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Incidence of fungi in the indoor environment of Library of Raje Dharmarao College of Science Aheri, Dist. Gadchiroli

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Abstract: *Present study leads to know about the incidence of fungi in the in the indoor environment of Library of Raje Dharmarao college of Science, Aheri, Dist. Gadchiroli. Total 308 fungal colonies comprised of 28 different species were isolated from the indoor environment over PDA medium by Petri plate exposer method. Ascomycotina was the most dominated group followed by Deuteromycotina and Zygomycotina. Aspergillus was observed to be most dominated species followed by Fusarium, Curvularia and Penicillium.*

Key Words: *Fungi, Library, Gadchiroli, Aspergillus.*

1. INTRODUCTION:

Library is the prime source for cellulose degrading fungi. Library environment provide the ambient temperature and humidity for the growth of saprophytic fungi [1, 2]. Many books, papers, journals, and other cellulosic material in the library are prone to biodeterioration by the cellulose degrading and saprophytic fungi [3].

Now a day's libraries are equipped with the fans and air conditioners (AC). These machines make the indoor environment of library more humid and maintain the temperature of the room. This moderate temperature and humidity favors the growth of different fungi [4].These proliferating fungi leads towards the pollution of indoor environment of library which may be hazardous to the visitors including students as well as teachers and the other staff of college [5]. Since these fungi are responsible for the many allergic problems and respiratory diseases in human being, an investigation was carried out in the library of Raje Dharmrao Science college Aheri Dist. Gadchiroli.

2. MATERIALS AND METHODS:

For the present study following methodology were implemented

Sampling site and sampling period: The library of Raje Dharmarao Science college Aheri Dist Gadchiroli (MS), India was selected as a sampling site as it is one of the big and important library of the city. The study was undertaken in the winter season of 2019.

Culture Medium: Otato Dextrose Agar (PDA) was used to isolate the intramural fungi. The medium was prepared by using 200 gm peeled potato, Dextrose 20 gm/l and Agar 20 gm/l. The prepared medium was poured aseptically into the petri plates and let it be to solidify at room temperature.

Spore sampling: Petri plates containing sterilized PDA medium were exposed in the library in triplicates for 5 to 10 minutes. After exposer they were sealed with cellotape and brought into laboratory. Petri plates were incubated at 26^{o}C±2 for 5-6 days.

Identification of Fungi: Fungal colonies appeared on the medium were further identified by using standard literature like Illustrated Genera of Imperfect Fungi [6], A Manual of Aspergilli [7], Pictorial Atlas of Soil and Seed Fungi [8].

Data analysis: The isolated fungal colony count were recorded in the form of tabulated data and were further analysed for frequency, by using following formulas.
Frequency = Number of individual colony/Total number of all fugal colonies ×100

3. RESULT AND DISCUSSION:

The present study showed that the highly dominance of fungal spores in the indoor environment of library of Raje Dharmarao College of Science, Aheri. The heavy spore count of indoor fungi in library is receiving the attention

of today's researcher with reference to the losses caused by the fungal spore and the health hazards caused to the human beings. In the present study incidence of fungal spore in the indoor environment of library was analyzed for quantitative and qualitative parameters. It was observed from the present study that altogether a total of 28 fungal species comprises under 15 genera were found to be present inside the library during sampling period (Table 1).

In the present investigation, total 308 fungal colonies have been isolated over the PDA medium by using petri plate exposer method. This method was also used by other researchers [9,10] and found to be more appropriate than other methods [1,11]. Ascomycotina was dominated with the frequency of 45.78% followed by Deuteromycotina with 35.06% and Zygomycotina with 13.64%. Not a single member of Oomycotina was isolated during this study (Table 1 and Fig. 1).

4 species were recorded comprising 3 genera from Zygomycotina. *Rhizopus* was dominated with 6.49%. *Mucor* and *Cunninghamella* contribute nearly same i.e. 3.90% and 3.25% (Table 1 and Fig. 2). Ascomycotina was dominated with the count of 141 fungal colonies among which *Aspergillus* was most dominated fungus with the 34.74% and with the diversity of 8 different species. Among which *A. niger* was dominated followed by *A. japonicus*. *Chaetomium* was recorded with the count of 9 colonies. *Penicillium* was found to contribute 8.2% with diversity of two species (Table 1 and Fig 1&2).

