



Plant Archives

Journal homepage: <http://www.plantarchives.org>
doi link : <https://doi.org/10.51470/PLANTARCHIVES.2021.v21.S1.353>

DIVERSITY OF MACROFUNGI FROM THE SEONI DIST. OF M.P. AND THEIR NUTRITIONAL, PATHOLOGICAL AND ECOLOGICAL IMPORTANCE

V.M.Kamble,¹ S. A. Firdousi² and S. A. Khan³

¹Dr. A G Mahila Mahavidyalaya Jalgaon, Maharashtra, India

²H J Thim College of Arts & Science Mehrunjalgaon, Maharashtra, India

³A E S College Hingoli, Maharashtra, India

Corresponding authors email. shakeel.talk@gmail.com

ABSTRACT

A frequent, extensive and intensive survey was made in order to collect the macro fungi of the Seoni district. The Seoni is one of the districts in the Madhya Pradesh in south region with great bio-diversity of plants. A frequent survey was conducted to study the diversity of Macro fungi of the forest of the Seoni District. The present paper deals with the species of mushroom from study sites of the forest of Seoni District (Madhya Pradesh). These species are reported for the first time from the Seoni District. The study provides a detailed taxonomic description and relevant information based on fresh collections about the mushroom. In all about 90 macrofungi collected from four different sites of Seoni District. Among them five species of Ganoderma are found as pathogenic causing heart and root-rot disease in different tree species. About 40 macrofungi are found edible and others are saprophytes on humus and are wood decaying fungi. Three species of Lenizites were found wood decaying fungus and edible also. This is the first report of the survey and documentations of macro fungi from the Seoni district

Keywords : Mushroom, Pathological, Ecological, Medicinal, Nutraceutical, Heart diseases, stem and root rot.

Introduction

The Seoni is located at 22.08°N 79.53°E. It has an average elevation of 611 metres (2005 feet). The city is 2,005 ft. above sea level, halfway between Nagpur and Jabalpur. As of 2011, the city had a population of 1,379,131. It was founded in 1774, and contains large public gardens, a market place and a tank dalsagar. It has 37% forest cover. The Seoni district is located in the southern part of Madhya Pradesh. Geographically the district extends over an area of 8758 km². It is bordered by Jabalpur, Narsinghpur and Mandla districts to the north, Balaghat to the east and Chhindwara to the west and the shares its southern boundary with Nagpur (Maharashtra). National Highway No. 44 is longest of India connects the Kanyakumari-Banaras passes through the district from north to south. Fair weather roads connect the major towns in the district. The narrow-gauge Chhindwara-Nainpur Central Railway passes through Seoni connecting Jabalpur, Nagpur, Chhindwara, Balaghat, Katangi, Keolari and Nainpur. Forest of Seoni Districts is Deciduous type. Dominant tree is Teak with many diversity of tree plants like Palash, Tendu, Lagerstomia, Harda, Bahedaetc

The forest of the Seoni district is a tropical dry deciduous type forest. The vegetation varies with changes in attitudes, topography and rainfall. There are various sub types of forest in this area. The Seoni district is located in the Southern part of Madhya Pradesh. The district extends over an area of 8758 km. It is bordered by Jabalpur, Narsinghpur and Mandia districts of north. Balaghat to east and Chhindwara to west and the boundary with Nagpur. It has

about 37% forest cover National Highway-44 to Kanyakumari passes through the district. The north part of Seoni consists of a large trap hills and the crystalline rock. M.P is one of the largest state of India covering an area of 307, 713 km² adjoined by Maharashtra. were also collected from different regions in the present study and presented in the checklist. In addition, a checklist of agarics occurring in Maharashtra state is provided.

Mushroom may be either hypogenous or epigenous, large enough to be seen with the naked eye and usually picked by hands. They provide the fleshy fruit bodies belonging to Basidiomycotina and Ascomycotina. Macrofungior mushroom are important natural sources of foods medicine. They have great importance in ecosystem specially in ecology, pathology and nutraceutical. Edible mushroom have great alternative source of food against plant or animal derived food.

