



Study in relation to Biodiversity of Aeromycological species in chikhloli, Ambarnath, MS, India

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ABSTRACT

The present investigation is carried out in Chikhloli area of Ambarnath, which has varied geographical structure. Climate is comparatively less humid and temperature is variable. Extramural aerobiological research includes aero microbial survey at various places of chikhloli region. The Aeromycological survey was carried out from March 2016 to February 2017 by using Petri - plate exposure method. Total Twenty two micro fungi trapped from the air. This study is very important with respect to qualitative and quantitative information about the airborne fungi. The prevalence of dominant airspora was found to be correlation with the metrological parameter like Temperature and Humidity. The maximum mycoflora was registered during the monsoon period between July to October, which is gradually decreased during summer from March to June.

Keywords: Aeromycological, Metrological parameter, Petriplate exposure method, Micro fungi.

INTRODUCTION

Aerobiology is a scientific and multidisciplinary approach focused on the biodiversity of biological significant materials. It is deal with the science which provides information from various disciplines like ecology, mycology, plant pathology, palynology, bio-chemistry, immunology and clinical medicine. Fungi are the most important aero allergens. Fungal spores constitute a significant fraction of air borne particles. They occur in varying concentration in the atmosphere depending upon the climatic factors, locations.

The present study was carried out to identify prevalence of dominant airspora at the various location of Ambarnath and to study the correlation with the metrological parameter like Temperature and

Humidity. The different locations of chikhloli have been selected, this area has well developed residential sector and hills having good amount of vegetation.

MATERIAL AND METHODS

Petri plates exposure methods were used to know the status of culture airborne fungi at different locations of chikhloli. Petri plates containing potato dextrose agar as culture medium were exposed once in a month for 15 minutes. The petriplates after exposure were incubated at laboratory temperature for 6-7 days till sporulation. The fungal forms were identified and isolated to obtain pure cultures. Identification of fungal colonies up to generic level was done on the basis of relevant literature. (Gilman 1957; Barnett 1991; Ellis 1971 and Subramanian 1971). At the time of petriplate exposure, sterilized medium was poured under aseptic condition in each petriplate later on it covered with lid. Occurrence of culturable fungal colonies was correlated with meteorological factors such as rainfall, relative humidity and temperature.

RESULTS AND DISCUSSION

After the one year of the observation period, culturable molds present in the air from the different sites were collected. In all an average during the period of the present investigation, 22 genera were recorded including fungal fragments and unidentified group of spores (Table 1). Highest colony count (720) was recorded from residential area, while another sites shows count of 544, 321 and 217 number of colony.

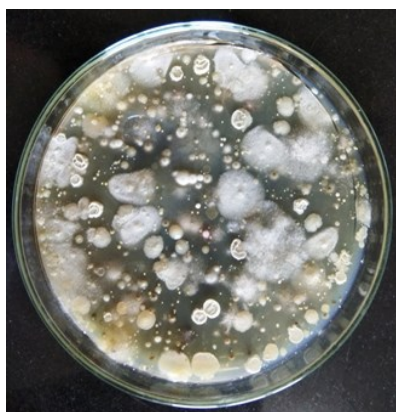


Fig. 1 Fungal spores near chikhloli region

During the period of investigation, spore belonging to group Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina together contributed 92.55% and other types 7.45% to the total air-spores respectively. Among all these types of spores, the group Deuteromycotina contributed highest percentage and lowest percentage contribution was found in group of Zygomycotina.

Out of 22 spore types few of them were belonging to Zygomycotina which includes *Mucor*, *Cunninghamella*, etc. It is found to be common during August and September due to high humid conditions and considerable rain fall.

The group Ascomycotina was represented by spores belonging to order Sphaeriales, Pleosporales, Hysteriales, Dothidiales etc. Occurrence of many spore types in airspora revealed the presence of many parasitic and saprophytic ascomycetes. Temperature plays significant role in release of ascospores. spores was pronounced prominently in the month of September and October. Less concentration of the spores in July was probably due to less rainfall and humidity.

