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Updated Checklist of Woodrooting fungi of Nashik District, Maharashtra State, India

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ABSTRACT

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The current work aimed to document the wood rooting fungi belongs to Nashik district and prepare a check list based on field observations, collection, taxonomic characterization and identification of the fungal specimens and published literatures, the check list of wood rooting fungi contains 55 species of 30 genera distributed across 09 families. These fungal specimens were collected from regions of Nashik District, namely Surgana, Peth, Trimbakeshwarand Igatpuri. This updated checklist will be useful for mycologists for retrieving fungal species records from Nashik district and also for enriching culture banks. The work will serve as a baseline for future additions and updation of fungal database.

Introduction

Fungi play an important ecological role as primary decomposers by breaking down plant biomass, particularly lignified cellulose, thereby recycling nutrients and contributing significantly to ecosystem functioning (Sudharsan *et al.*, 2023). Wood rooting fungi

are vital role in ecosystem as decomposer, nutrient recycling, natural recycler, medicinal, antiviral, antifungal, Pharmacological, immunological effects (Zjawiony, 2004). The recently 54,000 species of Basidiomycota have been known and studied at molecular phylogeny level but some of the species till unknown (Sum *et al.*, 2023). Koltzsch published the first

findings and information on the Indian Aphyllophorales fungus in 1832. (Randive *et al.*, 2013). Many studies on 80 species of Polypores from 32 genera and three recognized families viz Ganodermataceae, Hymenochaetaceae, and Polyporaceae have been uncovered by the Kerala state. (Leelavathy *et al.*, 2000). In the middle of the 20th century, Indian Aphyllophorales were studied and released in Tamilnadu, Kerala, Maharashtra, Western Bengal, and the Himalaya. Research conducted by Natarajan and Kolandavelu revealed more than 1077 Indian fungal species, including 39 new Polyporales species. (Natarajan, 1985). In regard to various research conducted by different Indian mycologists, Bakshi (1971), Randive (2013), Mali *et al.*, 2016, Kaur *et al.*, 2017, Chouse *et al.*, 2020, and Gore *et al.*, 2021). Randive published a list of 170 Aphyllophorales species from various regions of Pune District, Maharashtra, that are members of the Poroid 10 and Non Poroid 86 Families. (Randive, 2011). A taxonomic analysis of 110 Aphyllophorales taxa was then carried out by (Hakimi *et al.*, 2013). Studies on the variety of Aphyllophorales from the Latur area were conducted by (Chouse *et al.*, 2020). From Marathwada region 37 Aphyllophorales species was studied based on morphological and microscopic data (Gore *et al.*, 2021). Six districts of Maharashtra state (Pune, Aurangabad, Jalgoan, Parbhani, Amaravati, Kolhapur, Ratanagiri) are known to feature Aphyllophorales flora, Only 20.5% of the Aphyllophorales are found in different parts of Maharashtra, and more than 80% of the land has not been well studied for its diversity. (Mali *et al.*, 2016). Literature survey reveals that the study of Aphyllophorales has only 20.5% of Aphyllophorales fungal flora was reported from various regions of Maharashtra and leaving more than 80% of the area untouched for intensive research in this field (Gavit *et al.*, 2024). Therefore, the present study aims to address the knowledge gap in wood-rotting fungal diversity of the Northern Western Ghats (Nashik District) by compiling a critical literature-based checklist of reported species.

Materials and Methods

Survey of Study area: The survey of wood rooting fungi was carried out throughout the various areas of Nashik district of Maharashtra State, India. The Nashik district is situated at the northern western part of Maharashtra, it located on between 18.33 degree and 20.53 degree North latitude and between 73.16 degree and 75.16 degree East Longitude. Belongs to fifteen

