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Flora of Aphyllophorales from Pune District- Part I

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ABSTRACT

The tropical forests of Pune District are mainly classified into Tropical stunted semi-evergreen forests, stunted semi-evergreen scrub forests, moist deciduous and dry deciduous forests. In the present study a total of 20 species of Aphyllophorales (8 families and 14 genera) from the 10 respective hosts were identified out of 126 collected specimens from 15 different localities throughout the Western Ghats of Pune districts, Maharashtra State.

Key Words: Fungi, Maharashtra State, Pune, Western Ghats.

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 some times on lamellae, the poroid or lamellate hymenophores being tough and not fleshy as in the Agaricales. Traditionally the order has had a core of four families based on hymenophore shape, as described above, but recent detailed microscopic studies of basidiocarp structure has shown these groupings to be unnatural and the taxonomy of the order is at present in a state of flux. Donk (1964), who recognized 22 families are now followed, (Hawksworth et al.1991). Keys to 550 spp. in culture are recognized by Stalper (Stalper, 1978).

Up to the end of the 19th Century, all these classifications were based on macro-morphological features of the sporophore. Patouillard (1900) was the first mycologist who used microscopic characters for the delimitation of higher taxa.

In his **"**Essai Taxonomique**"**, Patouillard made groupings in polypores on the basis of such characters as detailed hyphal morphology, structure of the pileus and characters of basidia, spores and cystidia. He divided the Basidiomycetes into Homobasidiomycetes with secondary spores and the Heterobasidiomycetes without secondary spores. The Heterobasidiomycetes were further subdivided according to the septation of the basidia. Species with transversely septate basidia were classified in the Auriculariaceae, species with longitudinally septate basidia in the Tremellaceae, and species with aseptate basidia in the Tulasnellaceae and Caloceraceae. The Homobasidiomycetes had non-septate basidia and were divided into four families as follows the parasitic Exobasidiaceae, the gymnocarpous Aphyllophoraceae, the hemiangiocarpous Agaricaceae and the angiocarpous Gasteromycetaceae. Patoulillard divided the Aphyllophoraceae into two tribes namely: Clavariales and Porohydnales.

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British mycologists, Berkeley (1839) described about five hundred and sixty polypores. It was rather difficult to survey the group and no comprehensive flora had been written for any country. Prof. Murrill (1903–1915) felt the need for a manual of the American species and was a pioneer of the long series **"**Polyporaceae of North America**"** (1903–1908). Patouillard's system was also adopted by Bourdot and Galzin (1928), in their classical manual. They realised that several species which they considered to be closely related, had to be placed in different groups. Donk (1931, 1933) also fundamentally used the Patouillardian system but his generic concepts were mainly based on microscopical characters. Donk (1960) in his work considered the taxonomic status of all published genera until then. It has resulted in establishment of many monotypic genera. His work is based on Patouillard, Murrill and Berkeley, who studied Aphyllophorales from different parts of the world. Corner (1932 a, b) distinguished three possible types of hyphae which may be present in the basidiocarps, namely, generative, skeletal and binding hyphae. Corner introduced the concept of **'**hyphal system' and thus opened a new era in the field of modern taxonomy.

The major significance of Corner's findings was first realized by Cunningham who applied Corner's system in his paper **"**Notes on classification of Polyporaceae**"**, (1946). Later, in a series of publications he emphasized the value of thorough analysis of hyphal systems in the better understanding of a species. Donk's series on resupinate Hymenomycetes (1954, 1956 a, 1956 b, 1957, 1958) and Eriksson's studies on resupinate Aphyllophorales of the Muddus National Park in Sweden (1958), greatly altered the generic delimitation within the Corticiaceae. Boidin (1958 b, 1959 a, b) published three essays on the genus *Stereum* and redescribed a number of genera. Lowe, monographed the American species of *Fomes* (1957), *Poria* (1966), *Tyromyces* (1975), Reid (1965) monographed the stipitate steroid fungi of the world. Mass-Geesteranus revised many of the hydnoid fungi of the Eastern old world (1971). The monographs by Eriksson of the genus *Peniophora* (1950), of *Aleurodiscus* by Parmasto's (1968) **'**Systematic Survey of the Corticiaceae**'** together with the voluminous work of Eriksson and Ryvarden on the **'**Corticiaceae of North Europe**'** (1973, 1975, 1976) were important contributions to our knowledge of this group of Basidiomycetes. Talbot in his earlier work studied many specimens of Aphyllophorales from tropical countries which initiated him to publish the classical work of **"**Study of some South African resupinate Hymenomycetes**"** (1951). He published a review paper entitled **"**Micro-morphology of Lower Hymenomycetes**"** (1954). This paper concerned with macro and micro-morphological characters of Aphyllophorales, is still considered as an important literature in understanding the sexual, accessory and hyphal configuration of basidiocarp of Aphyllophorales. Many regional floristic studies were carried out during the last 50 years and these provided a basis for a more sound and natural classification for Aphyllophorales. Donk (1964) reviewed all the progress and proposed a new conspectus for the families of **"**Aphyllophorales**"**. Parmasto (1968) discussed inter-relationships in Corticiaceae and related families.

Taxonomy of Aphyllophorales is still in a state of flux, as a result, Gilbertson (1980) made an effort to develop a system based on phylogeny. Generic monographs on Aphyllophorales published by Gilbertson (1977-1978), Ginns (1982), Julich (1984) and also type species studies have revealed a lot of ambiguity in confirming the status of old traditional species. But very recently good effort has been taken by Kim S.Y. and Jung H.S. in 2000 on the Phylogenetic classification of the Aphyllophorales was conducted based on the analysis of nuclear small subunit ribosomal RNA gene (nuc SSU rDNA) sequences. Based on phylogenetic groupings and taxonomic characters, 16 families were recognized and discussed. Although many of the characters had more or less homoplasies, microscopic characters such as the mitic system and clamp, spore amyloidity and rot type appeared to be important in the classification of the Aphyllophorales. Phylogenetically significant families were newly defined to improve the classification of the order Aphyllophorales. (Kim and Jung, 2000)Till the end of 19th century all the studies on Aphyllophorales were based on external morphological features of basidiocarps (Persoon, 1801; Fries, 1821). Patouillard (1900) was a pioneer worker to bring about a change in this trend of research by introducing microscopical characters in taxonomic study.

The present work deals with the species studied from the family Corticiaceae with non-poroid hymenium, Polyporaceae and Hymenochaetaceae with poroid hymenium. The external morphology of the basidiocarps of non-poroid and poroid Aphyllophorales differ from each other. The morphology of non-poroid Aphyllophorales was

studied by Prof. Talbot and he published a review **"**Micro morphology of the lower Hymenomycetes**"** (1954 a), while the morphology of poroid Aphyllophorales was published by Gilbertson and Ryvarden (1986) in **"**North American Polypores, Vol. I**".** The delimitations of the Aphyllophorales from the Agaricales and the Termellales has not yet been definitely established (Bondarzew and Singer, 1941; Oberwinkler, 1972) and the position of genera such as *Polyporus*, *Pleurotus*, *Lentinellus*, *Ceratobasidium* and *Tulasnella* is still a matter of dispute (Oberwinkler, 1972; Roy 1976).

The literature on the Aphyllophorales is vast and can be conveniently divided into four major parts according to its period:

PART-1:

This part mainly consists of the work of Linneaus (1753), Persoon (1801), Fries (1849) and Cooke (1886). Their work mainly deals with the broad external characters (features) of these fungi, on the basis of which they are broadly classified into different groups.

PART-2:

During this period (1881 to 1930), workers like Bresadola (1881 to 1900 and 1897); Karsten (1881 and 1889), Patouillard (1900), Llyod (1898-1925), Murrill (1915); studied for the first time the microscopic characters of these fungi and divided them into many traditional genera; into monotypic and other genera.

PART -3:

This part is of major activities, Corner (1932-1953) and Cunningham (1945-1963) brought out the significance of the hyphal organization in the identification of the fungi, belonging to the Aphyllophorales.

PART- 4:

This part consists of current works of Eriksson (1958); Donk (1964); Roy (1971-1987); Pegler (1973 a.b); Hjortstam (1973-1988); Eriksson and Ryvarden (1973, 1975, 1976); Gilbertson (1977-1978); Rajchenberg (1987 a,b) etc. , which deals in detail with the external and internal characters, chemical reactions, hyphal structures of the basidiocarps under natural and culture conditions. This leads to an understanding of the phylogenetic affinities among the members of Aphyllophorales.

National and International work on Aphyllophorales:

Studies on Aphyllophorales were initiated along with the launch of studies on Indian fungi. The first Indian record of a member of the Aphyllophorales can be traced to Koltzsch (1832) in his paper on Indian Polyporaceae. Later Berkeley (1839) described a few Indian polypores which were collected by W. J. Hooker. During the first quarter of the 20th century, Massee (1901, 1906, 1908 and 1910) published several accounts of Indian fungi based on collections sent to Kew Herbarium by several workers, notably by Sir Butler (1905a, b, c, d and 1918). Several Indian Aphyllophorales were also reported by Lloyd (1898–1924) and Sydow et al., (1906, 1907, 1911, 1912, 1916). Theissen (1913 a, b) reported many poroid Aphyllophorales collected from the Bombay presidency by Blatter. S. R. Bose (1919, 1923, 1924, 1925 and 1927) was the first Indian mycologist to provide a comprehensive account of the Indian polypores which he collected from Bengal and its surroundings. Sundaramani and Madurajan (1925) reported several members of Polyporaceae from Madras, and by 1925 there were more than 300 reports on the Aphyllophorales. Butler and Bisby (1931) made a compilation of the Indian fungi in their classic work "The Fungi of India". This important work stimulated the study of Indian fungi including Aphyllophorales.

Our knowledge about the Indian Aphyllophorales increased by the contributions of Bagchee and Bakshi (1950) Bagchee *et al.* (1954), Bakshi (1958, 1971), Bakshi *et al.* (1963), Puri (1956), Ramakrishan (1959), Rehill and Bakshi (1965), Welden (1965), Reeves *et al.* (1967), Thind (1973, 1975), Sathe and Rahalker (1977), Rattan (1977), Thind and Dhanda (1978), Thind and Dhanda 1978 a), Anjali Roy (1979, 1981, 1981a, b, 1982, 1983, 1984, 1987), Harsh (1982), Natarajan and Raman (1980), Natarajan and Kolandavelu (1985),Vaidya (1987) Vaidya and Bhor (1990) Vaidya *et al.* (1991), Vaidya and Rabba (1993 a, b), Rabba (1994), Sharma (1995) and Nanda, M. K. (1996). Leelavathy and Ganesh (2000) published details of 80 species of polypores belonging to 32 genera from three families (Ganodermataceae, Hymenochaetaceae and Polyporaceae) in the book "Polypores of Kerala". The earliest reports of hymenochaetaceous fungi from India date back to

Montagne (1842, 1846), Lloyd (1898–1925) and Theissen (1911). Later papers were published by Bose (1924, 1925, 1934, 1946), Bagchee *et al.* (1954), Bagchee (1961), Bagchee and Bakshi (1950), Bagchee and Singh (1954), Bakshi (1955), Bakshi *et al.* (1963), Banerjee (1935), Ganesh and Leelavathy (1986), Lowe (1963 a, b), Pegler (1966, 1967 a, b), Roy (1979), Ryvarden and Dhanda (1975), Sharma (1993 a, b), Sharma and Ghose (1989), Thind and Adalkha (1956), Thind and Chatrath (1960), Thind and Dhanda (1978 a), Thind and Rattan (1971 a, b, c , 1973 a, b) and Thind et al. (1970). Rattan (1977) published a book entitled "The Resupinate Aphyllophorales of the North Western Himalayas". A good piece of work was done by Sharma (1995) on "Hymenochaetaceae of India". Special efforts were taken to publish the book entitled "Genera of Indian Polypores" by Sharma (2000), who gave an idea about the diversity of polypores from India.

The manual entitled "Polyporaceae of India" by Anjali Roy and De Asit (1996) was based on exhaustive studies on fungi belonging to the family Polyporaceae collected from different parts of India during the preceding 40 years. Studies on resupinate Aphyllophorales were initiated along with the launch of studies on Indian fungi. Later Hennings (1901) published "Fungi India Orientalis". However, in comparison with the work on non-poroid resupinate Aphyllophorales in the other states of India, there is very little information available on this group in the state of Maharashtra, particularly from Western Ghats. In fact, study of non-poroid resupinate Aphyllophorales largely remained neglected and there were only a few incidental reports of their occurrence. The first serious study was made by Bagchee and Bakshi (1954) who described 14 species. Six more species were described by Thind and Adalakha (1956). Reid *et al.* (1958) and Rehill and Bakshi (1965, 1966) in their generic monographs recognised one species of *Peniophora*, seven species of *Corticium* and 18 species of *Stereum* as validly reported from the area, while four more species were added by Thind and Rattan (1971 a, b). In addition, there are other scattered reports of a few species in such genera as *Pellicularia*, *Hymenochaete*, and *Coniophora*. Thind and Rattan (1968, 1970, 1971 a, b, c, 1972, 1973 a, b) described 59 species (under Thelephoraceae) including 36 new records and 6 new species while Thind and Khara 1968) and Khara (1978 a, b) recorded 24 more species (under Hydnaceae) including one new species, from the North Western Himalayas.

A few additions were made by Natarajan and Kolandavelu (1985 and 1998) on resupinate Aphyllophorales from South India, Naik-Vaidya CD. (1990) on wood rotting fungi from Karnala and Kankeshwar, Rabba (1994) on the genus *Phellinus* from Maharashtra and Nanda M. K. (1996) on wood rotting fungi from Bhimashankar. The bibliography includes those references which were used for identification of genera and species mentioned in the checklist. Good amount of contribution was made on resupinate Aphyllophorales by Hakimi (2008). Taxonomy and diversity of *Ganoderma* from Western Parts of Maharashtra has been studied by Bhosale *et al.* (2010). The check list giving complete Aphyllophorales diversity data from Western Ghats of Maharashtra State has been done by Ranadive *et al.* (2011). 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 (Ranadive *et al.*)." The complete literature survey of Indian Aphyllophorales was taken by Ranadive (2012) in the form of **Indian Aphyllofungal database** i. e **IAD** which has been published on the website www.fungifromindia.com in the Database section.