Material and Methods

In order to collect the mushroom fungi of the forest of Seoni district a frequent survey was conducted into different sites like Khamaria Forest, Ghansor Forest, Chhapara Forest Ganeshganj Forest, field and Plantation, In the field, other information such as place of collection, locality, local names of the plant and date of collections were noted. Morphotaxonomic study was followed by Legend and Singer (2013). A thin section was made of the specimen.

Extensive and intensive survey was made in different locally of the forest of Jalgaon Districts in the different season. The sample was kept in the Polythene bag and

brought in the laboratory. Morphological character was noted in the field character charts and field number was given in the specimen. Spoke was made after removing the pious and

placing on the slide. Material were dried kept in the oven and identified with the help of various monographs, reviews, authentic books, research papers published.

Table 1 : Occurrence of different Mushroom on different hosts in different sites of Seoni.

S.N.	Host	Macrofungi	Site/ Location
1	<i>Lagerstoema pariviflora</i>	<i>Ganoderma lucidum</i>	Khamaria Forest (Seoni)
2	<i>Dalibergia sisso</i>	<i>Ganoderma lucidum</i>	Ghansor Forest(Seoni)
3	<i>Carica papaya</i>	<i>Ganoderma lucidum</i>	Chhapara Forest (Seoni)
4	<i>Delonix regia</i>	<i>Ganoderma lucidum</i>	Ganeshganj Forest (Seoni)
5	<i>Azadiracta indica</i>	<i>Ganoderma lucidum</i>	Khamaria Forest (Seoni)
6	Dead trunk	<i>Ganoderma Sp.</i>	Khamaria Forest (Seoni)
7	<i>Tamarindus indica</i>	<i>G.tsuga</i>	Ganeshganj Forest (Seoni)
8	<i>Butea monosperma</i>	<i>Ganoderma lucidum</i>	Ganeshganj Forest (Seoni)
9	<i>Muraya koenigii</i>	<i>Ganoderma lucidum</i>	Khamaria Forest (Seoni)
10	<i>Accacia sp.</i>	<i>G. tsuga</i>	Ghansor Forest (Seoni)
11	<i>Terminalia arjuna</i>	<i>Ganoderms sp.</i>	Ghansor Forest (Seoni)
12	Dead trunk	<i>Ganoderma lucidum</i>	Khamaria Forest (Seoni)
13	Dead trunk	<i>Ganoderma sp.</i>	Khamaria Forest (Seoni)

Table 2 : Medicinal Properties of Mushroom

S.N.	Application	Reference
1	Anticancer	Mizuno, 1995
2	Antivaral, HIV	Kim <i>et al.</i> , 1994
3	Antibacterial	Yoon <i>et al.</i> , 1990
4	Auto.immune disorder	Chang, 1993
5	Conary dilution	Soo, 1994
6	Anti-Hyperlipidemic	Changand Butt, 1990
7	Cancer Therapy	Chang., 1994
8	Relief of discomfort of high altitude stress, headaches, Dharmananda, 1998	Dharmananda, 1988
9	Anti-aging, antioxidant	Muzuno, 1955
10	Antidiabetic	Gudi-cimerman, 1999

Table 3 : Important mushroom and their use in different diseases

S.N.	Mushroom	Diseases	Reference
1	<i>Tremetes versicolor</i>	Lung diseases	Chang and Miles(2008)
2	<i>Tremetes versicolor</i>	Immunusupression	Kim <i>et al.</i> (2004)
3	<i>Tremetes versicolor</i>	HIV_I	Konno <i>et al.</i> (2002)
4	<i>Ganoderma lucidum</i>	Advance cancer	Lindequest. U(2005)
5	<i>Sprassis crispa</i>	Cancer	Yim <i>et al.</i> (2009)
6	<i>Phellinus lentius</i>	Cancer	Kim (2003)
7	<i>Agracus brasiliensis</i>	Meth. A.Tumer cells	Cheng and Miles (2008)

