JETIR.ORG | ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

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

Vijay Udhav Gore[1]* & Vasant Pandit Mali[2]

[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:

Ninety-three fruiting bodies of wood-rotting fungi were collected from various area of Jalna District, belongs to eight tehsil, (M.S.) India. Specimens were identified according to morphological and microscopic characters, from that thirty-one species are new recorded to Jalna District, belongs to twenty-three genera and eleven families. Most dominating family was observed Polyporaceae (Ten genera) and genus were observed *Auricularia* and *Phellinus* (Three species each).

KEYWORDS: *Auricularia*, Fruiting bodies, Jalna, Morphological, Microscopic, *Phellinus*.

INTRODUCTION:

Jalna district is situated at the Marathwada region of Maharashtra state, located between 19.01' N to 21.03'N and from 75.04'E to 76.04'E. Belongs to eight tehsil Bhokardan, Jafrabad, Jalna, Badnapur, Ambad, Ghansawangi, Partur, and Mantha. From these study area wood-rotting fungi were collected. Wood-rotting fungi are important component and play a major role in ecosystem functions such as natural recycler i.e. litter decomposition, nutrient cycle and nutrient transport. Most fungi are parasite or saprobes occurs on living trees, decaying wood, litter and among other. Such type of macro-fungi 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. Woody products and slash, there is strong tendency for softwood to be decay by brown rot and hardwood decay by white rot fungi (Scheffer, 1964). 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 (Liese, 1970; Wilcox, 1970). Brown rot fungi utilize the cell wall's hemicellulose and cellulose, leaving lignin essentially undigested, but slightly modified (kirk & Alder 1970; Kirk, 1975). The first Indian record traced back to the work on his paper on Indian Polyporaceae (Klotzsch, 1832). While undertaking the review of literature on wood-rotting fungi of Maharashtra, I came to know that the Western part of Maharashtra focusing mainly on Western Ghats regions is comparatively well documented. These is because (Blatter, 1911) provided a list of Indian fungi, with the description of two new species. (Sathe and Rahalkar 1975), (Sathe and Sasangan, 1977), and (Sathe and 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 collected from 629 specimens of aphyllophoraceous fungi included 170 species from 10 poroid families and 86 species from 20 non-poriod families (Ranadive et al, 2011). 14 genera and 14 species of wood-decaying fungi were reported from Mantha (Kakde and Gaikwad, 2014). 14

genera and 15 species of wood decaying fungi reported from Dr. Babasaheb Ambedkar Marathwada University, Aurangabad Campus, Maharashtra (Gore and Mali, 2021). 11 genera and 11 species were reported from Gautala Autram Ghat Sanctuary, Maharashtra (Gore and Mali, 2021). 5 species of genus *Xylaria* reported from Aurangabad District of Maharashtra (Gore and Mali, 2022). Recently from collected 93 specimens, 27 species were identified followed by 22 genera and 14 families from Soygaon Tehsil Aurangabad district (M.S.) India (Gore and Mali, 2023).

MATERIALS AND METHODS:

Collection of wood rotting fungi were done 20 to 25 days after heavy rainfall month of July to November from year (2021-2022), from various region of Jalna District. The fruiting body of fungi is first photographed then noted down macro-morphological features by using a hand lens (20 X) color, shape, dimension, consistency, sterile surface, fertile surface, pore per mm. Microscopic observations were done by taking freehand thin section cutting of fruiting bodies with the help of sharp razor blades, stained and studied in 5 % KOH, Lactophenol, and Melzer's reagent under 40X and 100X Magnification (Olympus CX 41) in laboratory.

RESULTS AND DISCUSSION:

In present study 31 species of wood rotting fungi were identified from various regions of Jalna District, Maharashtra state. Followed by 23 genera and 11 families. Have been summarized (Table 1).

Table 1:- Diversity and distribution of Wood-rotting Fungi with host susceptible from Jalna District

