properties. These mushrooms have high content of proteins, vitamins, minerals, fibers, trace elements and low or no calories and cholesterol (Ao et al. 2016). These mushrooms are also used as a traditional medicine in treating fever, cold and fungal infections. They also act as a blood tonic during wound healing and blood coagulation (Elkhateeb and Daba 2020). The most commonly found wild edible mushroom throughout the world are *Agaricus bisporus*, *Boletus edulis*, *Cantharellus cibarius*, *Morchella conica*, *Volvoriella volvaceae*, *Lentinula edodes*, *Tuberborchii*, *Flammulina velutipes*, *Amanita caesarea*, *Amanita egregia*, *Russula rosea*, *Termitomyces medius*, *Termitomyces microcarpus*, *Termitomyces heimii*, *Schizophyllum commune* etc. (Rout et al. 2020; Kumar et al. 2022a; Kumar et al. 2022b). Among them, the species of *Termitomyces* are more preferred delicacy due to their flavour, texture, and palatability because of which these are one of the highly valued mushrooms (Kumari et al. 2022). In India, several species of *Termitomyces* are consumed like *T. badius*, *T. clypeatus*, *T. eurhizus*, *T. heimii*, *T. mammiformis*, *T. medius*, *T. microcarpus*, *T. radicans*, *T. reticulatus*, *T. schimperi*, *T. striatus*, and *T. globules* (Paloj et al. 2023). In Rourkela Forest Division of Odisha state, *T. heimii*, hunted by local inhabitants for consumption and income generation by selling these in the local markets during rainy seasons. It usually grows terrestrial, solitary, and often beneath the canopy of *Shorea robusta* (Figure 1) in association with termites. The fruiting body of this mushroom is medium to large. Cap plano-convex with a distinct conic umbo at the center of the disc, white to bone white, umbo darker as greyish-brown, surface. Gills are free to adnexed, crowded, white in colour, edges serrulate (Semwal et al. 2007). Even having significant role in providing food and medicines to the human beings, very less reports are available on *T. heimii* and its medicinal, economical, and nutritional aspects. Keeping the importance of this wild edible mushroom, a field survey work is carried out during May-July 2023 in Rourkela Forest Division (RFD), Odisha, India and collected information from local tribal communities and field staffs.



Figure 1: *Termitomyces heimii* in wild from Rourkela Forest Division, Odisha, India

It is known as Bharnda Chatu in RFD. During interactions authors found that locals also collect it from forest to sell in local markets. As per the information, authors also collected Bharnda Chatu from forest areas with filed staffs and cooked in a tribal style. It was observed that palatability of this mushroom is very good and delicious. Using an illustration authors tried to give message through this communication about its food values to the urban people (Figure 2). It was noticed that it is a food of many insects and play very important role in balancing the ecology of the forest floor. It was observed that the population of this wild edible mushroom is declining in RFD due to forest fire and other anthropogenic activities. After observation of its significance for forest and tribal communities, authors have given some recommendation for future works.

Authors have suggested following recommendations:

- 1. Harvesting:** *T. heimii*, one need to make a species like the nutritional composition of termite house, which is suitable for forest environment in RFD, Odisha. Therefore, to maintain forest ecology with plantation of indigenous plant species not only tree but also herbs, shrubs, and climbers are necessary. Besides that, forest fire also play an

important role in the population of wild mushrooms. Prescribed or control burning is a forest management practice that benefits certain forests by reducing the number of leaves, branches and dead trees accumulated on the forest floor that could help in the production of this mushroom for easy harvesting. Identification of harvesting locations and record could be useful with the help of local communities and field staffs.