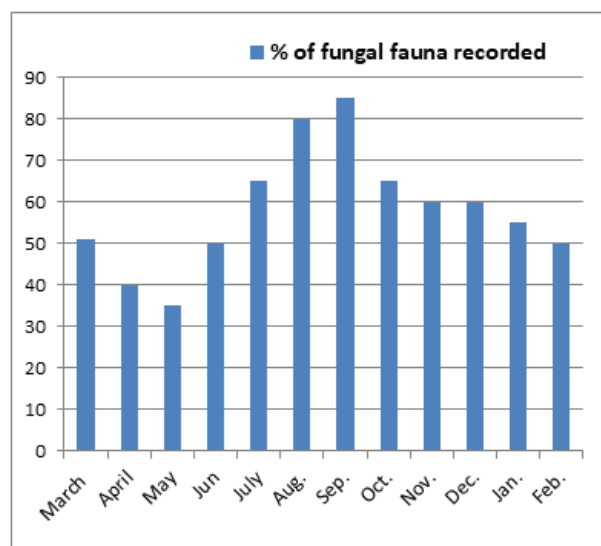
Group Basidiomycotina was represented by smut spores, Basidiospores, Uredospores, and Ganoderma. Among all the types, Basidiospores showed highest percentage contribution as compare to Smut and Uredospores.

The group Deuteromycotina was represented by maximum different types of spores. The member of Melanconiales and Moniliales showed considerable domination as compared to others. During the period of investigation, spores of *Aspergillus*, *Alternaria*, *Cladosporium*, *Curvularia*, *Helminthosporium*, *Penicillium*, *Periconia* and *Fusarium* found to be contributed in maximum percentage to the total air-spores.

Maximum spore was found in the month of August and September (Fig. 2). Highest percentage of *Aspergillus* and *Penicillium* in the present studies might be due to infected and decaying food grains which were treated as debris present at residential area. The present investigation also includes other types such as fungal fragments and unidentified spore groups

Table 1: List of Fungal taxa identified from the exposed petriplates at different sites

Sr.No.	Fungus Name
1	<i>Cunninghamella</i>
2	<i>Sclerospora</i>
3	<i>Alternaria</i>
4	<i>Curvularia</i>
5	<i>Nigrospora</i>
6	<i>Humicola</i>
7	<i>Helminthosporium</i>
8	<i>Mucor</i>
9	<i>Cladosporium</i>
10	<i>Papularia</i>
11	<i>Heterosporium</i>
12	<i>Penicillium</i>
13	<i>Periconia</i>
14	<i>Fusarium</i>
15	<i>Rhizopus</i>
16	<i>Chaetomium</i>
17	<i>Aspergillus</i>
18	<i>Gleotrichum</i>
19	<i>Drechslera</i>
20	<i>Pleospora.</i>
21	<i>Biospora</i>
22	<i>Sporormia</i>

**Fig. 2: Month wise variation of fungal spores in percentage**

contributed 7.45% to the total air-spora. Unclassified group was found to be changed time to time and change was associated with varied atmospheric

conditions. This indicates close relation between spore of this type and meteorological conditions. Maximum percentage of this group was noted in the month of August. The obtained result and conclusion would definitely help to understand the various components of air and their occurrence in the close environment.

CONCLUSION

"Aeromycology can be used as a tool for human welfare". Its relation to phytopathology has an ample scope for further investigation. Such studies would bring many useful results like disease forecasting. Biocomponents like fungal spores and pollen grains may initiate allergic responses. Allergic people have an altered capacity to react to potential allergens, causing several types of respiratory and allergic disorders like Asthma and hay fever, eye, skin disorders. Extensive studies on these issues have been carried out in UK and Canada. (Bartzokas 1975). Airborne infections and the resulting diseases threaten the lives and productivity of human beings, animals and plants. Aerobiology thus not simply means the study of microorganism in the atmosphere, but it also take into consideration the allergic properties of various bioparticles like pollen and spores. Last three decade the allergic patients are increasing tremendously in cities as well as villages. The result of the present study will be valuable in solving to cure various diseases and environmental issues.

Conflicts of interest: The authors stated that no conflicts of interest.

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