Sr. no	Scientific name	Family	Host	Thallus Dimension	Spore Dimension	Date & Locality	Latitude & Longitude
Ascomycota							
01	*Hypoxylon haematostroma* Mont.	Hypoxylaceae	*Peltophorum pterocarpum* (DC.) K.Heyne	Annual, resupinate or crust like, 0.5–6.2 × 0.4–3.9 × 0.1–0.3 cm, fertile surface minutely papillate, cinnabar red.	Spore 15–18 × 5.5–8.5 µm, elliptic-fusiform.	19/09/2021 Saklecha nagar, Jalna, Tq. Jalna	19°51'04" N 75°52'53" E
02	*Hypoxylon rubiginosum* (Pers.) Fr.	Hypoxylaceae	*Acacia nilotica* (L.) Delile	Annual to perennial, crust like, 1–17 × 1.8–5.5 × 0.1–0.4 cm, fertile surface papillate, rusty brown.	Spore 11–15 × 5–6 µm, ellipsoid-in-equilateral.	23/10/2022 Old MIDC, Jalna, Tq. Jalna	19°51'40" N 75°54'12" E
03	*Xylaria feejeensis* (Berk.) Fr.	Xylariaceae	*Senna siamea* (Lam.) H.S.Irwin & Barneby	Annual, upright, in groups, 14.5 cm high, corky, fertile surface 2.4–14.5 × 0.1– 0.3 cm, clavate, stalk cylindrical	Spores 9.8–16.5 × 3.5–6 µm, ellipsoid to equilateral	29/09/2021 Parner, Tq. Ambad.	19°38'57" N 75°47'07" E
04	*Xylaria multiplex* (Kunze) Fr.	Xylariaceae	*Acacia nilotica* (L.) Delile	Annual, in groups, stalked, small, brittle, fertile surface 2.4–3.9 × 0.1– 0.3 cm, clavate, stalk short, cylindrical.	Spores 9–10.5 × 4–6 µm, Ellipsoid to equilateral.	02/10/2022 Hatdi, Tq. Partur	19°31'19" N 76°10'15" E
05	*Xylaria polymorpha* (Pers.) Grev.	Xylariaceae	*Senna siamea* (Lam.) H.S.Irwin & Barneby	Annual, 1.6–6.3 × 1.4–3.2 cm, Sub-stalked to sessile, clavate to cylindrical, fertile surface papillate with black.	Spores 10–15 × 4–5 µm, fusiform.	09/10/2022 Antarwala, Tq. Jalna	19°46'16" N 75°51'11" E

