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Diversity of Polypores (Basidiomycota: Aphyllophorales) from Kolhapur District (M.S.), India

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ABSTRACT
In continuation of the exploration of the diversity of Aphyllophorales fungi from Kolhapur district,total 35 species of Polypore fungi from 23 different genera belonging to 7 different families of order Aphyllophorales have been identified. All the species are new records for the study area and collected from different localities of Kolhapur district.
Keywords *- Diversity, Enlisting, Ecology, Polypores.*

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INTRODUCTION

Aphyllophorales order was proposed by Rea, after Patouillard, for Basidiomycetes having macroscopic basidiocarps in which the hymenophore is flattened (Thelephoraceae), club-like (Clavariaceae), tooth-like (Hydnaceae) or has the hymenium lining tubes (Polyporaceae) or sometimes on lamellae, the poroid or lamellate hymenophores being tough and not fleshy as in the Agaricales. Anatomically, the hyphal system may be monomitic, dimitic or trimitic [1-2]. Keys to 550 spp. in culture are recognized by Stalper [3]. At present, MycoBank [4] record shows 77 families with over 1800 described species making it one of the largest order in Agaricomycota [5].

A few additions were made by Naik-Vaidya [4] on wood rotting fungi from Karnala and Kankeshwar, Rabba [5] on the genus Phellinus from Maharashtra and Nanda [6] on wood rotting fungi from Bhimashankar. Good amount of contribution was made on resupinate Aphyllophorales by Hakimi [7]. Taxonomy and diversity of Ganoderma from Western Parts of Maharashtra has been studied by Bhosale, et al. [8]. The check list giving complete Aphyllophorales diversity data from Western Ghats of Maharashtra State has been done by Ranadive, et al. [10]. Sizable amount of data on Resupinate Aphyllophorales is yet to publish in the form of Important Resupinate Aphyllophorales from India by Hakimi, et al. The host distribution of Phellinus has been elaborated in the paper entitled "Host Distribution of Phellinus from India [10]." Patil [11] studied Aphyllophorales of Jalgaon district and reported 5 genera and 12 species. Mali and Raibole [12] collected 500 specimens of Aphyllophorales from Parbhani and Nanded districts of Maharashtra. They identified 52 species of Aphyllophorales. Mali and Chouse [13] studied Aphyllophorales from Latur and Osmanabad districts of Maharashtra. Yemul, Kanade and Murumkar [14] studies in Aphyllophorales of Ratnagiri district of Maharashtra and reported 35 species belonging 22 genera of 7 different families. Additions of macrofungi of India, from Kolhapur district have been published by Patil, *et al*., [15].

Study Area

Kolhapur is the extreme southern district of Maharashtra state encompassing an area of about 7685 sq. kms (Banthia, 1995-96) and it is an irregular belt of Deccan plateau lying along east of Sahyadri crest. The district is blessed with hilly terrain which is the main natural feature that includes the main range of Sahyadri running north and south and large spurs stretch north-east and east from Sahyadri and valleys. The wet rugged hilly terrains provide luxuriant suitable forest. The climate of the district is tropical and receive south-west and north-east monsoon. The temperature remains between 21°C to 30°C during the months from June to September, with average relative humidity between 57% to70%. Such conditions provide favorable conditions for nurturing the macrofungi. Total 35 species of polypore fungi collected

from different localities of Kolhapur district during year 2022-2023 have been illustrated and identified with phenetic and micro-taxonomic characters for the first time from the study area.

MATERIAL AND METHODS

Visits were made to the 27 different localities in Kolhapur district during year 2022 - 23. Extensive collection of Aphyllophorales fungi has been done at least 2 to 3 times from the same localities. The specimens were photographed in field with the help of Nikon D-7500 DSLR camera showing all macro-morphological details. Free hand sections of the fruit bodies were taken for primary observations using lacto-glycerin mounts to see the colour of basidiospores, setae and other elements. Sections were also stained in cotton blue Microscopic observations were made using Lawrence and Mayo N-300M research microscope. The specimens were air dried and preserved in polythene bags with field numbers and deposited in the departmental herbarium of Rajaram College, Kolhapur. Specimens were identified by using standard literature mostly published during the last decade.