Table 4 : Proximate composition of important mushroom of Seoni

Species	Protien	Carbo-hdrate	Lipid	Ash	Fibre	References
<i>Agaricus arvensis</i>	32.87	32.97	-----	.08	.14	Kumar <i>et al.</i> (2013)
<i>Agaricus bisporus</i>	41.06	28.41	-----	.01	18.23	Pushpa and Purushothama (2010)
<i>Agaricus heterocysts</i>	32.04	48.03	2.10	11.23	19.36	Manimozhi and Kaviyarasan (2013)
<i>Agaricus langei</i>	35.14	34.83	14.10	3.28	14.20	Kumar <i>et al.</i> (2013)
<i>Auricularia auricul</i>	4.20	82.820	28.28	2.10	4.70	Johnsy <i>et al.</i> (2011)
<i>Auricularia polytricha</i>	37.00	38.10	.74	6.87	21.97	Kumar <i>et al.</i> (2013)

<i>Calocybe indica</i>	7.69	64.26	4.10	7.43	3.40	Manikandan (2011)
<i>Cantharellus cibarius</i>	21.1	1.6	-	13.2	21.8	Agrahar-murugkar and Subbulakshmi (2005)
<i>Flammulina velutipes</i>	17.60	73.10	1.90	7.40	3.70	Manikandan (2011)
<i>Hypsizygos tessulatus</i>	37.80	51.20	----	9.09	12.90	Kumar et al. (2013)
<i>Lactarius hygrophoroides</i>	44.93	42.00	-----	2.00	10.58	Kumar et al. (2013)
<i>Lactarius quieticoloz</i>	19.0	-----	2.6	6.6	14.4	Kumar et al. (2013)
<i>Pleurotus ostreatus</i>	30.40	57.60	2.20	9.80	8.70	Manikandan (2011)
<i>Ramaria brevispora</i>	24.1	---	1.3	10.9	8.8	Agrahar-murugkar and Subbulakshmi(2005)
<i>Termitomyces microcarpus</i>	29.4	46.53	2.33	11.2	11.5	Johnsy et al. (2011)
<i>Volvariella bombycina</i> (Fruit)	28.30	38.90	2.72	10.90	24.60	Jagadeesh et al. (2010)

Table 5 : List of species of Macrofungi occurring in of Seoni

S.N	Name	Distribution	Substate
1	<i>Agaricus abruptibulbus</i> Peck	Ganeshganj Forest	Saprophytesaprophyte
2	<i>Agaricus arvensis</i> Schaeff	Khamaria Forest	Saprophyte
3	<i>Agaricus bisporus</i> (J.E. Lange)	Khamaria Forest	Saprophyte
4	<i>Agaricus rodmanii</i> Peck	Ganeshganj Forest	Saprophyte
5	<i>Agaricus brunnescens</i> Peck Pun	Ganeshganj Forest	Saprophyte
6	<i>Agaricus campestris</i> L	Khamaria Forest	Saprophyte
7	<i>Agaricus bitorquis</i>	Ghansor Forest	Saprophyte
8	<i>Agaricus micromegethus</i>	Ghansor Forest	Saprophyte
9	<i>Agaricus micromegatha</i>	Khamaria Forest	Saprophyte
10	<i>Agaricus pattersoniae</i> Peck Pun	Khamaria Forest	Saprophyte
11	<i>Agaricus placomyces</i> Peck	Ganeshganj Forest	Saprophyte
12	<i>Agaricus citulus</i> Masee Aur	Ganeshganj Forest	Saprophyte
12	<i>Anellarias citula</i> (Masee) Sacc..	Khamaria Forest	Saprophyte
13	<i>Agaricus semotus</i> Fr	Khamaria Forest	Saprophyte
14	<i>Agaricus subedulis</i>	Ganeshganj Forest	Saprophyte
15	<i>Agaricus sylvaticus</i> Schaeff.	Ganeshganj Forest	Saprophyte
16	<i>Agaricus sylvicola</i> (Vittad.) Peck	Khamaria Forest	Saprophyte
17	<i>Agaricus xanthodermus</i>	Ghansor Forest	Saprophyte
18	<i>Agaricus xantholepis</i>	Ghansor Forest	Saprophyte
19	<i>Ganoderma lucidum</i>	Khamaria Forest	parasite
20	<i>Ganoderma lucidum</i>	Ganeshganj Forest	Parasite
20	<i>Lepiota beckleri</i> (Berk.) Sacc	Ghansor Forest	Saprophyte
21	<i>Lepiota rachodes</i> (Vittad.) Quél. Amr (Vittad.) Singe	Ghansor Forest	Saprophyte
22	<i>Macrolepiota asrhacodes</i>	Khamaria Forest	Saprophyte
23	<i>Macrolepiota sp.</i>	Khamaria Forest	Saprophyte
24	<i>Coprinus fimetarius</i> Fr	Ganeshganj Forest	Saprophyte
25	<i>Lepiota amanitifomis</i>	Ganeshganj Forest	Saprophyte
26	<i>Lepiota alluviina</i>	Ganeshganj Forest	Saprophyte
27	<i>Lepiota americana</i> (Peck) Sacc. Heinem. Kol 1977 as	Ganeshganj Forest	Saprophyte
28	<i>Leucoagaricus goossensiae</i> (Beeli)	Khamaria Forest	Saprophyte