Basidiomycota							
06	*Leucocoprinus cepistipes* (Sowerby) Pat.	Agaricaceae	*Mangifera indica* L	Annual, cap 1.7–4.4 cm in diameter, gills free 14–18 per cm, stalk 3.5–8.6 × 0.5–1.2 cm, annulus present.	Spores 7.5–10 × 5–7 µm, ovoid.	08/08/2021 Malkheda, Tq. Bhokardhan	20°16'34" N 75°41'56" E
07	*Auricularia auricula-judae* (Bull.) Quél.	Auriculariaceae	*Senna siamea* (Lam.) H.S.Irwin & Barneby	Annual, pileate, 1.5–4.3 × 1.4–4.1 × 0.2–0.4 cm, ear like, fertile surface smooth, sulcate to vein like.	Spores 14–21 × 4.5–6.5 µm, allantoid.	02/10/2022 Partur, Tq. Partur	19°35'28" N 76°12'59" E
08	*Auricularia mesenterica* (Dicks.) Pers.	Auriculariaceae	*Peltophorum pterocarpum* (DC.) K.Heyne	Annual, resupinate to effuse-reflexed, 0.5–9.1 × 0.5–8.1 cm, up to 0.3 cm thick, moist dependent, fertile surface smooth to slightly wrinkled.	Spores 8–13 × 5.5–6.5 µm, ovoid to reniform.	22/08/2021 Viragaon, Tq. Bhokardhan	20°15'52" N 75°48'12" E
09	*Auricularia nigricans* (Sw.) Birkebak, Looney & Sánchez-García,	Auriculariaceae	*Mangifera indica* L	Annual, pileate, 0.5–3.8 × 0.5–2.7 cm, up to 0.4 cm thick, ear likemoist dependent, fertile surface smooth.	Spores 14–16.5 × 5.5–7.5 µm, allantoid.	23/10/2022 Kankeshwar mandir, Jalna, Tq. Jalna	19°51'59" N 75°55'36" E
10	*Exidia recisa* (Ditmar) Fr.	Auriculariaceae	*Acacia nilotica* (L.) Delile	Annual, glubose, 0.5–3.8 × 0.4–3.1 × 0.5–2.1 cm, annual, moist dependent, lobed mass irregularly folded to form brain like structure, Fertile surface smooth.	Spores 13.5–14.5 × 3.5–4 µm, allantoid.	30/10/2022 Mantha, Tq. Mantha	19°39'02" N 76°22'58" E
11	*Amylosporus campbellii* (Berk.) Ryvarden	Bondarzewiaceae	*Leucaena leucocephala* (Lam.) de Wit	Annual, pileate, 11.4 × 9.2 cm, up to 1.2 cm thick at base, pores round to sub-angular 4–5 per mm.	Spores 4–4.5 × 2.5–3.5 µm, ovoid to ellipsoid,	22/08/2021 Sipora, Tq. Jaffrabad	20°15'35" N 75°51'08" E
12	*Fomitopsis* sp.1	Fomidopsidaceae	*Acacia nilotica* (L.) Delile	Annual, pileate, 3.8–6.3 × 2.1–4.1 × 0.5–2.1 cm, pores round to angular, 5–7 per mm.	Spores 6–7 × 3.5–4 µm, allantoid,	29/09/2021 Parner, Tq. Ambad.	19°38'46" N 75°46'58" E
13	*Fuscoporia senex* (Nees & Mont.) Ghob.-Nejh.	Hymenochaetaceae	*Acacia nilotica* (L.) Delile	Annual to perennial, effuse-reflexed to pileate, 5.4 × 1.9 × 1.2 cm, pores round, 8-10 per mm.	Spores 4–4.9 × 3.2–4 µm, broadly ellipsoid to subglobose.	02/10/2022 Hatdi, Tq. Partur	19°31'19" N 76°10'16" E
14	*Inonotus cuticularis* (Bull.) P.Karst	Hymenochaetaceae	*Ficus benghalensis* L	Annual, pileate, 5.7-9.2 × 4.3-7.1 × 1.7 cm, pores angular, 2–4 per mm.	Spores6.5–8 × 5.5–6 µm, ellipsoid to ovoid.	22/08/2021 Viragaon, Tq. Bhokardhan	20°15'52" N 75°48'12" E
15	*Inonotus rickii* (Pat.) D.A. Reid	Hymenochaetaceae	*Peltophorum pterocarpum* (DC.) K.Heyne.	Annual, globular to ellipsoidal, 11.2 × 9.6 × 9.7 cm.	Spores 8–22 × 7–14 µm, globose, ellipsoid.	19/09/2021 Jalna, Tq. Jalna	19°52'03" N 75°52'20" E
16	*Phellinus badius* (Cooke) G. Cunn.	Hymenochaetaceae	*Acacia nilotica* (L.) Delile	Perennial, 10.2 × 5.9 × 3.8 cm, pore round, regular 4–5 per	Spores 6.5–7.5 × 6–6.5 µm,	08/08/2021 Malkheda, Tq.	20°16'18" N

