**Scholars Academic Journal of Pharmacy (SAJP)** **ISSN 2320-4206 (Online)**
**Sch. Acad. J. Pharm., 2014; 3(1):6-8** **ISSN 2347-9531 (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublisher.com

## Research Article

# Aeromycoflora of Jackman Memorial Hospital, Bilaspur (C.G.)

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**Abstract:** Today the air surrounding us is getting polluted with different types of particles it may be biological (for example, pollen grains, fungal spores, viruses, actinomycetes and other bacteria, fern and moss spores, algal colonies, plant fragments, small seeds, protozoa, mites and insect fragments) or non-biological (for example, soot, diesel exhaust particles, ashes, sand and mineral fragments such as silicate minerals). Therefore this study was carried out to collect the data on the presence of fungal species in the hospital environment. This study was carried out from July 2011 to June 2012. During this 48 fungal species (367 fungal colonies) belonging to 34 fungal genera were isolated. In Zygomycotina, *Mucor racemosus* (50%), in Ascomycotina, *Eupenicillium purpurogenum* (25%), in Anamorphic Fungi, *Aspergillus niger*(100%), Mycelia sterilia (Black) (25%) showed highest percentage frequency. Few species isolated from the study area are reported pathogenic and therefore cleanliness should be maintained.
**Keywords**: Air, aeromycoflora, biological, non- biological, percentage frequency

## INTRODUCTION

The major part of the global ecosystem is the air surrounding us. There are different types of particles present in the atmosphere. They may be biological (for example, pollen grains, fungal spores, viruses, actinomycetes and other bacteria, fern and moss spores, algal colonies, plant fragments, small seeds, protozoa,mites and insect fragments) or non-biological (for example, soot, diesel exhaust particles, ashes, sand and mineral fragments such as silicate minerals). Air does not act as a natural environment for the growth and multiplication of aeromycoflora, but it acts as a very good medium for their dispersal from one place to another.

Aerobiology is an interdisciplinary subject with numerous aspects and characterized by continuous interaction between the biological components and their physical and chemical environment. According to Natural Resources Institute (NRI, 1990) Aerobiology is the study of the movement and dispersal of living or nonliving material through the atmosphere but now included the movement of fungal spores and pollen through atmosphere in relation to plant and human health.Aerobiological studies have received much attention recently because of application in the field of allergy, dispersal of pathogens and in allied aspect of microbiology. Since fungal species constitute the major component of airborne flora, the study of aeromycology is highly significant. Thus, to collect the essential data on the presence of fungi in air of hospital environment this study was done from July 2011 to June 2012.

## MATERIALS AND METHODS

### Isolation of Aeromycoflora

Jackman Memorial Hospital, Bilaspur (Chhattisgarh, India) established in 1885 also known as Mission Hospital. This is the first hospital in Bilaspur and surrounding region. It basically started with providing maternal and childcare. Female surgical ward were selected for this study. For isolation of aeromycoflora, PDA media was used. Aeromycoflora of the given area was observed by gravity settle plate method containing PDA medium [1,2]. Ten sterilized Petri plates containing PDA media were exposed 5 to 10 min. in the study area. These exposed Petri plates were brought in to the laboratory and incubated at $28\pm1^0$C for 6-7 days. At the end of incubation period fungal colonies were counted, isolated and identified with the help of available literature and finally identified by the authentic authorityNational Center of Fungal Taxonomy, Delhi.

## RESULTS AND DISCUSSION

During the study of aeromycoflora of Jackman memorial hospital, total 48 fungal species (367fungal colonies) belonging to 34 fungal genera were isolated. Out of these 48 fungal species, 2 fungal species (10 fungal colonies) belongs to 2 fungal genera of Zygomycotina, 3 fungal species (7 fungal colonies) belongs to 3 fungal genera of Ascomycotina, 45 fungal species (346 fungal colonies) belongs to 28 fungal genera of Anamorphic fungi, 1 species of (4 fungal colonies) belongs to 1 fungal genera of Mycelia sterilia were isolated. The fungal species isolated from Jackman Memorial Hospital were:

| Sl.No. | Name of Fungi | Total No. of Fungal Colonies | Percentage Frequency (%) |
|---|---|---|---|
| | **Zygomycotina** | | |
| 1. | *Choanephora cucurbitarum* | 1 | 8.33 |
| 2. | *Mucor racemosus* | 9 | 50 |
| | **Ascomycotina** | | |
| 3. | *Eupenicillium purpurogenum* | 3 | 25 |
| 4. | *Pleospora harbarum* | 2 | 16.66 |
| 5. | *Thielavia terricola* | 2 | 16.66 |
| | **Anamorphic Fungi** | | |
| 6. | *Alternaria alternata* | 20 | 75 |
| 7. | *Aspergillus flavus* | 21 | 50 |
| 8. | *Aspergillus fumigatus* | 14 | 58.33 |
| 9. | *Aspergillus japonicus* | 10 | 66.66 |
| 10. | *Aspergillu sluchensis* | 9 | 41.66 |
| 11. | *Aspergillus niger* | 43 | 100 |
| 12. | *Aspergillus nidulans* | 9 | 41.66 |
| 13. | *Aspergillus ochraceus* | 7 | 25 |
| 14. | *Aspergillus sclerotiorum* | 4 | 16.66 |
| 15. | *Byssoclamus niveus* | 2 | 16.66 |
| 16. | *Cladosporium cladosporioides* | 83 | 91.66 |
| 17. | *Cladosporium oxysporum* | 15 | 33.33 |
| 18. | *Cunninghamellae chinulata* | 2 | 16.66 |
| 19. | *Curvularia pallescence* | 9 | 58.33 |
| 20. | *Curvularia lunata* | 22 | 83.33 |
| 21. | *Drechslerarostrata* | 2 | 16.66 |
| 22. | *Epicoccum nigrum* | 1 | 8.33 |
| 23. | *Epicoccum purpurascence* | 1 | 8.33 |
| 24. | *Fusarium equiseti* | 5 | 25 |
| 25. | *Fusarium oxysporum* | 2 | 16.66 |
| 26. | *Mamnoniella echinata* | 2 | 16.66 |
| 27. | *Monodictys levis* | 2 | 16.66 |
| 28. | *Myrothecium rodium* | 3 | 16.66 |
| 29. | *Nigrospora oryzae* | 7 | 41.66 |
| 30. | *Paecilomyce svarioti* | 4 | 16.66 |
| 31. | *Penicilliumchrys ogenum* | 5 | 25 |
| 32. | *Penicillium citrinum* | 3 | 16.66 |
| 33. | *Penicillium* sp. | 1 | 8.33 |
| 34. | *Periconia digitata* | 1 | 8.33 |
| 35. | *Periconia sacchari* | 1 | 8.33 |
| 36. | *Pestalotiopsis versicolor* | 1 | 8.33 |
| 37. | *Phoma exigua* | 7 | 41.66 |
| 38. | *Pithomyces chartarum* | 2 | 8.33 |
| 39. | *Pseudeurotium zonatum* | 3 | 16.66 |
| 40. | *Stachybotrys chartarum* | 2 | 16.66 |
| 41. | *Tetracoccosporium paxianum* | 1 | 8.33 |
| 42. | *Torula* sp. | 2 | 16.66 |
| 43. | *Trichobotrys effusa* | 4 | 16.66 |
| 44. | *Trichoderm aviride* | 2 | 16.66 |
| 45. | *Trichothecium roseum* | 5 | 33.33 |
| 46. | *Trichurus spiralis* | 4 | 25 |
| 47. | *Vericillium alboatrum* | 3 | 16.66 |
| | **Mycelia sterilia** | | |
| 48. | Mycelia sterilia (Black) | 4 | 25 |
| | **Total** | 367 | |

Zygomycotina –*Choanephora cucurbitarum, Mucor racemosus,*

Ascomycotina–*Eupenicillium purpurogenum, Pleospora harbarum, Thielavia terricola,*

