IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

WILD EDIBLE MUSHROOMS USED BY TRIBAL PEOPLE OF SOUTH GUJARAT, INDIA

Fulesh K. Kokni[1]and Hitesh A. Solanki[2]

1st Assistant Professor, Botany Department, Dr. APJ Abdul Kalam Government College, Silvassa, Dadranagar Haveli.

2nd Professor, Department of Botany, Bioinformatics and Climate Change Impact Management, University School of Science, Gujarat University, Ahmedabad.

Email ID: koknifulesh02@gmail.com and husolanki@yahoo.com

Abstract: The present study mainly deals with collection of information on different Basidiomycetes Fungi found distributed in the region of South Gujarat, India. The study mainly tried to cover six different districts of South Gujarat. A continues field work was carried out in the study area for three years. Mainly the field survey was carried out in the month of July-October 2017, 2018 and 2019. A total of 40 different mushrooms were collected having edibility characters during the rainy season and identified on the basis of macroscopic and microscopic characteristics. Out of this a total of 22 fungi were found to be used as food by different tribes in different parts of South Gujarat. These fungi mainly belong to family Agaricaceae (10 Sp.), Lyophyllaceae (5Sp.), Pleurotaceae (3Sp.), Tricholomataceae (3 Sp.) and Pluteaceae (1Sp.).

Index Terms - Basidiomycetes, Edible, Wild Mushrooms, South Gujarat, Tribal, Gujarat.

INTRODUCTION

Mushrooms are one of the most cosmopolitan heterotrophic organisms. They are gill bearing, fleshy, Agarics (Phillips, 1981). It bears cap and gills on the underside producing spores (Boa, 2004). Edible fruiting bodies of fungi are the mushroom and inedible or poisonous are the toadstools (Miller, 1984). They exhibit remarkable diversity in form, as in Ascomycetes and Basidiomycetes (Alexopoulos & Mims, 1993). Mushrooms have long been used as a valuable food source and as traditional medicines around the world. Records of health promoting properties such as antioxidant, antimicrobial, anticancer, cholesterol lowering, and immunostimulatory effects have been reported for some species of mushrooms (Anderson et. al,1992 and Mau et. al,2004).

Edible mushrooms are the fleshy and edible fruit bodies of several species of macro fungi which bear fruiting structures that are large enough to be seen with the naked eye. They can appear either below ground (hypogenous) or above ground (epigeous) where they may be picked by hand. Edibility may be defined by criteria that include absence of poisonous effects on humans and desirable taste and aroma.

Generally, the growth of fruit body is controlled by different environmental and ecological factors where they retain. They appear in such place where the habitats are undisturbed and ample volume of moisture and nutrition are necessary for growth, fructification and reproduction. Anthropogenic activities, human disturbance leads to threat the growth and developments declining their production.

Edible mushrooms are consumed for their nutritional value and for their culinary value. Mushrooms consumed by those practicing folk medicine are known as medicinal mushrooms. While psychedelic mushrooms are occasionally consumed for recreational or entheogenic purposes, they can produce psychological effects, and are therefore not commonly used as food. There is no evidence from high-quality clinical research that 'medicinal' mushrooms have any effect on human diseases.

Several researchers have shown the antimicrobial potential of numerous wild and edible mushrooms (Gau et. al,2005 and Turkuglo et. al, 2006). Both fruiting body and the mycelium contain compounds with wide-ranging antimicrobial activity. In recent years, multiple drug resistance in human pathogenic microorganisms has developed due to indiscriminate use of commercial antimicrobial drugs commonly used in the treatment of infectious diseases. This situation compels scientists for searching new antimicrobial substances from various sources which are the good sources of novel antimicrobial chemotherapeutic agents (Karaman et. al,2003).

2. RESEARCH METHODOLOGY

2.1 Field study and Collection of Samples:

Fruiting bodies of Basidiomycetes growing in different forests, sub urban areas, agricultural field and secondary forests were collected and packed in sterile polyethylene bags for further laboratory investigation. Morphological characteristic of Fruiting bodies like pileus colour, diameter, shape, stipe colour, length, diameter, gills colour and attachment were recorded. Collected Basidiomycetes specimens were identified on the basis of their microscopic characters. Forceps, knife as well as steel spatula was used for the collection of samples. Good photographs with DSLR 80D were taken before and after collection of samples.

2.2 Identification of Macro-fungi:

Standard morphological characters were used in identification of fungi like hymenium type, cap shape, gills types, stipe character, colour of the spore print, ecological type, and edibility. The species of Basidiomycota were identified by comparing the morphological characters found in the literature available (Arya, 2004) (Rajput, et al 2015), (Nagadesi and Arya, 2014). Identification was also done by the key available in book by Thomas Lassoes (2013). Some fungi were also referred to the checklist given by Legon and Henrici (2005).

