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## NEW RECORDS OF POLYPORES (BASIDIOMYCOTA: APHYLLOPHORALES) FROM THE SOUTHERN WESTERN GHATS WITH AN IDENTIFICATION KEY FOR POLYPORES IN PEECHI-VAZHANI WILDLIFE SANCTUARY, KERALA, INDIA

### OPEN ACCESS

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**Abstract:** The present study reports new distribution records of two species of polypores; *Pycnoporus cinnabarinus* (Jacq.) P. Karst. and *Datronia mollis* (Sommerf.) Donk under family polyporaceae from the moist deciduous forests of southern Western Ghats, Peechi-Vazhani Wildlife Sanctuary, Kerala. This paper also provides detailed macro-morphology and micro-morphology of newly recorded fungi and key for identification of polypores reported from the study area. An opportunistic sampling was carried out along with the plot based sampling in order to maximize the documentation of polypore distribution. A total of 36 polypore species in 21 genera belonging to six families were recorded throughout the entire study period of 2012–2014. Out of these, 26 species were annuals and 10 species perennials. Thirty-four polypores were identified as white rotting and two species were brown rotting.

**Keywords:** Brown rotting, moist deciduous forests, Peechi-Vazhani Wildlife Sanctuary, polypores, Polyporaceae, white rotting.

The tropical regions are endowed with diverse types of forest ecosystems that support a unique assemblage of biotic communities including wood decaying polypores. Polypores are distinguished from other groups of fungi

by their macroscopic basidiocarps with pores (Leelavathy & Ganesh 2000). They decompose coarse woody debris like fallen trunks, branches, twigs and stumps and play a pioneering role in ecosystem system functioning such as nutrient cycling and transport. The ability to break down the lignocelluloses that help in wood decomposition appears to be mainly restricted to basidiomycete fungi. Based on this unique functional role, they have been divided into white rot fungi and brown rot fungi (Peace 1962).

European scientists had initiated the taxonomic studies of Indian polypores by the middle of the 19<sup>th</sup> century. Klotzsch (1832) described four polypore fungi and seems to be the earliest report on Indian polypores. Bose (1919-28) was the first Indian mycologist who collected and described 143 species of polypores from the Bengal region on a comprehensive scale. Later on Sundaramani & Madurajan (1925) reported several members of Polyporaceae from Madras. Butler &

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Conflict of Interest: The authors declare no competing interests.

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Bisby (1931) made a compilation of the Indian fungi which includes 293 polyporoid species in 16 genera. Polypores and its forest pathological aspects were widely studied by Bagchee & Bakshi (1950, 1951) and Bagchee (1953) extensively studied the diseases and decays on forest trees. Bakshi and co-workers reported new polypores on forest trees of Himalaya and southern India (Bakshi 1956, 1965). Moreover, Bakshi (1971) in his monograph "Indian Polyporaceae (on trees and timber)" gave an account of 355 species of polypores belonging to 15 genera. Rattan (1977) described the resupinate Aphyllophorales of the North Western Himalayas. However, Natrajan & Kolandavelu (1985) studied resupinate Aphyllophorales from southern India and reported 82 species belonging to 48 genera of these fungi from Tamil Nadu. Sharma (1995) published the list of polypores under the family Hymenochaetaceae from India. Roy & De (1996) published a manual on the Indian Polyporaceae. Verma et al. (2008) described forest fungi of central India including polypores. Tiwari et al. (2013) reported 191 wood decaying fungi on 86 timber species.

Leelavathy & Ganesh (2000) conducted an extensive study on the polypores of Kerala and reported 73 species belonging to 26 genera. Florence & Yesodharan (2000) conducted a survey on macro fungi occurring in the Peechi-Vazhani Wildlife Sanctuary and reported 57 species belonging to 37 genera; out of this 35 species of polypores belonging to 24 genera were recorded. More recently Mohanan (2011) identified and described a total

of 89 species of polypores belonging to 32 genera from different forest ecosystems of Kerala. The proportion of studies of species richness in tropical forests dealing with fungi in general (studies of polypores are in turn only a fraction of this proportion) is seldom reported. A checklist on polypores is very important in order to know their distribution in a particular forest type of Western Ghats. The present study is an attempt to study the polypores among the macro fungi and to prepare a checklist along with key for identification.

