

RESEARCH ARTICLE

Diversity of Wild Macrofungi in forests of Bhandara District, (MS), India

Tagade WY^{1*} and Kawale MV²¹Department of Botany, C. J. Patel College Tirora²Department of Botany, D. B. Science College GondiaCorresponding author email : kawalemahesh@rediffmail.com

Manuscript details:	ABSTRACT
<p>Date of publication 18.10.2014</p> <p>Available online on http://www.ijlsci.in</p> <p>ISSN: 2320-964X (Online) ISSN: 2320-7817 (Print)</p> <p>Editor: Dr. Arvind Chavhan</p> <p>Cite this article as: Tagade WY and Kawale MV (2014) Diversity of Wild Macrofungi in forests of Bhandara District, (MS), India, <i>Int. J. of Life Sciences</i>, Special Issue A2: 125-127.</p> <p>Copyright: © Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derives License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>Bhandara district is well-known for the forest resources. 1343.77 Sq. Km. land is under forest which constituted 36.15% of total geographical area of the district. Forest resources contribute significantly to the economy of the district. Mushroom is a general term used mainly for the fruiting body of the macrofungi. In a present study, a survey of the biodiversity of wild macrofungi, including edible species, was carried out in two major forest area of Bhandara district. The Koka forest is one of the recently declared sanctuaries by Government of Maharashtra. While Chandpur forest is well known tourist place covered with dense forest. In these forests, numbers of macrofungi are available, which play an important role in forest ecosystem. Macrofungi like <i>Coprinus comatus</i>, <i>Daldinia concentrica</i>, <i>Xylaria polymorpha</i>, <i>Polyporus lucidus</i>, <i>Marasmius delectans</i>, <i>Schizophyllum commune</i>, <i>Mycena</i> sp., <i>Dictyophora duplicata</i>, <i>Clavaria stricta</i>, <i>Geaster fimbriatus</i>, <i>Cantharellus infundibuliformis</i>, <i>Mutinus ravenelii</i>, <i>Lepiota americana</i>, <i>Clathrus cancellatus</i> are occur commonly in Koka and Chandpur forest.</p> <p>Key words: Macrofungi, Koka forest, Chandpur forest, <i>Geaster fimbriatus</i>, <i>Lepiota Americana</i>.</p>
	<p>INTRODUCTION</p> <p>The study of fungal biodiversity has been carried out in all over the world (Crous, 2006) and about 1.5 million species has been reported so far (Hawksworth, 2004). About approximately 50% of them have been characterized (Monoharachary <i>et al.</i>, 2005). The total numbers of fungal species in India is 27,000. Wild mushrooms have a profound biological and economical impact. From ancient times, they have been consumed by man with delicacy probably, for their texture and pleasing flavour. Mushrooms proteins contain all nine essential amino acids for man (Chang and Miles, 2004) as well as most commonly occurring non-essential amino acids and amides. They have rich nutritional value with high content of proteins, vitamins, minerals, fibres, trace elements and low/no calories and cholesterol. Many of them have been used in folk medicine for thousands of years. Some of them are neutralceuticals (natural food having potential value in maintaining good health and boosting immune system of the human body) while some can produce potent nutraceuticals (compounds that have medicinal and nutritional attributes and are consumed as medicines in the form of capsules or tablets but not as food). They are the sources of various bioactive substances like, antibacterial, antifungal, antiviral, antiparasitic, antioxidant,</p>

antiinflammatory, antiproliferative, anticancer, antitumour, cytotoxic, DNA damaging, anti-HIV, hypocholesterolemic, antidiabetic, anticoagulant, hepatoprotective, etc.

Bhandara district (21.09 N latitude and 79.42 E longitude) situated in the Nagpur division of Vidarbha region and is surrounded by Balaghat district of Madhya Pradesh in the north, Gondia in the east, Chandrapur in the south and Nagpur in the west. Out of total geographical area of the district, 1343.77 Sq.Km is under forest which constituted 36.15% of the total area. District is famous for its lakes and forest area which comes under dry deciduous sub-tropical type. Forest resources contribute significantly to the economy of the district. From the month of June upto December and January different types mushrooms grows in these forests. Yet no work has been done on the diversity of macrofungi of the district. The current deforestation trends, which threatened the existence of plants as well as mushrooms, make it inevitable that this information be made available in the area.

During the investigation, the checklist of wild mushrooms was prepared. The formation of checklists for future comparison is vital to our understanding of changing fungal diversity.

MATERIALS AND METHODS

Study Area : Two forests areas of Bhandara district of Maharashtra in India were selected for the study. One was Koka forest which is a Reserve forest area since 1879. It was a shooting block during the Raj era. Recently, Government of Maharashtra has declared as Sanctuary. Koka is located at 21°20' N 79°81' E / 22.67°N 81.75°E. The total sanctuary area comes to 92.35 sq km.

