

Mushrooms And Macrofungi From Jnanadweepa, College Campus in Thane, Maharashtra

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Abstract : Fungi and mushrooms; their wide variations in range of colours, shapes, sizes and other characteristics and the secretive status attached to their way of life have always intrigued and fascinated botanists, mycologists and laymen alike. Mushrooms and toadstools have been associated with several animals, fictitious creatures, mysterious entities, super natural beings and happenings, mythological associations which unsurprisingly and appropriately are reflected in their common and vernacular names. These small and relatively insignificant entities today continue to play important roles in feeding the populace, as dietary supplements, as medicines and sources of drugs and pharmaceuticals, sources of novel compounds, in modern research and in agriculture.

In the present investigation biodiversity studies employing the survey method were carried out to record mushrooms and other macrofungi from Jnanadweepa, Vidya Prasarak Mandal's college campus, popularly known as Thane college campus. The study recorded 22 different types of macrofungi inclusive of several mushrooms; prominent among them being the genera *Auricularia*, *Daldinea*, *Ganoderma*, *Laccaria*, *Mycena*, *Schizophyllum*, *Polyporus*, *Xylaria* among several others, details of which, as well as the ecological significance and economic importance of the types recorded, are mentioned in the research paper.

Key Words: biodiversity, mushrooms, macrofungi, polyporaceae, Thane college campus

Introduction

The word fungus by itself denotes mushrooms and its colloquial usage has grown to include other related organisms such as molds, polypores, puff balls, rusts, smuts, yeasts and many other similar groups. The wide range of variations in colours, shades, sizes, shapes and other characteristics exhibited by fungi, particularly mushrooms, accompanied with the mysterious and secretive status attached to their way of life; while fine mycelial threads maintain an invisible presence in the soil, the mystifying appearance and disappearance of fruiting bodies above the ground, have always fascinated botanists, mycologists, naturalists and also laymen; many of whom have evolved into amateur mycologists and mushroom hunters. Another prominent group of macrofungi; namely, members of the polyporaceae family, inhabit wood; growing on trees, timber and decaying wood, although there are also instances of soil inhabitation.

It is equally interesting to trace the origins of vernacular names of mushrooms. While some, such as amethyst tallowgill, chestnut bolete, saffron milkcap, scarlet hood and yellow morel have names referring to their colours; those like slippery jack, waxycap, velvety psathyrella and smooth volvariella have reference to textures, those such as bitter bolete, and pungent fiber head refer to tastes; while honey mushroom, shell fish scented russula, soap scented trich and sweet bread mushroom bear reference to aroma and flavor; the likes of black trumpet, pear shaped puffball, common funnel cap, jew's ear and stag's horn denote shapes among many other connotations. Indian literature refers to

mushrooms as *bhuchhatri*, *kavaka*, *ksumpa*, *kukurmutta*, *kumbhi* among other colloquial names. The intoxicating drink *soma* or *somarasa*, mentioned in the *Rig veda* also has reference to mushrooms (Wasson, 1969).

On the dietary frontier, no other food is so wrapped in mystery as the mushrooms (Bahl, 1998). Their food value is well acclaimed (Shukla, 1991; Patil, 2013), however distinguishing between the poisonous and edible ones is a matter of expertise (Khaund and Joshi, 2013). Cultivation of edible mushrooms is a science in itself that has been in the limelight of research (Ram, 2007; Sharma and Thakur, 2010) and the trend is catching up even in remote areas as an answer to dietary deficiencies (Dayaram, 2009; Dorugade *et al.*, 2009). Amongst the several other uses of mushrooms and macro fungi are their applications in agriculture and horticulture (Tibuwah, 2012; Sendi *et al.*, 2013), dying, as exhibition articles, as hallucinogens (Kolet and Sonparate, 2011), therapeutic agents (Villares *et al.*, 2012), nutraceuticals, as sources of novel bioactive compounds (Sengar, 2006; Tripathi and Tiwary, 2013), tinder, writing material and several others (Nair and Balakrishnan, 1995). In spite of the aspects mentioned above, literature on macrofungi from Mumbai region is scarce and scattered and there are practically no reports of this important component of biodiversity from Thane region, adjoining the metro city of Mumbai. Hence the current investigation was undertaken to study and document mushrooms and macrofungi from V.P.M.'s Jnanadweepa campus in Thane city.

The area of study viz. Jnanadweepa, popular amongst locals as Thane college campus is a large 13.5 acre island campus situated in the Chendani area of Thane city, alongside the Thane creek, near Thane railway station (Central Railway) on the outskirts of Mumbai, the commercial capital of India. Apart from housing some of the best educational institutes in the region, the world class campus also sports a huge biodiversity of vegetation, both natural and cultivated. Various mushrooms and macrofungi appear on the educational campus, especially during the monsoon season, which prompted the present study.

Materials And Methods

The study was carried out by employing the survey method for collection and documentation of data during the monsoon and post-monsoon season from June to November 2013; wherein a survey of all specimens of macrofungi was carried out in the area of study. The specimens were identified in the field and in the department of botany, B.N Bandodkar College of Science, a NAAC reaccredited A Grade institution from amongst the VPM Group of Institutes, situated on the campus, using standard literature (Bakshi, 1971; Keizer, 1997; Polese, 2000) and techniques suggested by Buczacki (1992) and Kaul (1999).

