VI. RESULTS AND DISCUSSION

Species of the order *Aphyllophorales* are lignicolous Basidiomycetes, which have perennial basidiocarp and gives xanthochroic reaction in KOH solution. All species of *Aphyllophorales* cause white rot and degrade both lignin and cellulose from the woody tissue. In major Indian taxonomic work this fungi has been placed in the genera like *Fomes*, *Poria* and *Polyporus* of the family *Polyporaceae*. Presently the order is recognized in the family *Hymenochaetaceae*, *Corticiaceae*, *Lachnocladiaceae*, *Schizopyllaceae*, *Stereaceae*, *Aurisalpiaceae*, *Ganodermataceae*, *Hericiaceae*, *Polyporaceae*, *Thelephoraceae* and recent information is available with respect to taxonomical and distributional aspect of the genus species.

Systematic surveys in the forest areas during different seasons revealed over 500 specimens of the order *Aphyllophorales* found on 58 different hosts and they fall into 52 species; 02 forms and varieties. Detailed account of their morphological characteristics, drawings of each representative characters and their natural photographs is given for first time in India.

It is noteworthy that species like *Albatrellus confluens*, *Earliella scabrosa*, *Epithele fulva*, *Flavodon flavus*, *Hheterobasidion insulare*, *Irpex lacteus*, *Microporellus chocolatus*, *Stereum gausapatum*, *Stereum sanguinolentum*, *Trametes tephroleuca*, *Trametes menziezii*, *Trametes pubescens* and *Trametes cingulata* are reported for the first time in Indian Mycoflora while 52 species are new for the Marathwada (Table 6).

It can be concluded that the species of *Aphyllophorales* try to colonises the heart wood of the live standing trees either through the broken branches or the lateral limbs or the basal wounds caused during thinning operation or the wounds on the main stump due to animal or even human interference. Such wound proliferate due to the mycelia; activity of the species of *Aphyllophorales* in the heart wood of the live standing tree. Mycelium continues to develop in
an enormous amount causing unseen standing tree or breaking tree at the point
the tree may fall down due to the internal growth of the mycelium during
winds, storms or by uplifting of the trees. In other trees the heart wood core
which has started decaying during early growth of colonization may get
compartmentalized so that the new sound wood starts developing from their
periphery due to the activity of barrier zone. In this group central core slowly
and steadily continues to decay so that the species of *Aphyllophorales* fruit
either through the callus or through the basal wounds. These members namely
are the one in which the fruiting of *Aphyllophorales* occurs or several years or
may be few years. Due to circumferencial compartmentalization some heart
wood continues to grow there in and increase the growth of trees slowly.
Basal central hollow which are developed in such decayed trees at one time or
the other became weak and result in by breaking of the main stump in this
region or even uplifting of trees during heavy storm.

To put in a nut shell, majority of the *Aphyllophorales* species that cause
heart wood rot in live standing trees or fallen logs play key role in developing
of increasing vigorous growth of young seedling after their tree fall. In addition
to this, on forest floor as soon as tree fall, logs left on the forest floor that
continues to live over years. In undisturbed localities then other wood rotting
fungi enter the fall logs. Wood log which is previously predisposed by
*Aphyllophorales* exaggerate the process of decaying increase of the heart wood.
Due to the decay of the heart wood, enormous amount of mycelia profusely
entered through the decaying wood into the forest leaflitter. That continues to
decay the litter and ultimately so called white rot humus which is mainly seen
in tropical forest, can be said to be partly contributed due to the activity of the
mycelium of species *Aphyllophorales*.

The hollows developed due to the activity of *Aphyllophorales* species on
the main stump or on the lateral branches of the main stump on which cavity
nesting birds occupy such hollows are their breeding sites. In addition to this
the air-borne Basidiospores developed during the favorable period of fruiting are major dispersal unit of this group of fungi. In addition to this the mycelia fragments attached either on the body or on the beaks of cavity nesting birds (fairy tern *Gygis alba*, *Goldcrest regulus regulus* etc.) which fly from their breeding sites to the freshly cut wounds as a colonizing unit (module).

**Why the species of *Aphyllophorales* have largest number of species?**

The species of *Aphyllophorales* occur on more than 420 woody tree host species. Out of which 95 hosts are recorded from India (Table 9) and 58 from Marathwada (Table 1). None is the species found in Marathwada is host specific except one in which species with diversified allied host showing unique morphological variability is created as variety of forma in present studies.