Deuteromycotina was isolated with the count of 108 colonies. Total 10 fungal species comprising 7 genera were isolated. *Fusarium* was most dominated with the count of 27 colonies followed by *Curvularia* with 26 colonies. *Alternaria*, *Curvularia* and *Fusarium* were isolated with 2 species each. *Alternaria* isolated with frequency of 4.55%. The genera like *Bipolaris*, *Nigrospora* and *Torula* were also reported with moderate count. Black and white sterile mycelia were also reported during the investigation (Table 1, Fig. 1 & 2).

4. CONCLUSION:

A total 308 fungal colonies have been reported from the indoor environment of Raje Dharmarao Science college library. Isolated fungal colonies have been diversified into 28 species and 15 genera. Ascomycotina was found to be the most dominated followed by Deuteromycotina and Zygomycotina. Among all the isolates, *Aspergillus* was most dominated followed by *Fusarium*, *Curvularia* and *Penicillium.*

Fig. 1. Frequency distribution of fungal divisions

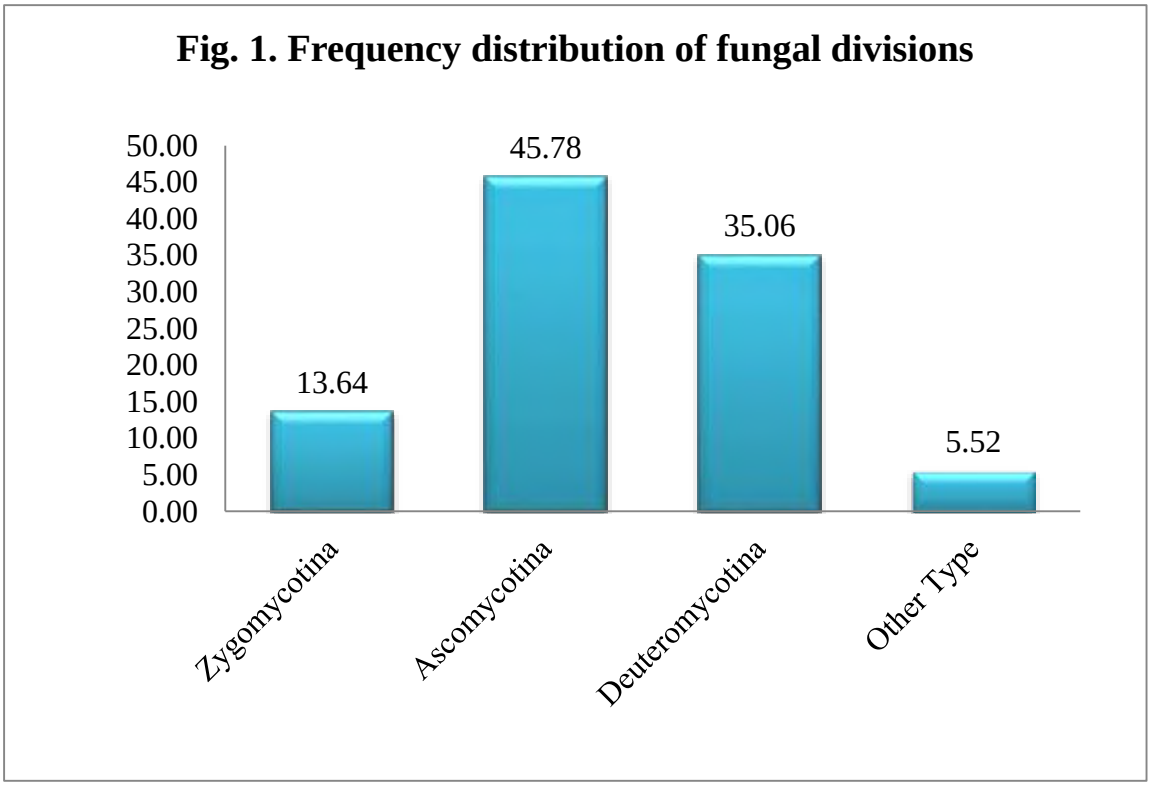
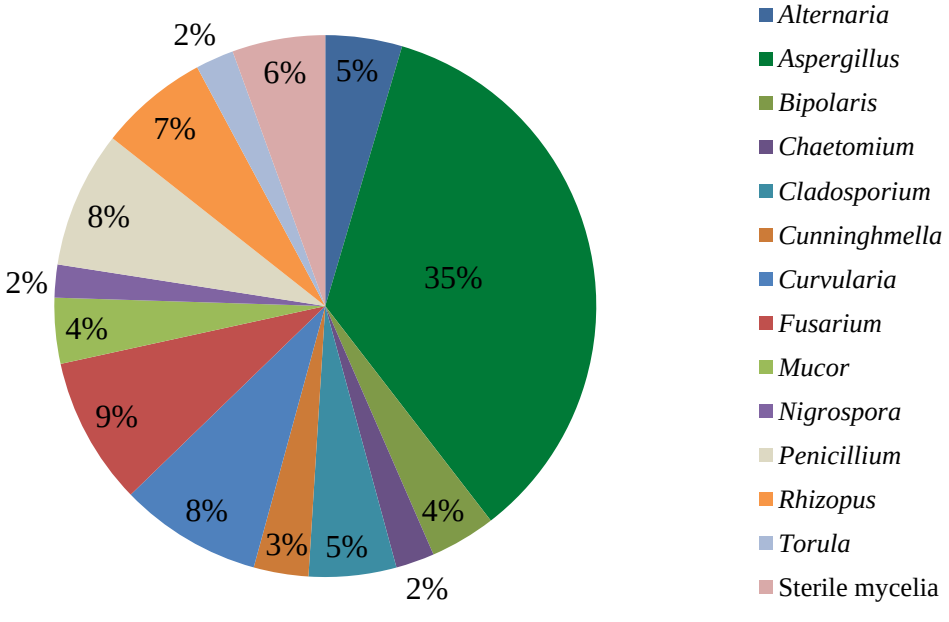


