



**ORIGINAL RESEARCH PAPER**

**Botany**

**ECOLOGICAL ROLE OF LEAF LITTER FUNGI IN GANGOBA SACRED GROVE HASANE, FROM RADHANAGARI TEHSIL (DIST. KOLHAPUR).**

**KEY WORDS:** Ecology, Leaf litter fungi, sacred groves, Radhanagari

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**ABSTRACT**

An attempt has been made to study ecological role of fungi associated with the decomposition of leaf litter of some plants of Gangoba sacred grove Hasane from Radhanagari Tehsil, District Kolhapur. Vegetation of sacred groves is rich with plant diversity. The sacred groves floor possesses rich leaf litter which undergoes a process of decomposition by variety of organism among which fungi play crucial role in the decomposition leaf litter. The fungi are necessary for the nutrients recycling on soil surface because the fungi are the predominant decomposers. In present study, 39 species of fungal communities are isolated by using culture method which belongs to Ascomycotina, Zygomycotina and Deuteromycotina. These fungi play important role in ecology.

**INTRODUCTION**

In India there has been a dedicating tradition of conservation of nature and, preservation and worshiping forest patches in the name of deity. Such patches of forest are called sacred groves. These are distributed in all states of India and proved to play role in preserving vegetation since their existence. According to National Forest Policy Ministry of Environment and Forest (1988), sacred groves are the last valuable remnants of natural forest with store houses of biodiversity. In maharashtra there were 2820 sacred groves are found in tribal and non-tribal areas ([www.cpreecensis.nic.in](http://www.cpreecensis.nic.in)). From Kolhapur district, 37 Sacred Groves were visited from Radhanagari; Bhudargad; Ajara; Malkapur areas (Anonymous, 1983-86). Radhanagari tehsil was recorded for several times to study the leaf litter fungi from sacred groves. We were visited two sacred groves from Hasane, tehsil Radhanagari viz. Gangoba and Ugawai. Gangoba sacred grove is one of the sacred groves in Radhanagari Tehsil having about 8 ha area situated at Hasane village. Geographical coordinates of Hasane 16°20'45.75" N and 73° 51' 19.55" E and Altitude -600 meters above msl, Temperature -28 °C, Humidity-90% . Its weather is moist and salty during September to November. It is not affected by anthropogenic activities and well presented patch of natural evergreen forest.

The plant diversity of sacred grove is always rich which possesses diverse spectrum of ecosystem. Therefore, the sacred groves floor possesses rich leaf litter which successively decomposed by fungal communities. All organisms provide some kind of function to an ecosystem and the fungi are playing a vital role in degrading complex organic material of plant litter. Leaf litter from different host plants vary in their chemical content and may influence the fungi growing on it (Duong et al. 2008). Various kind of study carried out on leaf litter fungi in individual plant species such as Cashew (Shanti and Vittal 2010), *Syzgium calophyllifolium* Walp., *Anacardium occidentale* (Shanti and Vittal 2012). The study on diversity of leaf litter fungi from various plants were reported earlier (Saravanan 2013; Tokumasu et al. 1997). Most decomposers were of litter specific (Li et al. 2000). This may due to the fact that the fungi have their own ecological characteristics to litter (Akare et al/ 2016) Because of the involvement of fungi in nutrient cycling, their mycorrhizal and endophytic associations with plants and their interaction with insects, fungi are known to have vitally important contributions to ecosystems (Sumitra et al. 2016).

Investigations of fungal succession have taken synecological approach and fungal diversity of decomposing leaf litter. High species diversity and spatial heterogeneity of decomposer fungi on decaying leaf litters in tropical forest reported earlier (Bills and Polishook, 1994 a, b; Santana et al. 2005). The decomposer fungi play an important key role in maintaining the fertility and sustainability in the tropical forest (Lodge 1997).

**MATERIAL AND METHODS**

Forest floor of Gangoba sacred grove from Hasane, the leaf litter samples of numerous plant species were collected randomly during March to September months respectively and are carried in sterilized polythene boxes and deposited in the laboratory for further study. Identification of samples were done by using relevant literature (Yadav and Sardesai 2002; Pascal 1987; Singh and Karthikeyan 2000; Singh et al.2001).

Fungal species from leaf litter was isolated by culture method (Sharma et al. 2011). Washed disk method was applied for isolation of leaf litter fungi. Isolation of fungi made by washing disk culture method from collected leaf litter samples respectively. In washed disk technique 5 leaf disks were prepared by using 4 No. stem bore. These leaf disks are washed serially using sterilized distilled water and allow drying in air in chamber. Leaf disks put into the Petri plates containing Potato Dextrose Agar (PDA) and it incubated at 25±1°C for 7 days. The fungi were mounted on slide in lactophenol and cotton blue in lactophenol (Patil and Patil 2002). Identification was done by using relevant literature (Subramanian 1971; Barnett 1997; Thom 1945; Tsuneo 1937; Ellis 1971). Leica Dm 2000 Fluorescence Microscope equipped with digital camera was used for Photomicrographs. Identified samples with accession DM number are deposited in the mycological herbarium of college.

