

Diversity Of Macrofungi from Melghat Forest Amravati Maharashtra.

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ABSTRACT

In the present investigations authors collected many fungal samples from Melghat forest of Amravati at Satpuda ranges of Maharashtra and Madhya Pradesh. In the forest area close to Amravati, Maharashtra, the current study was conducted to map out the diversity and distribution of native macrofungi. During the wet and early dry seasons of July to October 2022, samples were collected and these samples were collected from low and high altitudinal ranges. Various sites in the research area of forest investigated and used to collect various wild fungus species. According to reliable sources and microscopic characteristics, the macro fungi species *Ganoderma sp.*, *Hexagonia sp.*, *Microporus sp.*, and *Phellinus sp.* were identified. The early dry season saw the greatest abundance of *Ganoderma sp.* among these species. The study showed that the macro fungal diversity has observed. Maharashtra region required for conservation efforts, particularly for species that are edible and therapeutic.

INTRODUCTION :-

Fungi are among the most crucial elements of the forest ecosystem, regardless of whether they have a positive or negative impact. Diverse kinds of fungi have been shown to grow and multiply in a range of climatic conditions (Bilgrami et al., 1991). They make up the second-largest group of terrestrial animals and are present in all ecosystems on the planet. There are an estimated 1.5 million different types of fungi, but only 69000 of them, including 46124 different Basidiomycetes and Ascomycetes species, have been identified. In ecosystems, fungi perform key roles as decomposers, soil biogeochemical recyclers, and partners in symbiosis with plants. Aside from their use in biocontrol, medicine, food, and fermentation, fungi also have economic worth. A particular subgroup of macroscopic fungus includes mushrooms. The higher fungus are Macromycetes, which are classified in the phylum Basidiomycota and some of them in the Ascomycota. The number of species of mushrooms on the earth is thought to be around 1,40,000, but only approximately 10% are known.

A member of the Hymenochaetaceae family is *Phellinus*. Hymenochaetaceae is a diverse family of plants that includes fungus that can consume wood components while also impeding wood growth cells need their cell walls for growth and reproduction. Wood contains cellulose, lignin, and hemicellulose, which are structural polymers. But there is a lot of variance, which is very live trees' heartwood, which contains a variety of compounds, is visible. Materials that are not structurally necessary are deposited as the mature cells expire. *Phellinus* species that cause white rot and break down both lignin and cellulose are parasitic, perthophytic, or saprobic (Rabba 1994, Vaidya 1993, 1990, 1991). They occupy a wide range of angiosperms and/or gymnosperms, which they feed on, causing heart rot disease in live, standing trees (Wagner & Fischer 2002). Because they provide us with food, medication, biocontrol agents, chemical makers of bioactive substances utilised in the pharmaceutical industry, and many other industries, mushrooms are essential to our economy.

The current study focuses on the diversity and morphological description of the poroid fungi from Melghat, Amravati.

MATERIALS AND METHODS

Area of study:-

Material was gathered from the Melghat region, which is in the northern Amravati District of Maharashtra State, India, and is located at 21°26'45"N and 77°11'50"E. A number of poroid fungi find Melghat to be one of the best environments. From the Melghat area, various members of the poroid were collected.

Collection of Sample:-

During the rainy season (month of June to July) and Early dry Season (month of October to November). The chosen poroid fungi will be harvested from several locations inside the Melghat forest. A hand lens, forceps, sharp knife, and axe were used to collect the fruiting bodies of wild mushrooms. In their natural setting, fresh mushrooms were captured on camera.

For macro and microscopic examinations, mushrooms were transported to the lab in separate polythene bags to prevent mixing. Each time, on a piece of note paper that will be attached to the packet in which the collection will be wrapped, a brief description of the growth habit, habitat, location, altitude, collection number, date of collection, and forest type is noted. The collections are preserved for conducting microscopy after noting the taxonomically significant macroscopic features on the field key on the above specified line.

Sample Identification:-

Visual examination of the specimens and optical microscopy observation of their spores, along with the use of keys from reference books (Konstantinidis, 2009; Phillips, 1981 and Leif Ryverden, Ireneia Melo) and online databases (Indexfungorum and Mycobank), will be used for taxonomic identification of the sample. The description of aspects from the macroscopic study included the habit and habitat of the basidiomata, the shape, surface, edge, and size of the pileus, as well as the colour, shape, and number of pores per millimeter; shape, colour, consistency, surface, apex, base and size of the stipe (when present). Detailed examination at laboratory reveals further essential information for identification. In laboratory, collected specimen will be studied under hand lens and / or microscope where features of gills, spore, stipe and other microscopic features were observed (Yadav et al, 2017).

RESULTS AND DISCUSSION:-

Analyzing samples of macrofungal organisms:-

Microporous sp.

They are taken out of the tree's trunk. The fruiting body has a yellowish brown colour, is extremely paper-like, and is also rather light in weight. Typically, the pileus is 1 to 3 mm thick. The fruiting body's diameter is 9 cm, and the stipe's length is 2 cm. The lower surface is white, and the margin exhibits a wavy nature. The upper portion exhibits the presence of rings 10–12 in number and brown in colour. The mycelium is branching, and the spores, which are spherical, uniformly tiny and of a light colour, have thin walls and are transparent and light in colour.