				mm.	ellipsoid to sub-globose.	Bhokardhan	75°41'53" E
17	*Phellinus gilvus* (Schwein.) Pat.	Hymenochaetaceae	*Azadirachta indica* A.Juss.	Annual to perennial, effused-reflexed to pileate, 1.7-5.2 × 1.3-3.1 × 1.7 cm, pores round, 4–6 per mm.	Spores4.5–6 × 2.5–3.5 µm, ellipsoid to ovoid.	29/09/2021 Ambad, Tq. Ambad.	19°37'28" N 75°48'25" E
18	*Phellinus igniarius* (L.) Quel.	Hymenochaetaceae	*Senna siamea* (Lam.) H.S.Irwin & Barneby	Perennial, 8.2 × 3.9 × 3.1 cm, pore round, regular 5–6 per mm.	Spores 5–7 × 4–6 µm, ovoid to subglobose	29/09/2021 Ambad, Tq Ambad	19°36'20" N 75°47'35" E
19	*Gymnopilus purpureosquamulosus* Høil.	Hymenogastraceae	*Mangifera indica* L	Annual, cap 2.5–6.2 cm in diameter, Stalk 4.2–6.1 × 0.5–0.9 cm, Gills free, 15–18 per cm.	Spores 7.5–9.5 × 4–6 µm, ellipsoid,	30/10/2022 Mantha, Tq. Mantha	19°39'02" N 76°22'58" E
20	*Scytinostroma duriusculum* (Berk. & Broome) Donk	Lachnocladiaceae	*Butea monosperma* (Lam.) Taub.	Anuual, resupinate, 3.8–16.2 × 2.7–10.7 cm, up to 0.05 cm thick, fertile surface smooth,when touched gives hair-like or velvety sensation.	Spores 5–7 × 4.5–7 µm, globose to subglobose.	29/09/2021 Ambad, Tq Ambad	19°36'20" N 75°47'35" E
21	*Podoscypha petalodes* (Berk.) Boidin	Podoscyphaceae	*Senna siamea* (Lam.) H.S.Irwin & Barneby	Annual, 3.5–7 cm high, 1.6–5.2 × 1.2–3.1 cm in diameter, up to 0.2 cm thick, fertile surface smooth, Stalk 2.1–4.4 × 0.2–0.4 cm.	Spores 2.5–4 × 1.5–3 µm, broadly ellipsoid	29/09/2021 Lalwadi, Tq Ambad	19°39'36" N 75°48'24" E
22	*Cellulariella acuta* (Berk.) Zmitr. &Malysheva	Polyporaceae	*Acacia nilotica* (L.) Delile	Annual, pileate, 14.4 × 8.7 × 2.6 cm thick near base, pores, maize like to lamelloid 1– 4 mm wide.	Spores 6–7.5 × 2–3 µm, cylindrical.	02/10/2022 Hatdi, Tq. Partur	19°31'18" N 76°10'15" E
23	*Coriolopsis brunneoleuca* (Berk.) Ryvarden	Polyporaceae	*Ficus amplissima* S m.	Annual, effused reflexed to pileate, 25.2 × 17.2 × 0.3 cm, pores round to angular, 2–3 per mm.	Spores 8.5–12 × 2.5–4 µm, cylindrical.	22/08/2021 Harpala, Tq. Jaffrabad.	20°13'58" N 75°59'22" E
24	*Earliella scabrosa* (Pers.) Gilb. &Ryvarden	Polyporaceae	*Leucaena leucocephala* (Lam.) de Wit	Annual, effused reflexed to pileate, 17.9 9.4 × 0.2–0.6 cm, pores 1–3 per mm angular to iripicoid.	Spores 7–9 × 3–4 µm, cylindrical to oblong ellipsoid.	05/09/2021 Swanghi, Tq. Jaffrabad	20°11'02" N 76°00'08" E
25	*Funalia leonina* (Klotzsch) Pat.	Polyporaceae	*Mangifera indica* L	Annual, pileate, 5.3 × 4.7 × 2.3 cm, pores 1–2 per mm, angular to iripicoid.	Spores 11–14.5 × 3.5–5 µm, cylindrical.	18/09/2022 Badnapur, Tq. Badnapur	19°52'01" N 75°43'54" E
26	*Ganoderma australe* (Fr.) Pat.	Polyporaceae	*Azadirachta indica* A.Juss.	Annual to perennial, pileate, 20.4 × 11.2 × 5.3 cm, pores, round, regular, 3–5 per mm.	Spores 7–13 × 5–8.5 µm, ovoid to broadly ellipsoid	08/08/2021 Nasirabad, Tq. Bhokardhan	20°16'19" N 75°44'18" E
27	*Lentinus sajor-caju* (Fr.) Fr.	Polyporaceae	*Butea monosperma* (Lam.) Taub.	Annual, cap 4.1–6.3 cm in diameter, gills decurrent, 9–12 per cm, stalk 3.9–7.4 × 0.7–1.4 cm, central.	Spores 4–8 × 1.5–2.3 µm, cylindrical.	05/09/2021 Gondhankheda, Tq. Jafrabad	20°10'59" N 76°00'38" E
28	*Navisporus floccosus*	Polyporaceae	*Cordia dichotoma*	Annual, pileate, 15.9 × 11.2 × 8.7 cm, pores	Spores 8–11 × 5–	29/09/2021 Ambad, Tq	19°36'20" N

	(Bres.) Ryvarden		G.Forst.	round, 2–3 per mm.	5.5µm ellipsoid to navicular.	Ambad	75°47'35" E
29	*Pseudofavolus tenuis* (Fr.) G. Cunn.	Polyporaceae	*Peltophorum pterocarpum* (DC.) K.Heyne	Annual, effused-reflexed to pileate, 1.2–5.4 × 0.8–3.6 × 0.1–0.3 cm, pores 1–2 per mm wide, angular to hexagonal.	Spores 8.8–14.7 × 2.9–4.4 µm, cylindrical	05/09/2021 Borkheda Tq. Jafrabad	20°14'23" N 75°54'30" E
30	*Trametes cingulata* Berk.	Polyporaceae	*Acacia nilotica* (L.) Delile	Annual, pileate, 3.2–6.8 × 1.4–4.5 × 1.2 cm,pores, 3–6 per mm round.	Spores 4–5 × 3–3.5µm, broadly ellipsoid	16/10/2022 Indewadi, Tq. Jalna	19°48'18" N 75°51'41" E
31	*Truncospora tephropora* (Mont.) Zmitr.	Polyporaceae	*Eucalyptus obliqua*L'Hér	Perennial, crust-like, 4.6 – 27.2 × 2.9 – 7.3 cm up to 1.8 cm, pores 4–6 per mm, round, regular, decurrent toward margin.	Spores 4.5–6 × 3.5–4.5 µm, broadly ellipsoid.	22/08/2021 Borgaon, Tq. Bhokardhan	20°16'29" N 75°51'49" E

