

# The Monitoring of Airborne Mycoflora in the Vicinity of the Library

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**Abstract** - For a period of four months beginning in July 2020 and terminating in October 2020, we attempted to methodically evaluate the airborne fungal flora at Govt. College of Education with the objective to determine their identification, concentration, and diversity in order to properly understand the composition of the entire aeromycoflora. The study period was during the monsoon period, which included mild to moderate temperature and high humidity, with ranges of 17.0-38.2°C and 26-92%, respectively. After two weeks, an air sample was taken using the culture plate technique (CPT) on petri dishes using Potato Dextrose Agar (PDA) media. After a 3-5 day period of incubation at 25-28°C, the fungal colonies that emerged were identified according to micro and macro morphological characteristics followed by the percentage contributions of individual species of fungi were calculated.

Altogether ten different kinds of fungal colonies, including *Alternaria alternata*, *Asperillus niger*, *Alternaria tenuissima*, *Cladosporium herbarum*, *Cladosporium cladosporioides*, *Curvularia lunata*, and *Fusarium oxysporum*, were found in outdoor environments. Deuteromycotina displayed dominance in the overall spore contribution among all taxonomic categories.

**Keywords** - Outdoor environment, Aeromycoflora. Fungal spores and Library

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## INTRODUCTION

Atmosphere is rich source of diverse groups of contaminants which may be biological or non-biological in origin. Maximum contaminants have hazardous health effects such as allergic reactions, asthma, varied skin diseases, internal organ infection and toxicity as well. An organized collection of information resources in the form of books, magazines, and newspapers that are made available to a designated community for reference or borrowing comprises the foundation of an institution of learning is a library. As these books are used as a source of nutrients for the development of fungal organisms, their being present in the library encourages bio deterioration of the books and other things present. Books can become damaged and prints and photos become discolored due to bio deterioration by fungi (Thakre and Bhajbhujje, 1989; Kalbende et al., 2012).

Aeromycoflora of the outdoor environment of the library, were isolated, out of which some are responsible to the book deterioration, stored in the library and also cause some health problems viz

respiratory disorders, allergic diseases, and asthma, to the readers and visitors. The outdoor concentration of aeromycoflora, maybe because of favorable conditions (viz. stored books, old newspapers) for the growth of fungi. The use of antiseptic materials and vacuum cleaner should be used. This will help to reduce the concentration of aerospora as well as dust (Ambhore V. J et al.2020.).

Recently, it became accepted that the only way for preserving the ideal temperature and levels of humidity was through artificial climate control. Natural ventilation can frequently turn out to be the best option, particularly in libraries where maintaining an air conditioning system would be difficult and it would only run occasionally. However, effective moisture exchange between objects and the air may be made possible by good air circulation . (Ambhore J.S. 2003) (J. S. Ambhore and V. P. Mali's 2007) study on Aeromycoflora in libraries demonstrated that in addition to damaging the books, it may also cause allergic issues in both library patrons and staff members who spend the

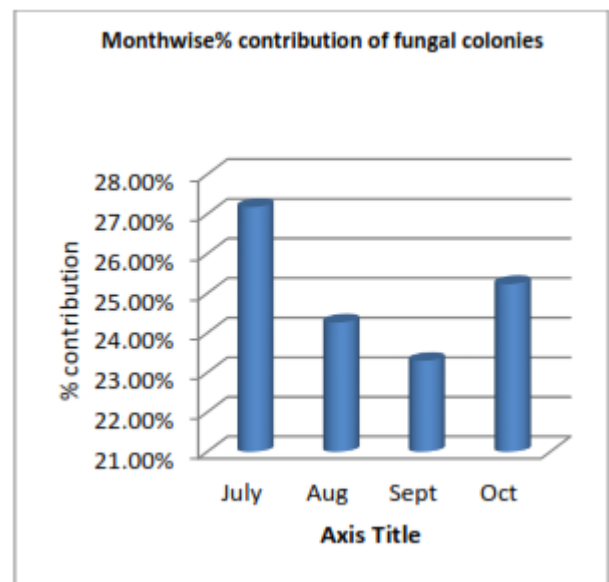
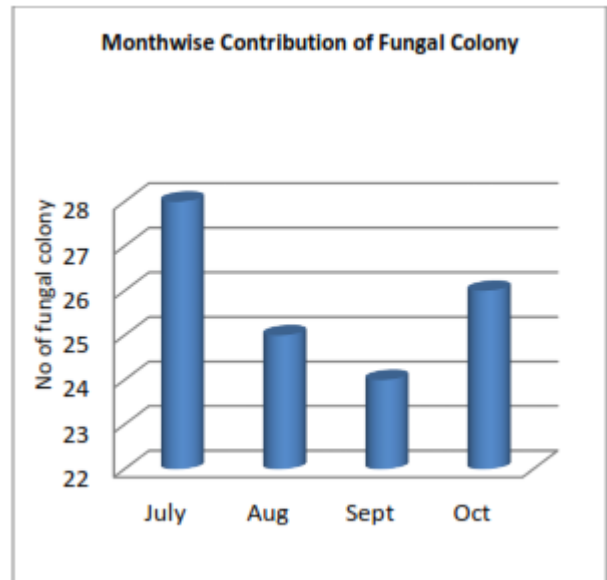
majority of their time there. Ambhore, J. S. (2015). In his book “Aeromycological studies over maize and paddy crops”, Given the information about the release, transport and deposition of fungal spores. While study of Aeromycological Studies over some oilseed crops in Maharashtra (Bhagat G.S., Ambhore J.S (2015)., discussed the sources of outdoor fungal spores

