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# Aeromycoflora inside Different Scientific Laboratories at College Campus

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***Abstract***
Aeromycoflora inside different scientific laboratories (Botany, Zoology and Chemistry laboratories) of Sunderwati Mahila Mahavidyalaya (a renowned women's college situated in Bhagalpur, Bihar) was investigated for a period of one year from December 2015 to November 2016. The trapping of spores was done by exposing the Petriplates with Potato- Dextrose-Agar (PDA) media one metre above the ground level. Altogether 25 fungal genera were isolated belonging to different class i.e. Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes. Deuteromycetes were recorded in dominant form inside the laboratories. *Aspergillus* being the most common genus occupies the 1st position and recorded throughout the investigation period. *Aspergillus* is a well known hazardous fungal genera and responsible for different kinds of allergic diseases. In the present work, we have investigated the fungal genera like *Alternaria, Curvularia, Cladosporium, Drechslera, Epicoccum* and *Penicillium* and are recorded in dominant form. These fungal genera are reported earlier as allergenic to human beings. Peak incidence of fungal genera was in winter season which was followed by monsoon and summer season.

## INTRODUCTION

In the midst of past few decades extensive work on the aeromycoflora of the outdoor environment has been done in the various parts of the country but little attention has been paid to aeromycoflora of the indoor environment.

Indoor environment though small in area are important as they provide microbes with an environment different from the outdoor environment (Gregory, 1973).In scientific laboratories different fungal species are isolated in different culture media to know the concentration and dissemination of fungal spores which may become allergic to human beings. Cunnighum for the first time described about the aerobiology and tried to correlate his result with the prevalence of fungal diseases at Calcutta. Since, then the fungal aerospora of some urban and rural areas of the country have been studied (Cunningham, 1873; Mishra, and Kamal, 1971; Agrawal, and Shivpuri, 1974; Sharma *et al.,* 2013; Singh *et al.,* 2019). However, studies on indoor aeromycoflora have been lacking. Hence, present investigation is an attempt to know the concentration, type and composition of

different aeromycoflora of different scientific laboratories (Botany, Chemistry and Zoology) located at Bhagalpur.

## MATERIALS AND METHODS

Fungal colonies were isolated by exposing petriplates containing Potato-Dextrose-Agar (PDA) media for 1 year (December 2015 toNovember 2016) of S.M College, Bhagalpur. The petriplates (9 cm diameter) were exposed horizontally once in a month for 15 min between 10 a.m. to 11a.m. in order to collect fungal mycoflora. The petriplates were incubated for 5 five days at room temp. (24.37°C ± 6.614°C). The number of colonies per petriplate of same group as well as of different group were counted qualitatively and quantitatively while identification of fungal genera were done on colony characteristics, growth, morphology of fungal spores under compound microscope and was subsequently confirmed by consulting relevant literatures(Nandi and Chanda, 1989;Prince *et al.,*1964).

## RESULTS AND DISCUSSION

Fungal colonies were isolated inside Botany, Zoology and Chemistry laboratories with 788, 431 and 284 colonies respectively during the 1 year investigation period (Tab-1). A total of 25 types of fungal genera were encountered belonging to different group i.e. Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.

In Botany Laboratory the % contribution of Phycomycetes was 4.16%, Ascomycetes was 8.33%, Basidiomycetes (sterile form) was 4.16% and Deuteromycetes was 83.33% respectively. In Zoology Laboratory the percent contribution of Phycomycetes was 5.55 %,Ascomycetes was 11.11 %, Basidiomycetes (sterile form) was absent and Deuteromycetes was 83.33% respectively. In Chemistry Laboratory the percent contribution of Phycomycetes was7.69 %, Basidiomycetes (Sterile form) was 7.69% and Deuteromycetes was 84.61% respectively. Ascomycetes was absent in Chemistry Laboratory. The total number of fungal colonies was the highest in Botany Laboratory (788) followed by Zoology Laboratory (431) and lowest in the Chemistry laboratory (284) as shown in Fig.1.

*Aspergillus* was isolated throughout the survey period and it was recorded 14.59%, 22.54% and 22.54% respectively inside laboratories. High count of *Aspergillus* is observed by other workers also. During the investigation period *Alternaria, Curvularia, Penicillium* and *Cladosporium* were also present in dominant form after *Aspergillus*. These fungal forms are also reported as allergenic to human beings according to (Prince *et al.,* 1964). Peak incidence of fungal genera was observed in the month of February while minimum occurrence was in June.

