Diversity and Distribution of Wood-Rotting Fungi from Kannad Tehsil Aurangabad District, (M.S.) India

[1]Vijay Udhav Gore, [2]Vasant Pandit Mali

[1]Shiveshwar junior college Takli (A), Taluka Kannad, Dist. Aurangabad (M.S.) India, Pin. 431147
[2]J. Watumull Sadhubella Girls College, Ulhasnagar Dist. Thane (M.S.) India, Pin.421001

***Abstract*-Two hundred and fifty-three fruiting bodies were collected various area of Kannad tehsil Aurangabad district (M.S.) India. Specimens were identified according to morphological and microscopic features, from that first record of forty-three species, belongs to thirty-one genera *Coriolopsis* Murrill, *Datronia* Donk, *Duportella* Pat, *Favolus* Fr, *Flavodon* Ryvarden, *Fomitopsis* P. Karst, *Fuscoporia* Murrill, *Ganoderma* P. Karst, *Gloeoporus* Mont, *Gyrodontium* Pat, *Inonotus* P. Karst, *Lopharia* Kalchbr. & MacOwan, *Macrocybe* Pegler & Lodge, *Navisporus* Ryvarden, *Phanerochaete* P. Karst, *Phellinus* Quél, *Phlebiopsis* Jülich, *Pleurocybella* Singer, *Pleurotus* (Fr.) P. Kumm, *Pluteus* Fr, *Podoscypha* Pat, *Psathyrella* (Fr.) Quél, *Serpula* (Pers.) Grey, *Tomophagus* Murrill, *Trametes* Fr, *Truncospora* Pilát, *Auricularia* Bull, *Exidia* Fr, *Heterochaete* Pat, *Daldinia* Ces. & de Not, *Xylaria* Hill ex Schrank and fifteen families Auriculariaceae, Callistosporiaceae, Coniophoraceae, Hymenochaetaceae, Hymenogastraceae, Hypoxylaceae, Irpicaceae, Peniophoraceae, Phanerochaetaceae, Pleurotaceae, Pluteaceae, Podoscyphaceae, Polyporaceae, Serpulaceae, and Xylariaceae.**

***Keywords*-Fruit bodies, Kannad, Morphological, Microscopic, Specimens.**

INTRODUCTION:

Wood-rotting fungi are important component and play a major role in ecosystem functions such as litter decomposition, nutrient cycle and nutrient transport. Most fungi are saprobes occurs on living trees, decaying wood, litter and among other. Saprophytic members constitute major recycler of nutrients and know to break down lignin and cellulose in wood. Wood rot is categories into two main groups white rot and brown rot. White rot degrade lignin, while brown rot degrade cellulose and hemicellulose. Hyphae of the white rot fungi are concentrated in the ray cells and vessels although, other cells are invaded very earlier in decay, initially invade other cells from ray cells and vessels via pits or directly by penetration of cell wall (Wilcox, 1970; Liese, 1970). Brown rot fungi utilize the cell wall's hemicellulose and cellulose, leaving lignin essentially undigested, but slightly modified (Kirk,1975; kirk & Alder 1970).The first Indian record traced back to the work of (Klotzsch, 1832) in his paper on Indian Polyporaceae. While undertaking the review of literature on wood-decaying fungi of Maharashtra, I came to know that the Western part of Maharashtra focusing mainly on Western Ghats regions is comparatively well documented. This is because (Blatter, 1911) provided a list of Indian fungi, with the description of two new species. (Sathe & Rahalkar 1975) and (Sathe & Sasangan, 1977), (Sathe & Deshpande, 1980), did limited taxonomic studies of agaricoid wood-decaying fungi of Maharashtra State. Checklist of Aphyllophorales from the western ghat of Maharashtra state reported 256 species of aphyllophoraceous fungi included 170 species from 10 poroid families and 86 species from 20 non-poriod families (Ranadive et al, 2011). Fourteen species of wood-decaying fungi from Mantha (Kakde & Gaikwad, 2014). Eleven species of wood-rotting fungi were reported from Gautala Autram Ghat Sanctuary, Maharashtra (Gore & Mali, 2021).