Pune District

Pune, an important district of Maharashtra is located between 17°52' to 19°23'North and 73°20' to 75°10' East and extends over an area of 15, 640 sq. kms. **(Map 1)** It has a near triangular shape with its base coinciding with the continental divide, which marks the boundary between the plateu on the East and the Konkan to the West. It extends South-South-Eastwards over a distance of approximately 212 kms. Along the Sahyadri ranges, it has a North South width of about 150 kms. Pune District is in the Western region in Maharashtra in India. It is bounded by Thane District to the North-West, Raigad District to the West, Satara District to the South, Solapur District to the South-East, and Ahmednagar District to the North and North-East. Pune district lies in the Western Ghats or Sahyadri mountain range and it extends on to the Deccan Plateau on the East. Pune stands on the leeward side of the Western Ghats. Pune is at an altitude of 567.842 m. (Anonymus-Geological Survey of India, 1976).In the West, along the Sahyadris; Pune has a breadth of nearly 128.74 kms. From this it stretches

about 209.21472 kms South-East, sloping gradually from about 609.6 to 304.8 m above the sea and narrowing in an irregular wedge-shape to about 32.18 kms in the East. It is bounded on the North by the talukas of Akola, Sangamner and Parner in Ahmednager District on the East by Parner. Shrigonda; Karjat, also in Ahmednager District and Karmala in Sholapur District; on the South by Malshiras in Sholapur District; Phaltan and Wai in North Satara District; on the West by Roha, Pen; Karjat in Raigad (Kolaba) District and Murbad in Thane District (Map 2).

Micro-Morphology of Aphyllophorales

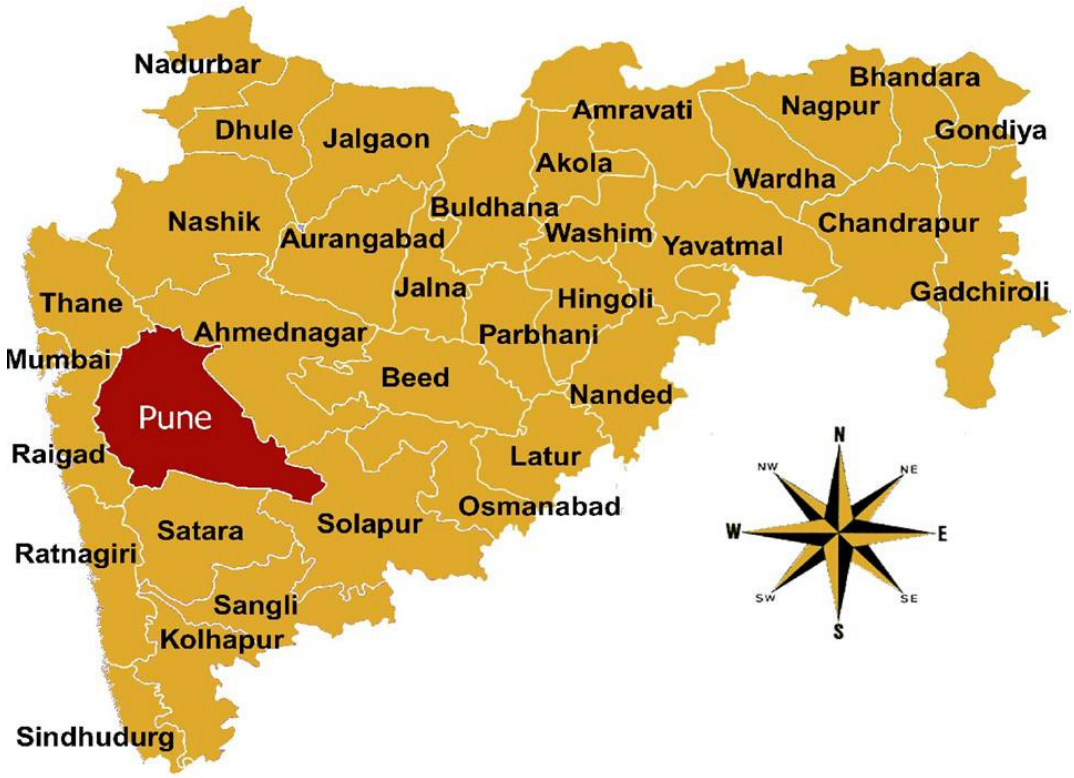
The importance of micro-morphology of basidiocarp in taxonomy was introduced by Corner (1933 and 1953) by introducing the concept of **"**hyphal system**".** The basidiocarp consists of hyphae for a long time no attention, in particular, was paid to them, except for mentioning of septation, rarely. Corner's fundamental work on the hyphal system brought out the importance of the microstructures of the basidiocarp to the taxonomy of Aphyllophorales. With the advancement in knowledge over a period of time through experience it was analyzed that hyphal is considered more complicated than originally assumed. Hence there has been some modifications in Corner's system for hyphal classification. In a series of publications, Corner (1932 a, b) described the anatomy of the basidiocarp in the five polyporoid fungi namely *Polystictus xanthocarpus* Fries, *Fomes lavigatus* Corner, *Fomes lamaensis* (Murr). Sace. ex. Trott., *Fomes maxium* Corner, *Fomes pachyphloeus* Pat. Cunningham (1946, 1965) realized the significance of Corner's (Corner, 1947, 1948 and 1950) finding and confirmed his results through a series of publications. Cunningham (1946-1965) further brought out the importance of the hyphal configuration in the understanding of the limits in the Aphyllophorales. Corner (1932 a) discovered that the context of members of Aphyllophorales may consist of morphologically distinct hyphae which he classified into three basic groups namely: Generative**,** Skeletal and Binding hyphae. When only generative hyphae are present in a sporophore, the hyphal system is **monomitic**; when skeletal hyphae are present along with generative hyphae, the hyphal system is called **dimitic**; when all the three types of hyphae are present in the sporophore it is called **trimitic.** Cunningham (Cunningham 1945) observed and stressed the presence of clamps as an important character and it is significantly connected with hyphal types and systems.

Materials and Methods

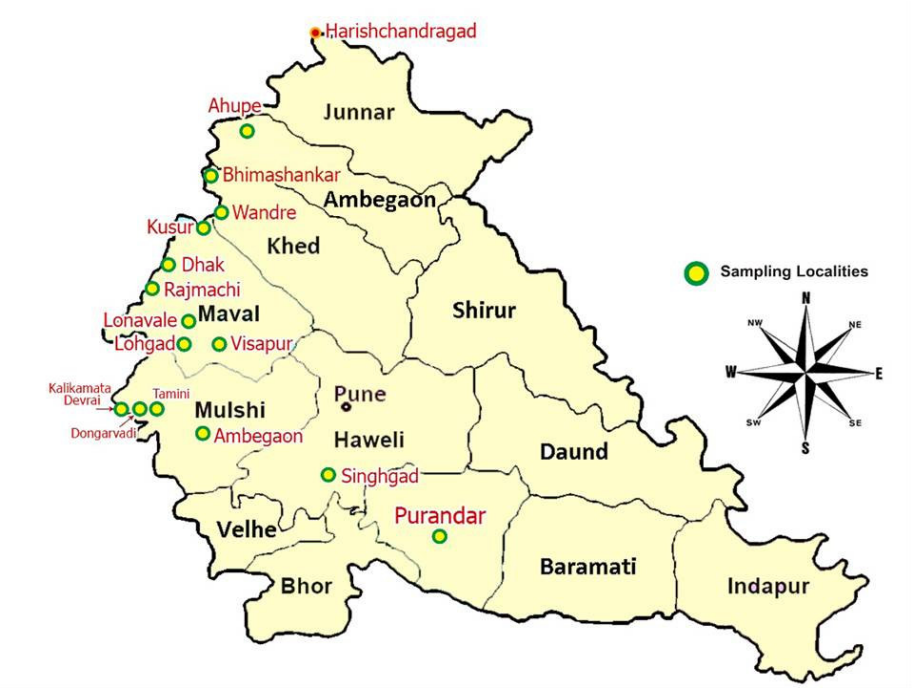
All the species described in the present study have been collected personally by the author through extensive field survey of the Western Ghats of the Pune District, Maharashtra State. Visits were made to the 15 different localities which include Ahupe, Bhimashankar, Dongarwadi, Harishchandragad, Kalkaimata Devrai, Lohagad fort base**,** Lonavala-Dhak Bhairi**,** Lonavala-Kusoor Plateau**,** Lonavala-Rajmachi fort base, Lonavala-Wandre Khind, Lonavala, Panshet-Ambegaon**,** Purandar fort base**,** Sihagad fort base and Vinjai Devrai-Tamini**.** Extensive collection of Aphyllophorales fungi has been done at least 2 to 3 times from the same localities.

Some of the study area localities

Ahupe ($19^0$04'N, 73^0 32'E), located in North-West Ambegaon, is also a tribal village spread out on a plateau and within the boundaries of the Bhimashankar wildlife sanctuary. In Ahupe, the grove was bigger in area and quite thick with a number of trees with huge girth. The dominant feature of Ahupe, a tribal village, is the fact that it is within the limits of a protected area, the Bhimashankar sanctuary. The area was declared a wild life sanctuary in 1985 under the Wild life (Protection) Act of 1972 (Borges, 1996). Sanctuary status implies restriction on free use of forest resources, which is considered necessary for ecosystem conservation (Dey, 1996)**.** Bhimashakar (19°04'N.73°32'E.; height. 1050.950 m), in the village limits of Bhovargiri at the river Bhima near the crest of the Sahyadris, about 48.2803 kms North-West of Khed, is famous for its temple of Madadeva, said to be one of the twelve Jyotirlingas of India. Harishchandragad (19°23′N 73°46′E. height. 1423.720 m), is a hill fort in the Ahmednagar region of India. Its history is linked with that of Malshej Ghat, and it has played a major role in guarding the surrounding region. Harishchandragad lies where the boundaries of Thane, Pune and Ahmednagar districts converge. Lohagad Fort (18°42'N., 73°29'E; height 957.681 m), 6.43 kms South of Malavali Raliway Station is situated on a striking hill in the same range



Map. 1. Map of Maharashtra showing Pune District



Map. 2. Map of Pune District showing sampling localities

as the neighboring Visapur fort. Lonavala (18°45'N., 73°24'E; a. 38.84 sq. kms; p.16, 771; elevation between 609.6 and 626.059 m) is a hill station situated on the top of the Bor pass of the Sahyadris and at a distance of 128.74 kms from Bombay and 64.373 kms from Pune, either by rail or by road. Rajamachi (18°49'N., 73°24'E,; height 826.008 m) is an isolated double-peaked fortified hill on the main line of the Sahyadris, about 9.65 kms as the crow flies and ten by path North East of the Bor Ghat. Purandar (18°17'N., 73°52'E ; height 1385.316 m), is a famous fortified hill about 40 kms South of Pune and about 9.6560 kms South-West of Saswad from where a very fair road leads to the foot of the Purandara hill. Sinhagad or Kondhana Fort (18°22'N., 73°46'E,; height 1316.736 m), about 24.14 kms South-West of Pune, stands on one of the prominent points of the Sinhagada-Bhulesvar range nearly 701.4 m above the Pune plain. Vinjai Devrai (Tamini) village, located in South-West Mulshi.

Vegetation of the Pune District

The tropical forests of Pune District are mainly classified into the following types following Champion and Seth (1968) with slight modifications The types are as follows Tropical stunted semi-evergreen forests (West coast tropical semi-evergreen forests), Tropical stunted semi-evergreen scrub forests, Tropical moist deciduous forests (Southern moist mixed deciduous forests and secondary moist mixed deciduous forests) and Tropical dry deciduous forests **(Table No. 1 and 2).**

Collection and Preservation of samples

During the collection tours the fungal material, mostly dead twigs and wood with fruit bodies were examined using a 3 fold pocket lens (15X) and kept in the zip lock polythene bags as well as some times paper bags. This method though it appears simple, needed extensive screening of maximum fallen twigs, bark and wood, dead wood, dead roots of trees as well as the infected trees and shrubs. This was done during all seasons but the collections were abundant after rainy season. Most of the forms collected were growing saprophytically and their substrates were identified following the latest nomenclature (as far as possible) after tentative identification on the spot. The specimens were brought to the laboratory and examined under a stereo-binocular to observe position of the fruit bodies, their gross morphology, shape, size colour of the fruit body, presence or absence of the appendages etc. All the specimens described are labeled and deposited in the Department of Botany, University of Pune, Pune - 411007.The collected materials were kept in brown paper folders of size 20 x 15 cms prepared from paper of 29 x 33 cms size with label. (Size 16.5 x 7.5 cms)

Photographic Documentation

The speciemens were photographed with the help of Panasonic FZ-50 (Pro-SLR) camera to get the best result showing all Macro-morphological details of the specimen. Selection of the quality photographs was done by checking its zooming quality.

Stains and Mounting medium preparation

Lactic acid in glycerol

Although less effective than lacto-phenol for cleaning plant tissues, lactic acid has similar properties and can be used neat or combined with glycerol and water for routine examinations of many fungi. (Composition for 100 ml.){**Lactic acid: 25 ml, Glycerol: 50 ml and Distilled water: 25 ml}**

Cotton blue in lactic acid

This is widely used as standard mordant which rapidly stains the cytoplasm of fungal cells. Permanent mounts can be prepared by sealing with nail varnish. Add cotton blue powder to lactic acid. Heat in a glass beaker and stir until dissolved. Add to cool then filter to remove any sediment. (Composition for 100 ml.){**Cotton blue: 0.01 gm and** Lactic **acid (85%): 100 ml**}

Potassium hydroxide (KOH)

Used at 5-10 % potassium hydroxide is useful for softening the fungal tissue. After clearing, the KOH can be washed off with water using a dropper or pipette and replaced with stain. A 5 % solution is prepared as follows: Weigh out 5gms of potassium hydroxide pellets. Add to distilled water in a glass beaker. Stir until dissolved. (Composition for 100 ml.){**Potassium hydroxide: 5 gm, Dist. water: 100 ml**

Melzer's regent

Mainly used for testing the amyloid reaction in sporulating structures of Basidiomycetes. Also clears and stains the fungal tissues including cell walls and can be used for general examination of fungal structures. Prepare in a fume cupboard. Dissolve

potassium iodide in distilled water. Add iodine and leave to dissolve for 24 hours. Add chloral hydrate and stir until dissolved. Mix thoroughly. (Composition for 100 ml.){**Cholral hydrate: 100 gm, Iodine: 1.5 gm, Potassium iodide: 5 gm and** Distilled **water: 100 ml}**

Microscopic Examinations

Free hand sections of the fruit bodies were taken carefully and primary observations were made using lacto-glycerin mounts to see the colour of basidiospores, setae and other elements of the section. Sections were also stained in cotton blue and mounted in lacto-glycerin.

Preparation of Slides

For microscopic examinations of the basidiocarps, the specimens are sectioned along the tubes with razor blades for noting down the shape, size and dimensions of the hyphae, spores, basidia, and various setal elements. In poroid samples, the pore mouths are mostly sterile and a fertile hymenium is found a certain distance beyond the pore mouths where spores and possibly cystidia may be observed. A small context of pileal cover maybe mounted in the same preparation.The processed micro glass slides of size 76 mm x 25 mm, without lint free packing having thickness 1.45 mm (Sunbeam Company) are used for all microscopic preparations. The micro coverslips of the same company are used having size of 22 x 22 mm square made up of English glass (Half mm thickness). Nail paint is used for the temporary sealing of the slides. All these slides are stored in the plastic slide box of size 12 x 9.8 cms with slide holder strips inside having capacity of 25 slides. All the slides are properly labeled (specimen number and spore slide / hymenium slide / context slide / trama slide etc.) with permanant glass marker.

