

Study of Aeromycoflora in Different Patient Wards of PMCH Patna (Bihar)

Shivani Jaiswal¹, Dr. Surendra Kumar Prasad²

¹Associate Professor Magadh Mahila College, Patna University, Patna (Bihar), India

²Department of Botany Magadh Mahila College, Patna University, Patna (Bihar), India

¹Corresponding author Email: [sjaiswal679\[at\]gmail.com](mailto:sjaiswal679[at]gmail.com)

Abstract: An attempt was made for purpose of isolation and identification of the fungal load in air indoor and outdoor of Different Patient wards in Patna Medical College and Hospital, Patna, Bihar. The study of aeromycoflora which refers to the airborne fungal spores in the atmosphere was performed during month of September 2020 to March 2021. Potato Dextrose media Poured Petri dishes were exposed directly in air, and with Burkard volumetric spore trap placed near patient table and beds in indoor and outdoor areas for 10 to 20 minutes. Incubated at 27 degree for one week. After week grown fungal were identified On the basis of morphological studies taking picture by camra and making slides identifying under microscope. Morphological studies shows total number of 9 to 12 airborne fungal species were observed from both the indoor and outdoor areas, and among them *Rhizopus*, *Aspergillus*, *Mucor*, *Curvularia*, *cladosporium*, *Penicillium*, *Fusarium*, *Alternaria*, *Histoplasma*, *Microsporium*, there were some species which could not be identified. *Microsporium* and *Aspergillus* were reported as dominant species followed by *Rhizopus* and *Mucor* in air of PMCH patient ward.

Keywords: Aeromycoflora, patient ward, fungal colonies, Allergies, Environment, Hospital, OPD

1. Introduction

Patna Medical College and hospital was established in 1925 and originally known as Prince of Wales Medical College is a Medical College located in Patna the state capital of Bihar India it is located on the Southern Bank of the river the exact location is on Ashok Rajpath it has more than 1748 beds which is at par with AIIMS. The emergency ward is called IGCE Indira Gandhi central Emergency and has additional 220 Beds. it is one of the busiest hospital in India. Aeromycoflora simply refers to the airborne fungal contributors of the environment. The term aerobiology was coined by American plant pathologist Fred Campbell meier to denote the airborne fungal spores pollen grains and other airborne microbes. *Rhizopus oryzae* causes the disease is known a Mucormycosis characterized by the growing hyphae and surrounding blood vessels. Different studies indicated that fungal extracts can cause allwrgic rhinitis and bronchial asthma in indoor dwellings (Al. Suwaine et al. 1 2001 suet et. al. 2001). Air almost always contains expose but the number and type of expose depends on the time of day weather season and geographical location usually.

2. Material and Methods

Aeromycoflora from different Patient Wards of PMCH Patna, was isolated during September 2020 to March 2021, spore trap with the help of Burkard volumetric air sampler and Petri plate exposure method an employing culture plate

exposure method at weekly intervals. Petri - plates containing sterilized Potato Dextrose Agar PDA medium were exposed for 10 to 20 minutes inside different corners of patient beds in the indoor patient ward's and also placed outdoor areas. After exposure the petri - plates were incubated at 27°cfor 3 - 4 days in incubator. After incubation fungal colonies were grown, the colonies were counted with the help of electronic colony counter. C. F. U= Total number of colonies

% of contribution=Total no. of colonies of 1species ×100

Total no of colonies of all species identification of species were made on the basis of micro and macro morphological reverse and surface colonies colorations grown on Medium and the colonies were counted identified on morphological characters with the help of literature.

3. Result

Research on aeromycoflora of patient ward in PMCH Patna Bihar was carried out since September 2020 to march 2021 during this season five sampling was done as a result total 11 genera, 20 sps. were observed. Out of total observed genera black fungus (*rhizopus*, *mucor*) dermatophytic fungus i.e. (*Culvularia lunata*, *Cladosporuim herbarum*, *Microsporium cannis*, *Histoplasma capsulatum*) showed their maximum dominancy, which was given below in tabular form.

