I. INTRODUCTION

Studies on *Aphyllophorales* were initiated with launch of studies in Indian fungi. The first Indian record of *Aphyllophorales* could be traced back to the work of Klotzsch (1832) in his paper on Indian Polyporaceae. Later Berkeley (1939), who described few Indian Polypores. After a period over century, several Indian *Aphyllophorales* were reported by Lloyd (1937), Sydow *et al.* (1919, 1907, 1911, 1912 and 1916). Bose was the first Indian Mycologist to provide the comprehensive account on *Aphyllophorales* from Bengal (1919, 1923, 1924, 1925 and 1927). Vaidya and Bhor (1990), Vaidya *et al.* (1991), Rabba (1994), Sharna (1995) and Nanda (1996). 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 (under *Aphyllophorales*) from India.

Randive *et al.* (2011) from Pune collected and studied 629 samples from Western Ghat of Maharashtra. A checklist prepared by Randive *et al.* (2011) gave the total count of Aphylloporaceous fungal diversity from Western Ghats of Maharashtra and also it is an authentic and valued additional record for comparing Aphylloporaceous diversity in the world.

A tree has its own strong survival system that allows it to live longer and grow larger than any other creature on the earth. Wood perennials constitute a very large fraction of the total biomass of the earth which is yearly \(80 \times 10^9\) metric ton (Basham, 1975). However, determination of wood tissue has received a scanty attention, compared to that of herbaceous plants, which leads to great loss of commercial timber (Cooke and Rayner, 1984).

Wood decay is a major cause of damage in trees. Decay usually being as wounds to branches, trunks or roots and caused by decay fungi and wood
borers, where usually succession of microorganisms is responsible for the process these wood decaying fungi (WDF) under favorable conditions produce basidiocarps that remain dry and dormant over long period of low precipitation. After monsoon, they revive and begin sporulation very quickly.

Spread of disease in managed forests often occurs when air-borne basidiospores colonize freshly cut stump surfaces during thinning operations. The fungus then grows through the stump and infects other trees at the point of stem grafts or contact. This disease goes on for many years inside the trees and is unseen. Strength is lost as wood is decomposed by microorganisms for wood. Finally results are seen as big hollow cores in old trees which come crashing down in storms.

Tropical forest of Parbhani and Nanded districts of the Indian peninsula, have particularly rich fungal flora, but there are only a few references concerning enumeration of wood decaying mycobiota and there is no comprehensive account on WDF polyporaceae of bracket fungi include a large number of genera and species which are most interesting from the point of view of their habitats, nutrition requirements and capacity to decompose the lignin.

Although these fungi have been primarily considered as destroyer of timber, they may have positive applications beside their value of recycling process of decomposed wood. Prof. Bose investigated the possibility of antibiotic production on the polyporaceae and thus laid to the foundation for the study of antibiotics in India (Bannur et al, 1967). White rot fungi namely *Ganoderma* and *Polypore* are medicinally important used by local doctors Vaidus under the name Phansomba (Bhor, 1989; Mali and Raibhole, 2012a).

The consolidated survey of Taxonomic data of the wood-rotting fungi (WRF) was carried out from the different forest areas of Parbhani and Nanded Districts, especially from the Aundha Nagnath and Kinwat forest. It was
revealed that among the collections; the *Aphyllophorales* were the major causal members. Therefore, Author has decided to explore only one order of wood rotting basidiomycetous fungi, i.e. the order *Aphyllophorales* for the degree of Philosophy in Botany.

**The order *Aphyllophorales***

The order *Aphyllophorales* is the largest order among the Basidiomycetes as there are around 3200 species known to date, the fungi currently placed in this order are:

- Lignicolous/Russulaces/Hymenochetales/Ganodermatales/Polyporales,
- Bondarzewiales in the *Aphyllophorales* of the Family Polyporaceae,
- Ganodermataceae, Schizophyllaceae, Corticiaceae, Stereaceae,
- Hymenochaetaceae, Lachnocladiaceae, Auriscalpiaceae, Stecchherinaceae etc.

of this order are important pathogens of Angiosperms in natural as well as plantation forest or even many garden and orchard trees. All species are parasitic or pertophytic or saprophytic wood dwellers causing root rot and cankers on live standing trees, coppiced stools, felled stumps and branches. They destroy slash and other wood residues to a varying extent or as active pathogenesis during the process of colonization. In addition, there are extensive wood decaying losses in stored logs and wood products in use. They weaken the plant structurally and contribute to their eventual decline and death.

The species of *Aphyllophorales* play a major role in the process of wood decay resulting at times in serious damage to the forest economy of our country. They all are lignicolous and grow on bark or wood. Several others are economically important causing decay of wood or timber. Most of the conk forming species of Braket *Aphyllophorales* grow on Sissam, Amba, Babhual, and Awla which are medicinally important. All species of *Aphyllophorales* cause white rot, where lignin is degraded and cellulose is partially degraded and thus wood is bleached.
It is therefore very important to identify the species of the order *Aphyllophorales*, that cause a great deal of damage to our structural timbers and valuable forests. The systematic of wood rotting fungi have been worked out by mycologists for several years. Many of to days leading taxonomists are in disagreement to delimit the order of *Aphyllophorales*, as it is a subjective science which is ultimately based on personal taste. (Ryvarden., personal communication, 1989).

Parbhani and Nanded Districts show typically tropical vegetation. The heavy/less rainfall, high/les less humidity and hot temperature in the forests favors the growth of WDF. The angiospermic vegetation is of unique type showing a mixture of semi-evergreen and moist deciduous forests with few isolated patches of evergreen vegetation in deep ravines for luxuriant growth of WDF especially for the order *Aphyllophorales*.

The order *Aphyllophorales* is roughly characterized by brown, poroid, pileate to resupinate, annual to perennial basidiocarps, with a hymenophore in the form of united tubes and have brown context tissue that darken in KOH solution (Xanthochroic reaction). Hyphae may have simple septa but lack or present of clamp connections. Setae are present in the hymenium of rare species while in few setal hyphae occur in tramal or context tissue. The basidiospore very from hyaline to pale yellow brown to golden yellow and stain negative and dextrinoid with Melzer’s reagent.

*Aphyllophorales* is a large order with about 500 species known from India out of these only 52 species have been reported so far from Marathwada. But there is no comprehensive account of monographic studies on this order from Marathwada except some scattered references and hence the area was selected for this particular study.

The literature on the order *Aphyllophorales* is very vast and can be conveniently divided into four scientific contributions.
I. Persoon (1801) was the first to segregate the lamellate and poroid fungi. Fries (1821) in his “Systema Mycologicum” accepted two genera for the polypores.

II. Patouillard (1900) was the first author to see microscopic characters for delimitation of higher taxa.

III. Corner (1932ab) distinguished hyphal system Cunningham (1946) applied Corner’s system in his paper “Notes on Classification of Polyporaceae” (1946).

IV. Later on workers like Overholts (1953), Lowe (1957), Donk (1960-64), Ryvarden (1972 onwards), Gilbertson and Ryvarden (1986 onwards), Niemela (1982 onwards), Rajchenberg (1989), Larsen and Cobb-Poulle (1990), Juliet Carranza-Morse (1992) are important contributors to our knowledge of this group of Basidiomycetes.

The present investigation was undertaken for through understanding of the order *Aphyllophorales* with respect to its taxonomic identity, detailed macro and micromorphological characters and distribution patterns.

The results of this study are represented in this work on the following lines:

- Materials and Methods
- Taxonomy of the order *Aphyllophorales*
- Mycogeography of the order *Aphyllophorales*. 