

## AEROMYCOFLORA OF TWO RESIDENTIAL PLACES AT NAGPUR (MS) INDIA

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### ABSTRACT

Aeromycological study of two residential places viz. well aerated bungalow and poor constructed house was carried out for two consecutive years i.e. September 2006 to August 2008 by using rotorod air sampler. A total of 29985 spore/m<sup>3</sup> catch from site I and 33510 spore/m<sup>3</sup> from site II were observed. Aerospora study showed dominance of fungal spores. *Cladosporium*, *Aspergilli*, *Curvularia*, *Alternaria*, *Nigrospora* and *Helminthosporium* were predominant fungal forms from both sites. The occurrence of fungal spores was correlated with the meteorological parameters. These studies will be helpful for allergologists, allergy patients, plant pathologists and other related fields.

**KEYWORDS:** Aeromycoflora, Aspergilli, meteorological parameters.

### INTRODUCTION

Aerobiology is the science concerned with airborne microbes, pollen grains, fungal spores and other substances of biological origin as well as their occurrence, characteristics, relation to human welfare and control (Frank Land 1991). Thus aerobiology is a multidisciplinary branch of science which deals with dispersion, deposition and dissemination of micro-organ and bioparticles through the atmosphere and their impact on plants animals and human beings. Indoor air and outdoor air is usually exchanged continuously and rapidly by ventilation.

Singh et al (2002) has categorized the indoor environment into two type's viz. industrial work place and non industrial work places. But the residential places are not totally free from

industrial pollution. But due to a urbanization pollution takes places because of which airborne transmission of human diseases is especially common in indoor environment of residential places. Hence the study of intramural aerobiology is important in human diseases to check the concentration of bioparticles suspended in the air. Keeping in mind such wide scope of the subject the present work was undertaken to study the indoor air borne allergens in air.

## MATERIAL AND METHODS

The aerobiological survey was carried out at two different sites viz. Well aerated bungalow and Poor constructed house at Nagpur for a period of September 2006 to August 2008.

### Sampling

Air sampling was done by Rotorod air sampler (Perkins 1957) modified by Hurrington (1959). Sampler was kept at a height of one meter above ground level and run for half hour and data was collected at fortnightly intervals. Adhesive transparent cello tape was cut into strips of an approximate size which were applied on the sampling surface of the rods. The strips on the arms were coated with melted petroleum jelly. Strips were carefully removed after exposure and placed on the glass slides and mounted in glycerin jelly for microscopic observations and identification. Identification of fungal spore was done on the basis of reference slides, culture plate technique and standard literature (Barnett and Hunter 1972, Tilak 1989).

## RESULT AND DISCUSSION

During the aeromycological survey from both sites viz. well aerated bungalow and poor constructed house pertained total 29985 spore/m<sup>3</sup> and 33510 spore/m<sup>3</sup> respectively.

Total 68 spore types were recorded during study period, representing 4 major groups i.e. Zygomycotina (1.26%, 1.04%), Ascomycotina (7.90%, 8.30%), Basidiomycotina (3.81%, 3.96%), Deuteromycotina (59.89%, 62.72%) and other types (27.11%, 23.96%) from both site respectively.

### From Site I

Total 60 spore types and 7 other types and from site II 61 spores types and 7 other types were recorded. The group Deuteromycotina formed the bulk of aerospora from both sites respectively to the total aerospora and the major contribution genera in the order of

dominance were *Cladosporium*, *Aspergilli*, *Curvularia*, *Alternaria*, *Nigrospora* and *Helminthosporium*. (Table 1).

Burge (2001) stated that fungi are common indoor and outdoor environment and nearly 10% of people worldwide have fungal allergy. The substances which are responsible for allergy are called allergens. The allergens either come in contact or enter into the body through nose and mouth. Numerous studies have shown that exposure for fungi, may be associated with acute toxic effects, allergies and asthma (Bush & Portnoy, 2001, Su H.J., *et al* 2001). To observe the occurrence of allergy the survey was conducted carried out by questionnaire method and Clinical method.

### **Questionnaire method**

The questionnaire included the personal history, hygiene and preventive measures and case history of any allergy in the family members. According to Jain and Rjendra Prasad, (2000) family and personal history is very important in patients with allergic disorders. The following information was collected from the people—Age of person at which symptoms begin. Type of symptom and is perennial or seasonal. Period of disease, its severity and variations. Previous and present medications with their Family history of Naso-bronchial asthma, Asthma with Rhinitis, Eczema (dermatitis), itching of eyes etc.

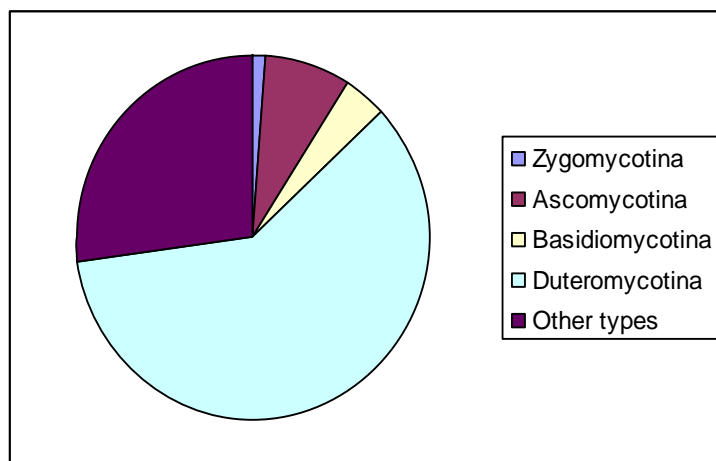
### **Clinical method**

After taking survey in some people were found out allergic symptoms. Clinical method is confirmatory diagnostic method for the occurrence and identification of allergy. In clinical method skin prick test is very useful and inexpensive and was used for the present study.