Anamorphic Fungi –*Alternaria alternata, Aspergillus flavus, Aspergillus fumigatus, Aspergillus japonicus, Aspergillus luchensis, Aspergillus niger, Aspergillus nidulans, Aspergillus ochraceus, Aspergillus sclerotiorum, Byssoclamus niveus, Cladosporium cladosporioides, Cladosporium oxysporum, Cunninghamella echinulata, Curvularia pallescence, Curvularia lunata, Drechslera rostrata, Epicoccum nigrum, Epicoccum purpurascence, Fusarium equiseti, Fusarium oxysporum, Mamnoniella echinata, Monodictys levis, Myrothecium rodium, Nigrosporao ryzae, Paecilom ycesvarioti, Penicillium chrysogenum, Penicillium citrinum, Penicillium* sp., *Periconia digitata, Periconia sacchari, Pestalotiopsis versicolor, Phoma exigua, Pithomyces chartarum, Pseudeurotium zonatum, Stachybotrys chartarum, Tetracoccosporium paxianum, Torula* sp., *Trichobo tryseffuse, Trichoderma viride, Trichothecium roseum, Trichurus spiralis, Vericillium alboatrum,*

Mycelia Sterilia–Mycelia sterilia (Black). There are many studies which show similar results.

Youssef and Refai[3] isolated *Alternaria, Cladosporium, Fusarium, Penicillium, Mucor*species from Ain Shams Hospitals, Egypt and Cancer Institute Hospital.

With respect to hospitals Lohoue*et al*. [4] isolated *Aspergillus, Cladosporium, Penicillium, Fusarium species* from the air of central hospital.

**Percentage Frequency**

In Zygomycotina, *Mucorracemosus* (50%) showed highest whereas *Choanephoracucurbitarum* (8.33%) showed minimum percentage frequency.

In Ascomycotina, *Eupenicillium purpurogenum* (25%) showed highest whereas *Pleosporaharbarum, Thielaviaterricola* (16.66%) showed minimum percentage frequency.

InAnamorphic fungi, *Aspergillusniger* (100%) followed by *Cladosporium cladosporioides*(91.66%), *Curvularialunata*(83.33%), *Alternariaalternata* (75%), *Aspergillus japonicus*(66.66%), *Aspergillus fumigatus, Curvulariapallescence* (58.33%), *Aspergillus flavus, Aspergillus luchensis, Aspergillus nidulans, Nigrosporaoryzae, Phomaexigua* (41.66%), *Cladosporium oxysporum, Trichothecium roseum*(33.33%) showed highest whereas *Aspergillus ochraceus, Fusarium equiseti, Penicillium chrysogenum, Trichurus spiralis* (25%), *Aspergillus sclerotiorum, Aspergillus stillatus, Aspergillus sydowii, Byssoclam usniveus, Cunninghamellaechinulata, Drechslerarostrata, Fusarium oxysporum, Mamnoniellaechinata, Monodictys levis, Myrotheciumrodium, Paecilomycesvarioti, Penicilliumcitrinum, Pseudeurotium zonatum, Stachybotrys chartarum, Torula*sp., *Trichobotrys effuse, Trichoderma viride,Vericillium alboatrum* (16.66%) showed moderate whereas *Epicoccum nigrum, Epicoccum purpurascence, Penicillium* sp.,*Periconia digitata,Periconia sacchari, Pestalotiopsisversicolor, Pithomyces chartarum, Tetracoccosporium paxianum* (8.33%) showed minimum percentage frequency.

InMycelia sterilia, Mycelia sterilia (Black) showed (25%) percentage frequency.

Verma and Pandey[5] reported *Aspergillus sp*., *Cladosporium sp*., *Curvularia sp*., *Alternaria sp*. the most frequent fungal species in the allergy ward of medical college, Jaipur. Agashe and Anuradha [6] reported that the *Cladosporium* are the most frequent fungi in a hospital ward in Bangalore. Kalkar and Tatte [7] have also reported that the *Alternaria, Aspergillus, Cladosporium* and *Curvularia* are most frequent in hospital ward. It is reported that *Aspergillusfumigatus, A.niger, A.parasiticus, A,ustus, A.versicolor, Paeciliomyces lilacinus, Penicillium rubrum, Cladosporium cladosporoides and Geotrichum candidum*are species pathogenic or opportunistic pathogenic to humans[8]. From this study it can be concluded that the some of the species isolated were pathogenic and therefore cleanliness of the hospital should taken in priority.

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