Results And Discussion

A total of 22 types of macrofungi, comprising 18 genera, were recorded during the investigation. Amongst the fungi recorded, 5 forms comprising 3 genera belonged to Ascomycetes, while 17 forms comprising 15 genera were members of Basidiomycetes. The results of the survey are presented in Table 1. Forms such as *Auricularia auricula*, *Daldinea concentrica*, *Schizophyllum commune* and *Xylaria* sp. (1) were not uncommon and prominently represented. The findings are in agreement with Deshmukh (2004) and Todawat and Papdiwal (2012). Most of the forms recorded in the current investigation had remarkable wood rotting activities that are considered indispensable for maintenance of carbon cycle in the biosphere (Ichinose, 2013).

From amongst the macrofungi reported, *Daldinia concentrica* has been reported as a wood decay fungus (Shary *et al.*, 2007) and also has applications in the form of tinder as well as in traditional medicine (Benie *et al.*, 2008). The 2 species of genus *Xylaria* recorded in the current study exhibited significant differences in the heights of fruiting bodies, while species of *Hypoxylon* showed differences in colours, one being bright orange and the other, black in appearance. Species of the genus *Xylaria* have been used

for isolation of novel metabolites (Shiono *et al.*, 2009) and enzyme (Liers *et al.*, 2007) whereas *Hypoxylon* has been successfully exploited for metabolites exhibiting anti-fungal activity (Qing and Yan, 2009). Apart from yielding metabolites, the fairly common macrofungus *Auricularia* was recently tapped as a source of novel enzyme (Aschoff *et al.*, 2013) while *Schizophyllum commune* was implicated as a common and harmful human respiratory allergen (Singh *et al.*, 2013). *Polyporus*, *Poria* and *Trametes*, notorious for their wood rotting activity, also have great therapeutic values (Cheng *et al.*, 2013; Zhao, 2013). The wood rot fungus *Daedalea* and *Marasmius* were reported as important sources of laccase (Dedeyan *et al.*, 2000; Baldrian, 2004). *Ganoderma lucidum* has had a long and effective tradition in the science of medicine and therapy (Sliva, 2003). Apart from its food value, *Sparassis crispa* was reported as a source of novel metabolites having therapeutic properties (Kimura, 2013). Lawrence and Harniess (1991) reported *Mycena* as a fairly common and inedible mushroom. While the culinary aspects of *Agaricus* are well known, its medicinal value (Wang *et al.*, 2013) also inspires awe. Pushpa and Purushothama (2012) reported *Chlorophyllum* from Bangalore city while Gulati *et al.*, (2011) assessed the food value of genus *Lentinus*. The current study revealed a rich biodiversity of macrofungi on Jnanadweepa, VPM's Thane College Campus.

Conclusion

A survey of mushrooms and macrofungi was conducted during monsoon and immediate post monsoon months in the current year 2013 on Jnanadweepa, VPM's College Campus, Thane, Maharashtra, India. A total of 22 types of mushrooms and macrofungi, belonging to 18 genera, were recorded during the study. Amongst the fungi recorded, 5 forms comprising 3 genera belonged to Ascomycetes, while 17 forms comprising 15 genera were members of Basidiomycetes. All the macrofungi found growing in the area of study were economically important. Most of the forms documented, were reported to exhibit wood rotting activities which are indispensable for carbon cycle in the biosphere.

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Table 1: Macrofungi and mushrooms recorded on Jnanadweepa, Thane

S. No.	Botanical Name	Common Name	Habitat
Ascomycetes			
1	<i>Daldinia concentrica</i> (Bolton) Cesati & de Notaris	King Alfred's cakes, carbon balls	On decaying wood/ logs
2	<i>Xylaria sp.</i> (1)		On decaying logs
3	<i>Xylaria sp.</i> (2)		On decaying logs
4	<i>Hypoxylon sp.</i> (1)	Strawberry hypoxylon	On decaying wood
5	<i>Hypoxylon sp.</i> (2)		
Basidiomycetes			
6	<i>Auricularia auricula</i> (Bull.) J. Schrot	Jelly ear, tree ear	On decaying wood stumps
7	<i>Schizophyllum commune</i> Fries	Split-gill	On decaying wood stumps
8	<i>Polyporus rubidus</i> Berk.	Bracket fungus	On tree stump
9	<i>Polyporus sp.</i>	Bracket fungus	On tree stump
10	<i>Poria sp.</i>		On decaying wood, twigs
11	<i>Trametes sp.</i>	Many zoned polypore	On decaying logs
12	<i>Daedalea sp.</i>	Maze gill	On decaying wood and logs
13	<i>Daedaleopsis sp.</i>	Blushing bracket	On dead wood stump
14	<i>Ganoderma lucidum</i> (Curtis) P. Karst	Reishi/ Lingzhi	On decaying wood stump
15	<i>Sparassis crispa</i> Fr.	Cauliflower fungus /Brain fungus	On decaying wood stump
16	<i>Cantharellus sp.</i>	Chanterelle	On soil near bamboo clumps
17	<i>Marasmius sp.</i>		Common in large groups on coconut trees
18	<i>Mycena sp.</i> (1)	Common mycena	On leaf litter and rotting wood
19	<i>Mycena sp.</i> (2)	Common mycena	On leaf litter and rotting wood
20	<i>Agaricus sp.</i>		On humus rich soil among decaying organic matter
21	<i>Chlorophyllum sp.</i>	Chlorophyllum	On decaying leaf litter
22	<i>Lentinus sp.</i>		On decaying logs

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