CONCLUSION:

93 fruiting bodies were collected from various area of Jalna District, belongs to eight tehsil, Bhokardan, Jafrabad, Jalna, Badnapur, Ambad, Ghansawangi, Partur, and Mantha. (M.S.) India. In present study, wood rotting fungi is categories into two Phyla Ascomycota and Basidiomycota. Ascomycota belongs to 2 families, 2 genera and 5 species and Basidiomycota belongs to 9 families, 21 genera and 26 species, from above observation it is concluded that Phyla Ascomycota is poorly known from study area. Most dominant family were observed Polyporaceae (10 species) and genus were observed *Auricularia* and *Phellinus* (3 species each). All these 31 species wood rotting fungi first time reported from study area and occurs on 11 different host *Acacia nilotica, Azadirachta indica, Butea monosperma, Cordia dichotoma, Eucalyptus obliqua, Ficus amplissima, Ficus benghalensis, Leucaena leucocephala, Mangifera indica, Peltophorum pterocarpum,* and *Senna siamea*.

REFERENCES:

1. Blatter, E. A (1911). List of Indian fungi, chiefly of the Bombay Presidency, with the description of two new species. J. Bombay Nat. Hist. Soc. 21: 146–152.
2. Gore VU and Mali VP. (2021). Babasaheb Ambedkar Marathwada University Aurangabad Campus, Maharashtra (India). Academicia: an international multidisciplinary research journal. 11(6): pp 40-49.
3. Gore VU and Mali VP. (2021). Some Wood-Rotting Fungi from Gautala Autram Ghat Sanctuary, Maharashtra (India). Bioinfolet. 18(3): pp 398-403.
4. Gore VU and Mali VP. (2022). Taxonomy and Diversity of Genus Xylaria from Aurangabad District, (Maharashtra) India. International Journal of Scientific Research in Science and Technology. 9(9): pp 141-144.
5. Gore VU and Mali VP. (2023). Wood Decaying Fungi from Soygaon Tehsil District Aurangabad (M.S.) India. Plant Archives. 23(2): pp 351-356
6. Kakde R.B, Gaikwad R.S. (2014). Diversity of Wood Decaying Fungi at Mantha, Jalna (MS) India. Bioscience Discovery, 5(2): pp 230-236.
7. Kirk, T.K. & E. Alder (1970). Methoxyl-deficient structural elements in lignin of Sweetgum decayed by a brown rot fungus. Acta. Chem. Scand. 24: pp 3379-3390.
8. Kirk, T.K. (1975). Effects of a brown rot fungus Lenzites trabea on lignin in spruce wood. Holzforschung 29: pp 99-107.
9. Liese, W. (1970). Ultrastructural aspects of woody tissue disintegration. Ann. Rev. Phytopath. 8: pp 231-258.
10. Klotzsch, J.F. (1832). Mycologische Berichti-gungen. Linnaea. 7: pp 193–204.
11. Ranadive, K.R. (2011). Checklist of Aphyllophorales from the Western Ghats of Maharashtra State, India. Mycosphere 2(2): pp 91– 114.

12. Scheffer, T.C. (1964). Biological observations of significance for improved preservative treatment. *Holzforschung* 18: pp 88-94.
13. Sathe, A.V. and Deshpande, S. (1980) Agaricales (Mushrooms) of Maharashtra State.In: Agaricales (Mushrooms) of South West India. Maharashtra Association for the Cultivation of Science, Agharkar Research Institute, Pune pp 9–42.
14. Sathe, A.V. and Rahalkar, S.R. (1975). Agaricales from South West India-I. Biovigyanam 1(1): pp 75–78.
15. Sathe, A.V. and Sasangan, K.C. (1977). Agaricales from South West India-III. Biovigyanam 3(1): pp 119–121.
16. Wilcox, W.W. (1970). Anatomical changes in wood cell walls attacked by fungi and bacteria. Bot. Rev. 36:128.