29	<i>Lepiota goossensiae</i> Beeli	Khamaria Forest	Saprophyte
30	<i>Macrolepiota dolichaula</i>	Ganeshganj Forest	Saprophyte
31	<i>Amanita vaginata</i> (Bull.)	Ganeshganj Forest	Saprophyte
32	<i>Amanita nauseosa</i>	Khamaria Forest	Saprophyte
32	<i>Hygrocybe pratensis</i>	Ghansor Forest	Saprophyte
33	<i>Lepiota amricana</i>	Ghansor Forest	Saprophyte
34	<i>Panaeolus ephincitrinus</i>	Khamaria Forest	Saprophyte
35	<i>Polyporu salbellus</i>	Khamaria Forest	Saprophyte
36	<i>Panaeolus cyanescens</i>	Ganeshganj Forest	Saprophyte
37	<i>Agaricus sp</i>	Ganeshganj Forest	Saprophyte
38	<i>Pleurotus sp</i>	Khamaria Forest	Saprophyte
39	<i>Ganoderma lucidum</i>	Khamaria Forest	Saprophyte
40	<i>G.chalceum,</i>	Ganeshganj Forest	Saprophyte
41	<i>G. curtisii,</i>	Ganeshganj Forest	Saprophyte
42	<i>G .lipsiense</i>	Khamaria Forest	Saprophyte
43	<i>G. multicornum,</i>	Ghansor Forest	Saprophyte
44	<i>G stipitatum,.</i>	Ganeshganj Forest	Saprophyte
45	<i>G .testaceum</i>	Khamaria Forest	Saprophyte
46	<i>G Sessili-formae</i>	Khamaria Forest	Saprophyte
47	<i>G .orbiformum</i>	Ganeshganj Forest	Saprophyte
48	<i>G perzonatum,</i>	Ganeshganj Forest	Saprophyte
49	<i>G .tornatum</i>	Khamaria Forest	Saprophyte
50	<i>G .philippi</i>	Ghansor Forest	Saprophyte
51	<i>Calocera cornea</i> (Batsch.) Fr	Ghansor Forest	Saprophyte
52	<i>Clitocybe sp.Fr</i>	Khamaria Forest	Saprophyte
53	<i>Craterellus tubaeformis</i> (Fr.) Quel.	Khamaria Forest	Saprophyte
54	<i>Daldinia concentrica</i>	Ganeshganj Forest	Saprophyte
55	<i>Craterellus tubaeformis</i> (Fr.) Quel	Ganeshganj Forest	Saprophyte
56	<i>Dictyophora duplicata</i> (Bosc.) E. Fish	Khamaria Forest	Saprophyte
57	<i>Entolomaroseo flavum</i> Noordelose	Khamaria Forest	Saprophyte
58	<i>Hygrocybe conica</i> (Schaeff.) P. Kumm.	Ganeshganj Forest	Saprophyte
59	<i>Hygrocybe miniata</i> (Fr.)	Ganeshganj Forest	Saprophyte
60	<i>Lepiota spp.</i> (Agaricaceae)	Khamaria Forest	Saprophyte
61	<i>Lepis tanuda</i> (Bull.) Cooke	Ghansor Forest	Saprophyte
62	<i>Leucocoprinus brinbaumii</i> (Corda	Ganeshganj Forest	Saprophyte
63	<i>Macrolepiota procera</i> (Scop	Khamaria Forest	Saprophyte
64	<i>Marasmiushaemato cephalus</i>	Khamaria Forest	Saprophyte
65	<i>Pisolithust inctorius</i> (Fr.) Pilat	Ganeshganj Forest	Saprophyte
66	<i>Pleurotus ostreatus</i> (Jack.) P. Kumm	Ganeshganj Forest	Saprophyte
67	<i>Pleurotus pulmonarius</i> (Fr)Koel	Khamaria Forest	Saprophyte
68	<i>Pluteus cervinus</i> (Schaeff.) P. Kumm	Ghansor Forest	Saprophyte
69	<i>Termitomyces clypeatus</i> R. Heim	Ghansor Forest	Soil with termite
70	<i>Termitomyces heimii</i> Natarajan	Khamaria Forest	Soil with termite
71	<i>Termitomyces longiradicatus</i> Sathe& Daniel	Khamaria Forest	Soil with termite
74	<i>Termitomyces microcarpus</i> (Berk. & Broome	Ganeshganj Forest	Soil with termite