The best results are achieved under stereo microscope. In dense polypores, sections often contain entrapped air which can be difficult to remove, but a drop of ethyl alcohol will solve this problem. Sample from various parts of the fruit body should be taken for cutting thin sections as recommended by Teixeira (1962 a).Basidiocarp sections from various parts of the fruit body were teased by fine needle under dissecting microscope and mounted in 5 % KOH solution. Staining of the sections was done with cotton blue and mounted in lacto-glycerin. Stain containing material was gently warmed on the slide, allowed to act for 30 seconds, washed and mounted in lacto-glycerin. The sections mounted in 5 % KOH, can easily be squashed with a gentle tap on the coverslip and it facilitates the recording of hyphal morphology and dimensions. The spore measurements were taken from thin sections or hymenial squashes and should mostly based on the observations on spores not yet detached from their basidia.Basidiocarps and hyphae were also stained with Melzer's reagent (IKI). If they are yellow to nearly colourless they are said to be inamyloid or IKI –ve. The reaction is said to be amyloid if they turn grey or blue and dextrinoid if becomes reddish brown. Microscopic details of various representative areas of the fruit body, hyphal system and spores were studied as suggested by Teixeira (1962 b)

Processing Flow Chart for slide preparation

First place a drop of KOH or staining reagent on slide. Dip the edge of your cutting tool in the fluid and scrape or cut a small piece of hymenium. The fluid will moisten your sample so normally this will not be difficult. Transfer the loose part with your cutting tool to the drop where it will normally release itself. Cut a clean vertical surface and try to make a total section of the whole fruit body; not only the hymenium. Now place a coverslip on your preparation and gently tap the slide with a pencil until you have squeezed the tissue for examination. Eventually remove the excess KOH with a blotting paper. Sections in cotton blue should be warmed before squeezing the tissue.

Camera Lucida Drawing Preparation

Camera lucida sketches were also made for all materials with prism type camera lucida. Measurements of the basidia, cystidia, setae, spores were made by ocular of ERMA INC , made in Japan and objective micrometer of ERMA TOKYO company and eyepiece micrometer under 10X, 45X, and 100X objectives. For fructification, measurements were taken 5-10 times and average values were recorded.

Identification

Materials were identified up to species level with the aid of standard literature namely Ainsworth (1973), Bakshi (1965), Berkeley (1866 a, b), Bose (1920), Butler and Bisby (1931), Cooke (1953), Cunningham (1947), Donk (1964), Eriksson and

Ryvarden (1976), Fidalgo (1968), Gilberstson and Ryvarden (1986-1987), Hjortstam and Ryvarden (1988), Julich (1976), Larsen and Cobb-Poulle (1990), Leelavathy and Ganesh (2000), Lloyd (1908-1912), Lowe (1934), Murrill (1907), Natrajan and Kolandavelu (1998), Pegler (1967 a, b), Rattan (1977), Roy and De (1996), Ryvarden and Johansen (1980), Ryvarden (1976 and 1987), Ryvarden (1976 a, b, c, d), Ryvarden (1991), Sharma (1995), Steyaert (1972), Talbot (1951, 1954 a, b, 1958), Teixeira (1962 a and b), Telleria (1980) and Moncalvo and Ryvarden (1997).

Observations and Results

Taxonomic part

In order to study the detailed Mycobiota of resupinate Aphyllophorales, a total of 20 fungal species from the 10 respective hosts were identified out of 126 collected specimens from 15 different localities **(Table No. 1).**

Taxonomy of Poroid and Non-Poroid Aphyllophorales

In the present investigation total 20 different Aphyllophorales fungi were identified from 08 different families. From these, **6 families belong to Poroid Aphyllophorales** group {**Fomitopsidaceae (***Lenzites***)**, **Ganodermataceae (***Ganoderma***)**, **Hymenochaetaceae** (*Inonotus* and *Phellinus*), **Meripilaceae (***Rigidoporus***),** **Meruliaceae** (*Flavodon* and *Podoscypha*) and **Polyporaceae** (*Funalia*, *Hexagonia*, *Microporus*, *Polyporus* and *Royoporus*)} and **2 are from Non-Poroid Aphyllophorales** group {**Peniophoraceae** (*Peniophora*) and **Stereaceae** (*Gloeocystidiellum*)**}**.

Key to the Poroid and Non-Poroid Aphyllophorales:

1 Fruit body poroid----------4
1*Fruit body nonporoid----------2
2 Hymenophore non-velvety, cream coloured----------***Gloeocystidiellum***
2* Hymenophore velvety, not cream coloured----------3
3 Hymenophore brownish, spores 9-13 ×4-5 µm, broadly cylindrical-narrowly ellipsoid----------***Peniophora laurentii***
3* Hymenophore bluish, spores 6.5-7.5×2.5-3 µm, spores suballantoid to allantoid ----------***Peniophora pithya***
4 Pore and teeth are present, Hymenophore typical yellow in colour----------***Flavodon***
4*Pores present but teeth absent, Hymenophore variously coloured----------5
5 Fruit body stipitate----------6
5* Fruit body sessile (non-stipitate) ---------- 10
6 Stipe lateral and less than 10 mm in length----------7
6*Stipe central more than 10 mm in length----------8
7 Stipe 8 mm long, spores hyaline, cylindrical, 5.0-7.5 x 2.0-3.0 µm----------***Royoporus***
7* Stipe 10 mm long, spores cylindrical, 10-13(14.5) x 3.5-5 µm----------***Polyporus alveolarius***
8 Pileus surface concolourous with pore colour----------9
8* Pileus surface not concolourous with pore colour----------***Microporus***
9 Stipe 1-2 cms in length, 8.75 x 4 µm ----------***Polyporus tricholoma***
9* Stipe 2-6 cms in length, spores 3.75 x 2.5 µm -----***Podoscypha***
10 Basidiocarp ash coloured ----------11
10* Basidiocarp other than ash coloured----------12
11 Pores circular to angular, spores 5-7.5 x 2-2.8 µm----------***Hexagonia caperata***
11*Pores hexagonal, spores 11-13.75 x 3.5-6.42µm----------***Hexagonia tenuis***
12 Pores daedaloid to sinuous lamellate----------***Lenzites acuta***
12*Pores never lamellate----------13
13 Contextual tissue turns black with KOH----------14
13* Contextual tissue do not turn black with KOH----------15
14 Pores angular, yellowish brown, 3-5 per mm----------***Inonotus***
14* Pores circular, reddish brown, 4-8 per mm----------***Phellinus***
15 Pileus colour concolorous with pore----------***Rigidoporus***
15* Pileus colour not concolorous with pore----------16
16 Pileus laccate, spores 5–6.6 × 9.1–10µm ----------***Ganoderma chalceum***
16* Basidiocarp non-laccate, spore (6) 7–11 × (4)5–7µm----------***Ganoderma lipsiense***

Table 1 Pune district localities-Details of Latitude, Longitude and forest types

Sr.No.	Collection localities from Pune District	Forest type present	Latitude Longitude
1.	**Ahupe** (Bhimashankar)	Tropical stunted semi-evergreen forest	19^0 04'N,73 ^{0} 32'E
2.	**Bhimashankar**	Tropical stunted semi-evergreen forest	19^0 04'N,73 ^{0} 32'E
3.	**Dongarwadi**	Tropical stunted semi-evergreen forest andTropical moist deciduous forests	18^0 29'N,73 ^{0} 25'E
4.	**Harishchandragad**	Tropical stunted semi-evergreen forest and scrubby woodlands	19^0 23'N,73 ^{0} 51'E
5.	**KalkaimataDevrai** (Tatyachi wadi)	Tropical stunted semi-evergreen forest	18^0 29'N,73 ^{0} 25'E
6.	**Lohagad**	Tropical moist deciduous forests , Tropical moist deciduous forests and scrubby woodlands	18^0 42'N,73 ^{0} 29'E
7.	**Lonawala**	Tropical stunted semi-evergreen forest and scrubby woodlands	18^0 45'N,73 ^{0} 24'E
8.	**Lonawala –Dhak**	Tropical stunted semi-evergreen forest and scrubby woodlands	18^0 53'N,73 ^{0} 25'E
9.	**Lonawala-Kusoor**	Tropical stunted semi-evergreen forest and scrubby woodlands	18^0 52'N,73 ^{0} 28'E
10.	**Lonawala –Rajmachi**	Tropical stunted semi-evergreen forest and scrubby woodlands	18^0 49'N,73 ^{0} 24'E
11.	**Lonawala – Wandre Khind**	Tropical stunted semi-evergreen forest and scrubby woodlands	18^0 52'N,73 ^{0} 28'E
12.	**Panshet- Ambegaon** area	Tropical stunted semi-evergreen forest and scrubby woodlands	18^0 22'N,73 ^{0} 39'E
13.	**Purandar**	Tropical moist deciduous forests and scrubby woodlands	18^0 17'N,73 ^{0}52'E
14.	**Sinhagad**	Tropical dry deciduous forests	18^0 22'N,73 ^{0} 46'E
15.	**Vinjai Devrai (Tamini)**	Tropical stunted semi-evergreen forest	18^0 27'N,73 ^{0} 26'E

Table 2 Forest Types in Western Ghats of Pune District

Sr.No	Type of Forest	Percentage
1	**Tropical stunted semi-evergreen forest**	40%
2	**Tropical stunted semi-evergreen forests and scrubby woodlands**	40%
3	**Tropical moist deciduous forests**	6.66%
4	**Tropical moist deciduous forests and scrubby woodlands**	6.66%
5	**Tropical dry deciduous forests**	6.66%

Description of the Poroid and Non-Poroid species

Flavodon flavus (KI.) Ryv. Norw. J. Bot. 20 (1973) 3; Ryvarden and Johansen (1980) 333. **(Plate 1, 2 Fig. A)**

Fruit-bodies sessile, applanate, horizontal, semicircular, often fusing into flanges, rarely imbricate, varying effuso-reflexed to entirely resupinate. Pileus 3-4 cm in radius, villous tomentose to subtomentose, narrowly concentrically sulcate, yellow to subfulvous, in age pallid to greyish; margin obtuse to subacute, pale yellowish white. Hymenophore yellow to fulvous and fulvous cinnamon, in some cases, at first shallowly poroid with angular to circular pores 0.2-0.7 mm wide, developing into narrow lacerate-dentate plates and narrow acicular spines 2-3 mm long, eventually wholly irpicoid-hydnoid; Hyphal pegs absent. Flesh 0.5-2.5 mm thick at the base of the pileus, 0.5 (-1) mm thick in the resupinate part, fibrilloso -floccose, light-weight, lurid yellow to fulvous, without crust. Spores 3.21-6 x 3-4 µm, white in the mass, smooth, ellipsoid, thinwalled, aguttate, not dextrinoid. Basidia 22 x 5 µm, subclavate; sterigmata 4; often with granular matter between the basidia. Cystidia 18-39 x 2-6.5µm, cylindric, subclavate, subfusiform to subventricose, often flexuous, mostly obtuse, with yellowish walls -1 µm thick, mostly thinly encrusted over the apex, derived from subhymenial hyphae and from the ends of outcurved skeletal hyphae, abundant. Hymenium not thick. Hyphae dimitic in the flesh and dissepiments, thickly encrusted in places, the encrustation more or less soluble in potash, not dextrinoid; skeletal hyphae 4-6.5 µm wide in the flesh, 3-4 µm in the dissepiments, unbranched, apparently unlimited, often sparsely septate, the yellowish walls -2 µm thick, not darkening in potash, the mediate part rather long with thinner pale yellow walls and septate; generative hyphae 2-4.5 µm, without clamps; dissepiments not agglutinated. Surface of pileus with an oblique pile loosely intertwined, rather thin-walled, ends of skeletal hyphae, some thinly granular encrusted, others with rather dense contents, often with subacute cystidiiform apices. Colour caused by the yellow hyphal walls and the brownish ochraceous incrustation. The catahymenium composed of hymenial cystidia and the subacute ends of skeletal hyphae. **Materials Examined:** On fallen sticks of angiosperms, Sinhagad (9/11/08) VKPO-198, On Fallen sticks, Purandar (30/10/08) VKPO-209, On fallen stump, Vinjai Devrai (12/11/08) VKPO-210, On dead wood, fallen dead stumps, sticks, Kalkaimata Devrai (12/11/08) VKPO-211, 212, 213, 235, 237, On fallen stumps, Harishchandragad (23/3/08) VKPO-214, On fallen stumps, Bhimashankar (12/11/07) VKPO-215, 216, On dead wood, Dongarwadi (7/5/07) VKPO-218. **Distribution:** Malesia, India. **Remarks:** Generally, there is no difficulty in recognising this fungus in the field, in spite of the variation in the hymenophore. Generally the yellowish colour hydnoid hymenophore is very much common. It occurs widely in most of the places in given collection localities on dead angiospermic wood.

Funalia leonina (Kl.) Pat. **(Plate 1, 2 Fig. B)**

Fruitbody annual, pileate, mostly with convex pileus and flat pore surface, but also deflexed with narrow pileus and decurrent pore surface, broadly attached, semicircular to elongated, up to 5 cm wide and 10 cm long and 3 cm thick at the base, soft when fresh, tough when dry. Pileus flat to convex, covered with a dense mat of strigose hairs, becoming hispid in old specimens, pure white when fresh, soon strawcoloured and finally greyish in old specimens, the tomentum is distinct down 2-3 cm depth at the base, thinner towards the margin which is rounded and straight in fresh specimens, often deflexed when dry. Pore surface flat or decurrent on oblique substrates, first white, soon straw-coloured when old and dry, pores large and angular, mostly 1-2 per mm in young specimens, large and often deeply split to an almost hydnoid hymenophore in larger specimens and then 1-2 mm across, tubes mostly concolorous with pore surface, but white towards the context, 8 to 10 mm deep at the base. Context white, hard, fibrous and horizontal in the lower part, up 4 to 5 mm thick in this layer, the upper part looser and with fibres bent upwards and into the tomentum which can be defined as the upper loose part of the context.Hyphal system trimitic, generative hyphae with clamps, the tomentum consists of long hyaline skeletal hyphae, thinwalled in the apices, more of less thick-walled to almost solid deeper in the pileus, 3-8 µm in diameter, mixed with a few generative hyphae, 3-6.25 µm in diameter, trama as the context, subhymenium is made up of thin generative hyphae, much branched, 2-4 µm in diameter, skeletal hyphae 2.5 µm in diameter. Binding hyphae 2-6 µm in diameter. No cystidia. Spores cylindrical, hyaline, smooth and non-amyloid, 6.25-11.25 x 3-6.25 µm. **Materials Examined:** Parasitic and saprophytic on *Terminalia* sp., Lohagad (23/3/08) VKPO-37, VKPO-39, VKPO-73, Saprophytic on *Terminalia* sp. Harishchandragad

(1/12/08) VKPO-38, On dead Angiospermic wood, Lonawala-Wandre Khind (16/11/08) VKPO-40. **Distribution:** Tropical Africa, Senegal Asia, Pakistan, India and Sri Lanka. New Guinea. **Remarks:** The species is usually easy to recognize in the field because of the pure white fruitbody with a dense mat of strigose hairs on the pileus on drying the colour changes to straw.