tehsils Suragana, Kalwan, Igatpuri, Satana (Baglan), Sinnar, Trymbkeshwar, Yeola, Niphad, Nashik, Malegoan, Nadagoan, Chandwad, Deola, Dindori (Gavit *et al.*, 2024). This forest areas of Nashik are connected by a continuous forest exists on the eastern side of Dang Forest, which is a border of Maharashtra State. The total forest area to geographical area ratio is 41.66 percent. Surrounded on three sides by the state of Maharashtra, with Surgana in the south, Peth in the north, and Saputara in the west, the forest in the western portion of Nashik District has a rich biodiversity. The survey was carried out throughout the year. First survey was conducted from June to September when natural conditions were moist and humid. The second survey was conducted in between October to December were condition high humid. The third survey was conducted from January to May were condition was relatively less. The survey were conducted at various region of Nashik dist. i.e Surgana, Igatpuri, Trymbkeshwar, Peth tehsils for investigation of diversity wood rooting fungi.

Collection of the specimens

The fungal fruiting bodies were gathering randomly based on different locations of of Nashik district. Then Samples were gathered and kept in plastic bags or airtight containers that were labeled them.

Photographs of all specimens were taken both in the lab and in the field. Geographical details, the date of collection, the location, and other relevant details were recorded for the collected specimens.

Identification

Identified were done by using standard macroscopic and microscopic keys and with earlier literature. (Gilbertson & Ryvardeen 1986, Sharma 2015 and Gavit 2024), (Gavit *et al.*, 2024).

This checklist was assembled using data collected exclusively from articles published up until June 2025, excluding all unpublished master's, doctoral, and M.Phil. Dissertations. This checklist excludes species that have only been identified at the genus level. Herbaria data are not included in this checklist since they can be found in the cited sources. The nomenclature and systematic arrangement used here are based on the Index Fungorum (www.indexfungorum.org) as of June 25th 2025. Using Index Fungorum, Mycokeys, and Mushroom Expert, the names of some species as they appear in the cited

publications are included in this checklist along with their current recognized names. The listing is arranged alphabetically by genus, species, order, and family.

Result and Discussion

This is an updated checklist of wood-rotting fungi, which includes a detailed list of all the species that have been collected and published so far as well as a full synopsis of new fungi found in Nashik District, Maharashtra State, for the first time. Since the fungi in India and Maharashtra are still mostly unexplored in comparison to other parts of the world that have been fairly thoroughly studied, a more comprehensive list of fungi will only be attainable by cataloging the present species and discovering new ones. (Gore *et al.*, 2021, Hakimi *et al.*, 2015, Gavit *et al.*, 2024). The 126 specimens were gathered in the Pune district for the first study on Aphyllphorales in Maharashtra. The Maharashtra State inventory contains

256 species of Aphyllphorales fungi, with 170 species from 10 poroid families and 86 species from 20 nonporoid families. Based on earlier Indian literature on the variety of woodrotting fungi states that 190 taxa, 52 families, and 1175 species have been identified. In addition to 126 species from fifteen distinct locations in the western ghat of Maharashtra Pune region, 20 species of Aphyllphorales which are separated into eight families and fourteen genera based on morphological and microscopic characteristics were examined. (Gavit *et al.*, 2024). *Phellinus* is a member of the Hymenochaetaceae family and the Aphyllphorales order state that both macroscopic and microscopic characteristics can be used to identify 17 genus and 18 species. Wood from the Paithan tehsil in the Indian district of Aurangabad is broken down by a variety of fungi (M.S. Following that, the Latur region of Maharashtra yielded 34 genera and 47 species of wood-rotting fungi. (Gore *et al.*, 2021).