## MATERIALS AND METHODS

### Study Area

The Peechi-Vazhani Wildlife Sanctuary (P-VWS) lies within the geographical extremes of latitudes  $10^{\circ}26'N-10^{\circ}40'N$  &  $76^{\circ}15'E-76^{\circ}28'E$ , covering an area of  $125\text{km}^2$  in Thrissur District, Kerala State (Fig. 1). Annual average precipitation in the sanctuary is  $3000\text{mm}$  and is situated at  $45-900\text{m}$ . As per Champion & Seth (1986), the forest type of the sanctuary (nearly 80%) is moist deciduous forest, 15% is evergreen and semi-evergreen and the remaining five per cent is under teak and soft wood plantations.

### Survey, Collection and Identification of fungi

The survey was conducted from January 2012 to October 2014 in P-VWS, Kerala for collection of polypores. Three permanent fixed size sample plots of  $100\times 100\text{m}$  were established in three different locations,

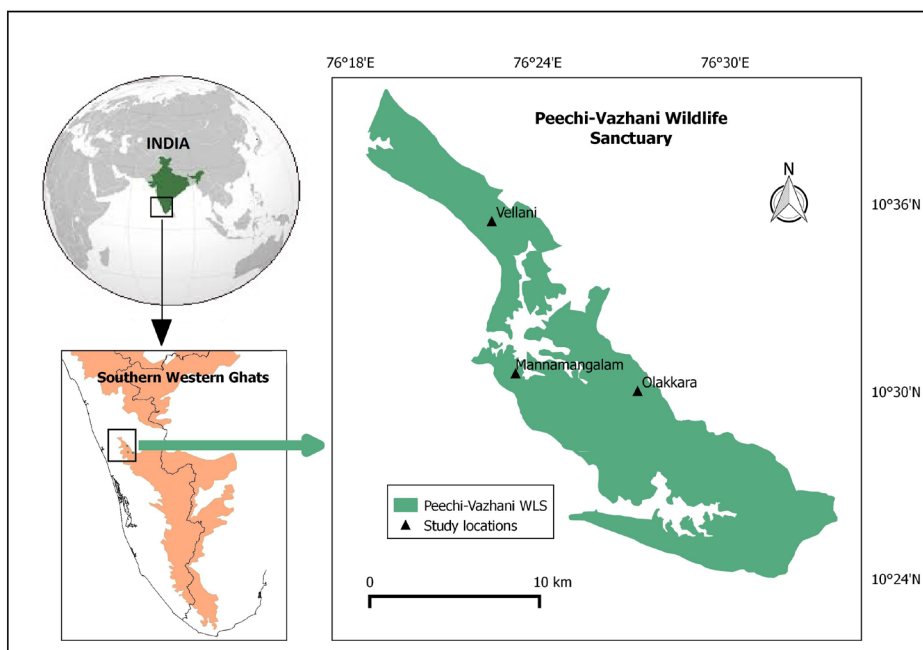


Figure. 1 Location map of the study area in Peechi-Vazhani Wildlife Sanctuary

viz., Vellani, Mannamangalam and Olakkara sections of the sanctuary as per the methodology of the earlier fungal studies (Yamashita et al. 2010; Mohanan 2011). Also subplots of 10x10 m were fixed in each permanent plot for detailed analysis. The sample plots were visited during pre-monsoon, monsoon and post monsoon periods for the documentation of polypores including collection of sporocarps, labelling with specimen number, rot character identification, taking photographs and recording macromorphological characters and details of substratum in the illustrated data sheet. A total area of 30,000m<sup>2</sup> was surveyed in each of the three climatic seasons. Additional collection of polypores was also made from “off plots” in the study area. Thus, a combination of opportunistic and plot-based survey was carried out to maximize the documentation of polypore diversity and distribution. The polypore specimens collected from the study area were kept in paper bags and brought to the lab. The specimens were properly air dried or oven dried and stored in polythene zip-cover under less humid conditions. The specimens were identified based on their macro and micro morphological features. The identification key provided by Bakshi (1971) and Leelavathy & Ganesh (2000) were used for the confirmation of polypore species. The micro-morphological characteristics of the polypores were drawn with the help of camera lucida. Some of the specimens were compared with those in the Herbaria at Kerala Forest Research Institute, Peechi. All the specimens collected during the study period were catalogued and kept under less humid conditions in the Department of Forest Management and Utilization, College of Forestry at Kerala Agricultural University. After proper identification, the current names of the identified polypores and their taxonomic details were accessed from the website: [www.mycobank.org](http://www.mycobank.org) (accessed on 15<sup>th</sup> January 2015).