Key to the species of *Ganoderma*

Pileus non-laccate; generally stipitate, Cutis trichodermis type, Spore (6) 7–11 × (4)5–7µm; ----------***G. lipsiense***

Pileus laccate; stipitate, Cutis type claviform, 30–33 µm; Spores 5–6.6 × 9.1–10µm----------***G. chalceum***

Ganoderma chalceum (Cooke) Steyaert 1967 **(Plate 1, 2 Fig. C)**

Basidiocarp corky, annual, 14–17 × 3–5 cm. Upper Surface reddish brown, laccate, highly sulcate, with crust Margin hard, acute, 2mm thick, creamish yellow, sterile (Fig. 1b). Pore Surface coffee colour. Pore minute, 3–5per mm angular. Tube unstratified concolourous to pore surface, 4–13 mm long. Dessepiment thickness is 54.85 µm. Context coffee coloured, fibrous, up to 15mm wide and more than 20mm at base. Cutis type claviform with various types, 29.1–32.14 × 5–5.5 µm, Hyphal System dimitic, generative hyphae 2.5 to 3.5 µm diameter, hyaline, thin walled with clamps; skeletal hyphae 3.5 to 6.5 µm diameter, brown. Basidiospore 9.1–10 x 5–6.6 µm, ellipsoid, yellowish brown. **Materials Examined:** Parasitic on angiosperms, Lohagad (6/11/07) VKPO-80, Root rot of *Acacia* sp., Panshet-Ambegaon (15/7/08) VKPO-236, On fallen wood, Ahupe (29/10/09) VKPO-274. **Distribution:** Africa and Asia (China), Malaya, Solomon Islands, Singapore, India. **Remarks:** Young fruit-bodies are recognised from the dorso-lateral stem and reddish brown laccate pileus with a cherry red zone near the margin.

Ganoderma lipsiense (Batsch) Atk. *Ann. Mycol.* 6:189.(1908). **(Plate 1, 2 Fig. D)**

Basidiocarp hard, dimidiate, medium, applanate woody. Upper Surface slightly zonate, pulverulent glabrous, tuberous, rugose solitary, crust, rigid, up to 1mm thick, reddish grey or cinnamon. Margin hard, obtuse, slightly thick and lobate, cinnamon to grayish white or slightly yellowish. Pore Surface milky coffee. Pore minute, 5–6 per mm. Tube unstratified concolourous to pileus, 4-13 mm long. Context reddish brown, sub ferrugineous to coccoa coloured, corky, tough, thin, up to 30 mm wide. Cutis type trichodermis 48.21 µm. Hyphal System trimitic, generative hyphae 2.5 to 3.75 µm diameter, yellow; skeletal hyphae 5 µm diameter, brown; binding hyphae 5.8 µm diameter, brown. Basidiospore: 6-10 × 4-5µm, ovoid to broadly ellipsoid. **Materials Examined:** Parasitic on angiosperm, Lohagad (18/10/08) VKPO-33, Root Parasite of angiosperm, Lonawala–Dhak Bhairi (2/11/08) VKPO-34, On fallen stumps, Dongarwadi (4/11/07) VKPO-35. **Distribution**: Europe, Norway, Sweden, Finland, U.S.A. and India.**Remarks:** *Ganoderma applanatum* is easy to recognize in the field. Specimens should be disinfected rapidly as they frequently harbour numerous beetles.

Gloeocystidiellum furfuraceum (Bresadola) Donk. *Fungus* **26:** 9, 1956. **(Plate 1, 3 Fig. E)**

Basidiocarp resupinate, effused, 8-10×3-4 cms., arachnoid-pellicular to soft membranaceous, often rimose, separable. Hymenial surface even, somewhat farinaceous, whitish to cream-coloured when fresh, becoming pale ochraceous with age. Margin indistinct. Hyphal system monomitic, generative hyphae hyaline, thin-walled, 2-3.75 µm. wide, with clamps. Gloeocystidia cylindrical, often flexuous or somewhat swollen at the base, thin-walled, typically with yellowish contents, 50-90 ×6-10 µm, sulpho-positive. Thin walled cystidia 50-60 µm. Basidia subcylindrical and often flexuous to clavate, 25-30 ×5-6 µm, typically with 4 sterigmata. Spores hyaline, thin to somewhat thick-walled, globose to subglobose, echinulate, 5-7.5 µm diam, strongly amyloid. **Materials Examined:** On dead sticks of angiosperms, Dongarwadi (4/11/07) VKNPO-118, On dead stump, Purandar (22/10/08) VKNPO-119, On dead wood, Lonawala-Kusoor (6/12/08) VKNPO-8. **Distribution:** Europe, North, South America, Japan. **Remarks:** Fruit body after rubbing turns dark reddish brown.

Table 3 Fungal species, their host, collection location, date and code

No	Name of the fungus	Host/Substratum	Location and Date	Code
1.	*Flavodon flavus* (KI.) Ryv.	On Fallen sticks of angiosperms,	Sinhagad (9/11/08) Purandar (30/10/08) Vinjai Devrai (12/11/08) Kalkaimata Devrai (12/11/08) Harishchandragad (23/3/08) Bhimashankar (12/11/07) Dongarwadi (7/5/07)	VKPO-198, VKPO-209, VKPO-210, VKPO-211, 212, 213, 235, 237, VKPO-214, VKPO-215,216, VKPO-218
2.	*Funalia leonina* (Kl.) Pat.	*Terminalia* sp., On dead Angiospermic wood	Lohagad (23/3/08) Harishchandragad (1/12/08) Lonawala-Wandre Khind (16/11/08)	VKPO-37, VKPO-39, VKPO-73, VKPO-38 VKPO-40
3.	*Ganoderma chalceum*(Cooke) Steyaert	Root rot of *Acacia* sp., On fallen wood,	Lohagad (6/11/07) Panshet-Ambegaon (15/7/08) Ahupe (29/10/09)	VKPO-80 VKPO-236 VKPO-274.
4.	*Ganoderma lipsiense* (Batsch) Atk.	Parasitic on angiosperm, On fallen stumps	Lohagad (18/10/08) Lonawala – Dhak Bhairi (2/11/08) Dongarwadi (4/11/07)	VKPO-33, VKPO-34, VKPO-35
5.	*Gloeocystidiellum furfuraceum* (Bresadola) Donk.	On dead sticks of angiosperms	Dongarwadi (4/11/07), Purandar (22/10/08), Lonawala-Kusoor (6/12/08)	VKNPO-118VKNPO-8 VKNPO-119
6.	*Hexagonia caperata* (Berk.) J. E. Wright & J. R. Deschamps	On fallen stumps of angiosperms, *Mangifera* sp	Bhimashankar (12/11/07) Dongarwadi (7/5/07 and 26/10/08) Lonawala (23/12/08), Kalkaimata Devrai (12/11/08) Harishchandragad (1/12/08)	VKPO-41 VKPO-42,66, VKPO-44 VKPO- 45, VKPO-46,
7.	*Hexagonia tenuis* (Hook.) Fr.	On fallen stumps of angiosperms, *Mangifera* sp., *Carissa* sp.	Lonawala Kussor (6/12/08) Lonawala Dhak (2/11/08), Sinhagad (9/11/08 and 5/11/08) Purandar (22/10/08 and 30/10/08), 54, Ahupe (29/10/09)	VKPO-48,50 VKPO-49 VKPO-51, 52, VKPO-53 VKPO-277,278,279, 280,281.
8.	*Inonotus cuticularis* (Bull.) P. Karst.	Parasite on unknown angiosperm wood	Ahupe (29/10/09)	VKPO-275, 276
9.	*Lenzites acuta* Berk.	On fallen stumps, Unknown On *Memecylon umbellatum* wood, fallen stumps of angiosperms, On fallen stumps, , On fallen trunk of angiosperm and dead stumps, , , , On dead wood of *Bambusa* sp	Bhimashankar (12/11/07), Dongarwadi (4/11/07 and 26/10/08) Harishchandragad, (1/12/08), Kakaimata Devrai (12/11/08) Lonawala-Kusoor (6/12/08) Lonawala- Dhak Bhairi (2/11/08 and 6/11/08) Lonawala-Wandre Khind (16/11/08) Sinhagad (5/11/08 and 5/8/07) (23/12/08), Ahupe (29/10/09).	VKPO-18,70 VKPO-19,71,72, VKPO-20,21,23 VKPO-24 VKPO-25,259 VKPO-26,27,28 and 29 VKPO-30 VKPO-31and 32. VKPO-260 VKPO-283

Table 3..contd..

10.	*Microporus xanthopus* (Fr.) Kunt.	On fallen branches of *Memecylon umbellatum*, On sticks of *Carvia calosa*, On fallen sticks of *Terminalia* sp. and, On *Mangifera* sticks On dead branches of *Carissa caranda*, On *Carvia calosa* sticks,	Bhimashankar (12/11/07 and 16/10/08) Dongarwadi (7/5/07 and 4/11/07) Harishchandragad, (23/3/08 and 1/12/08) Kalkaimata Devrai(12/11/08) Lohagad (8/11/07 and 6/11/07) Bhairi (3/11/08 and 2/11/08), Lonawala (23/12/08) Lonawala-Kusoor (6/12/08) Lonawala-Wandre Khind (16/11/08) Purandar (22/10/08) Sinhagad (9/11/08) Ahupe (29/10/09) Lonawala-Dhak (2/11/08 and 6/11/08)	VKPO-1,67, VKPO-2,3, VKPO-4,5, VKPO-6,7, VKPO-8, 68, VKPO-9,13 VKPO-10,12, VKPO-11, 14, VKPO-15, VKPO-16, VKPO-17 VKPO-282.
11	*Peniophora laurentii* Lundell.	On angiospermic wood,	Dongarwadi (7/5/07), Lohagad (8/11/07) Sinhagad (5/11/08)	VKNPO-120, VKNPO-20, VKNPO-25
12	*Peniophora pithya* (Persoon) J. Eriksson.	On fallen wood,	Purandar (30/10/08) Bhimashankar (12/11/07)	VKNPO-121, VKNPO-19
13	*Phellinus arctostaphyli* (Long) Niemelä.	On fallen sumps and dead branches, *Terminalia* sp, *Lagerstromia*	Ahupe (29/10/09) Dongarwadi (4/11/07, 7/5/07, 26/10/08) Vinjai Devrai (12/11/08) Lohagad (18/10/08, 6/11/07) Lonawala (23/12/08) Harishchandragad (23/3/08) Kalkaimata Devrai (12/11/08), Lonawala-Kusoor (6/12/08)	VKPO-265, 272, 271 VKPO-102,104,105,116, VKPO-103 VKPO-106,107,111, VKPO-109,110, VKPO-112 VKPO-114, VKPO-115
14	*Phellinus badius* (Berk. ex Cke.) G. H. Cunn.	On *Ficus* sp. as a root parasite and On dead wood	Ahupe (29/10/09), Lonawala (23/12/08)	VKPO-266,267, VKPO-113
15	*Phellinus sanfordii* (C.G. Lloyd) Ryvarden	On dead angiospermic wood	Lonawala (23/12/08)	VKPO-83,81
16	*Podoscypha petaloides* (Berk.) Boidin	On dead wood of *Ficus* sp.,	Lonawala-Dhak Bhairi Dhak (2/11/08), Lohagad (6/11/07) Ahupe (29/10/09)	VKPO-239, VKPO-264, VKPO-289
17	*Polyporus alveolaris* (DC.) Bondartsev & Singer	On dead wood,	Lonawala, (23/12/08)	VKPO-145.
18	*Polyporus tricholoma* Mont.	On dead angiospermic wood and fallen stumps,	Lonawala-Dhak (2/11/08), Lonawala-Wandre (16/11/08) Lonawala-Kusoor, (6/12/08) Ahupe (29/10/09)	VKPO-57, VKPO-58, VKPO-59, VKPO-288.
19	*Rigidoporus ulmarius* (Sow.: Fr.) Imazeki	On dead standing tree of *Terminalia sp.*	Purandar, (30/10/08)	VKPO-36
20	*Royoporus spathulatus* (Jungh.) De.	On angiospermic dead stumps	Dongarwadi (26/10/08), Sinhagad, (5/11/08), Lonawala-Dhak Bhairi (2/11/08), Lonawala, (23/12/08) Bhimashankar, (12/11/07)	VKPO-74, VKPO-60, VKPO-61, VKPO-145, VKPO-217.

