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## **SURVEY OF SOME BASIDIOMYCETES DIVERSITY OF MELGHAT REGION**

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### **ABSTRACT**

The present paper deals with an intensive and extensive exploration of diversification in Basidiomycetes members from East Melghat Forest. During exploration it was noted that 21 members of the Basidiomycetes have been identified. In all during frequent visits to these forest areas on above said period by the authors, a record of 7 edible and 14 non-edible mushrooms were noticed. This is the first report about the occurrence of mushrooms in large number from the Melghat region. Paper also includes some of the medicinal uses, ecological and economic benefits of the mushrooms.

### **Keywords:**

Basidiomycetes, East  
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## INTRODUCTION

Melghat, located in the Amaravati district of Maharashtra, is a Tiger Reserve wildlife sanctuary. Melghat Tiger Reserve is located on the southern offshoot of the Satpura Hill Range in Central India, called Gavilgarh hill. It is 225 km west of Nagpur. It was established as a wildlife sanctuary in 1967, and was declared a Tiger Reserve in 1974. It was among the first nine Tiger Reserves notified in 1973-74 under the 'Project Tiger', a wildlife conservation project initiated in India in 1972 to protect the Bengal Tigers

The inhabitants are mainly tribal, largely of the Korku tribe (80 per cent) and others like Gond, Nihal, Balai, Gaolan, Gawali, Halbi, Wanjari, etc. All inhabitants depend on the forest for bonafide domestic needs of firewood, timber, fodder, medicinal plants, and non-timber forest products like fruit, flowers, gum and medicinal plants. Their main source of income is from labor and rainy season agriculture. They augment their income by collecting non-timber forest products like mahuali flowers, seeds, charoli, gumcula, dhawada, tendu-leaves and musali. Higher mushrooms or macromycetes are because their size is great enough to permit their being un with the naked eye. The lower mushroom or micromycetes. In Basidiomycetes the spores form all the out side of the cell basidium to which they attached by little stems or strigmata. At maturity the each detach themselves from there strigma and are projected a short distance. It is among the basidiomycetes that we find the mushroom shapes most familier to the public. All mushrooms haveing gills under the cap such as the agaricus or spores or polypores or spines (hymenidium) are basidiomycetes so are all those in which the stem is decorated with a ring or has a covering. Practically although capsules, spores and basidium may not be observable except under the microscope .It is not difficult to distinguish these two major groups in several special cases.

Fungi including mushrooms make up an extremely large group – more than 100,000 species at the present time, Generally regarded as plant, Fungi vary greatly in outward appearance, but have at least one common characteristic. Chlorophyll is the green substance which enables other plants to take directly from the air the carbon-dioxide which is indispensable to their growth and nutrition .Many of the higher Mushroom have certain nutritive value and are sought by gourmet .In addition to these are beneficial factor

to man there is whole series of fungi that are formidable enemies of humankind illnesses of man and animals ( for example ringworm) other are parasites of cultivated plant ( Red and Black rusts, mildews etc) .

Certain higher mushroom are poisonous and even fatal and other constitute a grave danger to wood work ,floors, & Fence posts, which they destroy fairly rapidly .especially Basidiomycetes (cyphellinae).

In 1984 Zerova My , Helin YY, Koz'-yakov SM had work on mushroom : edible conventionally edible, non-edible, poisonous. After 1990 no of worker reported poisonous mushroom. Perez Moreno J, Ferrera Cerrato R, (1995)

Watling R (1997) .Baptista-Ferreria JL(2012) work on edible mushroom species. In 1995 Benjamin DR had written a handbook for naturalists, Mycologists and Physicians of mushrooms: Poisons and panaceas. In 2007 Garibay-Orijel R, Caballero J, Estrada-Torres A, Cifuentes J (2007) had studied the cultural significane, the edible mushrooms case. In 2012 Gry J, Andersson C, Kru ger L, Lyran B, Jensvoll L, et al. had work on the mushroom traded as food Nordic questionnaire, including guidance list on the edible mushroom suitable and not suitable for marketing Copenhagen.

