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OCCURRENCE OF WOOD ROTTING FUNGI IN AMRAVATI REGION

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ABSTRACT

The fungal organisms affect on the quality and quantity of timber wood through decay and degradation. A survey of wood decaying and wood rotting fungi were made from the campus of Institute and vast area of bamboo garden located in and around the city of Amravati. The survey region constitutes a mini forest. A survey was made during monsoon season. About eight different wood rotting fungi were reported from the campus of institute and bamboo garden.The fungal genera reported are *Phellinus*, *Ganoderma*, *Rhodofomitopsis*, *Trametes*, *Daldinia*, *Daedaleopsis*, P*ycnoporus*, *Microporus* and *Coprinopsis* These fungi were analysed quantitatively for its community characters.

KEYWORDS: *Phellinus*, *Ganoderma*, *Rhodofomitopsis*, *Trametes*, *Daldinia.*

INTRODUCTION

The timber wood is highly prized and commercialized for various construction purposes. The wood rotting fungi are significant in terms of quality and quantity of timber wood There are large number of lower and higher fungi distributed in aquatic, atmospheric and terrestrial habitat The wood rotting fungi are from higher group of Basidiomycetes. These fungi are generally known as bracket fungi .The wood decaying fungi destroy the quality and quantity of wood. They have ability to degrade cellulose, hemicelluloses and lignin of wood. These fungi interact with biotic and abiotic factors of the environment .The tropical region are hosting the highest diversity fungi The wood decaying fungi are also known as the macrofungi in the forests (Hawksworth, 2004). The wood decaying fungi causes white rot, brown rot and soft rot disease of wood They offer nutrition for many insects and birds in the forest The wood decaying fungi are considered as an ecosystem engineers (Lonsdale et al., 2008). The macrofungi develops big fruiting bodies known as basidiocarp. The wood decaying fungi are also known as xylophagous fungi that digesting the cellulose and lignin and causing rot. The fungi require moisture for its successful colonization and proliferation. The fungi helps to bring about breakdown of complex organic molecules that leading to returning of nutrients to the soil. The enzymes are responsible for degradation of the wood by degrading the cellulose and lignin. The water fallen on logs or wood is absorbed by the cellulose fibres where it starts the process of decay. The wood rotting fungi have played an important role in sustaining the forest ecosystem by way of decomposition of organic matter The mineral elements such as nitrogen and phosphorus are required in large quantities in functioning of biological systems. The action of wood degrading fungi allows the release of these elements from decaying woods and logs and made it available to other living organism. The fungi are the recyclers of the minerals nutrients and help in maintaining the biogeochemical cycle of nature.

Considering the importance of wood and role of wood degrading fungi in ecosystem, present work is attempted to find out the wood decaying fungi in region of Amravati city.

MATERIALS AND METHODS

The forest ecosystem constitutes variety of wood degrading fungi These fungi are nutrient recyclers of ecosystems and add beauty to the forest ecosystem due to its variously coloured fruiting bodies.

Sites of sample Collection

The site of survey was selected in and around the city of Amravati which is historically and geographically important city in Vidarbha region of Maharashtra state in India. It is well known due to presence of one of the tiger reserve forest which is recognized as Melghat tiger reserve forest The Amravati city is located at 20°56′N 77°45′E / 20.93°N 77.75°E.The climate of the city is tropical wet and hot. The city is having a big and old educational institute named as Government Vidarbha Institute of Science and Humanities The institute constitutes a campus of hundreds of acres of vegetation

forming a mini forest It is rich in biodiversity with lush of greenery with grass, herbs shrubs and trees The warm and moist environmental condition favours the growth of different kinds of lower fungi and higher fungi The higher fungi develop a big coloured fruiting body on the tree trunk The survey of wood degrading fungi was made in the campus of institute and bamboo garden area of the city. The bamboo garden constitutes of large number of species of bamboo collected from different parts of the world and they are adapted to local environment. The bamboo garden is having hundreds of hectares of land area with rich biodiversity The bamboo garden is located in the eastern region of the city.