Table 4 Distribution of identified species in the investigation areas

Sr. No	Name of the Fungus	Collection Localities														
		AH	BH	DO	HG	KD	LG	LO	LO-DB	LO-KR	LO-RJ	LO-WK	PA	PG	SG	VD
1	*Flavodon flavus*	-	●	●	●	●	-	-	-	-	-	-		●	●	●
2	*Funalia leonina*	-	-	-	●	-	●	-	-	-	-	●	-	-	-	-
3	*Ganoderma chalceum*	●	-	-	-	-	●	-	-	-	-	-	●		-	-
4	*Ganoderma lipsiense*	-		●	-	-	●	-	●	-	-	-	-		-	-
5	*Gloeocystidiellum furfuraceum*	-	-	●	-	-	-	-	-	●	-	-	-	●	-	-
6	*Hexagonia caperata*	-	●	●	●	●	-	●	-	-	-	-	-	-	-	-
7	*Hexagonia tenuis*	●	-	-	-	-	-	-	●	●	-	-	-	●	●	-
8	*Inonotus cuticularis*	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	*Lenzites acuta*	●	●	●	●	●	-	-	●	●	-	●	-	-	●	-
10	*Microporus xanthopus*	●	●	●	●	●	●	●	●	●	-	●	-	●	●	-
11	*Peniophora laurentii*	-	-	●	-	-	●	-	-	-	-	-	-	-	●	-
12	*Peniophora pithya*	-	●	-	-	-	-	-	-	-	-	-	-	●	-	-
13	*Phellinus arctostaphyli*	●	-	●	●	●	●	●	-	●	-	-	-	-	-	●
14	*Phellinus badius*	●	-	-	-	-	-	●	-	-	-	-	-	-	-	-
15	*Phellinus sanfordii*	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
16	*Podoscypha petaloides*	●	-	-	-	-	●	-	●	-	-	-	-	-	-	-
17	*Polyporus alveolaris*	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
18	*Polyporus tricholoma*	●	-	-	-	-	-	-	●	●	-	●	-	-	-	-
19	*Rigidoporus ulmarius*	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-
20	*Royoporus spathulatus*	-	●	●	-	-	-	●	●	-	-	-	-	-	●	-

Ahupe (AH)
Bhimashankar (BH)
Dongarwadi (DO)
Harishchandragad (HG)
Kalkaimata Devrai (KD)
Lohagad (LG)
Purandar (PG)
Vinjai Devrai (VD)
Lonawala-Dhak Bhairi (LO-DB)
Lonawala-Kusoor (LO-KR)
Lonawala-Rajmachi (LO-RJ)
Lonawala-Wandre Khind (LO-WK)
Panshet-Ambegaon (PA)
Lonawala (LO)
Sinhagad (SG)

Key to the species of *Hexagonia*

1. Basidiocarp thin up to 0.4 cm at the base, hymenophore buff brown to cream brown, pores circular to angular, 2-4 per mm.----------***Hexagonia caperata***

1. Basidiocarp thin, upper surface light brown with blakish or reddish crustose area at the base, hymenophore light cinnamon brown, pores hexagonal, 1 per mm,----------***Hexagonia tenuis***

Hexagonia caperata (Berk.) J.E. Wright & J.R. Deschamps Rev. Invest. Agropec. INTABuenos Aires ser. 5, X (1973) 141. **(Plate 1, 3 Fig. F)**

Pilei 4-6 cm in radius, sessile to effuso-reflexed, horizontal to slightly ascending, often fusing laterally, at first pale brownish with fuliginous fuscous zones, then fuscous brown with darker brown 2-6 mm wide, alternating with narrower dark fuscous fuliginous, smooth or apressedly fibrilloso-fasciculate zones, sometimes developing fibrilloso-spicate, subspathulate; margin white, entire; pileus drying radially rugulose. Tubes 1-3 mm long, concolorous with the flesh becoming plugged with pale hyphae; pores 100-150 µm wide, dissepiments 60-155 µm thick, pale brownish wood-colour with a white or greyish bloom. Flesh 1-1.8 mm thick at the base of the pileus, Spores 5-7.5 x 2-2.8 µm, white, smooth, oblong ellipsoid, guttulate, inamyloid; Hymenium not thickening. Cystidia absent. Hyphal pegs 29-35 µm long, sparse to abundant. Hyphae trimitic, scarcely swelling in potash, not encrusted, not dextrinoid; skeletals 3.5-5 µm wide, the lumen wide, aseptate or sparsely secondarily septate, unbranched, unlimited, in the dissepiments; binding hyphae 1.25-2.5 µm wide with slightly thickened brown walls, generative hyphae 2.5-3µm wide, colourless, clamped. Surface of pileus with the tomentum composed of more or less straight skeletal ends, often tapered 2-3.5 µm wide, many rather closely secondarily septate, no crust. **Materials Examined:** On fallen stumps of angiosperms, Bhimashankar (12/11/07) VKPO-41, On *Mangifera* sp. dead branches Dongarwadi (7/5/07 and 26/10/08) VKPO-42, 66, On dead angiospermic twig, Lonawala (23/12/08) VKPO-44, On dead angiospermic twig , Kalkaimata Devrai (12/11/08) VKPO- 45, Unknown angiospermic wood, Harishchandragad (1/12/08) VKPO-46. **Distribution:** White rot. Tropical Africa and America. Brazil, AmazonasManaus. **Remarks:** The species is variable when it comes to pileus cover and colour, but the numerous narrow finely velutinate to adpressed tomentose zones are usually a good field characteristic. The pores are frequently quite small, very rarely they are angular and larger

Hexagonia tenuis (Hook.) Fr. Epicr. Syst. Mycol. p. 498, 1838. **(Plate 1, 3 Fig. G)**

Fruit body annual to perennial, solitary or in clusters, pileate, broadly, narrowly attached to almost stipitate, often almost only papery thin, consistency flexible and coriaceous when dry. Pileus dimidiate, flabelliform to semicircular, flat when fresh, often bent when dry, upper surface glabrous, usually strongly concentrically zoned in shades of brown from ochraceous. Margin paper-thin, acute, slightly depressed, wavy, entire to lobed. Pore surface snuff-brown, often with a greyish to ashy-bluish tint, pores angular to hexagonal, very variable, mostly 0.5-1 per mm, dissepiments thin, entire, tubes up to 2 mm long, with or without hyphal pegs. Context up to1 mm thick, dark brown, blackening in KOH. Hyphal system trimitic, generative hyphae clamped, hyaline and thin-walled, 2-3 µm wide. Skeletal hyphae yellow to pale brown, thick-walled with a distinct lumen, 3-7 µm in diameter. Binding hyphae hyaline, thick-walled with indistinct lumen, often swollen in KOH, 2.5-3.2 µm wide, coralloid to little branched. Cystidia absent. Spores oval to cylindrical, hyaline, thick-walled and smooth, inamyloid, 11-13.75 x 3.5-6.42µm.**Materials Examined:** On fallen stumps of angiosperms, *Mangifera* sp., Lonawala Kussor (6/12/08) VKPO-48,50, On angiospermic stump Lonawala Dhak (2/11/08) VKPO-49, On fallen stumps and unknown angiosperms, Sinhagad (9/11/08 and 5/11/08) VKPO-51, 52, On fallen angiospermic twig, and *Carissa* sp. Purandar (22/10/08 and 30/10/08) VKPO-53, 54, On fallen stumps, wooden logs, Ahupe (29/10/09) VKPO-277, 278, 279, 280, 281. Distribution: Pantropical, Africa, South of the Sahara and India.**Remarks:** Because of its persistent fruitbodies it is one of the most collected polypores.

Inonotus cuticularis (Bull.) P. Karst. 1879 **(Plate 1, 3 Fig. H)**

Basidiocarps annual, sessile, solitary, dimidiate, applanate, up to 6 x 11 x l.2 cm, upper surface reddish brown, becoming glabrous and finally blackened faintly zonate, smooth or shallowly

Plate 1. Fungal Photographs: A. *Phellinus badius* (Berk. ex Cke.) G. H. Cunn., **B.** *Inonotus cuticularis* (Bull.) P. Karst. **C.** *Phellinus arctostaphyli* (Long) Niemelä. **D.** *Phellinus sanfordii* (C. G. Lloyd) Ryvarden. **E.** *Royoporus spathulatus* (Jungh.) De. **F.** *Funalia leonina* (Kl.) Pat. **G.** *Flavodon flavus* (KI.) Ryv. **H.** *Microporus xanthopus* (Fr.) Kunt. **I.** *Hexagonia tenuis* (Hook.) Fr. **J.** *Podoscypha petaloides* (Berk.) Boidin. **K.** *Lenzites acuta* Berk. **L.** *Peniophora laurentii* Lundell. **M.** *Peniophora pithya* (Persoon) J. Eriksson. **N.** *Gloeocystidiellum furfuraceum* (Bresadola) Donk.**O.** *Ganoderma lipsiense* (Batsch) Atk. **P.** *Ganoderma chalceum*(Cooke) Steyaert. **Q.** *Hexagonia caperata* (Berk.) J.E*. Wright & J. R. Deschamps. **R.** *Hexagonia tenuis* (Hook.) Fr. **S.** *Rigidoporus ulmarius* (Sow.: Fr.) Imazeki. **T.** *Polyporus alveolaris* (DC.) Bondartsev & Singer **U.** *Polyporus tricholoma* Mont. **V.** *Polyporus tricholoma* Mont. (Dried material).

Plate 2. Fig. A. *Flavodon flavus* (KI.) Ryv. a. Habit, b. Pore shape, c. Basidiospores (3.21-6 x 3-4 µm), d.Basidia (22 x 5 µm), e. Skeletocystidia (18-39 x 2-6.5µm), f. Encrusted hypa (1 µm), g.Skeletal hypha (4-6.5 µm), h. and i.Generative hyphae (2-4.5 µm). **Fig. B.** *Funalia leonina* (Kl.) Pat. a. Habit, b. Pore shape, c. Basidiospores (6.25-11.25 x 3-6.25 µm), d. Generative hypha (3-6.25 µm), e. Skeletal hyphae (2.5 µm), f. Binding hypha (2-6 µm). **Fig. C.** G*anoderma chalceum* (Cooke) Steyaert a. and b. Habit, c. Pore shape, d. Basidiospores (9.1–10 x 5–6.6 µm), e. Generative hyphae (2.5 to 3.5 µm), f. Skeletal hyphae (3.5 to 6.5 µm), g. Cutis (29.1–32.14 × 5–5.5 µm. **Fig.D.** *Ganoderma lipsiense* (Batsch) Atk. a. and b. Habit, c. Pore shape, d. Basidiospores (6-10 × 4-5µm), e. Generative hyphae (2.5 to 3.75 µm), f., g and h. Skeletal hyphae (5 µm), i. Cutis (48.21 µm).

sulcate, margin concolorous, usually acute, sterile below, pore surface pale brown, glancing, the pores angular, 3-5 per mm, dissepiments thin, context bright yellowish, tube layer pale brownish, tubes often yellowish brown within, 6 to 8 mm thick. Hyphal system monomitic, generative hyphae, pale yellowish, with infrequent branching, in the context 4-6.25 µm in diam, others thin to thick-walled, pale brownish to almost hyaline, with frequent branching. Setal hyphae branched, abundant on pileus surface 5-10 µm, thick-walled unbranched setal elements similar to hymenial setae also present on hymenial surface. Hymenial setae abundant, subulate to ventricose, frequently hooked, thick-walled, 12-20 x 4-7.5 µm. Basidia not seen, simple-septate at the base. Basidiospores broadly ellipsoid to ovoid, pale to dark yellowish brown, 6-8.75 x 3.5-5 µm.**Materials Examined:** Parasite on unknown angiosperm, Ahupe (29/10/09) VKPO-275, 276. **Distribution:** U.S., Canada, Japan, China, Russia and South to Central Europe and India. **Remarks:** From a longer distance fruit body can be mistaken as some species of *Ganoderma*. But pore size, colour as well as KOH reaction will clearly shows the characteristics of the family Hymenochaetaceae.

Lenzites acuta Berk. in Hooker, London Journ. Bot. 1:146 (1842). **(Plate 1, 4 Fig. I)**

Fruit body annual to perennial, pileate broadly attached, semicircular to flabelliform, 8 to 12 cm wide and 10 to 12 cm long and up to 2-3 cm thick at the base in large and broadly attached fruitbodies, coriaceous when fresh, flexible when dry. Pileus first dull and very finely velutinate and soft to touch, with age becoming glabrous, but without a cuticle, concentrically zonate, weakly sulcate smooth, first white, cream, pale ochraceous to clay-coloured, then leather-coloured or dirty brownish, old and dead specimens are frequently whitish to dirty greyish. Margin sharp, entire. Pore surface dirty yellow, daedaloid to sinuous lamellae up to 5 mm wide. Hymenophore lamellate up to 6 mm wide, lamellae straight 8 to 10 mm deep. Context yellowish, up to 7 mm thick. Hyphal system trimitic, generative hyphae hyaline and with clamps 1.5 µm, skeletal hyphae straight, thinwalled and pale yellowish 9.642 µm, binding hyphae common, richly-branched, solid 3.214 µm. Cystidia are absent. Spores cylindrical 6-7 x 3-3.214 µm, smooth, thinwalled and in-amyloid.**Materials Examined:** On fallen stumps, Bhimashankar (12/11/07) VKPO-18,70, Unknown angiospermic wood and fallen stumps, Dongarwadi (4/11/07 and 26/10/08) VKPO-19,71,72, On *Memecylon umbellatum* wood, fallen stumps of angiosperms, Harishchandragad (1/12/08) VKPO-20, 21, 23, On fallen stumps, Kakaimata Devrai (12/11/08) VKPO-24, On fallen trunk of angiosperm and dead stumps, Lonawala-Kusoor (6/12/08) VKPO-25, 259, On angiospermic wood, fallen stumps and unknown woody climber, Lonawala-Dhak Bhairi (2/11/08 and 6/11/08) VKPO-26, 27, 28 and 29, On Angiospermic wood, Lonawala-Wandre Khind (16/11/08) VKPO-30, On angiospermic wood, Sinhagad (5/11/08 and 5/8/07) VKPO-31 and 32, on dead wood of *Bambusa* sp. (23/12/08) VKPO-260, On fallen stump of angiosperm, Ahupe (29/10/09) VKPO-283. **Distribution:** Australian, Pakistan, Phillipine Islands, China, Australia and India. **Remarks:** The species has typical character is the yellowish colour of all parts of the fruitbody, fading on the pileus, presistent on the hymenial surface and in the context.

Microporus xanthopus (Fr.) Kunt. Rév. gen. Pl. 3:494, 1898. **(Plate 1, 4 Fig. J)**

Fruitbody annual, solitary or in small groups, centrally or laterally stipitate and usually infundibuliform, sometimes two or more fruitbodies may grow together to more complicated fruitbodies with several stipes and with imbricate pilei, margin wavy and lobed, often deeply incised, pileus may be irregularly developed and the fruitbody may appear almost flabelliform, but normally there is a poroid area surrounding the stipe even in the most irregular fruitbodies, in the peripheral parts often radially furrowed, consistency tough to coriaceous. Pileus 3 to 7cm in diameter and 1-2 mm thick, glabrous and shiny when fresh, more dull when dry, yellowish-brown to chestnut in numerous narrow concentric zones, often with alternating dark and light colours, margin thin and wavy. Stipe round, glabrous, covered with a thin, light yellowish to light brown cuticle, up to 2 to 4 cm high and 3-4 mm in diameter, slightly expanded upwards, and expanded to a disc like base up to 10 mm in diameter. The base is covered with a very finely adpressed tomentum which slowly wears

wavy with age, context of stipe pure white, dense in the periphery, somewhat looser in the core. Pore surface cream to pale buff, almost pure white towards the margin, pores entire and very minute, 7-9 per mm, tubes up to 0.1 mm deep. Context pure white, very thin and covered with a distinct cuticle. Hyphal system trimitic, generative hyphae thin-walled and with clamps, 2.5 to 3 µm in diameter, moderately branched, skeletal hyphae dominating, hyaline and thick-walled, 5 to 6.25 µm in diameter, binding hyphae tortuous and mostly broken in preparations, thick-walled to apparently solid, up to 1.25 to 2 µm in diameter, strongly coralloid dichophytic elements often present along the dissepiments, very finely branched and often partly covered with crystalline deposits so their true nature may easily be unnoticed by an untrained observer, in preparations they easily break off at the main stem and we have been unable to verify whether they arise from generative hyphae or represent the outer apices of the binding hyphae. Basidia 9.64 to 22.49 µm in length. Spores hyaline, cylindrical, often slightly bent, smooth and non-amyloid, 5-6.42 x 1-2.5 µm. **Materials Examined:** On fallen stumps of angiosperms, Bhimashankar (12/11/07 and 16/10/08) VKPO-1,67, On fallen wood of climber, fallen twigs, Dongarwadi (7/5/07 and 4/11/07) VKPO-2,3, On fallen branches of *Memecylon umbellatum*, Harishchandragad, (23/3/08 and 1/12/08) VKPO-4, 5, On fallen stumps of angiosperms, Kalkaimata Devrai (12/11/08) VKPO-6, 7, On sticks of *Carvia calosa*, Lohagad (8/11/07 and 6/11/07) VKPO-8, 68, Fallen stumps of angiosperms, Lonawala-Dhak Bhairi (3/11/08 and 2/11/08) VKPO-9, 13, On Angiospermic wood, Lonawala (23/12/08) VKPO-10, 12, On fallen sticks of *Terminalia* sp. and unknown angiospermic wood, Lonawala-Kusoor (6/12/08) VKPO-11, 14, On *Mangifera* sticks Lonawala-Wandre Khind (16/11/08) VKPO-15, On dead branches of *Carissa caranda*, Purandar (22/10/08) VKPO-16, On *Carvia calosa* sticks, Sinhagad (9/11/08) VKPO-17, On fallen stumps of angiosperm, Ahupe (29/10/09) VKPO-282. **Distribution:** Western Africa, Pacific Area and India. **Remarks:** Usually easy to recognize in the field because of the infundibuliform fruitbodies with a glossy and shiny strongly banded pileus, the yellowish glabrous stem and the very minute pores.