## **MATERIAL AND METHODS**

During explorations of Fungal diversity frequent visits are made to Melghat region the well grown material which is mature is collected for the identifications while critical material which is unable to collect and stored are photograph on each angle, that will easy for identifications, also avoid poisonous mushrooms during collection.

## **OBSERVATION AND RESULT**

### **Edible and Non-edible Mushroom**

#### **1) *Auricularia auriculata*:**

Basidiocarps hairy on upper surface, gelatinous central and broad hymenium on lower sides. It is found on many different deciduous trees. The colour varies from a rather dull flesh tint to a very dark brown.The flesh is thin & translucent and when moist it feels like soft rubber but becomes quit hard on drying. The shape is like very irregular shallow saucer with the inner surface shine & the outhter slightly velvety and grayish. Young light coloured specimens can be eaten.

**2) *Calocera cornea*:**

It is a jelly fungus that grows on decaying wood. It is a member of the Dacrymycetales, an order of the fungus characterized by their unique “ tuning fork” basidia.

Its yellow finger like tapering basidiocarps are somewhat gelatinous in texture. In typical specimens the basidiocarps become up to 3mm in diameter and 2 cm in height. The hymenium covers the sides of the basidiocarps, each basidium producing and forcibly discharging only two basidiospores.

**3) *Clavaria pyxidata*:**

Grows in clusters in a grass field on the ground or on wood. Basidiocarps spindle shape with pointed tip, bright colour 5-10 cm. high, flattened or grooved. Spores white but yellowish in mass. Total height 7-14 cm. trunk thin whitish, spotted with brown, branches like inverted cones, tips like inverted cones, crowned with white or yellowish teeth; flesh piquant; grows on decaying wood. Its edible, but a laxative to some individuals.

**4) *Cyathus striatus* (Bird's nest fungus) :**

It is a common saprobic bird nest fungus with a wide spread distribution throughout temperate regions of the world. Although most frequently found growing on dead wood in open forests. Fruiting bodies are sunken from summer until early winter, they are grey or brown in colour. These strange little fungi of which there are several species grow on dead twigs, straws, fir cones, beech-mast or even sometimes directly on the ground. They are shaped like shallow cups or inverted cones, and sometimes have a finely fluted interior. The cup is at first covered by a thin skin, but later this breaks away & reveals a varying number of more or less oval-shaped bodies lying inside the cup, just egg, in a miniature bird's nest. These are not outside spores, but only spore containers. Heavy rain drops bounce them out of the cups and in times the outer skin breaks and the spores are set free.

**5) *Fomes fomentarius* :**

Commonly known as tinder fungus, the species produce large polypore fruit bodies which are horse hoof shaped and varies in colour from silvery grey to almost black though they are normally brown. It grows on the side of various species of tree, which it infects through broken bark, causing rot. The species typically continues to live on trees long after they

have died, changing from a parasite to decomposer, species typically has broad Dacromyces are gelatinous in texture and cushion shaped , with smooth and wrinkled surface. Red –Milk cap [Lactarius rufus] In Scandinavia this is known as pepper fungus because of its very strong peppery taste which does not even disappear on boiling .It always grow in pine woods in late summer. There is usually a little knob in the centre of the cap. The gills are slightly paler than the cap. And stalk and when the fungus is broken a white milk oozen out of the flesh. Although it is used as a flavouring in some countries. It is likely to spoil a mushroom dish.

**6) *Mycen pura* :**

Cap violaceous pinkish or rose or ochraceous or blue green with yellowish or tawny umbo also white tinged with pink, or blue green or violaceous shades, especially in dry weather, conical, then expanded 2-7cm but the variety rosea can reach 10-12cm, unbonate: margin striate in humid weather stem slender, cylindric with thickened and woolly base; of the same colour as the cap or whitish; more often a methysline when the cap is ochraceous; with dark radial fibers; hollow as a pipe. flesh fragile thin white; with touches of the cap's colour odour & flavour mild of raddish. Gills rather sparse broad. Eroded near the stem. Connected by little veins; whitish tinged with the cap's colour. Spores white, It grows sometimes in large groups forming fairy rings, in woods in the most & among dead leaves Edible but not recommended because generally tasteless.