Table 1

Sampling/→ Genera/sps. ↓	21.09.2020 Day1	20.10.2020 Day2	04.11.2020 Day3	10.02.2021 Day4	09.03.2021 Day5
<i>Rhizopus</i>	+	+	+	-	-
<i>Penicillium sps.</i>	+	+	+	-	-
<i>Aspergillus flavus</i>	+	+	+	+	+
<i>A. niger</i>	+	+	+	+	+

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<i>A. fumigatu</i>	+	+	-	+	+
<i>Curvularia lunata</i>	+	+	-	+	+
<i>Cladosporium herborum</i>	+	-	-	+	+
<i>Microsporium canis</i>	+	+	+	+	+
<i>Histoplasma capsulatum</i>	+	+	-	+	+
<i>Fusarium alternaria</i>	+	-	-	-	+
<i>Mucor</i>	+	+	+	+	+

Table 2

S. No.		No. of Colonies	Percentage
1.	Rhizopus	28	8.77 %
2.	Penicillium sps	27	8.4 6%
3.	Aspergillus flavus	32	10.03 %
4.	A. niger	34	10.65%
5.	A. fumigatu	33	10.34 %
6.	Curvularia lunata	30	9.40 %
7.	Cladosporium herbarum	21	6.58 %
8.	Microsporium canis	33	10.34
9.	Histoplasma capsulatum	25	7.83 %
10.	Fusarium alternaria	20	6.26 %
11.	Mucor	36	11.28
	Total no of colonies	319	