**RESULT AND DISCUSSION**

Thirty nine species of fungi belonging to 14 genera of fungi are isolated from leaf litter in Gangoba sacred grove, Hasane. Table no. 1 revealed that During this investigation 11 species of *Aspergillus*, 4 species of *Fusarium*, 5 species of *Rhizopus*, 3 species of *Mucor*, 2 species of *Scedosporium*, *Penicillium* sp., *Pestalotiopsis* sp., *Beltrania* sp., *Colletotrichum* sp., *Daldinia* sp., *Geotrichum* sp., *Bipolaris* sp., each are isolated from leaf litter of some host plant viz. *Syzygium cumini* (L.) Skeels, *Aradhachandra heterophyllus* Lam., *Grewia asiatica* L., *Argyrea* sp., *Mangifera indica*, *Cissampelos pareira* and unknown host.

**Mycoflora of leaf litter**

A total of 4 species belonging to 3 genera were recorded such as *Fusarium ventricosum* Apple & Wollenw., *F. acutatum* Nirenberg & O'Donnell, *Rhizopus arrhizus* var. *tokensis*, *Penicillium purpurogenium* Stoll on *Syzygium cumini* (L.) Skeels. While total of 4 species belonging to 2 genera were recorded such as *Aspergillus niger* van Tieghem, *A. fumigatus* Fresenius, *A.japonicus* Saito, *Fusarium solani* (Mart.) Sacc., occurred on *Artocarpus heterophyllus* Lam. Maximum number of species occurred, 20 species belonging to 10 genera on *Mangifera indica* viz., *Aspergillus violaceo-fuscus* Gasperini, *A. japonicas* Saito, *A. niger* van Tieghem, *A. effusus* Tirab. *A.versicolor* (Vuill.) Tirab., *A. japonicas* Saito, *Fusarium mangiferae* Britz, Wingfield & Marasas, *Scedosporium apiospemum* (Saccardo) Casteilani and Chalmers,

*S. prolificans* (Hennebert & B.G.Desai) E.Guêho & de Hoog, *Mucor circinelloides* Tieghem , *Rhizopus microsporus* , var. *azygosporus* (G.F. Yuan & S.C. Jong) Schwertz,Villaume, Decaris, Percebois & Mejean, *Rhizopus stolonifer* Vuillemin, *R.sexualis* (G.Sm.) Callen, *R. oryzae* Went & Prins. Geerl., *Syncephalastrum racemosum* Cohn ex J. Schröt., *Curvularia pseudolunata* Da Cunha, Madrid & Gene, *Pestalotiopsis hainensis* A.R. Liu, T. Xu & L.D. Guo, *Beltrania* sp., *Colletotrichum* sp., *Daldinia* sp.,

A total of 7 species belonging to 4 genera were recorded on *Cissampelos pareira* L. viz., *Fusarium solani* (Mart.) Sacc., *Aspergillus flavus* Link, *Aspergillus ochraceus* Wilhelm, *Aspergillus panamensis* Raper, KB.; Thom, C., *Aspergillus japonicus* Saito, *Mucor* sp. *Geotrichum* sp. Only one species of genus *Diplococcium* sp., occurred on unknown member of Moraceae family. While *Fusarium solani* (Mart.) Sacc. and *Aspergillus niger* van Tieghem were isolated from *argyrea nervosa* (Burm.f.) Bojer and *Aspergillus awamori* Nakaz. reported on *Grewia* sp.

**CONCLUSION**

Leaf litter material is decomposed by micro-organism such as Bacteria and Fungi after decomposition it is efficient component of healthy soil. Fungi are predominant decomposer and they play a vital role in decomposition of leaf litter. The role of litter decomposition in the global carbon cycle has increased recently for the reasons that it is an environmental factor in ecological productivity, nutrient cycle and soil fertility. Therefore, the vegetation of forest is always rich and diversified.

**Table – 1. The ratios of Fungi to host are**

Sr. No.	Host Plants	No. of Fungal species
1	<i>Syzygium cumini</i> (L.) Skeels	4
2	<i>Artocarpus heterophyllus</i> Lam.	4
3	<i>Grewia asiatica</i> L.	1
4	<i>Argyrea nervosa</i> (Burm.f.) Bojer	2
5	<i>Mangifera indica</i> L.	20
6	<i>Cissampelos pareira</i> L.	7
7	Unknown	1
<b>Total = 39</b>		

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