Fig.1 Study Area of Nashik District Yellow names with Red place mark indicates study area

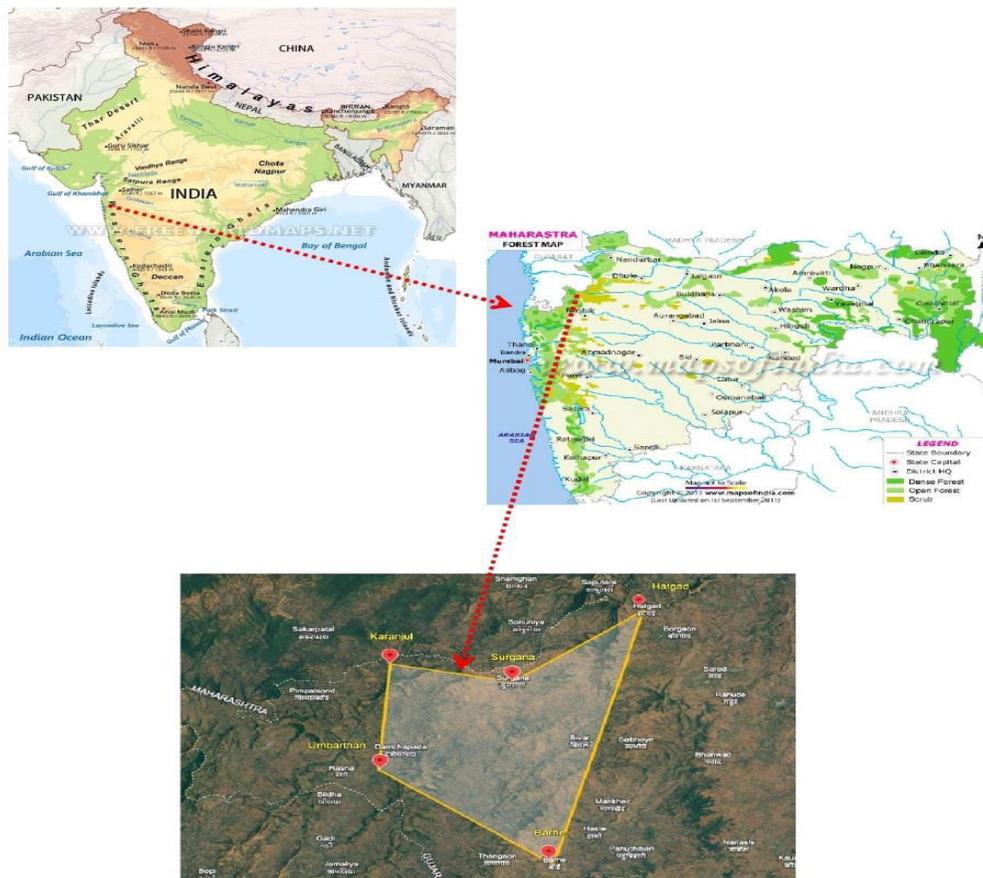


Table.1 List of specimens collected from various localities of Dang Forest

Sr. No.	Collection site	Species name	Host/Substrate	Part of host	Family	Reference
1	Surgana	Flavodon flavus	<i>Tectona grandis</i>	Stem	Meruliaceae	Gavit 2024
2	Surgana	Trametes meyenii	<i>Mangifera indica</i>	Stem	Polyporaceae	Randive 2013
3	Surgana	Coriolopsis trogii	<i>Ziziphus jujuba</i>	Branch	Polyporaceae	Randive 2013
4	Surgana	Leiotrametes sp.	<i>Mangifera indica</i>	Stem	Polyporaceae	Randive 2013
5	Surgana	Coriolopsis caperata	<i>Gliricidia sepium</i>	Bark	Polyporaceae	Gavit 2024
6	Surgana	Microporus xanthopus	<i>Eucalyptus sp.</i>	Stem	Polyporaceae	Randive 2013
7	Surgana	Trametes ellipsospora	<i>Tectona grandis</i>	Stem	Polyporaceae	Randive 2013
8	Surgana	Hexagonia tenuis	<i>Mangifera indica</i>	Stem	Polyporaceae	Gavit 2024
9	Surgana	Trametes sp.	<i>Ziziphus jujuba</i>	Branch	Polyporaceae	Gavit 2024
10	Surgana	Earliella scabrosa	<i>Mangifera indica</i>	Stem	Polyporaceae	Randive 2011
11	Surgana	Ganoderma lucidum	<i>Gliricidia sepium</i>	Bark	Ganodermataceae	Randive 2011
12	Surgana	Peniophora sp.	<i>Eucalyptus sp.</i>	Stem	Peniophoraceae	Randive 2011
13	Surgana	Fuscoporia gilva	<i>Tectona grandis</i>	Stem	Hymenochaetaceae	Gavit 2024