Rehab OPD Outdoor Area Indoor Delivery Room



Indoor Patient near Beds Indoor Patient Ward Delivery Rom ICU



A. Outdoor Sample



C. Outdoor Sample



B. Outdoor Sample



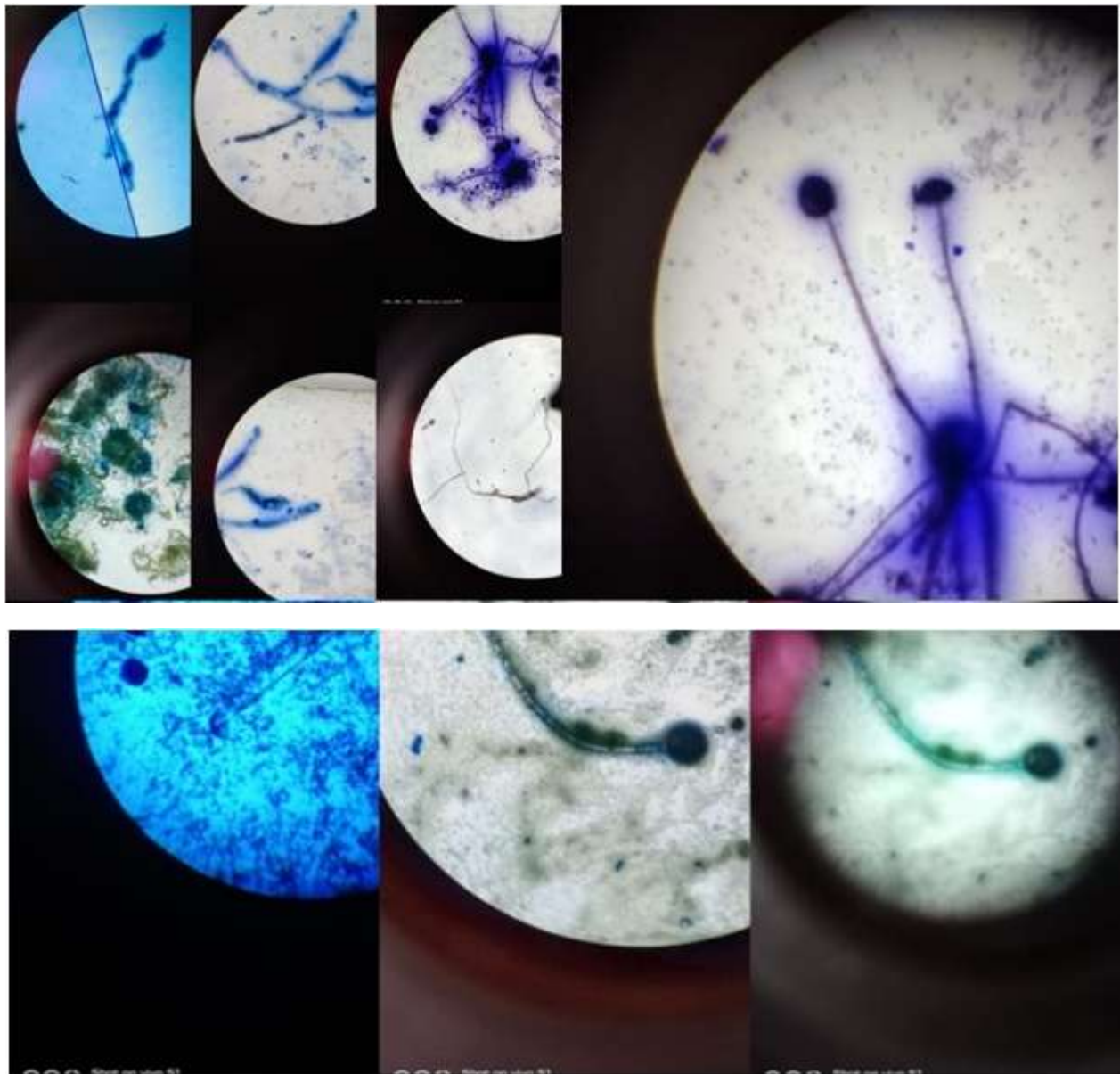
D. Indoor Sample

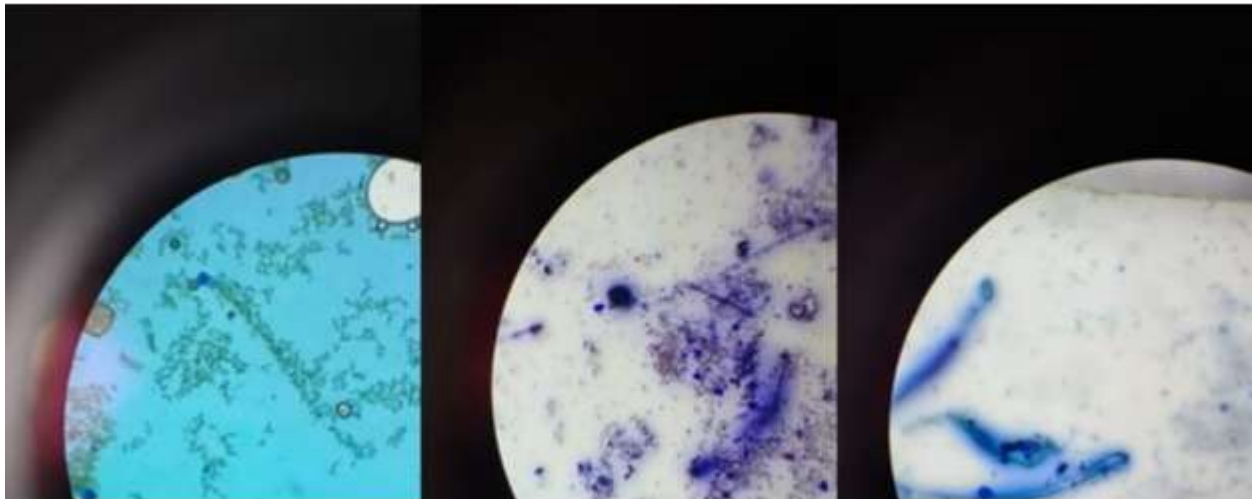


E. Indoor Sample

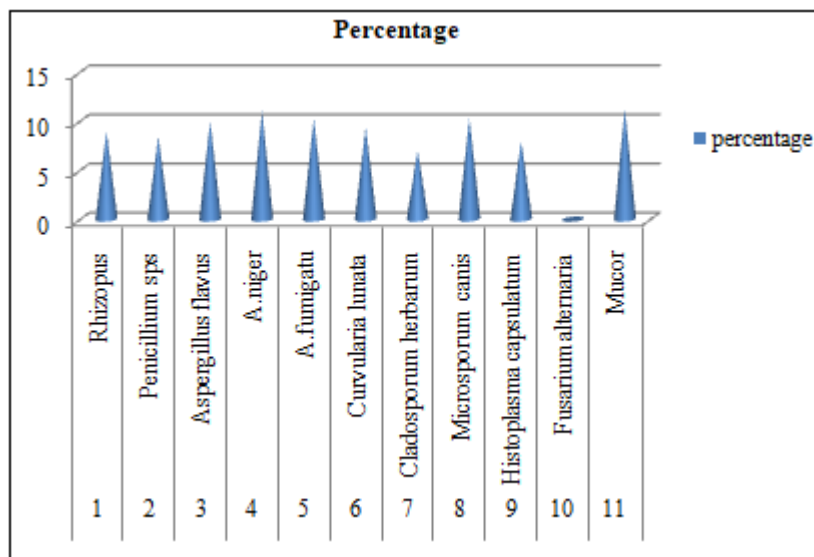


F. Indoor Sample Fungal Colonies

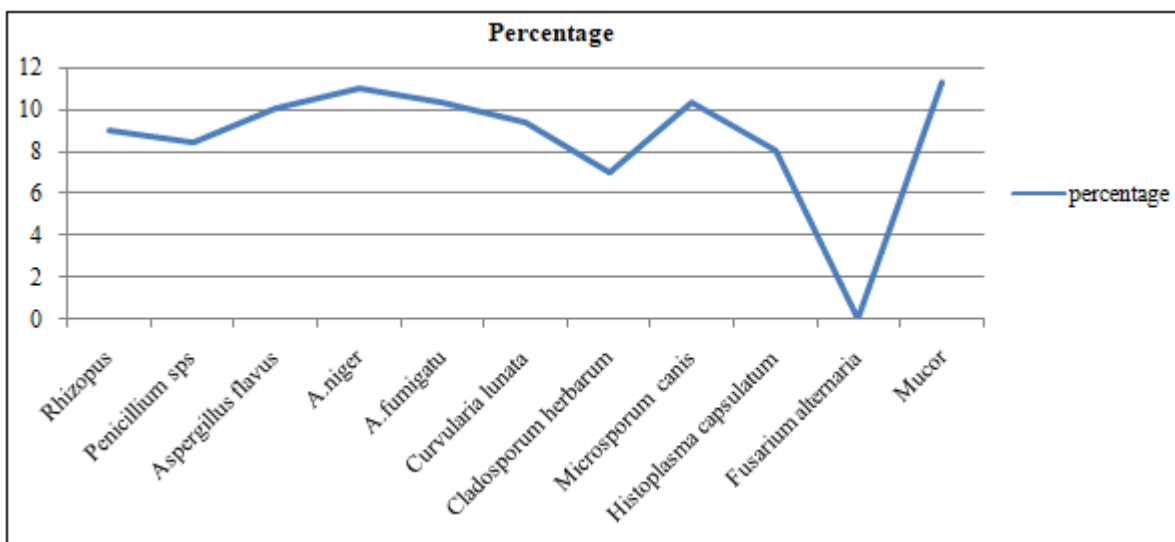




Under Microscope Different Species of Aeromycoflora of Indoor and Outdoor Patient Wards



Graph



4. Result Analysis

The culture plate Exposure methods was carried out for the isolation of fungal species from the genera found some of these fungi are Rhizopus and Mucor Alternaria caused asthma and the skin lesion and ulcers are caused by

Aspergillus in human. Aspergillus, mucor and penicillium were resulted as dominant species of the indoor and outdoor patient wards where as fusarium was least dominant species followed by cladosporium and Rhizopus.

Percentage contribution of individual species were calculated as per the formula.

% of contribution = $\frac{\text{Total no. of colonies of one species}}{\text{Total number of colonies of all species}} \times 100$

Least genera Fusarium Alternaria 6.26%,

Cladosporium herbarum 7% Histoplasma capsulatum 8%

Penicillium species 8.4 Rhizopus 9% curvularia 9.4%

Aspergillus flavus 10% A. fumigatus 10.34% Microsporium 10.34% A. niger 11% Mucor 11.28%

Fusarium < Cladosporium < Histoplasma < penicillium < Rhizopus < Curvularia A. flavus < A. Fumigatus Microsporium < A. Niger < Mucor

5. Discussion

Extensive literature survey of aeromycoflora is carried out by various authors in different sectors. Augustowska M, Dutkiewicz J (2006): Variability of airborne microflora in a hospital ward within a period of one year. Annals of Agricultural and Environmental Medicine, Dipak Paul et al.: Studies on Environmental Monitoring of Aeromicroflora in a Hospital at Kalyani, West Bengal, India

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7. Conclusion

The present study aeromycoflora survey shows that a number of harmful fungus present both in the indoor and outdoor patient wards of Pmch. Study shows that total no. of 11 genera were identified, which is harmful for us and causes many allergies. The indoor and outdoor areas must be kept clean always, properly ventilated, beds and tables cleaned properly, air conditioners and ICU rooms machines should be cleaned properly, always use neat and clean bedsheets and maintain personal hygiene not only patient also for the safety of others like doctors nurses and visitors indoor and outdoor patients wards cleaned regularly and garbage and other dirty (used products) disposed properly on time.

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