The spores typically have numerous, thick-walled hyphae. The mature fruiting bodies have narrow, funnel-shaped caps that are zoned in different colours of brown and are supported by a stalk with yellow feet. This fungus may be crucial for medicine, although less is known about its bioactive components and therapeutic efficacies. *Microporus xanthopus* is a tropical species, found on rotting wood. The initial stage of the fruiting body is simply a white fleck on the wood surface. This enlarges into a hemispherical cushion up to a millimetre wide, and elongates to develop the stem. Funnel-shaped caps of mature fruiting bodies are thin and are concentrically zoned in various shades of brown, usually with a pale margin which is sometimes wavy. The Caps can hold water. The fertile under-surface of the cap is white to dull yellow, with minute pores and can extend down the stem. The central or off-centre stem can be up to 40 mm long and 5 mm wide, expanding at the top. It is included under medicinal mushrooms.

Ganoderma Sp.:-

This fungus is completely covered in a shiny, brightly coloured coating .The cap is simply a pale projection at the top of the small reddish column which constitutes the stem. It then develops into a kidney shape or fan shaped fruiting body. The surface is flattened but uneven and consists of a tough crust which is elastic at first, then coriaceous. It appears to be coated with a smooth, shiny, mahogany-coloured, gleaming lacquer. The margin remains pale for a long time, and is whitish to yellowish. The tubes are white at first but they soon turn brown when mature, as do the pores which become gray when bruised. The lateral, vertical stem is uneven and compressed and covered in the same shiny, leathery substances as the cap. The creamy white flesh turns pale brown. It is spongy when young, later becoming corky. This fungus colonizes the rotting of various broad-leaved trees. It causes a white rot of the wood, attacking the coloured, tough lignin rather than the soft, white, cottony cellulose. It fruits mainly in summer and during fall. Some specimens may survive until winter but generally it does not like cold weather. *Ganoderma lucidum* is most important medicinal mushroom in the world. It has more pharmaceutical and therapeutical value. It also has antitumor, cardiovascular, respiratory, and hepatotoxic properties. Scientific studies have confirmed that the substances extracted from this mushrooms blood pressure, blood cholesterol and blood sugar level as well as inhibition of platelet aggregation. It is used to cure cardiovascular diseases and contains several major constituents which may lower blood pressure as well as decrease LDL cholesterol. These constituents also help reduce blood platelets from sticking together an important factor in lowering the risk for coronary artery diseases. It is used for treatment of general fatigue, weakness, asthma, insomnia and cough in traditional Chinese medicine. It has antioxidant and antitumor activities, and Camptothecin has been found to be responsible for its antioxidant properties. It has also been used as an adjuvant in radiotherapy of cancer.



Fig.1. *Microporous xanthopus*.



Fig.2. *Ganoderma lucidum*.



Fig.3. *Hexagonia tenuis*.



Fig.4. *Phellinus linteus*.

Hexagonia Sp.

Hexagonia is a genus of poroid fungi in the family Polyporaceae. The genus has a widespread distribution, especially in tropical regions. The generic name is derived from the Latin word hexagonus, meaning "with six angles" *Hexagonia crinigera* Fr. Synonym: *Apoxona* Donk 1969. The genus is characterized by a trimitic hyphal system with coloured skeletal hyphae and large cylindrical spores. Most species in the genus also have large hexagonal pores. *Hexagonia nidita* Durrieu & Mont., Syll.Gen.Sp. Crypt. p.170,1856. basidiocarps perennial, semicircular present on dead wood. Basidiospore 11-15 x 3.5-5 µm, cylindrical, thin walled hyaline, smooth. *Hexagonia tenuis* Hooker ex Fries 1836, Epicrisis Systematis Mycologici: 497. Synonyms: *Boletus tenuis* Hooker ex Kuntz 1822; *Daedaleopsis tenuis* (Hook ex Fr.) Lmazeki Basidiocarps, circular present on dried twigs of *Delonix regia*. Sporophores resupinate, semicircular to circular, context dark brown, less than 1mm thick, hymenial surface reddish to black, pores hexagonal sometimes round, 1- 4 per mm; basidia hyaline, clavate. Basidiospores cylindrical, 8.8 x 2.2 - 4.4 µm in size. Hyphal system trimitic. *Hexagonia hydnoides* can be used as Antispasmodic agents. (Andradea L H C. et.al.2021).

Phellinus Sp.

The ideal period to harvest *Phellinus*, a wood decay fungus, is from April to May. It grows on the trunk of tree. Perennial, pileate, sessile, and typically horseshoe-shaped, it produces basidiocarps. The pore surface is rusty brown when fresh and turns brown when dried, the context is brown, and the upper context is a black carapace, and its tubes are cinnamon yellowish-brown when dried. The pileal surface is dark brown when fresh and turns black when dried. The perennial fruiting body is sessile, 13 cm wide, and 2 cm thick. Its colour ranges from yellow to light brown. Smoothness topped the situation. Dimitic was the hyphal structure. On the lower surface, tiny pores are visible. Basidiospores are ovoid to subglobose, hyaline, thick walled, measuring range between 4 to 7 µm. On the most significant and popular traditional fungi remedies is *Phellinus linteus*. In China, it has a long history of use for treating chronic diarrhoea, removing blood consumption from arthralgia, and consolidating hemostasis channels.

CONCLUSION :-

These studies concluded that the mushrooms species grown in the wild plays an important role to maintain the forest health besides their medicinal importance value. Therefore, it becomes quite necessary to explore, document and conserve this natural wealth. Conservation can also be achieved through cultivation, creation of national parks and forest reserve areas, and the reduction of illegal logging of timber.

It is therefore necessary to include macrofungi biodiversity conservation in forest management policies in Melghat region of northern Amravati District. Maharashtra. Additionally, a database on the diversity of macrofungi, as well as their ecological preferences and usage, is provided by the current study.

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