The above table indicates number of host occur on *Aphyllophorales* species/forma/varieties having almost homogenous characters with respect to their mycelia characters and spore characters. Diversification occurs with respect to the morphological variability right from resupinate to effuse-reflexed to triquetrous. This may be due to the host fungus interaction in course of evolution. The variability in structural morphology of the species *Aphyllophorales* may be assigned (1). The amount of decay developed in the tree and amount of fruiting body formed on it (2). It may be due to host fungus interaction which is noticed in the species of *Ganoderma lucidum* where with some host it is imbricate or in other it is resupinate while in on majority of the host it is dimidiate. The genetic segregation of the species of the order *Aphyllophorales* which have come into existence into the present day plants where they are interacted with diversified substrata. Here phenotypic expression slightly vary from one another e.g. *G. lucidum* exhibit variable morphological characters with respect of their host range e.g. *G. lucidum* var. *Microporus*, Fa.
Present study also revealed that *G. lucidum* occurs on twenty-five diversified substrata followed by *L. acuta* (15), *C. gallica* (06), *Trametes mariana* (05). However, *P. alveolaris*, *T. menzeiezii*, *P. badius*, *P. gilvus*, *T. cingulata*, *P. ravenalae*, *C. reidii*, *C. brunneo-leuca*, *L. caperata*, *L. steroids*, *Lopharia cinerascens*, *L. papyracea* are restricted to only one or two host species.

In Marathwada, only *Mangifera indiaca* and *Zizyphus jujuba* belonging monocotyledon has been reported here *C. caperata* and *F. flavus* while, *G. ahmadii* is restricted in mangroves substrata from the litoral forest of konkan area (salav).

Now considering the floristic affinities of the member of *Aphyllophorales* in Marathwada, it has a close affinity with that of Asian and African continents. The species of *Aphyllophorales* might have arrived form early Mesozoic along with present day woods plants. The species may be considered as a tropical northern distribution with the members of Asian and African floristic elements. Data may be considered as an additional proof for Continental drift theory proposed by Wegener (1924) and Bharaucha (1983). Wadia (1975) has separated Gondwana land into Lemuria followed by separation of this land into four southern continent namely South America, Africa, East Asia and Australia, in early Mesozoic.

The species collected from the regions of Marathwada could be conveniently classified under following major categories.

1) Northern tropical having affinities with that of Himalayan species namely *Epithele fulva*, *Flavodon flavus*, *Heterobasidion insulare*, *Gramothelae fuligo*, *Scytinostroma portentosum*, *S Rhizomorpharum*, *Stereum hirsutum*, *S. Rugosum*, *S. Sanguinolentum*.

2) Southern tropical having affinities with that of tropical Africa, Australia and America. *Albatrellus confluens*, *C. caperata*, *C. gallica*, *Fomitopsis seei*,
*Hexogonia tenuis, Lenzites acuta, Perenniporia medulla-panis, Polyporus alveolaris, Trametes cingulata, T. pubescens.*

3) Arid species having affinities with either in the central peninsula of India or Afganistan, Baluchistan, Pakistan, etc. the list of the species among this categories are given bellow:

*Earliella scabrosa, Heterobasidion insulare, Lenzites acuta, Polyporus grammacephalus, Trametes cingulata and Trametes menziezii.*

Total scenario of distribution, the species of *Aphyllophorales* is looked on world wide basis species which are of mainly from centrical Africa namely, *Albatrellus confluens, Coriolopsis caperata, Coriolopsis gallica, Earliella scabrosa, G. ahmadii, H. tenuis, Irpex lacteus, L. steroids, L. elegans, Microporellus chocolatus, Perenniporia medulla-panis, Polyporus alveolaris, P. tenuiculus, Rigidoporus sp. Schizophullum commune, Scytinostromella heterogena, Trametes tephroleuca, Trametes mariana and Trametes cingulata.*

Out of which *E. fulva, F. flavus, Gramothele fuligo, Trametes tephroleuca, Trametes pubescens* are recorded for the first time from India.

The species that occur in Tropical Asian forests namely, *Loweporus tephroporus, Trametes cingulata, T. mariana, T. menziezii, Trametes pubescens, Trametes tephroleuca* are also recorded for the first time from India.

It was observed that species like *Albatrellus confluens, C. caperata, C. gallica, E. scabrosa, Fomotopsis feei, F. scutellata, H. tenuis, Irpex lacteus, P. medulla-panis, Polyporus alveolaris, P. tenuiculus, T. elegans, T. pubescens* are reported from this place, which has affinities with that tropical central America.

When analysis of the order *Aphyllophorales* was carried out as shown in table 5, it clearly indicate that majority of them belonging to Northern
distribution and as considered as tropical species. While, the species like *G. ahmadii, G. lucidum, G. sp. Polyporus alveolaris, P. grammocephalus, P. tenuiculus, T. cingulata, T. mariana, T. menziezii, T. pubescens, T. tephroleuca* are found in both the hemispheres and should be considered as cosmopolitan.

*Gloeoporus thelephorides* occur only in Argentina, *Phellinus gilvus* is restricted to Mexico and *Polyporus alveolaris* from Laos may be considered as species of disjunct distribution and these species are recorded for the first time from India.

Majority of the species of *Aphyllophorales* recorded from the region of Marathwada belonging to Eastern distribution.