## RESULTS AND DISCUSSION

A total of 36 polypore species in 21 genera belonging to six families were recorded and their distribution were analysed family-wise, rot-wise and habit-wise (Table 1, Images 1–36). Among these species, *Pycnoporus cinnabarinus* (Jacq.) P. Karst. and *Datronia mollis* (Sommerf.) Donk were found to be new records from the Southern Western Ghats and these species have been described based on macro-morphology and micro-morphology.

### 1. *Pycnoporus cinnabarinus* (Jacq.) P. Karst.

Revue Mycologique Toulouse 3(9): 18 (1881)

*Boletus cinnabarinus* Jacq., Flora Austriaca 4: 2, tab. 304 (1776)

*Coriolus cinnabarinus* (Jacq.) G. H. Cunn., Bull. N. Z. Dep. Industr. Res. 75: 8 (1948)

*Fabisporus cinnabarinus* (Jacq.) Zmitr., Mycena 1 (1): 93 (2001)

*Hapalopilus cinnabarinus* (Jacq.) P. Karst., Finlands Basidsvampar (11): 133 (1899)

*Leptoporus cinnabarinus* (Jacq.) Quél., Enchiridion Fungorum in Europa media et praesertim in Gallia Vigentium: 176 (1886)

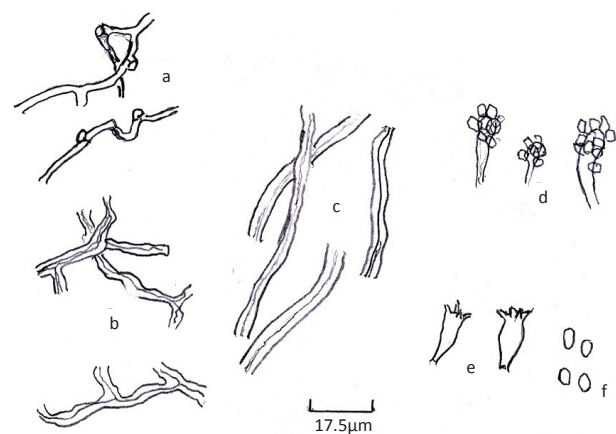
*Phellinus cinnabarinus* (Jacq.) Quél., Flore mycologique de la France et des pays limitrophes: 395 (1888)

*Polyporus cinnabarrinus* (Jacq.) Fr., Systema Mycologicum 1: 371 (1821)

*Polystictus cinnabarinus* (Jacq.) Cooke, Grevillea 14 (71): 82 (1886)

*Trametes cinnabarina* (Jacq.) Fr., Summa vegetabilium Scandinaviae 2: 323 (1849)

Fruit body annual, pileate, sessile, arising in small gregarious groups, sometimes solitary, imbricate, attached with a converging slightly broad base, dimidate to flabelliform, slightly conchate, sometimes marginally lobed, lobes overlapping, slightly tough when dry, 6–9 x 4–5 x 1–1.5 cm. Pileus surface uneven, almost radially rugose, azonate, reddish grey to dark yellowish orange, grayish yellow towards margin, shiny, glabrous, margin darker, round and undulating. Pore surface uneven, brick red to burned brick red, sometimes darker; pores visible to naked eye, round to angular rarely daedaloid towards margin, pores up to margin, 3–4 mm; dissepiments thinner towards pore mouth; context brick red to reddish orange, uniform, 5–12 mm thick, darker in



**Figure 2. Micromorphology of *Datronia mollis***  
a - generative hyphae; b - binding hyphae; c - skeletal hyphae;  
d - cystidia; e - basidia; f - basidiospores

KOH; pores arising in uniform or wavy layer, up to 5mm long, concolourous with the context.