MATERIALS AND METHODS:

Survey and collection of wood rotting fungi were done 15 to 20 days after heavy rainfall month of July to November from year (2014-2019) from various region of Kannad teshil. The fruiting body of fungi is first photographed at the site then noted down morphological features by using a hand lens (20 X) dimension, color, shape, consistency, upper sterile surface, lower fertile surface, margin, context, tubes, and pores per mm in the field book and then specimens are sun-dried. Microscopic observations were done by taking freehand thin section cutting of fruiting bodies with the help of sharp razor blades, stained and studied in 10 % KOH, Lactophenol, and Melzer's reagent under 40X and 100X Magnification (Olympus CX 41) in laboratory. Then specimens of macro-fungi were kept in brown paper packets as per international mycological herbarium guidelines according to date of collection, locality, host name, altitude, latitude, longitude, and classification of species. Naphthalene balls were placed in each herbarium packet to avoid insect attack.

RESULTS & DISCUSSION:

Total forty- three species of wood rotting fungi (Table-1) were recorded during present study. All these species have been recorded first time from Kannad tehsil of Aurangabad district, Maharashtra state.

Table-1: Diversity and Distribution of Wood-rotting Fungi

Sr. no	Family	Species	Host	Date & Locality	Altitude	Latitude& Longitude	Collection Number
01	Auriculariaceae	*Auricularia*	*Albizia lebbeck* (	08/08/16	630m	20˚21′03″N	VUG/VPM-

		mesenterica (Dicks.)Pers.	L.) Benth.	Digoan		75˚26′58″E	247
		Auricularia nigricans (Sw.) Birkebak, Looney & Sánchez-García,	*Azadirachta indica* A.Juss.	29/07/16 Chincholi (li),	652m	20˚22′57″N 75˚22′19″E	VUG/VPM-206
		Exidia recisa (Ditmar) Fr.	*Acacia nilotica* (L.) Delile	26/09/16 Aadgoan	640m	20˚19′35″N 75˚26′51″E	VUG/VPM-410
		Heterochaete delicata Bres.	*Mangifera indica* L.	29/07/16 Chincholi (li),	649m	20˚22′52″N 75˚22′29″E	VUG/VPM-207
02	Callistosporiaceae	*Macrocybe gigantea* (Massee) Pegler & Lodge	*Delonix regia* (Hook.) Raf.	27/09/16 Palshi	691m	20˚18′26″N 75˚17′28″E	VUG/VPM-430
03	Coniophoraceae	*Gyrodontium sacchari* (Spreng.) Hjortstam	*Pithecellobium dulce* (Roxb.) Benth	28/9/19 Satkundtanda,	663m	20˚19′14″N 75˚4′15″E	VUG/VPM-719
04	Hymenochaetaceae	*Fomitiporia* sp.1	*Mangifera indica* L.	23/10/16 Hasta,	733m	20˚17′08″N 75˚14′41″E	VUG/VPM-665
		Fuscoporia rhabarbarina (Berk.)	*Terminalia bellirica* (Gaertn.)Roxb.	10/08/14 Hasta,	729m	20˚17′09″N 75˚14′51″E	VUG/VPM-02
		Fuscoporia senex (Nees & Mont.) Ghob.-Nejh.	*Azadirachta indica* A.Juss.	14/09/14 Nevpur	664m	20˚22′44″N 75˚18′54″E	VUG/VPM-133
		Inonotus rickii (Pat.) D.A. Reid	*Senna siamea* (Lam.) H.S.Irwin & Barneby	29/07/16 Barkatpur	639m	20˚22′29″N 75˚23′27″E	VUG/VPM-211
		Phellinus gilvus (Schwein.) Pat.	*Acacia nilotica* (L.) Delile	14/09/14 Puranwadi	711m	20˚22′00″N 75˚11′28″E	VUG/VPM-143
		Phellinus mori Y.C. Dai & B.K.Cui	*Leucaena leucocephala* (Lam.) de Wit	23/10/16 Kannad	638m	20˚13′56″N 75˚07′50″E	VUG/VPM-675
05	Hymenogastraceae	*Gymnopilus pampeanus* (Speg.)Singer	*Mangifera indica* L.	08/10/16 Shelgaon	646m	20˚20′25″N 75˚25′31″E	VUG/VPM-521
		Gymnopilus purpureosquamulosus Høil.	*Zizyphus mauritiana* Lam.	02/09/16 Takli (A),	654m	20˚24′28″N 75˚22′24″E	VUG/VPM-326
06	Hypoxylaceae	*Daldinia concentrica* (Bolton)Ces. & De Not.	*Peltophorum pterocarpum* (DC.) K.Heyne	27/09/16 Palshi,	697m	20˚18′30″N 75˚17′14″E	VUG/VPM-428
07	Irpicaceae	*Flavodon flavus* (Klotzsch) Ryvarden	*Mangifera indica* L.	14/09/14 Puranwadi	711m	20˚22′00″N 75˚11′28″E	VUG/VPM-141
08	Peniophoraceae	*Duportella tristicula* (Berk. & Broome) Reinking	*Ricinus communis* L.	08/10/16 Shelgaon	646m	20˚20′31″N 75˚25′32″E	VUG/VPM-520
09	Phanerochaetaceae	*Lopharia cinerascens* (Schwein.) G. Cunn.	*Azadirachta indica* A.Juss.	23/10/16 Kannad	638m	20˚13′56″N 75˚07′50″E	VUG/VPM-679
		Phanerochaete sordida (P. Karst.) J. Erikss. & Ryvarden	*Zizyphus mauritiana* Lam.	23/10/16 Sakharvel,	715m	20˚19′30″N 75˚17′04″E	VUG/VPM-651