Identification of fungi

The identification of wood decaying fungi were made with the help of identification key, preserved specimens, characters of fruiting body and comparative study of photographs present in literature, research journals and websites The identification parameters such as colour texture, shape and size of fruiting body were taken into account.

RESULTS AND DISCUSSION

The survey made in the campus of institutes recorded different species of wood decaying fungi. The species of *Ganoderma brownie* was reported maximum(24). The minimum number (09) was reported of *Rhodofomitopsis lilacinogilva* .The *Phellinus pini* was found on the dead log of fallen tree , while the species of *Trametes* was found grown in moist fallen wood Total 10 species were recorded from the campus of institute. (Table 1).

Table 1: The wood rotting fungi reported from campus of Institute.

S.N.	Name of the Fungi	Total number of species found	Group of Fungi	Family of the Fungi
1	*Phellinus pini*	15	Basidiomycota	Hymenochaetaceae
2	*Phellinus igniarius*	18	Basidiomycota	Hymenochaetaceae
3	*Ganoderma lingjhi*	21	Basidiomycota	*Ganoderma*taceae
4	*Ganoderma brownii*	24	Basidiomycota	*Ganoderma*taceae
5	*Rhodofomitopsis lilacinogilva*	09	Basidiomycota	Fomitopsidaceae
6	*Trametes versicolor*	12	Basidiomycota	Polyporaceae
7	*Daedaleopsis tricolor*	16	Basidiomycota	Fomitopsidaceae
8	*Phellinus linteus*	13	Basidiomycota	Hymenochaetaceae
9	*Pycnoporus cinnabarinus*	13	Basidiomycota	Polyporaceae
10	*Trametes aesculi*	18	Basidiomycota	Polyporaceae

In the survey made in Bamboo garden region, The maximum number (17) of *Coprinopsis lagopus* were recorded. The minimum number (07) was noted of the species *Daedalea quercina.* Majority of wood decaying members were found on dead log of wood with few exceptions. In Bamboo garden total four members of wood decaying fungi were reported

Table 2: The wood rotting fungi reported from Bamboo garden area.

S. N.	Name of the Fungus	Total number of fungi	Division	Family
1	*Microporus xanthopus*	10	Basidiomycota	Polyporaceae
2	*Daldinia concentric*	12	Ascomycota	Hypoxylaceae
3	*Daedalea quercina*	07	Basidiomycota	Fomitopsidaceae
4	*Coprinopsis lagopus*	17	Basidiomycota	Psathyrellaceae

Features of wood decaying fungi

1. *Phellinus pini*

It causes red ring rot or white speck disease. It makes decays of tree trunks It attacks both heartwood and sapwood of trees. It produces a fruiting body of basidiocarp. The conks are most apparent signs on infected trees. The tops of conks are reddish brown to blackish with concentric furrows. The under surface and margin of growing conks is a bright, yellowish-brown with large irregular pores.

2. *Phellinus igniarius*

It is commonly known as bracket fungus It causes a white rot disease that leads decay of tree. It affects to the soft wood. It forms woody, hard, hoof or disc-shaped brackets from the bark of tree or dead log. There found small, grayish brown pores to the fruiting body. The fleshy and soft area were found to the body.

3. *Microporus xanthopus*

The fruiting body posse's minute pores. It was reported from rotting wood .It is found common on fallen branches and trees where wood is dead. The mature fruiting body was thin, funnel-shaped caps that are concentrically zoned in various shades of brown and yellow. The attachment disc is often yellow-colored. The lower surface is covered with white to pale brown numerous minute pores.

4. *Ganoderma lingzhi*
It is known as bracket fungus. It possesses and releases minute spores. The pores underside may be white or brown. It was found grown at the base and stumps of trees. It posses distinct red to orange colour .In fresh condition it is soft, cork-like .The underside of fruiting was white or tan or grey .It posses strong and pleasant woodsy scent.