Hyphal system trimitic; generative hyphae thin-walled, seldom branched, with clamps, 2–3(4)  $\mu\text{m}$  thick; binding hyphae yellowish, slightly thick-walled, branched, rarely septate, 4–6  $\mu\text{m}$  thick; skeletal hyphae yellowish, long, reddish encrustations with broad lumen, unbranched, 6–8  $\mu\text{m}$  thick; detached proterospores (chlamydospores) hyaline, thick-walled, without ornamentation, almost uniform in size and shape; 10x8  $\mu\text{m}$ ; basidia and spores not observed (Fig. 2).

Specimen examined: MIA 3/22-4-2012, on decaying logs of *Dillenia pentagyna* (Dilleniaceae).

Decay: White rot with scattered reddish patches in wood.

## 2. *Datronia mollis* (Sommerf.) Donk

Persoonia 4(3): 338 (1966)

*Daedalea mollis* Sommerf., Supplementum florae lapponicae: 271 (1826)

*Trametes mollis* (Sommerf.) Fr., Elenchus Fungorum 1: 71 (1828)

*Polyporus mollis* (Sommerf.) P. Karst., Bidrag till Kännedom av Finlands Natur- och Folk 25: 280 (1876)

*Antrodia mollis* (Sommerf.) P. Karst., Meddelanden af Societas pro Fauna et Flora Fennica 5: 40 (1879)

*Daedaleopsis mollis* (Sommerf.) P. Karst., Finlands Basidsvampar (11): 135 (1899)

*Cerrena mollis* (Sommerf.) Zmitr., Mycena 1(1): 91 (2001)

*Trametes serpens* Fr., Summa vegetabilium Scandinaviae 2: 324 (1849)

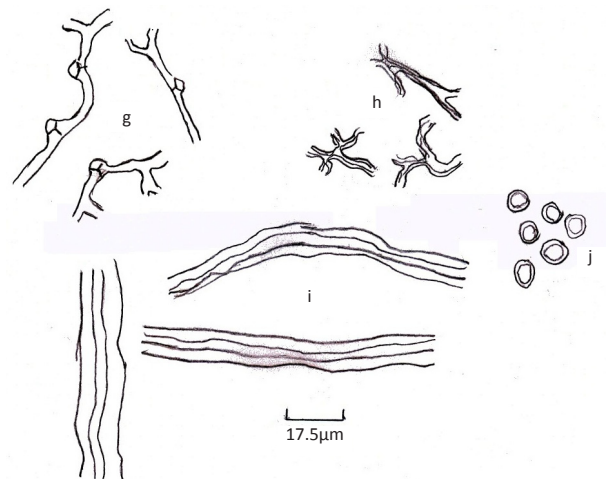
*Polyporus sommerfeldtii* P. Karst. (1878)

*Polyporus sommerfeldtii* P. Karst., Meddelanden af Societas pro Fauna et Flora Fennica 5: 53 (1879)

*Daedalea lassbergii* Allesch., Berichte des Botanischen Vereins Landshut 11: 23 (1889)

Fruit body annual, resupinate, slightly reflexed, leathery, 5–40 x 2–6 x 0.02–0.05 cm. Pileus surface creamy white to salmon to reddish yellow, slightly zonate, glabrous towards margin, margin smooth, thick and rounded. Pore surface uneven, yellowish-red, sometimes slightly brownish, shiny; pores visible to naked eye, round to angular, sometimes daedaloid towards margin, sometimes daedaloid in centre portions, often confluent, pores absent towards margin, 3–4 per mm, dissepiments thinner towards pore mouth; context uniform, yellowish-red, 0.2–0.4 cm thick pores arising in uneven sequence.

Hyphal system trimitic; generative hyphae thin-walled, branched, with clamps and seldom branched,



**Figure 3. Micromorphology of *Pycnoporus cinnabarinus***  
g - generative hyphae; h - binding hyphae; i - skeletal hyphae;  
j - proterospores

2–3  $\mu\text{m}$  thick; binding hyphae yellowish, thick walled, closely branched, with a narrow lumen, 2.5–4  $\mu\text{m}$  thick; skeletal hyphae yellowish, long, unbranched, thick-walled, with a narrow lumen, 4–6  $\mu\text{m}$  wide. Basidium broadly clavate, 4-spored, 20x6  $\mu\text{m}$ ; sterigmata up to 2  $\mu\text{m}$  long, encrusted cystidia present, hyaline, slightly thick walled, encrustations from half length upwards, 15–20 x 8–10  $\mu\text{m}$ . Basidiospores oval, hyaline, 6.5–7.5 x 3.5–4.5  $\mu\text{m}$  (Fig. 3).