The second forest area was Chandpur forest which is also well known tourist place due to famous Hanuman temple and its lake. This site is situated at N 21.51 latitude, E 79.81 longitude and altitude is around 357m. The Chandpur village is also surrounded with the Hills and dense forest.

Collection of mushrooms : The fungal surveys depend on timing and location of observations. The survey methods were adopted according to techniques adopted by Metzler Susan and Metzler Van (1992), Lodge *et al.* (2004) and Natrajan *et al.*, (2005). Systematic and periodical survey of different parts of forest and other habitats rich with organic matters of

Koka forest and Chandpur forest was undertaken during the period of July 2012 to October 2013.

Standard methods of collection, preservation, and identification were followed. Specimens were dried at 45°C - 50°C overnight and kept in plastic boxes with silica gel to keep out humidity. Each specimen was collected and labelled, indicating number, date of collection, locality and uses. Macrocharacters of the fungi were studied in the laboratory for identification and fruiting bodies were photographed by digital camera (Sony HD). Fungi were identified to genera and morphotypes and herbarium specimens are deposited in the College Museum (Christensen, 1970).

RESULTS AND DISCUSSION

It was observed that the climatic conditions prevailing in the areas of Koka and Chandpur regions of the Bhandara district favored the occurrence of diverse mushrooms. During the different visits to these forests total 30 Macrofungi were identified and collected (Table 1). Macrofungi like *Collybia butyracea*, *Conocybe tenera*, *Coprinus comatus*, *Daldinia concentrica*, *Xylaria polymorpha*, *Peziza badia*, *Polyporus versicolor*, *Polyporus lucidus*, *Polyporus elegans*, *Polyporus arcularius*, *Marasmius delectans*, *Scutellinia scutellata*, *Schizophyllum commune*, *Clitocybe ectypoides*, *Mycena* sp., *Marasmius rotula*, *Inocybe* sp., *Polyporus abbellus*, *Dictyophora duplicata*, *Clavaria stricta*, *Lactarius affinis*, *Geaster fimbriatus*, *Panaeolus sphinctrinus*, *Xylaria polymorpha*, *Cantharellus infundibuliformis*, *Polyporus lucidus*, *Mutinus ravenelii*, *Lepiota Americana* & *Clathrus cancellatus* are the common fungi occurred in both the sites of Bhandara district.

Of the collected and identified species of mushrooms, *Polyporus* was most dominating, as near about 7 species of it were observed in both the study sites. *Geaster* which is well known for its structure and famous as 'Earth Star' was found in both the study sites. *Clavaria stricta* well known with the name 'Coral Fungi' was also reported in both forests. Similarly, *Xylaria polymorpha* common name of which is 'Dead Ladies Finger' was shown its presence in both the sites. Three mushrooms with very interesting structures viz. *Clathrus*, *Mutinus* and *Dictyophora* were observed only in Koka forest, however, they were absent in Chandpur forest. Similarly some mushrooms were present in Chandpur forest absent in Koka forest which are *Clitocybe*, *Coltricia*, *Coprinus* and *Peziza* etc. After observing both these sites it can be concluded

that diversity of mushrooms is more in Koka forest as compared to Chandpur forest.

Table 1: List of identified wild mushrooms available at Koka and Chandpur Forest

Sr. No.	Name of Macrofungi	Koka forest	Chandpur forest
1.	<i>Cantharellus infundibulliformis</i>	+	+
2.	<i>Clathrus cancellatus</i>	+	-
3.	<i>Clavaria stricta</i>	+	+
4.	<i>Clavulina cristata</i>	+	+
5.	<i>Clitocybe ectypoides</i>	-	+
6.	<i>Collybia butyracea</i>	+	+
7.	<i>Coltricia perennis</i>	-	+
8.	<i>Conocybe tenera</i>	+	+
9.	<i>Coprinus comatus</i>	-	+
10.	<i>Daldinia concentric</i>	+	+
11.	<i>Dictyophora duplicata</i>	+	-
12.	<i>Geaster fimbriatus</i>	+	+
13.	<i>Inocybe fraudans</i>	+	+
14.	<i>Lacterius offinis</i>	+	-
15.	<i>Lepiota Americana</i>	+	-
16.	<i>Marasmius delectans</i>	+	+
17.	<i>Marasmius rotula</i>	+	+
18.	<i>Mutinus ravenelii</i>	+	-
19.	<i>Mycena sp.</i>	+	+
20.	<i>Panaeolus ephincitrinus</i>	+	+
21.	<i>Peziza badia</i>	-	-
22.	<i>Polyporus albellus</i>	+	+
23.	<i>Polyporus arcularius</i>	+	+
24.	<i>Polyporus elegans</i>	+	+
25.	<i>Polyporus lucidus</i>	+	+
26.	<i>Polyporus offinis</i>	+	+
27.	<i>Polyporus versicolor</i>	+	+
28.	<i>Schizophyllum commune</i>	+	+
29.	<i>Scutellinia scutellata</i>	+	-
30.	<i>Xylaria polymorpha</i>	+	+