2.3 Preservation:

Samples were preserved by using the fresh method. Fresh samples were preserved in 2% and 4% of Formaldehyde based on their appearance. The identification of edible mushrooms was based on the morphological characters of the fruiting bodies as well the edibility was conformed based on the accurate knowledge available by different tribal peoples of South Gujarat. Also following research papers were reviewed for conformation Swapna *et. al*, (2008), Kalita *et al*. (2016), Uzoebo et al. (2019), Aryal (2015), Panda & Tayung (2015), Atri (2005), Verma *et al*. (2019), Pradhan *et al*. (2010), Venkatachalapathi & Paulsamy (2016).

IV. RESULTS AND DISCUSSION

A total of 22 fungi were found to be used as food by different tribes in different parts of South Gujarat. These fungi mainly belong to family Agaricaceae (10 Sp.), Lyophyllaceae (5Sp.), Pleurotaceae (3Sp.), Tricholomataceae (3 Sp.) and Pluteaceae (1Sp.). From this studies the member of Agaricaceae were found to be most edible in part of South Gujarat.

Table No.1: List of 22 Wild edible fungi found from different parts of South Gujarat, India

List of 22 Wild edible fungi found from different parts of South Gujarat, India				
Sr. No.	**Scientific Name**	**Family**	**Edibility**	**Place**
1	*Agaricus xanthodermus* Genevier Bull.	Agaricaceae	Edible	Dang, Tapi and Narmada
2	*Agaricus bisporus* (Lange) Imbach Mitt.	Agaricaceae	Edible	Narmada, Dang and Tapi
3	*Agaricus fissuratus* (F.H. Møller) F.H.	Agaricaceae	Edible	Tapi and Dang

	Møller Friesia			
4	*Agaricus silvaticus* Schaeff.	Agaricaceae	Edible	Narmada and Tapi
5	*Agaricus subrufescens* Peck Rep. N.Y. St. Mus.	Agaricaceae	Edible	Navsari
6	*Agaricus bitorquis* (Quélet) Saccardo Syll. Fung.	Agaricaceae	Edible	Narmada
7	*Agaricus augustus* Fries Epicr.	Agaricaceae	Edible	Dang, Tapi, Narmada, Navsari
8	*Agaricus campestris* Linnaeus	Agaricaceae	Edible	Dang and Navsari
9	*Agaricus impudicus* (Rea) Pilát.	Agaricaceae	Edible	Navsari and Tapi
10	*Termitomyces eurhizus* (Berk.) R. Heim	Lyophyllaceae	Edible	Tapi
11	*Termitomyces heimii* Natarajan	Lyophyllaceae	Edible	Dang
12	*Termitomyces globulus* R. Heim & Gooss.-Font.	Lyophyllaceae	Edible	Tapi and Dang
13	*Termitomyces microcarpus* (Berk. & Broome) R. Heim	Lyophyllaceae	Edible	Narmada and Tapi
14	*Termitomyces albuminosus* (Berk.) R. Heim	Lyophyllaceae	Edible	Narmada, Dang and Tapi
15	*Pleurotus pulmonarius* (Fr.) Quél.	Pleurotaceae	Edible	Tapi and Dang
16	*Pleurotus ostreatus* (Jacq.) Quélet	Pleurotaceae	Edible	Narmada and Tapi
17	*Pleurotus cornucopiae* (Paulet) Rolland	Pleurotaceae	Edible	Dang, Narmada and Tapi
18	*Lepista nuda* (Bull.) Cooke	Tricholomataceae	Edible	Dang and Navsari
19	*Coprinus comatus* (O. F. Müll.:Fr.) Pers.	Agaricaceae	Edible	Navsari and Tapi
20	*Macrocybe titans* (H.E. Bigelow & Kimbr.) Pegler, Lodge & Nakasone	Tricholomataceae	Edible	Dang, Narmada and Tapi
21	*Clitocybe bresadolana* Singer	Tricholomataceae	Edible	Dang, Tapi, Narmada, Navsari
22	*Pluteus cervinus* (Schäffer : Fr) P. Kumm.	Pluteaceae	Edible	Dang

ACKNOWLEDGEMENT

The Author's would like to thank Ministry of Tribal Affairs for National Fellowship of Higher Education grant. Also would like to thank the local tribal people of South Gujarat for their valuable support in the field and research work.