75	<i>Termitomyces umkowaani</i> (Cooke & Masee)	Ganeshganj Forest	Soil with termite
76	<i>Termitomyces. Indicus</i>	Khamaria Forest	Soil with termite
77	<i>T. robustus</i>	Khamaria Forest	Saprophyte
78	<i>T. eurhizus</i>	Ganeshganj Forest	Saprophyte
79	<i>T. mammiformis</i>	Ganeshganj Forest	Saprophyte
80	<i>Tremella fuciformis</i> Berk. (Tremellaceae)	Khamaria Forest	Saprophyte
81	<i>Lenizitis elegans</i>	Ghansor Forest	Saprophyte
82	<i>Lenizites steroids</i>	Ghansor Forest	Saprophyte
84	<i>Lenizites acuta</i>	Ghansor Forest	Saprophyte

Discussion

Forays conducted in different habitats of the Seoni region of Madhya Pradesh during monsoon seasons of 2017, 2018 and 2019 revealed the repeated occurrence of 90 macrofungi in the region. These macrofungi were identified on the basis of their morphological characters described by earlier scientists

The macrofungal diversity is depleting fast due to deforestation, urbanization, climate change and unsystematic exploitation through collection of wild mushrooms. This situation demands an urgent need to collect, document and conserve this group. Most macrofungi are cosmopolitan, occurring both in tropical and temperate regions. They occur seasonally all over the world in various habitats such as humus rich soils, decaying plant litter and wood logs in forests as well as in meadows and even in sandy and other soils. Some species, particularly mycorrhizal mushrooms are on the verge of extinction.

In all about 90 macrofungi collected from four different sites of Seoni District. Among them five species of *Ganoderma* are found as pathogenic causing heart and root-rot disease in different tree species. About 40 macrofungi are found edible and others are saprophytes on humus are wood decaying fungi. Three species of *Lenizites* were found wood decaying fungus and edible also. This is the first report of the survey and documentations of macrofungi from the Seoni district.