**7) *Stereum hirsutum* (Rust Fungus) :**

*Stereum hirsutum* is a fungus typically forming multiple bracketes on dead wood; it is also a plant pathogen infecting peach trees. Basidiocarp small, semicircular in several tiers on the dead wood. Upper surface with several softs hairs, grey to brown. Fruiting body are long and tapering often branched and waxy. Irpex flate crust like sporophores found on rooting wood of porous surface the walls of the pores extending irregularly teeth like.

**8) *Agaricus arvensis* (horse mushroom) :**

It is commonly known as the horse mushroom. The gills are white at first, they later on pass through grey and brown to become dull chocolate. There is a large spreading ring with yellowish scale, the horse mushroom is regarded as one of the most delicious edible

fungi. *A. arvensis* is a secondary saprophyte and best grown on a suitably prepared and pasteurized mushroom compost substrate.

This looks like a more robust specimen of the field mushroom, but as it ages the skin of the cap becomes distinctly yellow. There is a lax ring round the white stem & the gills are greyish when young, not pink as in the field mushroom. It is important not to confuse this with the very similar yellow-staining mushroom, *Agaricus*, which is poisonous to some people. The test is to make a cut right at the base of the stalk. If the flesh turns bright yellow the mushroom is the Yellow stainer & should be discarded

**9) *Agaricus biporus* :**

The pileus or cap of the original wild species is a pale grey brown in colour with broad flat scales on a paler background and fading towards the margins. It is a first hemispherical in shape before maturity. Gills are free and pink in color then red and brown. The spores are oval to round.

**10) *Amanita muscaria* :**

It is commonly known Fly Agaric. It is cosmopolitan in distribution. It is generally considered as the poisonous mushrooms. The poisonous fly Agaric is so often pictured in story books for children that its unmistakable appearance is very familiar to most people. It is a beautiful fungus most common on poor soil under pines and birches often growing in quiet large groups. The taste is disgusting and although it is very seldom fatal, it has strongly poisonous effects, if eaten causing sickness & diarrhea, hallucinations, convulsions & coma. In many European countries it has in the past been widely used as a fly poison, and some primitive Asiatic tribes have employed it regularly as an intoxicant.

**11) *Catharellus cibarius* :**

It is probably best known species commonly called as "Golden chanterelle". which is orange or yellow in color, funnel shaped, on the lower surface below the smooth cap, it has gill like ridges that run almost all the way down its stipe. It emits a fruity aroma and peppery taste. It is considered as an excellent edible mushroom.

One of the best of the edible fungi and very easy to recognize by its uniform rich egg – yolk yellow color and its pleasant smell of apricots. It grows in woodlands of all kinds from late summer to autumn, usually in group & often along the pathways of wood ants.

Young specimens are button shaped , but later the margin becomes wavy & the center depressed. When moist , a chanterelle feels like damp chamois leather. It is hardly ever attached by insects & unlike most fungi will keep fresh for several days. Delicious fried in butter or oil , mixed with bread - crumbs.

**12) *Clavicornia pyxidata* :**

It is common saprobic birds nest fungus with a widespread distributions throughout temperate region of world. Although most frequently found growing on dead wood in open forest. Fruiting bodies are encountered from summer until early winter, they are grey or brown in colour, other common name is splash cups.

Total height 7-14 cm. trunk thin whitish ,spotted with brown, branches like inverted cones, tips like inverted cones ,crowned with white or yellowish teeth, flesh piquant; grows on decaying wood. Edible , but a laxative to some individuals.