Specimen examined: MIA 47/22-4-2012, on decaying logs of *Xylia xylocarpa* (Mimosoideae).

Decay: White fibrous rot.

These species were confirmed by comparing the characters described for the specimens collected by Bakshi (1971) and Ryvarden & Gilbertson (1993). The present collection of *Pycnoporus cinnabarinus* agrees with that of Bakshi (1971), but the hyphae are broader. Earlier this species was reported on wood logs of *Anogeissus latifolia* from central India (Tiwari et al. 2013). Bakshi (1971) reported this species as *Polyporus cinnabarinus* Jacq. ex Fr. The presence of detached proterospores (chlamydospores) is first being reported during the present study. Bakshi (1971) reported *Datronia mollis* as *Trametes serpens* Fr. for his collections from Uttar Pradesh and West Bengal. Tiwari et al. (2013) described this species on wood logs of *Pterocarpus marsupium* from Chhattisgarh. The present collection of *Datronia mollis* showed similarity to morphological features of North American collections but for the light coloured pore surface (Ryvarden & Gilbertson 1993). An identification key has also been provided for the polypores recorded from the study area (Appendix

**Table 1. List of polypore species and their families, habit and rot type in the Peechi-Vazhani Wildlife Sanctuary, Kerala, India**

Image no.	Species	Family	Habit	Rot type
1	<i>Corioloopsis sanguinaria</i> (Klotzsch) Teng.	Polyporaceae	Annual	White
2	<i>Corioloopsis telfarii</i> (Klotzsch) Ryvarden	Polyporaceae	Annual	White
3	<i>Daedalea flavida</i> Lev.	Fomitopsidaceae	Annual	White
4	<i>Datronia mollis</i> (Sommerf.) Donk	Polyporaceae	Annual	White
5	<i>Earliella scabrosa</i> (Pers.) Gilb. & Ryvarden	Polyporaceae	Annual	White
6	<i>Fomes pseudosenex</i> (Murrill) Sacc. & Trotter	Polyporaceae	Perennial	White
7	<i>Fomitopsis feei</i> (Fr.) Kreisel	Fomitopsidaceae	Annual	Brown
8	<i>Fulvifomes nilgheriensis</i> (Mont.) Bondartseva & S. Herrera	Hymenochaetaceae	Perennial	White
9	<i>Fuscoporia gilva</i> (Schwein) T. Wagner & M. Fisch.	Hymenochaetaceae	Annual	White
10	<i>Fuscoporia senex</i> (Nees & Mont.) Ghobad-Nejhad	Hymenochaetaceae	Perennial	White
11	<i>Ganoderma australe</i> (Fr.) Pat.	Ganodermataceae	Annual	White
12	<i>Ganoderma lucidum</i> (Curtis.) P. Karst.	Ganodermataceae	Annual	White
13	<i>Hexagonia tenuis</i> (Hook.) Fr.	Polyporaceae	Annual	White
14	<i>Inonotus luteoumbrius</i> (Romell) Ryvarden	Hymenochaetaceae	Perennial	White
15	<i>Melanoporia nigra</i> (Berk.) Murrill	Polyporaceae	Perennial	Brown
16	<i>Microporus affinis</i> (Blume & T. Nees) Kuntze.	Polyporaceae	Annual	White
17	<i>Microporus xanthopus</i> (Fr.) Kuntze.	Polyporaceae	Annual	White
18	<i>Microporellus obovatus</i> (Jungh.) Ryvarden	Polyporaceae	Annual	White
19	<i>Nigroporus vinosus</i> (Berk.) Murrill	Polyporaceae	Annual	White
20	<i>Oxyporus mollissimus</i> (Pat.) D. A Reid	Schizoporaceae	Annual	White
21	<i>Phellinus dependens</i> (Murrill) Imazeki	Hymenochaetaceae	Perennial	White
22	<i>Phellinus fastuosus</i> (Lev.) S. Ahmad	Hymenochaetaceae	Perennial	White
23	<i>Phellinus ferrugineo-velutinus</i> (Henn.) Ryvarden	Hymenochaetaceae	Perennial	White
24	<i>Phellinus gilvoides</i> (Petch) Ryvarden	Hymenochaetaceae	Perennial	White
25	<i>Phellinus punctatus</i> (P. Karst) Pilat	Hymenochaetaceae	Perennial	White
26	<i>Polyporus arcularius</i> (Batsch) Fr.	Polyporaceae	Annual	White
27	<i>Polyporus dictyopus</i> Mont.	Polyporaceae	Annual	White
28	<i>Polyporus grammacephalus</i> Berk.	Polyporaceae	Annual	White
29	<i>Polyporus virgatus</i> Berk. & M. A Curtis	Polyporaceae	Annual	White
30	<i>Pycnoporus cinnabarinus</i> (Jacq.) P. Karst.	Polyporaceae	Annual	White
31	<i>Rigidoporus lineatus</i> (Pers.) Ryvarden	Meripilaceae	Annual	White
32	<i>Trametes cingulata</i> Berk.	Polyporaceae	Annual	White
33	<i>Trametes cotonea</i> (Pat. & Har.) Ryvarden	Polyporaceae	Annual	White
34	<i>Trametes hirsuta</i> (Wulfen) Lloyd	Polyporaceae	Annual	White
35	<i>Trametes lactinea</i> (Berk.) Sacc.	Polyporaceae	Annual	White
36	<i>Trametes marianna</i> (Pers.) Ryvarden	Polyporaceae	Annual	White