**Table 1: Percentage contribution of airborne fungal genera encountered inside the laboratories during investigation period (December 2015 toNovember 2016)**

| Fungal genera | Botany laboratories | | Zoology laboratories | | Chemistry laboratories | |
|---|---|---|---|---|---|---|
| | Total no. of colonies | % composition | Total no. of colonies | % composition | Total no. of colonies | % composition |
| **Phycomycetes** | | | | | | |
| 1.*Choanephora* | 28 | 3.55 | 25 | 5.80 | 27 | 9.45 |
| **Ascomycetes** | | | | | | |
| 1.*Chaetomium* | 13 | 1.65 | 9 | 2.08 | _ | _ |
| 2.*Pringshimia* | 9 | 1.14 | 7 | 1.61 | _ | _ |
| **Basidiomycetes** | | | | | | |
| 1.Sterile form | 48 | 6.09 | _ | _ | 20 | 7.00 |
| **Deuteromycetes** | | | | | | |
| 1.*Aspergillus* | 115 | 14.59 | 98 | 22.54 | 55 | 19.25 |
| 2.*Alternaria* | 83 | 10.53 | 41 | 9.43 | 19 | 6.65 |
| 3.*Bispora* | 12 | 1.52 | 5 | 1.15 | _ | _ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4.*Curvularia* | 72 | 9.14 | 65 | 14.95 | 60 | 21.00 |
| 5.*Candida* | 17 | 2.16 | _ | _ | _ | _ |
| 6.*Cladosporium* | 30 | 3.81 | 25 | 5.75 | _ | _ |
| 7.*Colletotrichum* | 12 | 1.52 | _ | _ | _ | _ |
| 8.*Drechslera* | 11 | 1.39 | 7 | 1.61 | 2 | 0.70 |
| 9.*Doratomyces* | 13 | 1.65 | 9 | 2.08 | _ | - |
| 10.*Epicoccum* | 87 | 11.04 | 48 | 11.04 | 43 | 15.05 |
| 11.*Fusarium* | 11 | 1.39 | 7 | 1.61 | _ | _ |
| 12.*Gliocladium* | _ | _ | 7 | 1.61 | _ | _ |
| 13.*Geotrichum* | 7 | 0.88 | 2 | 0.46 | 1 | 0.35 |
| 14.*Helminthosporium* | 14 | 1.77 | 17 | 3.99 | 3 | 1.05 |
| 15.*Memnoniella* | 21 | 2.66 | _ | _ | 13 | 4.90 |
| 16.*Nigrospora* | 13 | 1.65 | _ | _ | 11 | 3.85 |
| 17.*Penicillium* | 92 | 11.67 | 41 | 9.43 | 28 | 9.80 |
| 18.*Periconia* | 18 | 2.28 | 9 | 2.08 | 2 | 0.70 |
| 19.*Pestalotia* | 19 | 2.41 | 9 | 2.08 | _ | _ |
| 20.*Torula* | 23 | 2.92 | _ | _ | _ | _ |
| 21.*Trichothecium* | 20 | 2.53 | _ | _ | _ | _ |
| Total | 788 | 99.94 | 431 | 99.30 | 284 | 99.75 |

# Figure

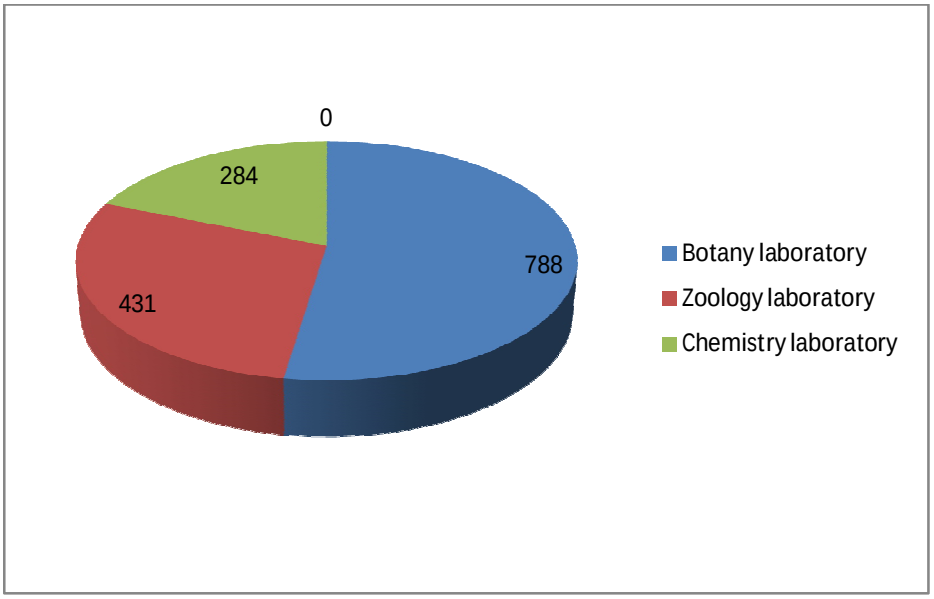


**Figure 1: Showing the total number of fungal colonies in different laboratories.**

## CONCLUSION

1. The totals of 25 types of fungal genera were encountered belonging to different group i.e. Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.
2. Throughout the survey period of our research work, the *Aspergillus* was isolated and it was recorded 14.59%, 22.54% and 22.54% respectively inside laboratories.

3. High count of *Aspergillus* was observed by other workers also. During the investigation period *Alternaria, Curvularia, Penicillium* and *Cladosporium* were also present in dominant form after *Aspergillus*.
4. These fungal forms are also reported as allergenic to human being. Peak incidence of the fungal genera was observed in the month of February, while minimum occurrence was in June.

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