**13) *Morchella esculenta* ( Morel ) :**

Another spring fungus, but of a totally different appearance, the morel can be found in meadows and in woodland clearing & parks during late spring . The fungus is quite hollow and rather brittle, the creamy white stem especially so the cap yellowish brown and slightly pointed & the surface is divided up into alternate ridges & irregular hollows in which the spores are formed . The cap is joined to the stem. Another closely related species. “*Morchella vulgaris*” is very similar but has a more conical cap. Both are delicious and best served in a creamy source.. All these mushrooms, ripe are fetid and absolutely not edible there are however, people who will eat sometimes one sometime another, when still unripe, at the egg-shape stage.

**14) *Pholiota adipsa* (Fat pholiata) :**

Cap 8-16 cm , yellow tending now to saffron ,now to golden yellow , brown or rust scales, disappearing with age and finally reduced to brownish granules ; growing preferably on a beech tree : edible ; but mediocre

**15) *Caprinus comatus* (Shaggy mane) :**

Cap ovoid 4-8cm , white soon brownish gray at the center, where as the cap cracks into filamentous scales, the margin turning upward and splitting stem cylindrical , slender white, sericeous hollow .Ring white thin , movable evanescent. Flesh thin, watery. Odour

mild, flavor pleasant. Gills first white appressed as the pages of a closed book; thin and very broad; than less closed, free pinkish, then violaceous finally deliquescent. Spores black, it grows from spring to autumn, in loose or sandy soil, rich with organic fertilizers or calcareous substance. Edible, delicate only if young; must be first boiled in water in this way it will keep for a while and it can be prepared and cooked later on.

**16) *Phallus impudicus* :**

Similar to Dictyophora, but without the characteristic net: grows in fields meadows. parks, under hedges, *Mutinus caninus* is smaller than the preceding species, 6-12 cm high, without net, thin, very fragile, fetid, ending in a point or like the head of a match, initially green, glutinous then red.

All these mushrooms, ripe are fetid and absolutely not edible. These are however people who will eat sometimes one, sometimes another, when still unripe. At the egg-shape stage

**17) *Dictydium cancellatum* (Chinese lantern) :**

The Chinese lantern slime mould is quite common across the country but is hard to spot. It is only a few millimeters tall & is often similar in colour to the well-rotted logs on which it fruits. This species has no capillitium to support the spore mass. The outer wall of the sporangium is thickened with stout ribs. The membranous peridium between the ribs breaks down and the surviving ribs then form a cage. The spore mass is contained inside the cage. The pendant head of the sporangium nods in the air currents and the spores trickle through the bars of the cage to be dispersed by the air. As it possesses no capillitium this species would be placed in the order Liceales.

Myxomycetes- Slime Molds *Hemitrichia stipitata*

**18) *Hemitrichia stiptata* :**

*Hemitrichia* is a common genus with most species occurring on dead wood. *Hemitrichia stiptata* is a readily recognized commonly found species. The yellow to brown sporangia are borne on dark brown stalks; In mature sporangia the upper peridium falls away leaving a distinct cup like portion below. The capillitium of *Hemitrichia* species is a network of threads that expand as the peridium falls away. Lifting spores mass into the air.

**19) *Lycogala epidendrum* :** *Lycogala epidendrum* means 'on the wood' in reference to its typical habitat. Commonly it is named as wolf's milk slime Toothpaste slime. It is occurred



on the wood substrate, saprobic, scattered to clustered on well-rotted wood, June through November. This slime mold forms fruit bodies 3-15mm wide. The globose to subglobose or compressed fruit bodies of lycogola epidendrum are at first pinkish-gray to bright cinnabar red when young at this stage the flesh is a pinkish paste-like sub.(like toothpaste) with maturity the fruitbody becomes yellow brown or olive – brown and the spore mass becomes powdery and pinkish-gray to ochre in mass.