RESULTS AND DISCUSSION

The present work materially adds to our knowledge of Aphyllophorales, their taxonomic aspects with respect to a total 35 species of Polypore fungi from 23 different genera belonging to 7 different families of order Aphyllophorales. The taxa viz. *Cellulariella acuta,Ceriporia purpurea, Daedale aquercina, D. flavida, Daedaleopsis confragosa, Eariella scabrosa, Flavodon flavus, Favolus grammocephalus, Fuscoporia senex, Ganoderma curtisii, G. lucidum, G. resinaceum, G.tsugae, G. applanatum, G. austral, G. lobatum, Hexagonia tenuis, H. glabra, Irpex lacteus, Lentinus sajor-caju, L.squarrosulus, Microporus xanthopus, M. vernicipes, Perenniporia medulla-panis, Polyporus arcularius, P. tricholoma, Panus velutinus, Tropicoporus tropicalis, Hymenochaete tabacina, Phellinus rickii, P. gilvus, Pycnoporus cinnabarinus, Phanerodontia chrysosporium, Podoscypha petaloides* and *Phlebiopsis crassa* are reported for the first time from the study area. of which, *Ceriporia purpurea, Eariella scabrosa, Favolus grammocephalus, Ganoderma. resinaceum, G.tsugae, G. G. austral, G. lobatum, Polyporus arcularius, Panus velutinus, Tropicoporus tropicalis*, *Pycnoporus cinnabarinus* and *Phlebiopsis crassa* have found to the specific localities and distribution of these species have not found elsewere. However, its clearliy indicate that the diversity of these species is rare and highly localised. The distribution of remaining species is found to be throughout the study area. The family Polyporaceae has the highest number of species (15), followed by Ganodermataceae (7), Hemenochaetaceae (5), Meruliaceae (2), Phanerochaetaceae (2), Fomitopsidaceae (2) and Irpicaceae (2). The genus Ganoderma has the highest representation with 7 species followed by Hexagonia, Lentinus, Microporus, Polyporus, Phellinus and Daedalea with 2 species each and *Flavodon, Podoscypha, Earliella, Deadaliopsis, Perenniporia, Favolus, Pycnoporus, Panus, Cellulariella, Tropicoporus, Fuscoporia, Hymenochaete, Phanerodontia, Phlebiosis, Irpex* and *Ceriporia* with single species each.

CONCLUSION

Kolhapur district has its unique flora of wood rotting fungi, causing decay of live standing trees. During the investigation it was found that many localities were disturbed because of human activities. Hence, there is an urgent need for their enlisting and conservation, both.The present work has great significance in updating the list of wood rotting Aphyllophorales of Kolhapur district and further ecological studies and their status will play an important role in their conservation programs.

Table No.1: The list of collected taxa from the study area during the present work

Genera	Species	Family	Specific localities	Species distribution
Flavodon	*Flavodon flavus (Klotzsch) Ryvarden*	Meruliaceae		1. Rajaram College, Kolhapur 2. Malapude, 3. Padsali 4. Radhanagari 5. Barki 6. Pombare 7. Amba 8. Kolhapur 9. Palasambe, 10. Gaganbawada 11. Ajara 12. Gargoti
Podoscypha	*Podoscypha petalodes (Berk.) Boidin*	Meruliaceae		
Earliella	*Earliella scabrosa (Pers.) Gilb. & Ryvarden*	Polyporaceae	Padsali, Radhanagari	
Daedaleopsis	*Daedaleopsis confragosa (Bolton) J. Schröt.*	Polyporaceae		
Hexagonia	*Hexagonia glabra Lév.*	Polyporaceae		
	Hexagonia tenuis (Fr.) Fr.	Polyporaceae		
Lentinus	*Lentinus sajor-caju (Fr.) Fr.*	Polyporaceae		
	Lentinus squarrosulus Mont.	Polyporaceae		

