



STUDY OF AEROMYCOFLORA IN INDOOR ENVIRONMENT OF COLLEGE BUILDING, GOVT.NAVEEN COLLEGE, SONAKHAN

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Abstract:-Fungi are cosmopolitan in distribution and occur in any habitat where life is possible. Aeromycoflora which refers to the airborne fungal spores in the atmosphere. A large number of aeromycoflora were found in indoor and also outdoor environment. The indoor environment is much more important as a major part of the day is spent indoors. The indoor fungi are not only responsible for causing disease but also responsible for the spoilage of food, clothes, books etc. Indoor environments play important roles in human health. The health hazards posed by polluted indoor environment. The primary objective of this study was to identify the aeromycoflora, their concentration and diversity in the indoor environment. Present investigation focuses on aeromycoflora survey of government college building of Sonakhan, dist. Balodabazar-Bhatapara (C.G.). Study carried out between June and October 2023. The indoor aeromycoflora species was represented by *Aspergillus*, *Penicillium*, *Rhizopus*, *Cladosporium*, and *Alternaria*.

KEYWORDS:- Cosmopolitan, aeromycoflora, sonakhan, *Aspergillus*.

1. INTRODUCTION:- Fungi are ubiquitous and versatile. The enormous types of spores, fungal propagules are found in large numbers in indoor and outdoor environment. Some of them have the potentiality to cause spoilage of food, allergies and many other adverse health effects namely allergic, bronchial, asthma and rhinitis. Fungi are eukaryotic and spore bearing organism, which exist as saprophyte or as parasite of animal and plants. Fungal spores are generally considered to be significant cause of both allergic rhinitis and allergic asthma. This paper deals with the aeromycoflora survey of Govt. Naveen College, Sonakhan. Aeromycoflora of college was studied by petriplate method. Environmental factors play an important role for the distribution of the fungal spore.

Fungal flora of the air was determined from different parts of the indoor environment of the college campus of Govt. Naveen College, Sonakhan every month during investigation period from June to October 2023.

2. METHODS AND MATERIALS: for study of aeromycoflora we required :

- i. Study site : Endoor environment of Govt. Naveen College, Sonakhan Dist.-Balodabazar-Bhatapara.
- ii. Culture Media : for culture of aeromycoflora, PDA (Potato Dextrose Agar) media was used.

Petriplate exposure method was used for the isolation of aeromycoflora from the environment every month. Five petriplates containing PDA media were exposed for 10 to 20 minutes in the indoor environment of college. After, these exposed petriplates were brought to laboratory and incubated at 28±1°C for 3 to 5 days. At the end of the incubation period the fungal colonies were counted, isolated and identified with the help of available literature.

Microphotography was performed by digital microscope in the laboratory of department of botany.