		Phlebiopsis crassa (Lév.) Floudas& Hibbett	*Acacia nilotica* (L.) Delile	02/09/16 Vakod	640m	20˚22′12″N 75˚24′07″E	VUG/VPM-329
		Phlebiopsis flavidoalba (Cooke)Hjortstam	*Zizyphus mauriti ana* Lam.	27/09/16 Khatkheda	720m	20˚19′10″N 75˚16′59″E	VUG/VPM-423
10	Pleurotaceae	*Pleurotus djamor* (Rumph. ex Fr.) Boedijn	*Mangifera indica* L.	10/09/14 Chincholi (li),	652m	20˚22′56″N 75˚22′18″E	VUG/VPM-105
		Pleurotus dryinus (Pers) P. Kumm.	*Mangifera indica* L	21/09/14 Wadichimnapur	655m	20˚22′59″N 75˚19′50″E	VUG/VPM-151
		Pleurotus ostreatus (Jacq.) P. Kumm.	*Mangifera indica* L	23/10/16 Wasadi,	703m	20˚18′26″N 75˚16′32″E	VUG/VPM-654
11	Pluteaceae	*Pluteus cervinus* (Schaeff.) P.Kumm.	*Acacia nilotica* (L.) Delile	03/10/16 Digoan	648m	20˚21′10″N 75˚26′34″E	VUG/VPM-448
12	Podoscyphaceae	*Podoscypha petalodes* (Berk.) Boidin	*Acacia nilotica* (L.) Delile	14/09/14 Chimnapur phata	683m	20˚23′39″N 75˚14′53″E	VUG/VPM-138
		Podoscypha sp1	*Albizia lebbeck* (L.) Benth.	28/9/19 Kannad	629m	20˚15′51″N 75˚08′47″E	VUG/VPM-722
13	Polyporaceae	*Coriolopsis brunneoleuca* (Berk.)Ryvarden	*Delonix regia* (Hook.) Raf.	27/09/16 Palshi,	691m	20˚18′26″N 75˚17′28″E	VUG/VPM-630
		Coriolopsis occidentalis (Klotzsch)Murrill	*Abelmoschus esculentus* (L.) Moench	10/09/14 Chincholi (li),	652m	20˚22′57″N 75˚22′18″E	VUG/VPM-107
		Coriolopsis telfairii (Klotzsch) Ryvarden	*Leucaena leucocephala* (Lam.) de Wit	20/10/16 Mohada	673m	20˚18′20″N 75˚23′59″E	VUG/VPM-629
		Datronia sp.1	*Albizia lebbeck* (L.) Benth.	06/08/16 Takli(A),	650m	20˚24′31″N 75˚22′33″E	VUG/VPM-239
		Favolus grammocephalus (Berk.)Imazeki	*Zizyphus mauriti ana* Lam.	21/09/14 Nagad	331m	20˚27′11″N 75˚10′16″E	VUG/VPM-165
		Favolus roseus Lloyd	*Mangifera indica* L	17/08/14 Puranwadi	718m	20˚22′02″N 75˚11′47″E	VUG/VPM-26
		Ganoderma chalceum (Cooke) Steyaert	*Pithecellobium dulce* (Roxb.) Benth.	02/10/14 Satkund	663m	20˚19′14″N 75˚4′15″E	VUG/VPM-191
		Ganoderma mediosinense J.D. Zhao	*Senna siamea* (Lam.) H.S.Irwin & Barneby	02/09/16 Vakod,	640m	20˚22′12″N 75˚24′07″E	VUG/VPM-331