Microporus	*Microporus xanthopus (Fr.) Kuntze*	Polyporaceae		13. Pal devrai 14. Panhala 15. Shahuwadi 16. Pawankhind 17. Anuskura 18. Karanjphen 19. Pendakhale 20. Gaulwada 21. Kaurwadi 22. Kisarul 23. Nandari dam 24. Bambawade 25. Bajar Bhogaon 26. Shivaji University, Kolhapur 27. Agriculture College, Kolhapur
	Microporus vernicipes (Berk.) Imazeki	Polyporaceae		
Perenniporia	*Perenniporia medulla-panis (Jacq.) Donk*	Polyporaceae		
Favolus	*Favolus grammocephalus (Berk.) Imazeki*	Polyporaceae	Radhanagari, Padsali	
Polyporus	*Polyporus arcularius (Batsch) Fr.*	Polyporaceae	Araja	
	Polyporus tricholoma Mont.	Polyporaceae		
Pycnoporus	*Pycnoporus cinnabarinus (Jacq.) P. Karst.*	Polyporaceae	Radhanagari	
Panus	*Panus velutinus (Fr.) Sacc.*	Polyporaceae	Gaganbawada	
Cellulariella	*Cellulariella acuta (Berk.) Zmitr. & Malysheva*	Polyporaceae		
Tropicoporus	*Tropicoporus tropicalis (M.J. Larsen & Lombard) L.W. Zhou & Y.C. Dai*	Hymenochaetaceae	Padsali	
Fuscoporia	*Fuscoporia senex (Nees & Mont.) Ghob.-Nejh. in Ghobad-Nejhad & Dai*	Hymenochaetaceae		
Hymenochaete	*Hymenochaete tabacina (Sowerby) Lév.*	Hymenochaetaceae		
Phellinus	*Phellinus rickii (Bres.) A. David & Rajchenb*	Hymenochaetaceae		
	Phellinus gilvus (Schwein.) Pat.	Hymenochaetaceae		
Phanerodontia	*Phanerodontia chrysosporium (Burds.) Hjortstam & Ryvarden*	Phanerochaetaceae		
Phlebiopsis	*Phlebiopsis crassa (Lév.) Floudas & Hibbett*	Phanerochaetaceae	Radhanagari	
Daedalea	*Daedalea quercina (L.) Pers.*	Fomitopsidaceae		
	Daedalea lavida Lév.	Fomitopsidaceae		
Ganoderma	*Ganoderma curtisii (Berk.) Murrill*	Ganodermataceae		
	Ganoderma lucidum (Fr.) P. Karst.	Ganodermataceae	Amba. Radhanagari	
	Ganoderma resinaceum Boud.	Ganodermataceae	Rajaram College, Kolhapur	
	Ganoderma tsugae Murrill	Ganodermataceae	Rajaram College, Kolhapur	
	Ganoderma applanatum (Pers. ex. Wallr.) Pat.	Ganodermataceae		
	Ganoderma lobatum (Schwein.) G.F. Atk	Ganodermataceae	Padsali	
	Ganoderma australe (Fr.) Pat	Ganodermataceae	Palsambe	
Irpex	*Irpex lacteus (Fr.) Fr.*	Irpicaceae		
Ceriporia	*Ceriporia purpurea (Fr.) Donk*	Irpicaceae	Rajaram College, Kolhapur	

Table 2: Species wise dominance of Genera

Sr. No.	Name of the Genera	No. of species
1	Flavodon	1
2	Podoscypha	1
3	Earliella	1
4	Daedaleopsis	1
5	Hexagonia	2
6	Lentinus	2
7	Microporus	2

8	Perenniporia	1
9	Favolus	1
10	Polyporus	2
11	Pycnoporus	1
12	Panus	1
13	Cellulariella	1
14	Tropicoporus	1
15	Fuscoporia	1
16	Hymenochaete	1
17	Phellinus	2
18	Phanerodontia	1
19	Phlebiopsis	1
20	Daedalea	2
21	Ganoderma	7
22	Irpex	1
23	Ceriporia	1

Table 3: Species wise dominance of Families

Sr. No.	Name of the Family	No. of species
1	Meruliaceae	2
2	Polyporaceae	15
3	Hymenocheataceae	5
4	Phanerochaetaceae	2
5	Fomitopsidaceae	2
6	Ganodermataceae	7
7	Irpicaceae	2

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