Table 1: Incidence of fungi in the indoor environment of library

Sr. No.	Fungal organism	Total colony	Frequency	
			Species	Genera
A.	**Zygomycotina**	**42**	**13.64**	**13.64**
1	*Cunninghamella echinulata*	10	3.25	3.25

2	*Mucor hiemalis*	12	3.90	3.90
3	*Rhizopus microsporus*	5	1.62	6.49
4	*Rhizopus stolonifer*	15	4.87	
B.	**Ascomycotina**	**141**	**45.78**	**45.78**
5	*Aspergillus awamori*	9	2.92	34.74
6	*A. flavus*	12	3.90	
7	*A. fumigatus*	8	2.60	
8	*A. japonicus*	20	6.49	
9	*A. niger*	26	8.44	
10	*A. ochraceus*	12	3.90	
11	*A. sulphureus*	15	4.87	
12	*A. versicolor*	5	1.62	
13	*Chaetomium globosum*	9	2.92	2.92
14	*Penicillium citrinum*	10	3.25	8.12
15	*P. oxalicum*	15	4.87	
C.	**Deuteromycotina**	**108**	**35.06**	**35.06**
16	*Alternaria alternata*	9	2.92	4.55
18	*Alternaria tenuissima*	5	1.62	
19	*Bipolaris tetramera*	**12**	3.90	3.9
20	*Cladosporium cladosporoides*	16	5.19	5.19
21	*Curvularia brachyspora*	12	3.90	8.44
22	*Curvularia lunata*	14	4.55	
23	*Fusarium monoliformae*	12	3.90	8.77
24	*Fusarium oxysporum*	15	4.87	
25	*Nigrospora oryzae*	6	1.95	1.95
26	*Torula herbarum*	7	2.27	2.27
D.	**Other Type**	**17**	**5.52**	**5.52**
27	Black sterile mycelium	9	2.92	2.92
28	White sterile mycelium	8	2.60	2.6
	Total	**308**	100	100

Fig. 2. Generic frequency distribution



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