		Gloeoporus sp.1	*Mangifera indica* L.	22/08/14 Chincholi (li),	652m	20˚22′51″N 75˚22′29″E	VUG/VPM-52
		Navisporus floccosus (Bres.) Ryvarden	*Senna siamea* (Lam.) H.S.Irwin & Barneby	19/10/16 Vakodphata	641m	20˚22′05″N 75˚24′20″E	VUG/VPM-600
		Trametes cingulata Berk.	*Acacia nilotica* (L.) Delile	29/09/14 Chincholi (li),	651m	20˚24′08″N 75˚22′13″E	VUG/VPM-185
		Trametes orientalis (Yasuda)Imazeki	*Acacia nilotica* (L.) Delile	10/11/19 Nagapur	675m	20˚23′01″N 75˚15′48″E	VUG/VPM-789
		Truncospora tephropora (Mont.)Zmitr	*Eucalyptus obliqua* L'Hér.	08/08/16 Takli(A),	646m	20˚24′25″N 75˚22′26″E	VUG/VPM-242
		Tomophagus colossus (Fr.) Murrill	*Acacia nilotica* (L.) Delile	28/9/19 Satkund	667m	20˚18′14″N 75˚05′02″E	VUG/VPM-721
14	Serpulaceae	*Serpula similis* (Berk. & Broome) Ginns	*Delonix regia* (Hook.) Raf.	21/09/14 Nagad,	334m	20˚27′04″N 75˚10′13″E	VUG/VPM-173
15	Xylariaceae	*Xylaria symploci* A. Pande, Waing., Punekar & Ranadive	*Acacia nilotica* (L.) Delile	26/09/16 Aadgoan	640m	20˚19′35″N 75˚26′51″E	VUG/VPM-409

CONCLUSION:

Macrofungi from Kannad tehsil of Aurangabad district first record of forty-three species belonging to fifteen families, and thirty-one genera. Phylum Ascomycota poorly reported belonging to single family, genus and species. Phylum Basidiomycota belongs to fourteen families, twenty-nine genera and fourty-two species grows on fifteen host.

REFERENCES:

1. Blatter, E. A list of Indian fungi, chiefly of the Bombay Presidency, with thedescription of two new species. *J. Bombay Nat. Hist. Soc.* 21: 146–152, 1911.
2. Kakde R.B, Gaikwad R.S. Diversity of Wood Decaying Fungi at Mantha, Jalna (MS) India. Bioscience Discovery, 5(2):230-236, 2014.
3. Kirk, T.K. & E. Alder Methoxyl-deficient structural elements in lignin of Sweetgum decayed by a brown rot fungus. *Acta. Chem. Scand.* 24: 3379-3390, 1970.
4. Kirk, T.K. Effects of a brown rot fungus *Lenzites trabea* on lignin in spruce wood. *Holzforschung* 29: 99-107, 1975.
5. Liese, W. Ultrastructural aspects of woody tissue disintegration. Ann. Rev. Phytopath. 8: 231-258, 1970.
6. Klotzsch, J.F. Mycologische Berichti-gungen. *Linnaea*. 7:193–204, 1832.
7. Ranadive, K.R. Checklist of Aphyllophorales from the Western Ghats of Maharashtra State, India. *Mycosphere* 2(2): 91–114, 2011.
8. Sathe, A.V. and Deshpande, S. Agaricales (Mushrooms) of Maharashtra State.In: Agaricales (Mushrooms) of South West India. Maharashtra Association for the Cultivation of Science, Agharkar Research Institute, Pune 9–42, 1980.
9. Sathe, A.V. and Rahalkar, S.R. Agaricales from South West India-I. Biovigyanam 1(1): 75–78, 1975.
10. Sathe, A.V. and Sasangan, K.C. Agaricales from South West India-III. Biovigyanam 3(1): 119–121, 1977.
11. Wilcox, W.W. Anatomical changes in wood cell walls attacked by fungi and bacteria. Bot. Rev. 36:128. 1970.