1). Among the polypores recorded, 26 species were annuals and perennials were represented by 10 species only. The rot characteristics of the polypores were also identified; the white rot polypores have a significant dominance over brown fungi. Within the species list, 34

polypores were identified as white rotting and only two species were brown rotting. The species composition of polypores in the sanctuary revealed that the species belonging to the family Polyporaceae was more common than other five families. Out of the 36 species confirmed,



Images 1–24. Polypores of Peechi-Vazhani Wildlife Sanctuary. Names of species are given in Table 1 as the serial numbers 1–24



Images 25–36. Polypores of Peechi-Vazhani Wildlife Sanctuary. Names of species are given in Table 1 as the serial numbers 25–36.

58.33% belonged to Polyporaceae and 25% belonged to Hymenochaetaceae, while Ganodermataceae and Fomitopsidaceae consisted of 5.56% each and Meripilaceae and Schizoporaceae consisted of 2.78% each. The species composition of the present study confirms the findings of previous studies conducted on different forest stands of the Western Ghats especially Kerala. Leelavathy & Ganesh (2000) mentioned that 53 species of polypores belonging to 26 genera from both the forest and non-forest areas of Kerala and in that study Polyporaceae was the major family and 90% of the species were white rotters. Noteworthy that, Florence & Yesodharan (2000) reported 31 species of polypores from the P-VWS and out of this, Polyporaceae was the major family and more than 90% of the species were identified as white rot fungi. More recently, Mohanan (2011) described the macrofungal flora of Kerala which comprised 89 polypores species with Polyporeceae as the major family and 90% were identified as white rotters. It was considered that the brown rot fungi are more adapted to coniferous habitats than white rot fungi and more efficient than white rot in acquiring food resources from wood (Gilbertson 1980). An evolutionary

flash back was suggested by Worrall et al (1997) that white rot fungi were highly specialized for the wood environment, brown rot fungi apparently arose from them in many groups, most especially in the polypores.

#### CONCLUSION

The surveys conducted on polypores and new reports from the southern Western Ghats region revealed the necessity of detailed studies in order to explore more polypores that will help to make an updated checklist of macrofungi of the state. Moreover, proper in situ and ex situ conservation measures are required for polypores as they play a vital role in the decomposition and nutrient cycling of forest ecosystems.