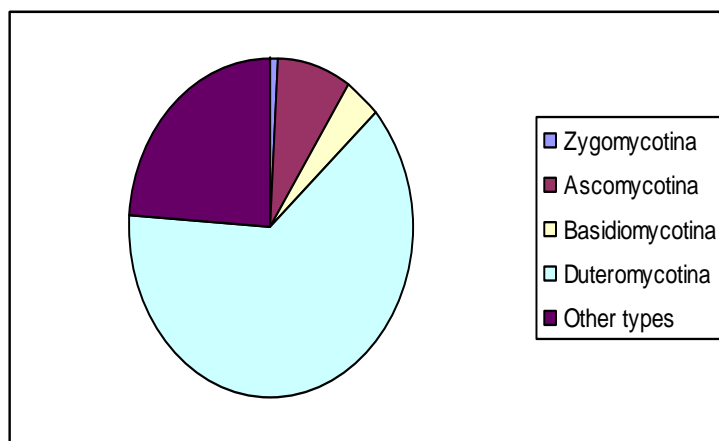
Prevalence of allergy patients were more during winter season followed by summer season and rainy season.

**Table 1: Occurrence and percentage contribution of Dominant fungal types to the total aerospora during September 2006 to August 2008 from both sites.**

Well aerated bungalow			
Sr.No.	Spore types	Spore /m <sup>3</sup>	% of
1	<i>Cladosporium</i>	4150	13.85
2	Aspergilli	3925	13.09
3	<i>Curvularia</i>	2110	7.03
4	<i>Alternaria</i>	1915	6.38
5	<i>Helminthosporium</i>	995	3.32
6	<i>Nigrospora</i>	655	2.18
Poor constructed house			
1	<i>Cladosporium</i>	4500	13.47
2	Aspergilli	4485	13.41
3	<i>Curvularia</i>	3115	9.32
4	<i>Alternaria</i>	2135	6.39
5	<i>Helminthosporium</i>	1100	3.29
6	<i>Nigrospora</i>	1100	3.29



**Fig. 1: Percentage Contribution of Aerospora composition from Site I.**



**Fig. 2: Percentage contribution of Aerospora composition from Site II.**



**Curvularia**



**Alternaria**



**Cladosporium**



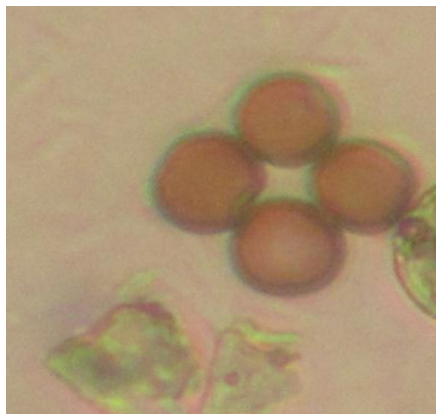
**Nigrospora**



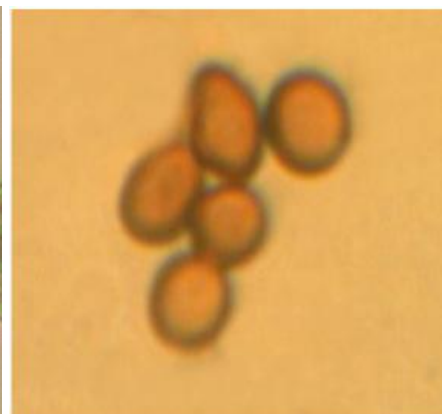
**Helminthosporium**



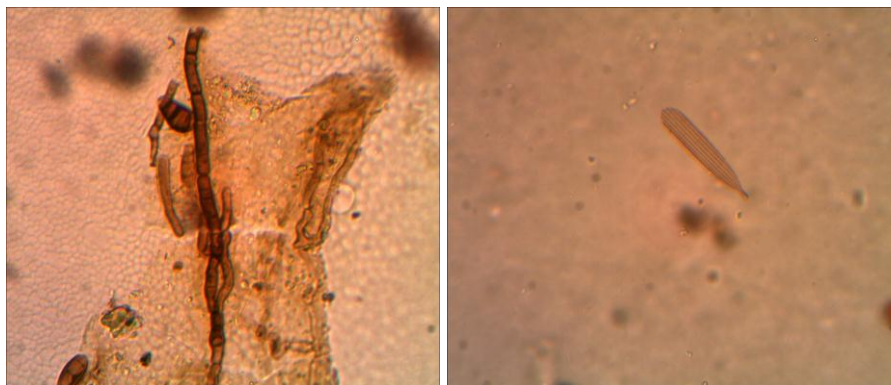
**Druchslera**



**Aspergilli**



**Aspergilli**

**Algal filament with Curvularia****Insect scale**

## CONCLUSION

Present qualitative and quantitative study was directed to determine the fungal spore count types of their seasonal variation into different residential places well aerated bungalows showed that the concentration of bioparticles was more in poor constructed house than well aerated bungalows. The aeromycoflora is correlated with weather parameters and also correlated with incidence of allergic disorders in the area.

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