REFERENCES

1. Anderson JB, Stasovski E. Molecular phylogeny of northern hemisphere species of Armillaria. Mycologia 1992;84:505-16.
2. Mau JL, Chang CN, Huang SJ, Chen CC. Antioxidant properties of methanolic extracts from Grifola frondosa, Morchella esculenta and Termitomyces albuminosus mycelia. Food Chem 2004;87:111-8.
3. Gao YH, Tang WB, Gao H, Chan E, Lan J, Li XT, et al. Antimicrobial activity of the medicinal mushroom Ganoderma. Food Rev Int 2005;21:211-29.
4. Turkoglu A, Kıvrak I, Mercan N, Duru ME, Gezer K, Turkoglu H. Antioxidant and antimicrobial activities of Morchella conica pers. Afr J Biotechnol 2006;5(11):1146-50.
5. Karaman I, Sahin F, Güllüce M, Ogütçü H, Sengül M, Adigüzel A. Antimicrobial activity of aqueous and methanol extracts of Juniperus oxycedrus L. J Ethnopharmacol 2003;85(2-3):231-5.
6. Phillips, R (1981) Mushrooms and other fungi of Great Britain and Europe. Pan Book Ltd. London; 288 pp.
7. Boa, E (2004) Wild edible fungi: a global overview of their use and importance to people. Non-Wood Forest Products Series, No. 17. FAO, Rome, Italy; 157 pp.

8. Alexopoulos, C J; Mims, C W (1993) Introductory Mycology. WEL, New Delhi, India; 632 pp (3rd edition).
9. Anderson JB, Stasovski E. Molecular phylogeny of northern hemisphere species of Armillaria. Mycologia 1992;84:505-16.
10. Mau JL, Chang CN, Huang SJ, Chen CC. Antioxidant properties of methanolic extracts from *Grifola frondosa*, *Morchella esculenta* and *Termitomyces albuminosus* mycelia. Food Chem 2004;87:111-8.
11. Gao YH, Tang WB, Gao H, Chan E, Lan J, Li XT, et al. Antimicrobial activity of the medicinal mushroom Ganoderma. Food Rev Int 2005;21:211-29.
12. Turkoglu A, Kıvrak I, Mercan N, Duru ME, Gezer K, Turkoglu H. Antioxidant and antimicrobial activities of Morchella conica pers. Afr J Biotechnol 2006;5(11):1146-50.
13. . Karaman I, Sahin F, Güllüce M, Ogütçü H, Sengül M, Adigüzel A. Antimicrobial activity of aqueous and methanol extracts of Juniperus oxycedrus L. J Ethnopharmacol 2003;85(2-3):231-5.
14. Lodge DJ, O'Dell TE and Mueller GM. 2004. Approaches to Sampling Macrofungi, Biodiversity of fungi-Inventory and Monitoring method: 163-168.
15. Natarajan K, Senthilarasuv G, Kumaresan V and Taiana Riviere. 2005. Diversity in Ectomycorrhizal fungi of a Dipterocarp forest in Western Ghats, Current Science 88 (12): 1893-1895.
16. Swapna, S., Abrar, S., & Krishnappa, M. (2008). Diversity of macrofungi in semi-evergreen and moist deciduous forest of Shimoga District, Karnataka, India. Journal of Mycology and Plant Pathology, 38(1), 21-26.
17. Kalita, K., Bezbaroa, R. N., Kumar, R., & Pandey, S. (2016). Documentation of wild edible mushrooms from Meghalaya, Northeast India. Current Research in Environmental & Applied Mycology, 6(4), 238-247.
18. Uzoebo, C. P., Azeez, A. A., Akeredolu, O. A., Adetunji, A. S., Bolaji, O. O., & Abdulkadir, A. K. (2019). History of mushroom hunting and identification in Nigeria. Journal of Medicinal Plants, 7(6), 89-91.
19. Aryal, H. P. (2015). Diversity of Wild Mushrooms In Rupandehi District, Western Nepal. Journal of Natural History Museum, 29, 19-31.
20. Panda, M. K., & Tayung, K. U. M. A. N. A. N. D. A. (2015). Documentation and ethnomedicinal knowledge on wild edible mushrooms among ethnic tribes of northern Odisha, India. Asian J. Pharma Clin. Res, 8(4), 139-143.
21. Atri, N. S. (2005). Wild mushrooms-collection and identification. Frontier in mushroom biotechnology, 9-26.
22. Verma, R. K., Pandro, V., Mishra, S. N., Raj, D., & Asaiya, A. J. K. (2019). Sal Forest: A Source of Wild Edible Mushrooms for Livelihood Support to Tribal People of Dindori District, Madhya Pradesh, India. Int. J Curr. Microbiol. App. Sci, 8(01), 563-575.
23. Pradhan, P., Banerjee, S., Roy, A., & Acharya, K. (2010). Role of wild edible mushrooms in the Santal livelihood in lateritic region of West Bengal. Journal of Botanical Society of Bengal, 64(1), 61-65.
24. Venkatachalapathi, A., & Paulsamy, S. (2016). Exploration of wild medicinal mushroom species in Walayar valley, the Southern Western Ghats of Coimbatore District Tamil Nadu. Mycosphere, 7(2), 118-130.
25. Miller, O K (1984) Mushroom of North America. E. P. Duttom Publishing Company Inc. New York, USA; 368 pp