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#### Appendix 1. Key to the polypore species collected from Peechi-Vazhani Wildlife Sanctuary, Kerala, India

##### Key to families of Polypores (partly adapted from Leelavathy & Ganesh 2000)

1. Spores with double wall, exosporium hyaline, thin, membranous covering an ornamented, thick brownish endosporium; spores round, truncate ..... Ganodermataceae
- 1'. Spores with simple wall, smooth or ornamented, hyaline or brownish ..... 2
2. Hyphal system monomitic; cystidia present ..... 3
- 2'. Hyphal system dimittic or trimitic, cystidia present or absent ..... 4
3. Fruit body brownish; xanthochloric; generative hyphae with simple septa, rarely clamped; hyaline if dimittic, dark brown if monomitic; setae brownish, present or absent ..... Hymenochaetaeaceae
- 3'. Fruit body white, cream, red, brown or black; generative hyphae simple-septate or with clamps, usually not xanthochloric, if xanthochloric generative hyphae clamped; hyaline if monomitic; setae absent ..... 5
4. Individual pileus effused-reflexed, zonation not prominent, context stratified, pores split ..... Schizophoraceae
- 4'. Individual pileus flabelliform with brown concentric zones, context uniform, hymenophore poroid ..... Meripilaceae
5. Context light shaded, corky, dimittic, normally unguulate with a crust, never stipitate ..... Fomitopsidaceae
- 5'. Context thin, whitish or coloured, coriaceous, dimittic to trimitic, stipitate or sessile ..... polyporaceae

##### Fomitopsidaceae Julich *Bibliotheca Mycol.* 85: 367, 1981

1. Fruit body with round pores, context with a distinct crust at least at the base, woody hard ..... *Fomitopsis* P. Karst. (*F. feei*)
- 1'. Fruit body lamellate to daedaloid, if poroid with large pores, >2mm in diam ..... *Daedalea* Pers. (*D. flavida*)

##### Ganodermataceae Karst. *Rev. Mycol.* 3: 17, 1881.

1. Sporophore stipitate; upper surface laccate, reddish brown to yellowish ..... *G. lucidum*
- 1'. Sporophore sessile; upper surface not laccate and shiny, brownish, powdery ..... *G. applanatum*

##### Hymenochaetaeaceae Donk *Bull. Bot. Gard. Buitenz.* 3 (17): 474, 1948.

1. Hyphal system monomitic ..... *Inonotus* Karst. (*I. luteoumbrinus*)
- 1'. Hyphal system dimittic ..... 2

2. Fruit body resupinate to effused, hymenial layer of honey-comb type, a dense palisade of basidia and paraphyses associated with setae ..... *Fuscoporia* Murr.
- 2'. Fruit body imbricate; context dimitic, firm, corky to woody; tubes frequently stratified; setae present or absent; ..... 4
3. Fruit body greyish-brown to black; basidiospores brownish yellow ..... *Fulvifomes* Murr. (*F. nilgheriensis*)
- 3'. Fruit body cinnabar coloured; basidiospores hyaline to yellowish ..... *Phellinus* Quel.

***Fuscoporia* Murr.** N. Am. Fl. 9: 3, 1907

1. Pileal surface radially wrinkled ..... *F. gilva*
- 1'. Pileal surface concentrically sulcate ..... *F. senex*

***Phellinus* Quel.** Elench. Fung. P. 172, 1886

1. Tramal setae or hymenial setae present ..... 2
- 1'. Tramal setae and hymenial setae absent ..... 3
2. Fruit body resupinate; pores 9–10 per mm..... *P. ferrugineo-velutinus*
- 2'. Fruit body imbricate; pores 6-8 per mm ..... *P. dependens*
3. Fruit body resupinate ..... *P. punctatus*
- 3'. Fruit body imbricate ..... 4
4. Pores 6–8 per mm; dissepiments 70–90  $\mu\text{m}$  thick..... *P. fastuosus*
- 4'. Pores 7–10 per mm; dissepiments 100–120  $\mu\text{m}$  thick..... *P. gilvoides*