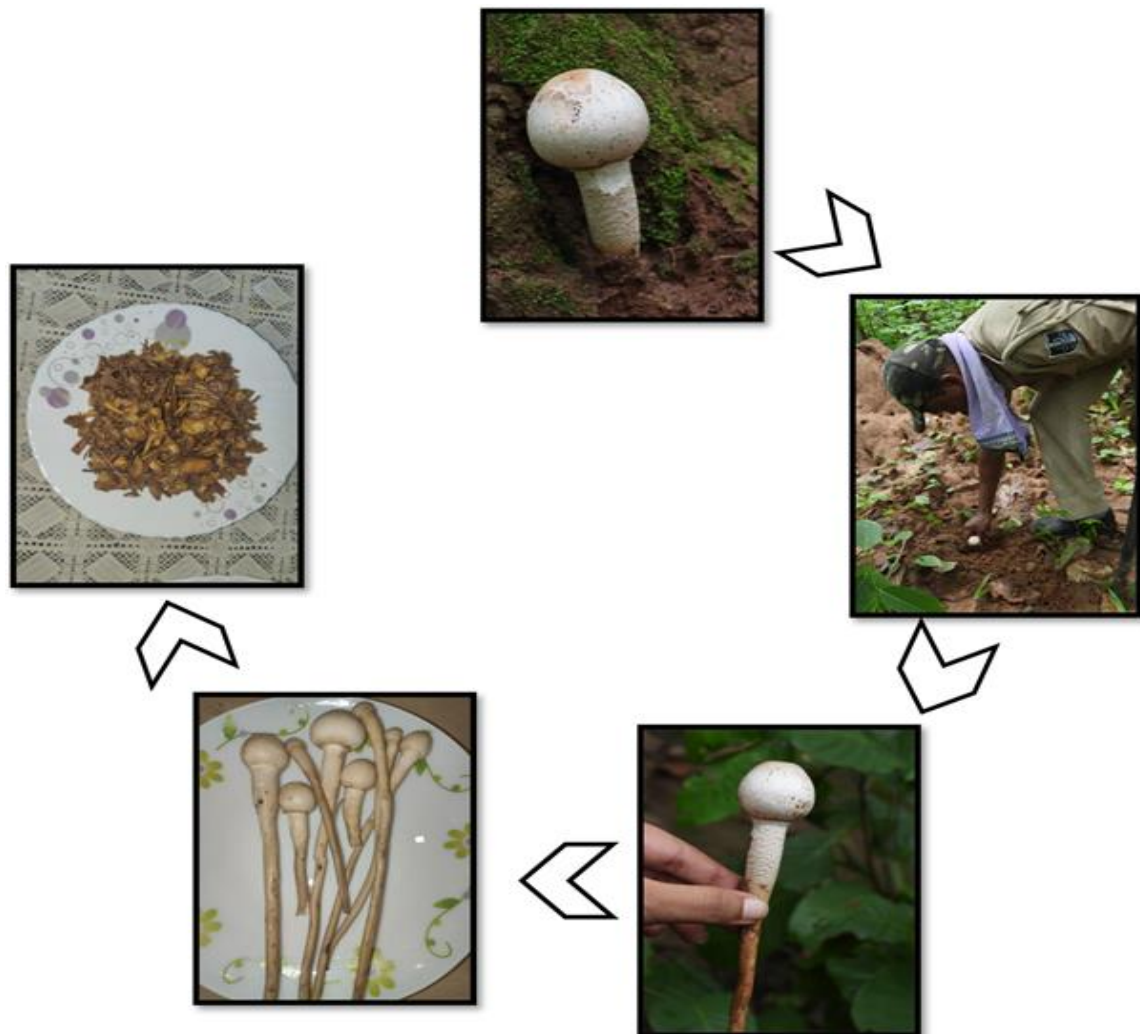


Figure 2: The food values of *T. heimii* (Bharnda Chatu collected from RFD, Odisha)

- 2. Awareness:** For the majority of people, especially in urban areas, there is a lack of knowledge about the consumption benefits of wild edible mushrooms. Even in some tribal areas, due to the impact of urbanisation, the youth are losing knowledge about them. They are also unable to identify them. Therefore, awareness is also needed on how to use these nutritious wild mushrooms and which ones are non-edible.

3. **Value addition:** For the value addition of the products made from *Termitomyces heimii*, cultivation will also be needed. Mushroom culture is one of the important components of an integrated farming system. Therefore, further research is needed to develop the cultivation techniques of the study areas.
4. **Cultivation:** For the value addition of the products made from *Termitomyces heimii*, cultivation will also be needed. Mushroom culture is one of the important components of an integrated farming system. Therefore, further research is needed to develop cultivation techniques for this wild mushroom.

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