During the study, total 26 non-edible, 04 edible and 01 medicinally important fungi were collected. Four edible mushrooms are *Cantharellus infundibulliformis*, *Coprinus comatus*, *Lepiota Americana* and *Panaeolus ephincitrinus*. Though the quantity of edible fungi likes *Agaricus* and *Pleurotus* was quite more but these were not found in the field as they were collected by the local peoples before our reach. Hence, these are not mentioned in a list. The local people called them as a 'Bhombhdi' or 'Satya'. One mushroom *Polyporus lucidus* was found to have medicinal value particularly in dermatological problems (Fig. 2 and 3). Singer (1989) had reported 1320 species belonging to 129

genera under Agaricalse. Mushrooms alone are represented by about 41,000 species, of which approximately 850 species are recorded from India (Deshmukh, 2004). Besides extensive surveys of the Himalayan region are compiled by Lakhanpal (1997). Atri *et al.* (2000) had done taxonomic studies of *Agaricus* from Punjab plains. Pradeep *et al.* (1998) worked on the diversity of mushrooms from Western Ghats.

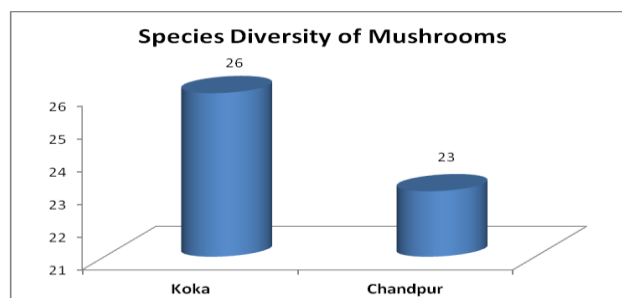


Fig. 2: Graph showing diversity of mushrooms in forest areas.

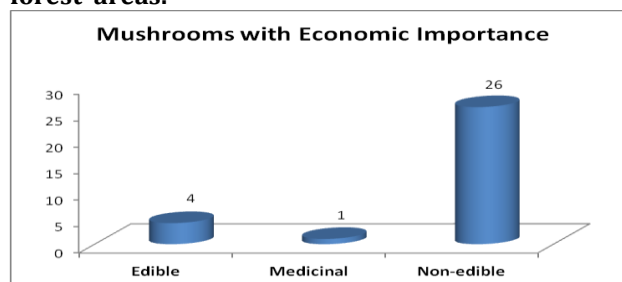


Fig. 3 Graph showing number of Economically important mushrooms species in forest areas

REFERENCES

- Christensen CM (1970) Common Fleshy Fungi. Burgess Publishing Company, Minneapolis (USA).
- Chang S, Miles GP (2004) Mushrooms: Cultivation, nutritional value, medicinal effects and environmental impact. CRC Press, USA, pp: 436.
- Crous PW (2006) How many species of Fungi are there in tip of Africa. *Studies in Mycology*, 55: 13.
- Deshmukh SK (2004) Mushroom Cultivation Nutritional value, Medicinal effect and Environmental impact. 11nd Ed. CRC Press, pp: 2-4.
- Hawksworth DL (2004) Fungal diversity and its Implications for Genetic Resource collections. *Studies in Mycology*, 50: 19
- Lakhanpal TN (1997) Diversity of Mushroom Microflora in the North Western Himalaya. In: Recent Research in Ecology, Environment and Pollution. Eds. Sati SC, Saxena J and Dubey RC. Today and Tomorrow's Printers and Publishers, New Delhi, pp: 35-68.
- Manoharachary C, Sridhar K, Singh RA, Suryanarayanan TS, Rawat S, Johri BN (2005) Fungal Biodiversity: Distribution, Conservation and Prospecting of Fungi from India. *Current Science* 89(1): 58-71.
- Pradeep CK, Virinda KB, Mathews S, Abrahm TK (1998) The genus *Volvariella* in Kerala state, India. *Mushroom Res.*, 53-62.
- Singer R (1986) The Agaricales in Morden Taxonomy. J. Cramer, Weinheim, 4th ed, pp: 912.