14	Surgana	Microporus vernicipes	<i>Mangifera indica</i>	Branch	Polyporaceae	Gavit 2024
15	Surgana	Neofavolus alveolaris	<i>Carissa carandas</i>	Stem	Polyporaceae	Randive 2013
16	Surgana	Trametes betulina	<i>Anogeissus latifolia</i>	Bark	Polyporaceae	Randive 2013
17	Surgana	Trametes gibbosa	<i>Tectona grandis</i>	Stem	Polyporaceae	Gore 2021
18	Surgana	Trametes aesculi	<i>Terminalia arjuna</i>	Bark	Polyporaceae	Gore 2021
19	Surgana	Inonotus hispidus	<i>Ficus racemosa</i>	Stem	Hymenochaetaceae	Sonawane 2025
20	Surgana	Inonotus subhispidus	<i>Terminalia arjuna</i>	Stem	Hymenochaetaceae	Gore 2021
21	Peth	Inonotus radiatus	<i>Ficus racemosa</i>	Stem	Hymenochaetaceae	Gavit 2024
22	Peth	Schizophyllum commune	<i>Tectona grandis</i>	Bark	Schizophyllaceae	Gavit 2024; Randive 2013
23	Peth	Ganoderma enigmaticum	<i>Acacia nilotica</i>	Stem	Ganodermataceae	Randive 2012
24	Peth	Ganoderma gibbosum	<i>Ficus benghalensis</i>	Stem	Ganodermataceae	Randive 2012
25	Peth	Ganoderma tropicum	<i>Tamarindus indica</i>	Stem	Ganodermataceae	Randive 2012
26	Peth	Peniophora incarnata	<i>Lantana camara</i>	Stem	Peniophoraceae	Randive 2012
27	Peth	Peniophora polygonia	<i>Lantana camara</i>	Branch	Peniophoraceae	Gavit 2024
28	Peth	Trametes elegans	<i>Terminalia arjuna</i>	Stem	Polyporaceae	Gavit 2024
29	Peth	Favolus tenuiculus	<i>Mangifera indica</i>	Stem	Polyporaceae	Randive 2012