**Meripilaceae Julich** Biblthca Mycol. 85: 378, 1981

One species collected during the study. *Rigidoporus lineatus* (Pers.) Ryvarden

**Polyporaceae Corda** Icon. Fung. 3: 49, 1839

1. Fruit body stipitate..... 2
- 1'. Fruit body sessile, effused-reflexed.....6
2. Spores elliptical; corolloid elements present in hymenium ..... *Microporus* P. Beauv.
- 2'. Spores globose to sub-globose, corolloid elements nil ..... *Microporellus* Murr. (*M. obovatus*)
3. Hyphal system di, trimitic, darker in KOH.....8
- 3'. Hyphal system di, trimitic, darker in KOH .....*Polyporus*. Str. Fr.
4. Pores hexagonal..... *Hexagonia* Fr. (*H. tenuis*)
- 4'. Pores round, rarely daedaloid.....5
5. Context coloured, poroid .....6
- 5'. Context white or cream, poroid, sometimes daedaloid .....9
6. Fruit body effused-reflexed, never imbricate ..... *Melanoporia* Murr. (*M. nigra*)
- 6'. Fruit body imbricate, attached with a broad base .....7
7. Context dark grey to black, hyphal system dimitic ..... *Nigroporus* Murr. (*N. vinosus*)
- 7'. Context reddish to orange, hyphal system trimitic ..... *Pycnoporus* P. Karst. (*P. cinnabarinus*)
8. Context dimitic, cystidioles absent ..... *Fomes* (Fr.) Fr. (*F. psuedosenex*)
- 8'. Context trimitic, cystidioles frequently present..... *Corioloopsis* Murr.
9. Sporophore dark at the base, reddish elsewhere, pileate .....*Earliella* Murr. (*E. scabrosa*)
- 9'. Sporophore creamish, thin, effused to reflexed.....10
10. Sporophore reddish towards reflexed basal region; pores daedaloid in older regions ..... *Datronia* Donk (*D. mollis*)
- 10'. Sporophore creamish throughout; poroid ..... *Trametes* Fr.

***Corioloopsis* Murr.** Bull. Torrey. Bot. Club 32: 358, 1905

1. Pileus surface glabrous; pores 6–8 per mm; dissepiments upto 50 $\mu\text{m}$  thick..... *C. sanguinaria*
- 1'. Pileus surface hirsute to scrupose; pores less than 5 per mm; dissepiments more than 50  $\mu\text{m}$  thick.. ..... *C. telfarii*

***Microporus* Beauv. ex Kuntze emend Pat.** Rev. Gen. Pl. 3: 494, 1898

1. Stipe central to slightly excentric, yellow to yellowish-brown; sporophores infundibuliform; pileus surface blabrous; spores 5–6.75 x 1.75–2.25  $\mu\text{m}$  ..... *M. xanthopus*
- 1'. Stipe lateral, blackish-brown; sporophores flabelliform to spatulate; pileus surface velutinate while young, seldom glabrous when old; spores 3.5–4 x 1.5–2  $\mu\text{m}$  ..... *M. affinis*

**Polyporus S. Str. Fr.** Syst. Mycol. 1: 341, 1821

- |     |  |                          |
|-----|--|--------------------------|
| 1.  | Stipe central to excentric .....                                       | <i>P. arcularius</i>     |
| 1'. | Stipe distinctly lateral .....   | 2                        |
| 2.  | Pileus surface dark coloured; spores 3–5 per mm.....                   | 3                        |
| 2'. | Pileus surface whitish; pores 7–8 per mm.....                          | <i>P. dictyopus</i>      |
| 3.  | Pileus surface dark brown to black when old; margin thick rounded..... | <i>P. virgatus</i>       |
| 3'. | Pileus surface reddish-yellow; margin thin and pointed.....            | <i>P. grammocephalus</i> |

**Trametes Fr.** Fl. Scan. P. 339, 1835.

- |     |   |                     |
|-----|---|---------------------|
| 1.  | Pileus surface velutinate, hirsute, or strigose.....  | 2                   |
| 1'. | Pileus surface glabrous.....  | 4                   |
| 2.  | Pileus surface finely tomentose, glabrescent when mature, white to cream-coloured.....                  | <i>T. cotonea</i>   |
| 2'. | Pileus surface adpressed-velutinate to strigose or agglutinated.....                                    | 3                   |
| 3.  | Pileus surface milky white azonate or faintly zonate.....   | <i>T. lactinea</i>  |
| 3'. | Pileus surface pale grey to brownish, deeply zonate.....  | <i>T. hirsuta</i>   |
| 4.  | Pileus surface partly dark brown to soot brown; stipe rudimentary or converging; pores 5–6 per mm ..... | <i>T. cingulata</i> |
| 4'. | Pileus surface yellowish , sessile; pores 6–8 per mm.....   | <i>T. marianna</i>  |

**Schizophoraceae Julich** Bibliothca Mycol. 85: 378, 1981

One species collected during the study: *Oxyporus mollismus* (Pat.) D.A.Reid





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