Key to the species of *Peniophora*

1 Generative hyphae without clamps, spores 9-13 ×4-5 µm, broadly cylindrical-narrowly ellipsoid ----------***Peniophora laurentii***

1 Generative hyphae with clamps, spores 6.5-7.5×2.5-3 µm, spores suballantoid to allantoid ----------***Peniophora pithya***

Peniophora laurentii Lundell. Fungi exsicc. suec. 1342, 1946. **(Plate 1, 4 Fig. K)**

Fruitbody resupinate, on smooth bark orbicular and adnate but usually confluent-effused, more or less detachable, 12 × 2.5-3 cms.; hymenium at first smooth, then tuberculate, plicate or merulioid, bright orange-red, fading to ochraceous red; subiculum white and often forming a white marginal zone; no rhizomorphs. Hyphal system monomitic; hyphae 3-5 µm wide, without clamps, subicular ones thick-walled, sparsely branched in all directions, forming it White, open texture; subhymenial hyphae thinwalled, richly branched and united into a dense texture, giving the layer a ceraceous membranaceous structure. Cystidia of two kinds a) encrusted pseudocystidia, thick-walled, 40-60 × 10-12 µm strongly encrusted b) sulfocystidia, 50-70 × 8-10 µm, thin-walled with grainy plasmatic contents. Basidia 40-50 × 6.25-7 µm, narrowly clavate, with 4 sterigmata and without basal clamp. Spores 7-8 × 3.75-5 µm, broadly cylindrical-narrowly ellipsoid, thin-walled, smooth. **Materials Examined:** On fallen sticks, Dongarwadi (7/5/07) VKNPO-120, On angiospermic wood, Lohagad (8/11/07) VKNPO-20, On dead wood, Sinhagad (5/11/08) VKNPO-25. **Distribution:** Sweden, India. **Remarks:** Owing to the red colour it may be mistaken for *P. incarnata*, but is easily distinguished thanks to clear microscopical chractristics. Its place in *Peniophora* is justified by the red color of the spores and the sulfo-aldehyde reaction in the gloeocystidia.

Peniophora pithya (Persoon) J. Eriksson.*Fungi exsicc. suec.* **37-38:**37, 1950. **(Plate 1, 4 Fig. L)**

Fruitbody resupinate, 5-7 x 2-3 cms. and up to 0.2 mm thick, closely adnate, smooth and continuous on wood, more uneven on bark, when dried more or less cracked, reddish or violaceous grey, when wet darker, sometimes bluish violaceous; margin abrupt, narrow sterile zone. Hyphal system monomitic, with clamps, thin-walled, hyaline 3.75 µm, subiculum varying in thickness from an inconspicuous layer of horizontal hyphae to a considerable thickness, composed of parallel, dense, dark brown hyphae; sub-hymenial layer of dense, vertically arranged hyphae, hyaline in young specimens, more or less

pigmented in older ones but as a rule sharply contrasting against the darker subiculum, sub-hymenium generally not stratified but in some specimens two or three layers visible. Cystidia numerous, of two kinds a) encrusted cystidia, generally conical, at first thin-walled and hyaline, then apically encrusted and at least in the basal part brown, 35-45 ×8-12 µm, encrusted part 25-35 µm long, those of the first hymenial layer biggest and basally brown, later cystidia smaller and more or less hyaline b) sulfocystidia oblong to sub-cylindrical, 30-45 × 8-10 µm, as a rule obtuse, with thin or basally thickened walls; contents continuous, granular. Basidia subcylindrical or subclavate, somewhat constricted or sinuous, 30-37.5 × 5-7 µm, with 4 sterigmata and with basal clamp. Spores 5-6.5 × 2.5-3 µm, allantoid, smooth, thinwalled, hyaline. **Materials Examined:** On fallen wood, Purandar (30/10/08) VKNPO-121, On fallen branches, Bhimashankar (12/11/07) VKNPO-19. **Distribution:** Denmark, Norway, Sweden, Finland, Scandinavia, Europe, India. **Remarks:** *P. pithya*, like all other *Peniophora*, varies greatly, e.g. in colour, size and thickness of the fruitbody and under the microscopically in the thickness of subiculum,but is in most cases recognized without difficulty. Dark bluish resupinate fruit body is the clear indication of the species on field also.

Key to the species of *Phellinus*

1 Basidiocarp less than 8 to10cm wide----------2

1 Basidiocarp more than 10cm wide----------***Phellinus badius***

2 Pileus 8 to10 cm long and wide and 3.5 to 4 cm thick at the base, woody hard; pileus tomentose, rusty brown in narrow sulcate zones, in older specimens becomes glabrous grey to black, spores 2.5-4 x 2-3 µm long, pore surface rusty to snuff brown, pores round, small, 6-8 per mm----------***Phellinus sanfordii***

2 Pileus 1-9 cm wide and 1-3.5 cm thick; upper surface quickly becoming glabrous and crustose, grayish, sulcate, becoming blackened and rimose with age, basidiospores ovoid, flattened on one side, hyaline, smooth, with slightly thickened walls, cyanophilous, 4-5 x 2-3.5 µm. pores circular, 4-6 per mm.----------***Phellinus arctostaphyli***

Phellinus arctostaphyli (Long) Niemelä. Ann. Bot. Fenn. 12:120. 1975. **(Plate 1, 6 Fig. M)**

Basidiocarps perennial, sessile, applanate to ungulate, dimidiate, 1-9 cm wide and 1-3.5 cm thick; upper surface quickly becoming glabrous and crustose, grayish, sulcate, becoming blackened and rimose with age; margin concolorous to light brown, rounded; pore surface pale grayish brown to dark rusty brown, smooth, the pores circular, 4-6 per mm, dissepiments thick, tomentose, entire; context reddish brown, azonate, fissile, firm, woody, up to 2 cm thick, tube layers indistinctly stratified, up to 1 cm thick. Contextual setae absent. Hymenial setae present 26.25 x 10 µm, pointed with broad base, dark brown. Hyphae of fibrous context parallel, skeletal hyphae thick-walled, aseptate, with rare branching, 2.5-3.75 µm in diam; Hyphae of trama parallel, skeletal hyphae thick-walled, dark brown in KOH, aseptate, with rare branching 2.5-5 µm diam; generative hyphae hyaline to pale yellow, thin-walled, with simple septa and occasional branching, 1.5-2.5 µm diam. Setal hyphae infrequent, thick-walled, 3.75 µm. Basidiospores ovoid, flattened on one side, hyaline, smooth, with slightly thickened walls, cyanophilous, 2.5-4 x 2-3.5 µm. **Materials Examined:** On fallen sumps and dead branches, Ahupe (29/10/09) VKPO-265, 272, 271, On *Lagerstromia* sp., Unknown angiosperm, On fallen stumps, On dead standing tree, Dongarwadi (4/11/07, 7/5/07, 26/10/08) VKPO-102, 104, 105, 116, On dead angiospermic branches, Vinjai Devrai (12/11/08) VKPO-103, On fallen branches and stumps, Lohagad (18/10/08, 6/11/07) VKPO-106, 107, 111, On fallen stumps and parasitic on unknown angiosperm Lonawala (23/12/08) VKPO-109, 110, On fallen trunk of angiosperm Harishchandragad (23/3/08) VKPO-112, On unknown angiosperm as a parasite on bark, Kalkaimata Devrai (12/11/08) VKPO-114, On *Terminalia* sp., Lonawala-Kusoor (6/12/08) VKPO-115. **Distribution:** Arizona, India. **Remarks:** Typical white rot.

Phellinus badius (Berk. ex Cke.) G. H. Cunn. New Zealand Dept. Sci. Ind. Res. Bull. 164:233. 1965. **(Plate 1, 5 Fig. N)**

Basidiocarp perennial, ungulate, attached sub-laterally and appearing somewhat pendant and narrowing to 2 x 4 cm at point of attachment; Upper surface glabrous, brownish black, indurate, appearing

in cross section as a black line 0.2 mm thick; margin obtuse, paler than the pilear surface. Pore surface flat, glancing slightly, dark brown, sterile margin narrow, pores 5-6 per mm, mostly angular with 4-5 sides; Tube layers 4 to 5mm thick each, individual layers not distinct, pale ferruginous brown; context dull yellowish brown tissue, somewhat zonate, hard; Skeletal hyphae 3.5-6.25 µm diam, becoming thick-walled, dull brown, infrequently branched and septate, some secondary septa present; generative infrequent, 2-3.75 µm diam, septate, pale brown. Setae absent. Basidia not seen. Basidiospores 3.75-6 x 2.5-3.75 µm broadly ovoid to sub-globose, wall thickening noticeable to thick-walled, yellowish brown to dark brown in KOH, darkening in IKI but not dextrinoid. White rot

Materials Examined: On *Ficus* sp. as a root parasite, Ahupe (29/10/09) VKPO-266, 267, On dead wood, Lonawala (23/12/08) VKPO-113. **Distribution:** Mexico and India. **Remarks:** *Phellinus badius* has a circumglobal Distribution in the tropics and subtropical regions.

Phellinus sanfordii (C.G. Lloyd) Ryvarden 1972 Norw. J. Bot. 19 (1972) 235; Ryvarden and Johansen (1980) 212. **(Plate 1, 5 Fig. O)**

Basidiocarps perennial, pileate, single to imbricate, semicircular, applanate to convex, 8 to 10 cm long and wide and 3.5 to 4 cm thick at the base, woody hard; pileus tomentose, rusty brown in narrow sulcate zones, in older specimens becomes glabrous grey to black, in zones from the base, margin fairly acute; pore surface rusty to snuff brown, pores round, small, 6-8 per mm, tubes indistinctly stratified, dark cinnamon to pale rusty brown, up to 1 cm long in each layer; context dark cinnamon, hard, up to 5 mm thick, separated from the tomentum by a black line. Hyphal system dimitic; generative hyphae simple-septate, hyaline, thin-walled, 1.5-2.5 µm; skeletal hyphae dominating, yellow to pale rusty brown, 3.75-6.25 µm, rarely branched. Hymenial setae abundant, mostly ventricose but a few also acuminate, dark brown, straight or slightly allantoid thick walled, 12.50-26.25 x 6-10 µm. Basidia not seen. Basidiospores broadly ellipsoid, pale yellow, 2.5-5 x 2.5-3 µm. **Materials Examined:** On dead angiospermic wood, Lonawala (23/12/8) VKPO- 85, 83, 81. **Distribution:** Sri Lanka, Pakistan India, and Japan. **Remarks:** The species is closely related to *P. extensus* and chiefly separated by its larger setae which are less ventricose than those of *P. extensus*.

Podoscypha petaloides (Berk.) Boidin 1959 **(Plate 1, 5 Fig.P)**

Sporophores 2-6 cm high and 1-2 cm wide. The fruitbodies are spatulate, although the edges of the pilei frequently curl inward and fuse to form pseudoinfundibuliform fructifications. The sporophores are usually gregarious but discrete. Pileus when fresh varying from light brown to pinkish-brown after drying becomes chestnut-brown and ornamented with darker concentric zones. Hymenial surface of dried specimens either ochraceous- or greyish buff or concolourous with the pileus. Stipe short and rudimentary. Hyphal structure dimitic, consisting of generative and skeletal hyphae. The freely branched generative hyphae, 2-5 µm in diam., are thin-walled, hyaline and bear clamp-connexions at the septa. The skeletal hyphae, 2.5 to 4.5µm in diam. are thick-walled and unbranched. However, there are subcylindric pilocystidia 12.50 µm, on the surface of the cap which have a rather superficial origin. Hymenial cystidia are absent. Gloeocystidia abundant as elongated, thin-walled organs with highly refractive contents 40 x 8 µm. These bodies are basically subcylindric, swollen base and narrow gradually toward the obtuse apex. They have the potential of unlimited growth and many traverse the entire width of the thickened hymenium; some cease to grow and become buried but their place is taken by others which arise at almost any level. Basidia 4-spored, and clavate, 18 x 9 µm. Spores 2.75-3.75 x 1.5-2.5 µm, thin-walled, hyaline, monoguttulate, varying in shape from ovate to elliptical. **Materials Examined:** On dead wood of *Ficus* sp., Lonawala-Dhak Bhairi Dhak(2/11/08) VKPO-239, On dead stumps Lohagad (6/11/07) VKPO-264, On fallen branches of angiosperms, Ahupe (29/10/09) VKPO-289. **Distribution:** America, Pacific Islands. **Remarks:**The fruit body is very thin than that of *Microporus* and it is fleshy when fresh.