30	Peth	Auricularia cornea	<i>Tectona grandis</i>	Stem	Auriculariaceae	Gavit 2024
31	Peth	Podoscypha petalodes	<i>Eucalyptus sp.</i>	Bark	Meruliaceae	Gavit 2024
32	Peth	Fomitiporella caryophylli	<i>Mangifera indica</i>	Stem	Hymenochaetaceae	Gavit 2024
33	Peth	Phellinus robustus	<i>Gliricidia sepium</i>	Stem	Hymenochaetaceae	Sonawane 2013; Gavit 2024
34	Peth	Microporus affinis	<i>Carissa carandas</i>	Stem	Polyporaceae	Gavit 2024
35	Peth	Peniophora quercina	<i>Mangifera indica</i>	Branch	Peniophoraceae	Gavit 2024
36	Peth	Inonotus rickii	<i>Tamarindus indica</i>	Wood	Hymenochaetaceae	Gavit 2024; Randive 2013
37	Peth	Podoscypha venustula	<i>Terminalia arjuna</i>	Stem	Meruliaceae	Gavit 2024
38	Peth	Trametes versicolor	<i>Mangifera indica</i>	Stem	Polyporaceae	Gavit 2024
39	Peth	Polyporus umbellatus	<i>Eucalyptus sp.</i>	Stem	Polyporaceae	Gavit 2024
40	Trimbakeshwar	Auricularia polytricha	<i>Mangifera indica</i>	Branch	Auriculariaceae	Gavit 2024
41	Trimbakeshwar	Ganoderma sessile	<i>Azadirachta indica</i>	Stem	Ganodermataceae	Gore 2021; Gavit 2024
42	Trimbakeshwar	Marasmius haematocephalus	<i>Lantana camara</i>	Branch	Marasmiaceae	Gavit 2024
43	Trimbakeshwar	Marasmius sp.	<i>Lantana camara</i>	Branch	Marasmiaceae	Gavit 2024
44	Trimbakeshwar	Hygrocybe acutoconica	<i>Tamarindus indica</i>	Branch	Hygrophoraceae	Gavit 2024
45	Trimbakeshwar	Geastrum triplex	<i>Cajanus cajan</i>	Dead stem	Geastraceae	Randive 2013; Gavit 2024
46	Trimbakeshwar	Polyporus alveolaris	<i>Tectona grandis</i>	Stem	Polyporaceae	Gavit 2024
47	Trimbakeshwar	Marasmius siccus	<i>Ficus religiosa</i>	Stem	Marasmiaceae	Gavit 2024
48	Igatpuri	Stereum hirsutum	<i>Terminalia arjuna</i>	Stem	Stereaceae	Gavit 2024
49	Igatpuri	Hygrocybe miniata	<i>Lantana indica</i>	Branch	Hygrophoraceae	Kaur 2017; Gavit 2024
50	Igatpuri	Podoscypha petalodes	<i>Senna siamea</i>	Stem	Meruliaceae	Gavit 2024
51	Igatpuri	Lenzites betulina	<i>Bombax ceiba</i>	Branch	Polyporaceae	Kaur 2017; Gavit 2024
52	Igatpuri	Clavaria fragilis	<i>Gliricidia sepium</i>	Bark	Clavariaceae	Gavit 2024
53	Igatpuri	Ganoderma applanatum	<i>Mangifera indica</i>	Stem	Ganodermataceae	Gavit 2024
54	Igatpuri	Trametes versicolor	<i>Tectona grandis</i>	Stem	Polyporaceae	Gore 2021; Gavit 2024
55	Igatpuri	Auricularia delicata	<i>Carissa carandas</i>	Branch	Auriculariaceae	Gore 2021; Gavit 2024

Morphology-based species identification is unreliable since some species are cryptic and have been mistakenly

recognized. Because many fungal species lack molecular information, including reference sequences, molecular-

based techniques are therefore more difficult (Leelavatey *et al.*, 2000).

In conclusion, the Present studies of total 55 species of wood rooting fungi belong to 30 genera were reported from Nashik district on the basis of earlier literature (Table 1). The geographical distribution of the reports covers all the 5 tehsils includes Surgana, Peth, Kalwan, Igatpuri, and Trymbakeshwar of the districts (Fig. 1). The list of 55 species in Table 1 might appear exhaustive, yet it only represents a portion of the true richness of wood rooting fungi in Nashik. The majority of surveys have been carried out in a few easily accessible district districts. In the majority of the district's dense forests, there is currently insufficient research on wood rooting variety. Based on the previous studies working list presented here, it is expected that future changes and additions will be made, particularly if they are connected to particular goals, priorities, or newly established or established fields of expertise. Additionally, it has been noted that the majority of fungal species that have been reported do not have DNA sequence data, and occasionally a fungal species has been reported without an accession number for the culture. Additionally, the majority of the species identified in the past fifteen years were members of the Basidiomycota (macrofungi) group of fungi. Therefore, it is essential to characterize and describe macro- and microfungi as well as the molecular phylogeny of species using the most recent taxonomic categorization methods; otherwise, these fungi will remain unknown.

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Author Contributions

Gavit Manohar: Investigation, formal analysis, writing—original draft. Sonwane Hiralal: Validation, methodology, writing—reviewing. More Kamlakar:—Formal analysis, writing—review and editing. Khan Amnulla: Investigation, writing—reviewing. Kale Balasaheb: Resources, investigation writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding

author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare that none of the work described in this publication may have been influenced by any known competing financial interests or personal relationships.

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