Acknowledgment-

Authors are thankful to Deptt of Botany University of Sagar for Identification of Mushroom and to the Principal of H.J. Thim College of arts and science for Laboratory facility

References

- Agrahar-murugkar and Subbulakshmi (2005) Nutritional importance of wild edible mushroom collected from Khasi Hills, Meghalaya. *Food Chemistry*, 89(4): 599-560.
- Chang, C.T. and Miles, P.G. (2008). Mushroom cultivation, nutritional value, medicinal effect and environmental impact. C.R.C Press. Fla. USA page 87-88.
- Elliot, M.L. and Broschat, T.K. (2001). Observation and Pathogenecity experiments on *Ganoderma zozanatum* in Florida. *Palms*. 45 : 62-72.
- Elliot, M.L. and Broschat, T.K. (2006). *Ganoderma* butt rot of Palms. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 17: 213- 218.
- Farook, A.V.; Khan, S.S. and Manimohan, P. (2013). A checklist of agarics (gilled mushrooms) of Kerala State, India. *Mycosphere* 4(1): 97-131.
- Flood, J.; Bridge, P.D. and Holderness, M. (2000). *Ganoderma* diseases of perennial crops. CABI publishing, UK, 275-279.
- Flood, J., Bridge, P.D. and Holderness, M. (2000). *Ganoderma* diseases of perennial crops. CABI publishing, Wallingford, U.K. 21: 23-29.
- Gottlieb, A.M. and Wright, J.E. (1999). Taxonomy of *Ganoderma* from South America: sub genus *Ganoderma*. *Mycological Research*. Cambridge. 103: 661- 673.
- Graham, R.J.D. (1915). Report of the Economic Botanist. In: Report of Agricultural College of Nagpur of Botanical and Chemical Research etc. Department of Agriculture, Central Provinces and Bihar, for the year 1914-15 (Nagpur: Government Press)
- Hedawoo, G.B. (2010). Wild mushroom flora from Amravati Regoin, Maharashtra, India.
- Idris, A.S.; Arifin, D.; Swinburne, T.R. and Watt, T.A. (2000). The identity of *Ganoderma* species responsible for basal stem disease of palm oil in Malaysia-morphological characteristics. MPOB information Series, TT No:77.
- Jagdeh *et al.* (2015). Antioxidant properties of seven wild edible mushroom from Tanzania. *African journal of food science* page. 64-65.
- Johnsy (2011). *African journal of food science*, 3(2): 67-68.
- Kim *et al.* (2004) Anti-inflammatory and pharmlological activities of the n-BuOH sub fraction mushroom *Phellinus Linteus* *journal of Eyhno Pharmacol.* 93: 141-146.
- Konno, S. *et al.* (2002). Anticancer and hypoglycemic effect of polysaccharide in edible and medicinal Maitake mushroom *Med, Mushroom*, 4: 185-195.
- Kumar *et al.* (2013). Role of edible mushroom as functional food- a review, 5: 56-57.
- Legend and Singer (2013). Review on Mushroom, edition-!, Chapter-5, Science and Development institute, Nigeria, 45-48.
- Lonsdale, D. (1999). Principles of tree hazard assessment and management. *Plant pathology*. 42: 321-328.
- Mizuno (1995). Antitumor active substance from Mushroom. *Jr of food reviews integrated* 11: 23-26.
- Moncalvo, J.M. and Ryvarden, L. (1997). A nomenclatural study of the *Ganodermataceae*. *Synopsis Fungorum. Fungiflora*. 11

- Ryvarden, L. (1991). Genera of Polypores nomenclature and taxonomy. *Synopsis Fungorum. Fungiflora*. 5: 363.
- Ryvarden, L. (2000). Studies in Neotropical polypore. A preliminary key to neotropical species of *Ganoderma* with a lacatepileus. *Mycologia*. 92: 180-191.
- Schwarze, F.W. (2000). Development of pro-progression of decay in the sap wood of living trees. *Arboricultural journal*, 25: 321-337.
- Willard, T. (1990). The Reishi Mushroom: Herb of Spiritual potency and Medical Wonder. *Syivan Press*, 23: 4-7.