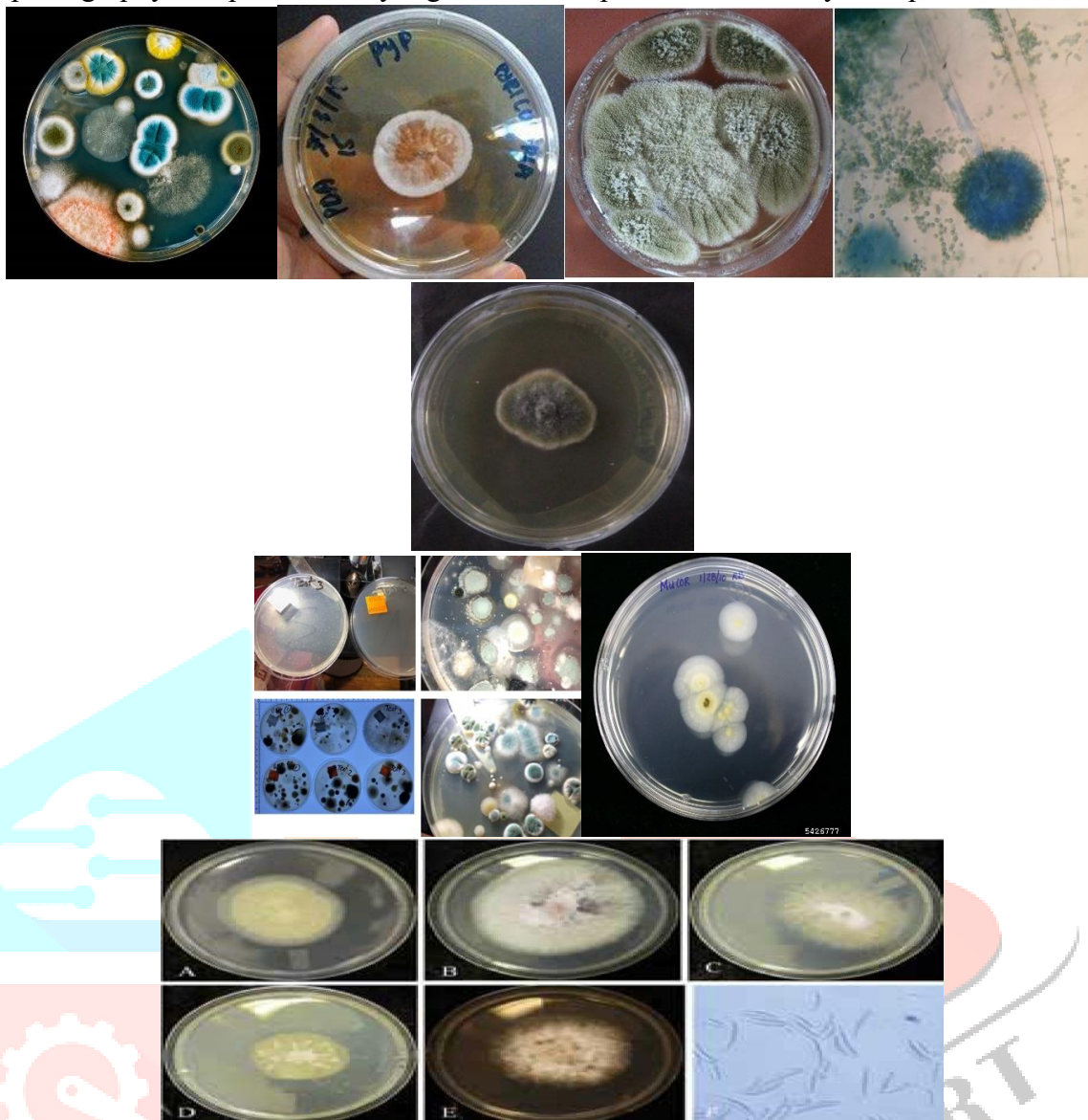


Fig:Fungal colonies growing on the Petriplate of different sampling site in the indoor environment at the Govt.Naveen College ,Sonakhan.

3.ECOLOGICAL STUDIES:-Percentage frequency and percentage contribution of fungal flora is calculated (Sharma K.2001) by the following formula:

$$\text{Percentage frequency} = \frac{\text{Number of observation in which a species appeared}}{\text{Total no.of observations}} \times 100$$

$$\text{Percentage contribution} = \frac{\text{Total no.of colonies of a species in all observations}}{\text{Total no.of colonies of all the species}} \times 100$$

4.RESULT AND DISCUSSION:-Indoor environment is rich in aeromycoflora,fungal species and fungal spore.

We isolated total 30 fungal flora from research site and categorized into three major group i.e.Zygomycotina,Ascomycotina and Anamorphic fungi.Environmental factor play a key role in fungal distribution. Highest fungal flora 23 out of 30 were isolated from anamorphic group .According to their distribution in the petriplates the highest percentage frequency was recorded as *Aspergillus niger*, *Aspergillus nidulans*,*A.flavus*,*A.fumigates*,*A.oryzae*,*Rhizopus stolonifera*,*Rhizopus oryzae*,*Cladosporium sp.* And *Mycelia sterile white*(100%) wheres lowest percentage frequency is represents by *Gilmaniella humicola* (20%)(Table-

2). *Aspergillus*, *Rhizopus*, *Penicillium* sp. and unidentified sterile hyphae is more common in indoor environment. In this research we observed the highest percentage contribution in *Aspergillus niger* (10.87) and lowest percentage contribution of *Gilmaniella humicola* (0.08). Distribution of fungal spore are affected by geographical location and meteorological condition. In the month of October high percentage of humidity and moderate range of temperature the spore concentration was more. The higher number of aeromycoflora was reported in the month of July and October.

Table: 1 Isolated aeromycoflora of indoor environment at Govt. Naveen College, Sonakhan from June to October 2023.