5. *Ganoderma brownii*
It is commonly called as shelf mushrooms or bracket fungi. It may grown solitary or scattered or in small groups on living wood or standing dead hardwood trees, stumps or logs. The fruiting body is large, perennial, woody brackets called as conks .They are leathery .They have double-walled truncate spores with yellow to brown ornamented inner layers. The colour of fruiting body may be dull, brown to grayish brown with lumpy zonate cap.The fruiting bodies grow in a fan-like or hoof-like form on the trunks of living and dead trees.

6. *Rhodofomitopsis lilacinogilva*
It is known as a bracket fungus. It grows on rotting wood. The lilac colour of the underside of fruiting body is distinct. It produces shelf-like fruit bodies attached directly to the substrate. The caps have *concentrica*lly ridged surfaces brown with lilac tints.

7. *Daldinia concentrica*
It is found commonly on dead and decaying wood. The fungus is ball-shaped with hard, friable, shiny black fruiting body. It is commonly known as coal fungus and carbon balls. The flesh of the fungus is purple, brown or silvery-black inside and arranged in concentric layers. The insects make their home inside this fungus.

8. *Daedalea quercina*
The fruiting body of this fungus is sessile and fan-shaped. It is found singly or in groups. The upper surface of the cap may be brown shaded .The pore surface is white to tan in colour. The texture is like cork. The tough flesh is whitish to pale brownish.

9. *Coprinopsis lagopus*
It is a delicate fungus. It appears as a paw of rabbit. The fruiting body is thick with club-shaped or bulbous base. It may grow solitarily or in groups on wood chips or compost heaps and vegetable refuse The colour of the cap surface is pale to dark-brown with silvery grey veil. The shape of the cap may be conical and convex and edges curved upward. The veil is initially whitish, and then turns to a silvery grey or grey-brown and eventually splits up and becoming hairy. The gills are freely attached to the stem, they are very thin and crowded closely together. The colour becomes black at maturity.

10. *Trametes versicolor*
The top surface of the fruiting body shows typical concentric zones of different colors. The flesh is thick and has leathery texture. It grows in groups or rows on logs and stumps of trees. It is stalk less and the cap is rust-brown or darker brown with blackish zones. The cap is flat, often triangular or round with zones of fine hairs. The pore surface is whitish to light brown with pores round and with age twisted.

11. *Daedaleopsis tricolor*
It is a bracket fungus. It is found on living and dead hardwood of trees .It is fan-shaped thin bracket with concentric bands on its upper surface. The fruiting body is many-zoned with reddish fan-like brackets. The gills are white to brown with age.

12. *Phellinus linteus*
The fruiting body is hoof like. The colour is dark brown to black. The upper surface of fruiting body is blackened The basidiocarp is sessile.

13. *Pycnoporus cinnabarinus*
It is found on fallen hardwood logs The fruiting bodies are sessile, corky.

14. *Trametes aesculi*
The fruiting body is tough and fleshy. It causes white rot of the sapwood. It grows alone or in groups on logs and stump of tree The cap of fruiting body is circular, irregularly bracket-shaped or kidney-shaped, flattened-convex near the point of attachment. It have thin margin with concentric zones of texture.

CONCLUSION

The wood rotting fungi are beautiful in appearance due to variation in shape, size, texture and colour. The majority of wood decaying and wood rotting fungi are from the large group of Basidiomycotina with few exceptions of Ascomycotina .These fungi form large fruiting bodies or basidiocarps .The fungal pathogens causes three types of wood rot such as brown rot, soft rot and white rot. The diversity of wood rotting fungi were found in the mini forest region of campus of Institute and Bamboo garden The wood rotting fungi showing their prevalence during the rainy season. The flourished growth of these fungi requires favourable mild temperature and sufficient moisture. The decomposition of wood takes place due to cellulose digestive enzymatic activity. The White rot is fibrous due to presence of intact cellulose in wood. Brown rot is brown because of utilization of carbohydrates and oxidized lignin. The wood shrinks on drying. The rot diseases are characterized by plant decomposition and putrefaction. The decay may be hard, dry, spongy, watery or slimy The Boric acid may be the most effective fungicides in the prevention and treatment of wood rot.

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