Ket to the species of *Polyporus*

1 Stipe central, spores broadly ellipsoid, 4.5-7 x 2-4 µm, thin-walled, hyaline -------***Polyporus tricholoma***

1 Stipe distinctly lateral, spores cylindric, 10-13(14.5) x 3.5-5 µm ----------***Polyporus alveolaris***

Plate 3. Fig.E. *Gloeocystidiellum furfuraceum* (Bresadola) Donk. a. Habit, b. Basidia (25-30 ×5-6 µm), c. Basidiospores (5-7.5 µm), d. Generative hyphae (2-3.75 µm), e. Gloeocystidia hyphae (50-90 ×6-10 µm), f. Thin walled cystidia (50-60 µm). **Fig. F.** *Hexagonia caperata* (Berk.) J.E. Wright & J. R. Deschamps a. and b. Habit, c. Pore shape, d. Basidiospores (5-7.5 x 2-2.8 µm), e. Generative hyphae (2.5-3 µm), f. Skeletal hyphae (3.5-5 µm), g. Binding hyphae (1.25-2.5 µm). **Fig. G.** *Hexagonia tenuis* (Hook.) Fr. a. and b. Habit, c. Pore shape, d. Basidiospores (11-13.75 x 3.5-6.42 µm), e. Generative hyphae (2-3 µm), f. Skeletal hyphae (3-7 µm), g. Binding hyphae (2.5-3.2 µm). **Fig. H.** *Inonotus cuticularis* (Bull.) P. Karst. a. and b. Habit, c and d. Pore shape, e. Basidiospores (6-8.75 x 3.5-5 µm), f. Generative hypha (4-6.25 µm), g. and h. Setal hyphae (5-10 µm), i. Hymenial Setae (12-20 x 4-7.5 µm)

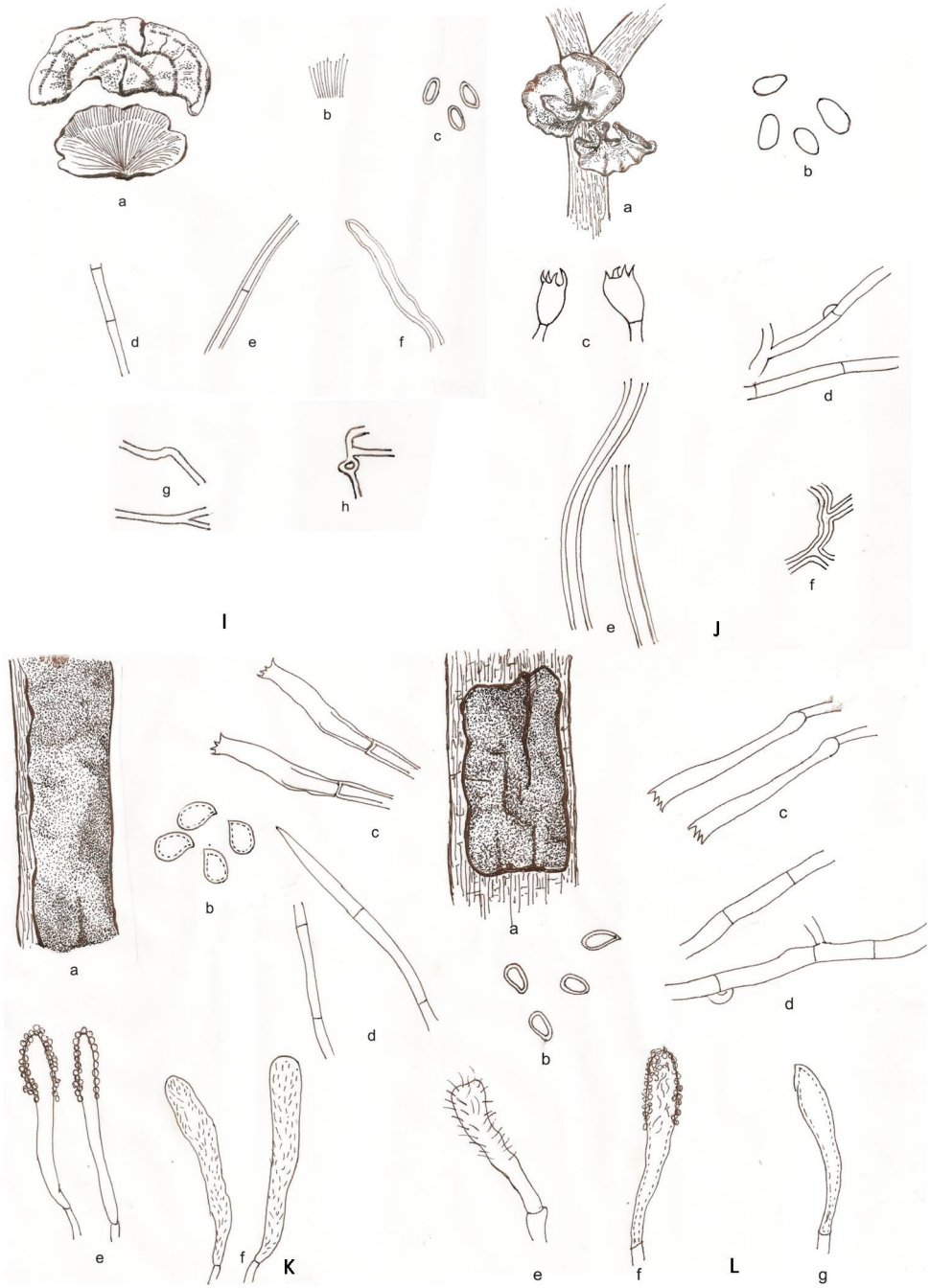


Plate 4. Fig. I. *Lenzites acuta* Berk. a. Habit, b. Pore shape (Lamellae), c. Basidiospores (6-7 x 3-3.214 µm), d. Generative hypha (1.5 µm), e. and f. Skeletal hyphae (9.642 µm), g. and h. Binding hyphae (3.214 µm). **Fig. J.** *Microporus xanthopus* (Fr.) Kunt. a. Habit, b. Basidiospores (5-6.42 x 1-2.5 µm), c. Basidia (9.64 to 22.49 µm), d. Generative hyphae (2.5 to 3 µm), e. Skeletal hyphae (5 to 6.25 µm), f. Binding hypha (1.25 to 2 µm). **Fig. K.** *Peniophora laurentii* Lundell. a. Habit, b.Basidiospores (7-8 × 3.75-5 µm), c. Basidia (40-50 × 6.25-7 µm), d. Generative hyphae (3-5 µm), e. Encrusted Pseudocystidia (40-60 × 10-12 µm), f. Sulfocystidia (50-70 × 8-10 µm). **Fig. L.** *Peniophora pithya* (Persoon) J. Eriksson. a. Habit, b. Basidiospores (5-6.5 × 2.5-3 µm), c. Basidia (30-37.5 × 5-7 µm), d. Generative hyphae (3.75 µm), e. and f. Encrusted cystidium (35-45 ×8-12 µm), g. Sulfocystidium (30-45 × 8-10 µm).

Polyporus alveolaris (DC.) Bondartsev & Singer 1941 **(Plate 1, 6, Fig. R)**

Basidiocarps annual, stipitate to sessile, circular to dimidiate, up to 5 cm wide and 2-3 mm thick; upper surface pale yellow, squamose with flattened, triangular squamules, with age becoming ivory to pale buff, azonate, glabrous, smooth, margin concolorous; pore surface white to tan, the pores diamond-shaped, radially elongated, 1-2 per mm tangentially, tube layer continuous with the context, 2-5 mm thick; context pale yellow, azonate, corky, up to 1 mm thick; stipe lateral, buff, glabrous, up to 0.5 to 0.8 cm long and 3-4 mm thick. Hyphal system dimitic; contextual generative hyphae hyaline in KOH, thin-walled, rarely branched, with clamps, 2 to 3 µm wide, forming a cutis on the stipe and the pilear surfaces; contextual skeleto-binding hyphae thick-walled, nonseptate, much branched, with tapering apices, all 3-5 µm wide; tramal hyphae similar. Basidia clavate, 4-sterigmate, 24-29 x 7-9 µm, with a basal clamp. Basidiospores cylindric, 10-13 (14.5) x 3.5-5 µm. **Materials Examined:** On dead wood, Lonawala, (23/12/08) VKPO-145. **Distribution:** Europe, Asia and North America. **Remarks:** The species commonly occurs on dead branches of the tree.

Polyporus tricholoma Mont. 1837 Ann. Sci. Nat. Ser. 2, Vol. 8:365, 1837. **(Plate 1, 6 Fig. S)**

Fruitbody annual, solitary, centrally stipitate, 1-2 cm in diameter, flat to centrally depressed 0.5-2 mm thick, margin flat when fresh, deflexed-curved when dry. Pileus pale brown, smooth, glabrous, up to 3-6 mm long. Stipe up 1 to 2 cm long, 1-3 mm wide, more or less glabrous, pale tan to dirty brownish or pale reddish-brown, often somewhat longitudinally wrinkled in dry condition. Pore surface ochraceous to pale brown in old specimens pores round to angular and thin-walled, 4-5 per mm, tubes as pore surface, up to 1 mm deep.Context whitish to faint brown 0.2-0.4 mm thick. Hyphal system dimitic, generative hyphae with clamps, hyaline and 2-5 µm wide, freely branched, thick-walled to almost solid in old specimens, up 4 to 6 µm thick main trunk. Binding hyphae 2 to 3.75 µm. Basidia not seen. Spores broadly ellipsoid, 5-8.75 x 2-4 µm, thin-walled, hyaline and in-amyloid. **Materials Examined:** On dead angiospermic wood, Lonawala-Dhak (2/11/08) VKPO-57, On fallen stumps, Lonawala-Wandre, (16/11/08) VKPO-58, On angiospermic stumps, Lonawala-Kusoor, (6/12/08) VKPO-59, On dead wood, Ahupe, (29/10/09) VKPO-288. **Distribution:** Nigeria and India. **Remarks:** The species is easily recognized when growing in groups of slender, white basidiocarps. Basidiocarp development has been studied by De & Roy (1978).

Rigidoporus ulmarius (Sow.: Fr.) Imazeki Fig. 8 Govt. Exp. Sta. Meguro 57: 119. 1952. **(Plate 1, 6 Fig.Q)**

Fruitbody annual, solitary, attached to the substratum by a broad base, 2.5 x 1.6 cms in diameter, biconvex 8 mm thick, margin blunt, more or less ungulate curved. Pileus yellowish to orangish brown, wrinkled, up to 2 cm long in dry condition. Pore surface faint yellow to pale brown in old specimens pores round to oval and thin-walled, 3-4 per mm, tubes concolorous to pore surface, up to 10 mm deep. Context concolorous with the tube layer 1-4 mm thick. Hyphal system monomitic, generative hyphae with clamps, hyaline and 3.214-6.428 µm wide, freely branched, thick-walled to almost solid. Basidia 16-18.75 x 8 µm, 4 spored. Spores subglobose to oblong- ellipsoid, tapering at one end, smooth, thin walled 6.42-16.07 x 6.42-9.642 µm, hyaline and in-amyloid. Cystidia absent. **Materials Examined:** On dead standing tree of *Terminalia* sp. Purandar, (30/10/08) VKPO-36. **Distribution:** Pune, India. **Remarks:** Species found to be occurring always on the tree bark on the slopes. Pores are very sofet to touch. The specimens are generally get the borer infection early.

Royoporus spathulatus (Jungh.) De, Comb. nov. **(Plate 1, 6 Fig. T)**

Basidiocarp annual, solitary or several growing from a common point on the substratum, coriaceous and corky, very shortly stipitate; pileus spathulate, flabelliform or dimidiate, tapering towards the base, upper surface flat or slightly convex, may be depressed near the stipe, straw coloured with sharp fine radial striations ; margin thin, entire or lobed, sterile below; hymenial surface white to ochraceous, pores hexogonal, radially aligned, 1-4 per mm, dissepiments very thin, tubes up to 3 mm long ; context white, up to 1 mm thick. Stipe very short, lateral, about 5 mm in diameter and up to 8 mm long. Hyphal system dimitic. Generative hyphae hyaline, thin-walled, rarely slightly thick-walled, simple septate, branching not common, 1.5-3.5 µm wide, abundant in trama and rare in context. Binding

Plate 5. Fig. M. *Phellinus arctostaphyli* (Long) Niemelä. a. Habit, b. Pore shape, c. Basidiospores (2.5-4 x 2-3.5 µm), d. Generative hyphae (1.5-2.5 µm), e. Skeletal hyphae (2.5-5 µm), f. Hymenial setae (26.25 x 10 µm). **Fig. N.** *Phellinus badius* (Berk. ex Cke.) G. H. Cunn.a. Habit, b. Basidiospores (3.75-6 x 2.5-3.75 µm), c. Generative hyphae (2-3.75 µm), d. Skeletal hyphae (3.5-6.25 µm). **Fig. O.** *Phellinus sanfordii* (C.G. Lloyd) Ryvarden, a. Habit, b. Pore shape, c. Basidiospores (2.5-5 x 2.5-3 µm), d. Generative hypha (1.5-2.5 µm), e. , f. and g. Skeletal hyphae (3.75-6.25 µm), f. Setae (12.50-26.25 x 6-10 µm). **Fig. P.** *Podoscypha petaloides* (Berk.) Boidin, a. and b. Habit, c. Basidiospores (2.75-3.75 x 1.5-2.5 µm), d. Basidium (18 x 9 µm), e. Generative hyphae (2-5 µm), f. Skeletal hyphae (2.5 to 4.5µm), g. Pilocystidia (12.50 µm), h. Gloeocystidium (40 x 8 µm).