**MATERIALS AND METHOD**

The present investigation was undertaken to study aeromycoflora around the library. Air sampling was carried out by exposing culture plates around the library environment after every fifteen days intervals from January 2017 to April 2017.. Samples were collected by exposing Petri plates containing potato-dextrose-agar (P.D.A) medium supplemented with rose Bengal (0.2g/l) for inhibiting the growth of bacteria, exposed for 5 minutes. After exposing Petri plates brought to the laboratory in sterilized polythene bags and incubated at 28.50c for a period of seven days. . After incubation the colonies appearing on PDA containing petri plates, colonies were counted and recorded as a percentage for the individual colony. The petri plates were examined periodically for changes in the growth of fungal colonies. For the purpose of identification and microphotography, slides were prepared with lactophenol cotton blue as the standard stain. Isolates were identified with the help of available literature (Barnett, 1969; Nigmani et al. 2006).

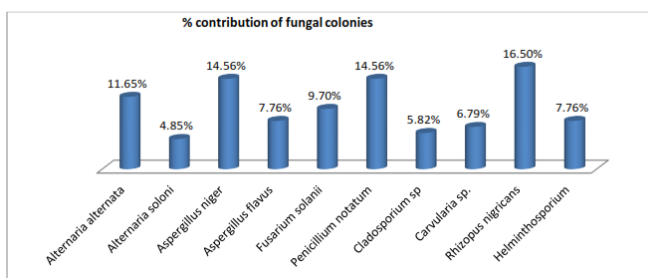
**Table 1: Total count and percentage contribution of fungal colony from outdoor environment**

Sr.No	Fungal Spore.	Nov.		Dec		Jan		Feb.		Total	%contrib ution
		Ist half	ii nd half	Ist half	ii nd half	Ist half	ii nd half	Ist half	ii nd half		
1	<i>Alternaria alternata</i>	2	3	1	-	2	1	3	-	12	11.65
2	<i>Alternaria soloni</i>	-	-	1		2	1		1	5	4.85
3	<i>Aspergillus niger</i>	2	3	1	3	1	1	2	2	15	14.56
4	<i>Aspergillus flavus</i>	3	1		1	1		2		8	7.76
5	<i>Fusarium solanii</i>	2	1		2	1	2		2	10	9.70
6	<i>Penicillium notatum</i>	2	2	2	3	1	2	2	1	15	14.56
7	<i>Cladosporium sp</i>		1		1	2		1	1	6	5.82
8	<i>Carvularia sp.</i>			1	1		1	2	2	7	6.79
9	<i>Rhizopus nigricans</i>	2	2	3	3	2	3	1	1	17	16.50
10	<i>Helminthosporium</i>		2		2	1		1	2	8	7.76
	<b>Total</b>	13	15	9	16	13	11	14	12	103	99.95



**RESULT AND DISCUSSION**

The result of outdoor aeromycological survey conducted around Govt. B.Ed. College library, shows that around the library environment total numbers of colonies are. 103 outside of the library were recorded from around the library. A total of 10 types of fungal colonies were identified from outdoor environment of the library, (table 1).According to their occurrence in the exposed petriplate samples, the population in terms of percentage occurrence were of *Alternaria alternata*-11.65%, *Alternaria soloni*- 4.85%, *Aspergillus niger* 14.56%, *Aspergillus flavus*-7.76%, *Fusarium solanii* 9.70%, *Penicillium notatum* 14.56%, *Cladosporium sp*-5.82%,,*Carvularia sp.* 6.79%, *Rhizopus nigricans*-16.50%, *Helminthosporium*-7.76%.



Among all the fungal spore types, the taxonomic group Deuteromycotina showed dominance in the total spore contribution. Vacuum cleaners and antimicrobial properties. Materials needed to be used. This will help in reducing the level of fungal

spores and dust

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