S.No	Name of Fungal species	June	July	Aug.	Sep.	Oct.	Total
1	<i>Aspergillus flavus</i>	18	12	10	5	9	54
2	<i>Aspergillus fumigatus</i>	21	15	13	22	17	88
3	<i>Aspergillus luchensis</i>	8	-	2	16	34	60
4	<i>Aspergillus nidulans</i>	16	8	11	23	10	68
5	<i>Aspergillus niger</i>	14	20	28	16	41	119
6	<i>Aspergillus oryzae</i>	14	6	9	5	16	50
7	<i>Rhizopus nigricans</i>	3	5	8	1	-	17
8	<i>Rhizopus stolonifer</i>	4	1	4	6	5	19
9	<i>Rhizopus oryzae</i>	3	1	4	1	2	11
10	<i>Penicillium chrysogenum</i>	16	3	6	8	-	33
11	<i>Penicillium citrinum</i>	1	-	-	-	5	6
12	<i>Penicillium expansum</i>	2	1	-	-	2	5
13	<i>Penicillium italicum</i>	1	3	-	-	-	4
14	<i>Cladosporium cladosporioides</i>	22	16	38	10	23	99
15	<i>Cladosporium herbarum</i>	30	15	8	14	6	73
16	<i>Cladosporium raphigera</i>	3	-	2	-	1	6
17	<i>Cladosporium oxysporium</i>	23	16	10	36	18	103
18	<i>Curvularia clavata</i>	10	-	-	8	1	19
19	<i>Alternaria alternata</i>	17	9	16	13	21	76
20	<i>Mucor varians</i>	3	-	1	6	-	10
21	<i>Mucor racemosus</i>	2	4	-	-	1	7
22	<i>Chaetomium globosum</i>	1	5	9	4	1	20
23	<i>Myrothecium roridum</i>	3	1	-	4	3	11
24	<i>Fusarium chlamydosporum</i>	6	9	4	-	13	32
25	<i>Fusarium moniliformae</i>	8	4	2	1	3	18
26	<i>Curvularia lunata</i>	-	2	1	-	5	8
27	<i>Alternaria citri</i>	3	8	-	12	4	27
28	<i>Alternaria tenuissima</i>	6	9	17	8	2	42
29	<i>Gilmaniella humicola</i>	-	-	1	-	-	1
30	<i>Mycelia sterile white</i>	21	14	16	32	10	83
	Total						1169

Table -2 Ecological fluctuation of Aeromycoflora

S.No.	Name of fungal species	Total	Percentage Frequency	Percentage Contribution
1	<i>Aspergillus flavus</i>	54	100	4.61
2	<i>Aspergillus fumigatus</i>	88	100	7.52
3	<i>Aspergillus luchensis</i>	60	80	5.13
4	<i>Aspergillus nidulans</i>	68	100	5.81
5	<i>Aspergillus niger</i>	119	100	10.17
6	<i>Aspergillus oryzae</i>	50	100	4.27
7	<i>Rhizopus nigricans</i>	17	80	1.45
8	<i>Rhizopus stolonifer</i>	19	100	1.62
9	<i>Rhizopus oryzae</i>	11	100	0.94
10	<i>Penicillium chrysogenum</i>	33	80	2.82
11	<i>Penicillium citrinum</i>	06	40	0.51
12	<i>Penicillium expansum</i>	05	60	0.42
13	<i>Penicillium italicum</i>	04	40	0.34
14	<i>Cladosporium cladosporioides</i>	99	100	8.46
15	<i>Cladosporium herbarum</i>	73	100	6.24
16	<i>Cladosporium raphigera</i>	06	60	0.51
17	<i>Cladosporium oxysporum</i>	103	100	8.81
18	<i>Curvularia clavata</i>	19	60	1.62
19	<i>Alternaria alternata</i>	76	100	6.50
20	<i>Mucor varians</i>	10	60	0.85
21	<i>Mucor racemosus</i>	07	60	0.59
22	<i>Chaetomium globosum</i>	20	100	1.71
23	<i>Myrothecium roridum</i>	11	80	0.94
24	<i>Fusarium chlamyosporum</i>	32	80	2.73
25	<i>Fusarium moniliformae</i>	18	100	1.53
26	<i>Curvularia lunata</i>	08	60	0.68
27	<i>Alternaria citri</i>	27	80	2.30
28	<i>Alternaria tenuissima</i>	42	100	3.59
29	<i>Gilmaniella humicola</i>	01	20	0.08
30	<i>Mycelia sterile white</i>	83	100	7.10

5.CONCLUSION: The primary objective of this study was to identify the aeromycoflora, their concentration and diversity in the indoor environment. A large number of aeromycoflora were found in indoor and also outdoor environment. The indoor environment is much more important as a major part of the day is spent indoors. The indoor fungi are not only responsible for causing disease but also responsible for the spoilage of food, clothes, books etc. Indoor environments play important roles in human health. The detailed study based on the atmospheric parameter could provide data for more understanding the correlation between abiotic and biotic factors. The effect of aeromycoflora, airborne fungal spore on human health is also a point of concern which could be studied by the use of preliminary data provided in this research article.

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