**20) *Pholiota tuberculosa* :**

It grows on the wood and also grows on the plant material manure: Cap 2-5cm across, subglobose becoming convex to flattened, sulphur yellow to orange converted in small rusty flattened scales. Stem 30-60 x 3-10 mm, yellow and smooth above the short lived ring , flaky below and becoming brownish towards the swollen base. Flesh yellow becoming reddish-brown on cutting. Taste bitter, small slight and mushroomy. Gills pale yellow becoming spotted rusty-brown Cheilocystidia- thin walled, hyaline, cylindrical-clavate or capitate. Spore print rusty-brown. Spore kidney-shaped, smooth, 6.5-9 x 4-5 um. Habitat on fallen twigs, branches and sawdust, season summer- occasional.

**21) *Polyporus (Polypilus) Sulphureus* :**

Cap numerous, with irregular, bizarre shapes, gibbous, horizontally protruding, lying one upon the other, shelf like, 20-40 centimeter in all ; with the margins undulate and divided into lobes by deep grooves; confluent at the base in a single mass, sometime in a single, short trunk, whitish and then yellowish. The upper part is yellow, rosy yellow or lemon yellow: but of a beautiful rosy colour in the variety *miniatus*. Which grows in the East; fading with age, but becoming stained with brownish yellow. The lower part is covered with small pore, first round, then angular, sulfur yellow, excluding dew, yellowish droplets. When the spores are ripe, they cover with a thick powder, first yellow, then white, the caps on which they fall. Flesh thick, soft, juicy, yellowish ; with agreeable Odor and acidulous flavor ; then it becomes light, hard, brittle, and exhales a sweet smell. It grows from spring to autumn on the trunks of latifoliate trees, also on fruit trees, which it erodes and causes to fall; found less frequently on the trunks of conifers or on the felled trunks.

## DISCUSSION AND CONCLUSION

Medicinal value of Mushroom : Fomes sps. are used for rapid coagulations of blood. Clavatia sps. is used for anesthesia. Amanita muscaria is used as homeopathic drug. Amanita muscaria induce hallucinations. Some mushroom are used as remedy for tuberculosis, rheumatism, jaundice etc. Mushroom as source of dye: polyporus gives a brown colored dye , which is used for coloring silk, cotton, and wool. Mushroom as ink : coprinus conatus is used as ink for writing purposes. All mushrooms contain a very high proportion of water is (82 to 92 %) in this respect resemble such vegetables as cabbage, Cauliflower and spinach, which are form 91 to 93 % water, against about 87 % for carrots and 75 % for apples. Mushroom are rich in nutrients. And are also reported to be very good sources of minerals. Mushroom contain nearly 26.9% proteins. 4) Nearly 4.4 % carbohydrates are present in mushroom. 5) Mushroom are very low in fats(0.3%). 6) Agaricus bisporus contain vitamins (mg/100g of fresh wt).

Economic importance: Mushroom is good sources of food and are utilized as vegetables. Various recipes like soup, pakodas, pulav, Manchurian, curry, sandwiches are prepared from mushroom. Mushroom is low calories diet as starch is absent. Hence it is an ideal food for diabetic patients. Ecological importance: some mushrooms grow as a decomposer in forest and caused degradations of forest wastes like litter and remove them. All the elements of a complete diet are present.

Melghat region is a stable for the growth of all kinds of plant including higher and lower plants such as Algae, Fungi, Bryophytes, Pteridophytes. Gymnosperm, Angiosperm, While the dead and decaying branches of tree plants trunks, barks allows the growth of fungal plants just after the first Rain ,also environmental conditions favorable for the growth of Number of Fungal organism in which the members of the Class Basidiomycetes are dominantly Found. In this region mostly Fungal organism are found on the dead material of plants and the waste residues present in the Forest. some dry or dried Fungi are also found on the decaying materials. Durring our investigations, In all 37 members from the class of Basidiomycetes are collected from the locality. Out of which 21 plants are correctly identified, By Using available Flora and some Text –written by T.N. kaul(1997) out of 21 Identified Mushrooms, 10 Mushroom are non-edible and they are considered as a

poisonous mushroom and remaining 11 are edible mushrooms regularly used by Tribals in Melghat region. As per opinion of Tribals they have highly proteinaceous and having Medicinal significance.

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