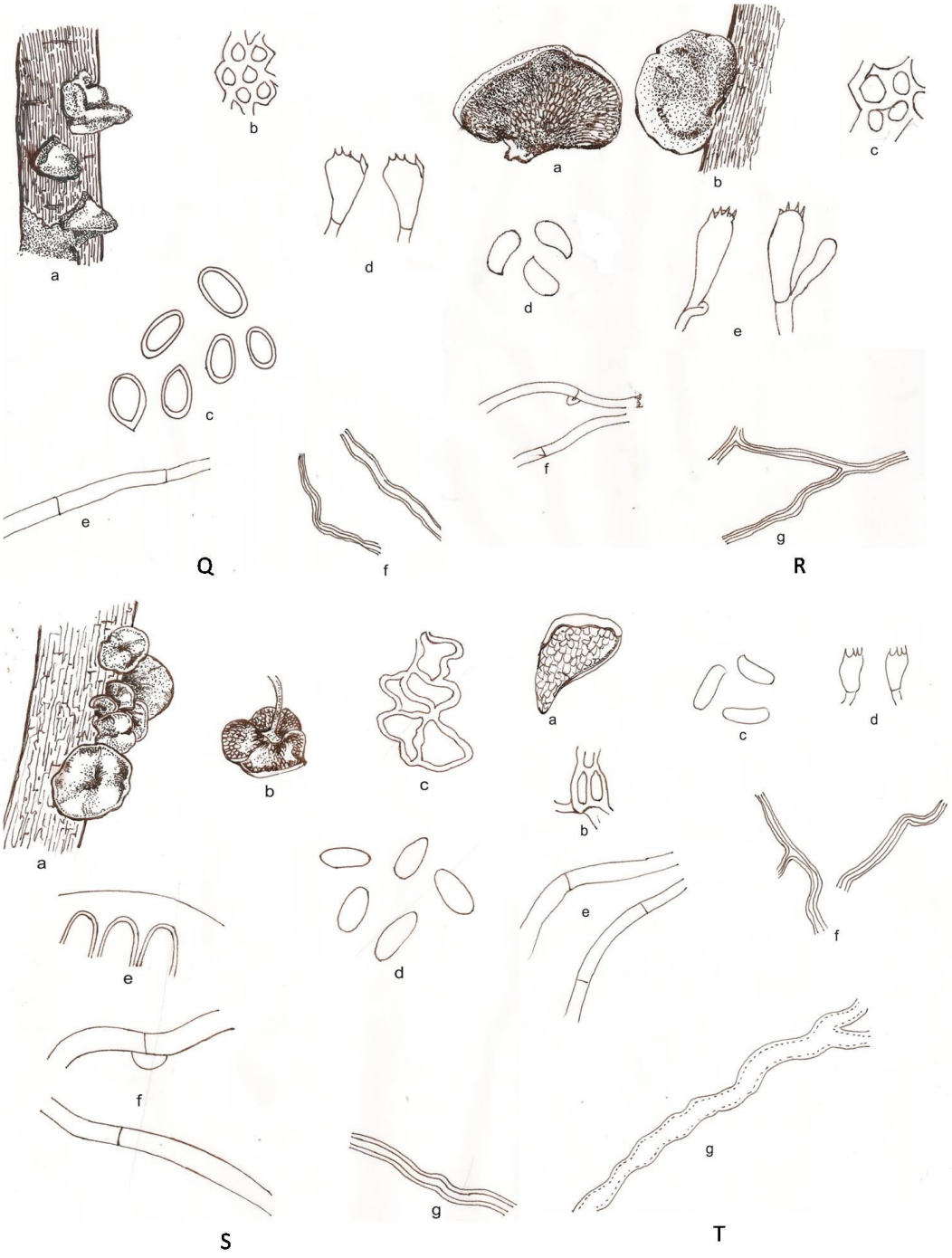


Plate 6. Fig. Q. *Rigidoporus ulmarius* (Sow.: Fr.) Imazeki a. Habit, b. Pore shape, c. Basidiospores (6.42-16.07 x 6.42-9.642 µm), d. Basidia (16-18.75 x 8 µm), e. Generative hypha (3.214-6.428 µm). **Fig. R.** *Polyporus alveolaris* (DC.) Bondartsev & Singer, a. and b. Habit, c. Pore shape, d. Basidiospores {10-13 (14.5) x 3.5-5 µm}, e. Basidia (24-29 x 7-9 µm), f. Generative hyphae (2 to 3 µm), g. Skeleto-binding hypha (3-5 µm). **Fig. S.** *Polyporus tricholoma* Mont. a. and b. Habit, c. Pore shape, d. Basidiospores (5-8.75 x 2-4 µm), e. V.S. of Pileus, f. Generative hyphae (2-5 µm), g. Binding hypha (2 to 3.75 µm). **Fig. T.** *Royoporus spathulatus* (Jungh.) De. a. Habit, b. Pore shape, c. Basidiospores (5.0-7.5 x 2.0-3.0 µm), d. Basidia (18.4-22.0 x 3.0-5.5 µm), e. Generative hyphae (1.5-3.5 µm), f. Binding hyphae (3.0- 6 µm), g. Gloeoplerous hypha (8 µm).

hyphae hyaline, corrugated, thick-walled, in the context showing wide lumina, in trama frequently subsolid to solid, usually dichotomously branched, 3.0-6 µm wide, often tapering to 1.5-2.0 µm: Gloeoplerous hyphae present, up to 8 µm wide. Basidia hyaline, clavate, 4-sterigmate, 18.4-22.0 x 3.0-5.5 µm. Basidiospores hyaline, thin-walled, smooth, cylindrical, non-amyloid, 5.0-7.5 x 2.0-3.0 µm, some with one or two guttulae. White rot. **Materials Examined:** On angiospermic stump, Dongarwadi (26/10/08) VKPO-74, On dead angiospermic wood, Sinhagad, (5/11/08) VKPO-60, On fallen stumps, Lonawala-Dhak Bhairi (2/11/08) VKPO-61, On dead wood, Lonawala, (23/12/08) VKPO-145, On dead wood, Bhimashankar, (12/11/07) VKPO-217. **Distribution:** West Bengal, India and Africa. **Remarks:** The small pores, the more alutaceous to pale reddish-brown pileus with the radial striae are usually sufficient to separate it from *F. brasilensis*. *Polyporus philippinensis*, which has somewhat similiar pileus colour and fine radial lines, can be separated by having small pores.

Discussion

In the present study a total of 20 species of Aphyllophorales (8 families and 14 genera) from the 10 respective hosts were identified out of 126 collected specimens from 15 different localities throughout the Western Ghats of Pune districts, Maharashtra State. From these 20 fungal species 1 species of *Flavodon*, 1 species of *Funalia*, 2 different species of *Ganoderma*, 1 species of *Gloeocystidiellum*, 2 species of *Hexagonia*, 1 species of *Inonotus*, 1 species of *Lenzites*, 1 species of *Microporus,* 2 species of *Peniophora,* 3 species of *Phellinus,* 1 species of *Podoscypha,* 2 species of *Polyporus,* 1 species of *Rigidoporus* and 1 species of *Royoporus* have been identified.

The state of India occupies a substantial portion of the Deccan Plateau in the Western peninsular part of the subcontinent. Its shape roughly resembles a triangle, with the 725 kms. Western coastline forming the base and the interior narrowing to a blunt apex some 804.672 kms to the East. It has an area of 307,713 sq. kms. It is surrounded by the states of Gujarāt, Madhya Pradesh, Andhra Pradesh, and Karnātaka (formerly Mysore) and, on the West, the Arabian Sea. The flora of Maharashtra is heterogeneous in composition. The Deccan traps continue into Madhya Pradesh and Gujarat through Khandesh. There is similarity between the plants of Maharashtra, Madhya Pradesh and South Gujarat. The rainfall and humidity progressively increase towards South and West. As a result Sahyadri regions in Karnataka have rich vegetation of moist deciduous species and some evergreen species which do not occur in Maharashtra. The Junagadh hill, Girnar Parvat and Barda-dongar have species akin to those in dry parts of Deccan of Maharashtra. The flora of Saurashtra resemble the flora in deciduous forests of Deccan and that in drier parts of Konkan like Deogad. The forest area recorded for Maharashtra state is 63,842 sq. kms which is 20.75% of its geographical area. The total forest cover is 46, 143 sq. kms which is 15% of area, out of which 23622 sq. kms is dense forest, 22,397 sq. kms is open forest and 124 sq. kms. is mangrove forests.

It was observed that out of 20 identified species, 3 species belong to resupinate basidiocarps (species of *Gloeocystidiellum , Peniophora*), 3 species belong to pileate basidiocarps(species of *Funalia*, *Hexagonia* and *Lenzites*), 1 species belongs to pileate to ungulate basidiocarp (species of *Rigidoporus*), 3 species belong to applanate basidiocarps (species of *Ganoderma* and *Inonotus*), 2 species belong to effused- reflexed (species of *Flavodon* and *Hexagonia*), 2 species belongs to infundibuliform and centrally stipitate forms (species of *Microporus* and *Polyporus*), 2 spathulate species (species of *Royoporus* and *Podoscypha*), 1 species belong to circular or dimidiate type (*Polyporus*), 1 species belong to applanate to ungulate (species of *Phellinus*), 1 species belongs to pileate, single to imbricate (species of *Pellinus*) and 1 species belongs to ungulate type (species of *Phellinus*). **(Table 6)**

The whole of the forest area in the Pune district falls under "reserved" forests category. The forests in the districts mainly shows following types: Tropical stunted semi-evergreen forest, Tropical moist deciduous forests, Tropical stunted semi-evergreen forest and scrubby woodlands, Tropical moist deciduous forests and scrubby woodlands and Tropical dry deciduous forests. Some of the localities show mixed type of forests in which we could get the different patches of different types of vegetation.(Table No. 4) As the forest type changes, the Aphyllophorales fungal flora also shows the variation in the forms.

The present work materially adds to our knowledge of Poroid and Non-Poroid Aphyllophorales. A total of **20** species of Aphyllophorales from the **10** respective hosts were identified. Most of the identified fungi such as *Funalia leonina, Hexagonia caperata, Inonotus*

Table 5. List of new records for India and Maharashtra

Name of the fungus	Name of the fungus
Flavodon flavus (KI.) Ryv.	*Peniophora laurentii* Lundell.
Funalia leonina (Kl.) Pat. *	*Peniophora pithya* (Persoon) J. Eriksson.
Ganoderma chalceum (Cooke) Steyaert	*Phellinus arctostaphyli* (Long) Niemelä. **
Ganoderma lipsiense (Batsch) Atk.	*Phellinus badius* (Berk. ex Cke.) G. H. Cunn.
Gloeocystidiellum furfuraceum (Bresadola) Donk.	*Phellinus sanfordii* (C.G. Lloyd) Ryvarden**
Hexagonia caperata (Berk.) J.E*. Wright & J. R. Deschamps	*Podoscypha petaloides* (Berk.) Boidin**
Hexagonia tenuis (Hook.) Fr.	*Polyporus alveolaris* (DC.) Bondartsev & Singer *
Inonotus cuticularis (Bull.) P. Karst. *	*Polyporus tricholoma* Mont. *
Lenzites acuta Berk. *	*Rigidoporus ulmarius* (Sow.: Fr.) Imazeki*
Microporus xanthopus (Fr.) Kunt.	*Royoporus spathulatus* (Jungh.) De. *

Reported previously (09) ** New for India (03) * New for Maharashtra (08)

Table 6. List of Non-poroid and Poroid identified species of Aphyllophorales

Poroid	Non-poroid
Flavodon flavus (KI.) Ryv.	*Gloeocystidiellum furfuraceum* (Bresadola) Donk.
Funalia leonina (Kl.) Pat.	*Peniophora laurentii* Lundell.
Ganoderma chalceum (Cooke) Steyaert	*Peniophora pithya* (Persoon) J. Eriksson.
Ganoderma lipsiense (Batsch) Atk.	
Hexagonia caperata (Berk.) J.E. Wright & J.R. Deschamps	
Hexagonia tenuis (Hook.) Fr.	
Inonotus cuticularis (Bull.) P. Karst.	
Lenzites acuta Berk.	
Microporus xanthopus (Fr.) Kunt.	
Phellinus arctostaphyli (Long) Niemelä.	
Phellinus badius (Berk. ex Cke.) G. H. Cunn.	
Phellinus sanfordii (C.G. Lloyd) Ryvarden	
Podoscypha petaloides (Berk.) Boidin	
Polyporus alveolaris (DC.) Bondartsev & Singer	
Polyporus tricholoma Mont.	
Rigidoporus ulmarius (Sow.: Fr.) Imazeki	
Royoporus spathulatus (Jungh.) De.	

Table 7. List of Host and Species observed

Name of the fungus	Host
Flavodon flavus (Kl.) Ryv.	On Fallen sticks of angiosperms
Funalia leonina (Kl.) Pat.	On wood of *Terminalia* sp.
Ganoderma chalceum (Cooke) Steyaert	On Fallen sticks of *Acacia* sp.
Ganoderma lipsiense (Batsch) Atk.	Root Parasite of angiosperms
Gloeocystidiellum furfuraceum (Bresadola) Donk.	On dead sticks of angiosperms
Hexagonia caperata (Berk.) J.E.Wright & J.R. Deschamps	On fallen stumps of angiosperms
Hexagonia tenuis (Hook.) Fr.	On Fallen sticks *Mangifera* and *Carissa* sp.
Inonotus cuticularis (Bull.) P. Karst.	Parasite on unknown angiosperm
Lenzites acuta Berk.	*Memecylon umbellatum, Bambusa* sp.
Microporus xanthopus (Fr.) Kunt.	On woods of *Memecylon umbellatum, Carvia calosa, Terminalia* sp., *Mangifera, Carvia calosa*
Peniophora laurentii Lundell.	On fallen sticks
Peniophora pithya (Persoon) J. Eriksson.	On fallen wood
Phellinus arctostaphyli (Long) Niemelä.	On wooden stumps of *Lagerstromia* and *Terminalia* sp.
Phellinus badius (Berk. ex Cke.) G. H. Cunn.	*Ficus* sp. and On dead wood
Phellinus sanfordii (C.G. Lloyd) Ryvarden	On dead angiospermic wood
Podoscypha petaloides (Berk.) Boidin	On Fallen sticks of *Ficus* sp.,
Polyporus alveolaris (DC.) Bondartsev & Singer	On dead wood
Polyporus tricholoma Mont.	On dead angiospermic wood
Rigidoporus ulmarius (Sow.: Fr.) Imazeki	On dead wood of *Terminalia sp.*
Royoporus spathulatus (Jungh.) De.	On angiospermic stumps

Table 8. Types of fruit bodies of the species found in the investigation areas.

Type of Fruit Body	Name of the Fungus
Resupinate	*Gloeocystidiellum furfuraceum* (Bresadola) Donk., *Peniophora laurentii* Lundell., *Peniophora pithya*(Persoon) J. Eriksson.
Pileate	*Funalia leonina* (Kl.) Pat. , *Hexagonia tenuis* (Hook.) Fr., *Lenzites acuta* Berk.
Pileate to Ungulate	*Rigidoporus ulmarius* (Sow.: Fr.) Imazeki
Applanate	*Ganoderma chalceum* (Cooke) Steyaert, *Ganoderma lipsiense* (Batsch) Atk., *Inonotus cuticularis* (Bull.) P. Karst.
Effused-Reflexed	*Flavodon flavus* (Kl.) Ryv., *Hexagonia caperata* (Berk.) J. E.,Wright & J. R. Deschamps
Infundibuliform, Centrally stipitate or **Spathulate or** **Circular to Dimidiate**	*Microporus xanthopus* (Fr.) Kunt., *Polyporus tricholoma* Mont. *Royoporus spathulatus* (Jungh.) De. *Podoscypha petaloides* (Berk.) Boidin *Polyporus alveolaris* (DC.) Bondartsev & Singer
Applanate to Ungulate	*Phellinus arctostaphyli* (Long) Niemelä.
Pileate Single to imbricate	*Phellinus sanfordii* (C.G. Lloyd) Ryvarden
Ungulate	*Phellinus badius* (Berk. ex Cke.) G. H. Cunn.

cuticularis, Lenzites acuta, Polyporus alveolaris Polyporus tricholoma, Rigidoporus ulmarius and Royoporus spathulatus (Total 8) are reported for the first time from Maharashtra (New to Maharashtra). The fungi namely *Phellinus sanfordii, Phellinus arctostaphyli* and *Podoscypha petaloides* (Total 3) are reported for the first time from India and Maharashtra as well (New to India). The Wood Rotting fungi are also distributed throughout the investigation areas and cause significant damage to trees.

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