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SEASONAL IMPACT OF AERO-MYCOFLORA OF BHILAI TOWNSHIP

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ABSTRACT

Present study of aero-mycoflora, a monthly survey report was conducted for intramural environment of Bhilai township. Three different sites of Bhilai i.e; slum area, residential area and market were selected. The survey was conducted for one year (July 2015- June 2016) using culture plate exposure method. A total number of 41 fungal Species were isolated from study area. In which various species of *Aspergillus* 34%, *Fusarium* 21% *Rhizopus* 17% were recorded as the principal Fungi in all sampling sites . A variation in fungal population in different season was also recorded. It shows maximum in pre-winter season. The present study indicates a co-relationship between pathogenic fungal population and their environmental conditions. Fungi are the group occur nearby everywhere in nature and occupy an important place in human view of life .The microbial population mainly depends on their host type, environmental condition and relation among them. Therefore the present study was undertaken with a view to identify the prevalence of airborne mycoflora in the Bhilai township.

KEYWORDS: Bhilai Township, Aeromicroflora, Environmental Conditions.

Bhilai is well known industrial area of Chhattisgarh. The area mainly receive tropical climate with hot summer, moderate rainfall and short period of winters which are suitable for microbial population but recent years the urbanization extremely large size population and high fragility of the tropical life-support systems may responsible for alter and destruction of climate, water soil and vegetation. Influenced the depression, and population of microorganism. Pandey and Chauhan; 2014.

Many research work have been conducted in field of aerobiology in last few years Agashse and Vinay 1980, Vanhage *et.al;*1987, Tilak 1998, Ahmad;2006, Verma and Khare 2009 Gill *et al*; 2016 etc..) In Chhattisgarh state Tiwari, *et al*;; 2006, Verma, Chile, Sahu; 1998, Rao;1993 etc. give their contribution in the field of aeromycology. The microbial population plays significant role in human life in many ways. The microflora of any habitat varies with host type, environmental condition and relation among them. Thus the diversity of microflora differs from time to time and place to lace. Therefore the systematic survey of different sites in the township area, the fungal diversity was carried out.

MATERIALS AND METHODS

Study of aeromycoflora, three different sectors of Bhilai was selected from there different locations i.e.; slum area, residential area and vegetable market area. Sample was taken in triplicates form of each site from July 2015- June 2016. Sample were collected during different seasons like Rainy winter and summer season. Nutrient containing petri plates were exposed twice a month for duration of 3-5 minutes of twelve exposures were made annually and microbial colony obtained were tabulated. Each count is based on an average of nine plates exposure simultaneously. The percentage of colony is also calculated by standard method given by Morris and Ridout ;2005. The three different Nutrient media was used i.e; PDA, Rose Bengal Agar, Czapek Dox Agar media. The sub- culture was carried out to purity the fungal isolation again.

Fungal Colonies were identified on the basis of visual and microscopic examination with the help of available literature.

RESULTS AND DISCUSSION

Aerobiological study shows that maximum fungal species was recorded in vegetable market area, then slum area residential area respectively . *A.nigar, A. flavus, Rhizopus monilifer , P. notatum , Fusarium solanai , Mucor recemosus* prevalent type in all study area. According to their percentage *Aspergillus* shows 34% ,*Fusarium* 21% *Rhizopus* 17%, *Mucor* 16%, *Penicillium* 12%, *Trichothecium* sps, *Cladosporium* sps found in 11% similar findings were obtained by Tilak and Chakra;1977, Santra and Chandra;1989. In the winter i.e; September and October the highest colonial count was obtained as compared to month of December to Februaryin winter .least number of Fungal frequency were

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recorded in dry season.(April –May). Deutermycetes was found maximum followed by Phycomycetes and Ascomycetes . Phycomycetes was most common in residential area, where as Deuteromycetes and Ascomycetes was most prevalent types in vegetable market area.

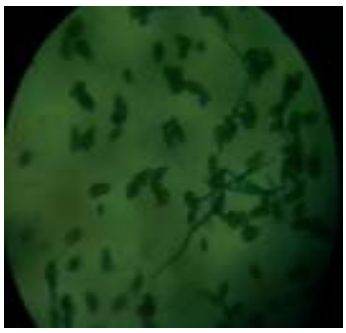
Aspergillus species are common in the intramural environments and they are considered responsible mainly for the contamination of food and vegetable and their biodeterioration. In many ways *Aspergillus flavus* is one of the common contaminants. According to mycologist of Chhattisgarh the most common species such as *A. fumigatus, A. flavus*, and *A. niger*, have beenreported regularly in human infections. Tilak and Chakre, (1977) reported the predominant toxic sps such as *Rhizopus* sp., *Penicillium* sp., *Aspergillus* sp., and other phytotoxic biopollutants e.g. *Alternaria* sp.*; Helminthosporium spp; Cladosporium* sp; which are associated with grains.

Airborne transmission is important to many of the fungi causing disease in man and animals, although seldom occurring from host to host. Most pathogenic fungi are opportunistic and able to grow saprophytically in stored crops. Rai *et al* .,(1988) reported the species of *Rhizopus, Aspergillus, Penicillium, Alternaria, Curvularia, Cladosporium and Helminthosporium* as predominant in the warehouse at Bhopal. In the present investigation same species were obtained in vegetable market area.

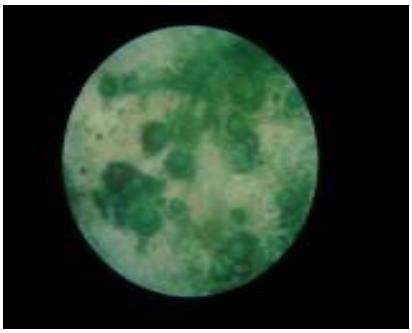
CONCLUSION

The work of aeromicroflora in Bhilai Township shows the numerous airospores found in atmosphere the result was strongly influenced by environmental condition i.e; temperature and humidity. The early winter season shows maximum fungal growth and least appearance found in summer season, shows that low temperature also ciated with high humid condition increase the percentage of fungal population. Thus, the investigations reveals that seasonal changes directly affected fungal diversity of the region. Therefore there is a need to understand the various aspects of aeromicrobial diversity.

Figure 1: Pure Isolates of different Fungal Species

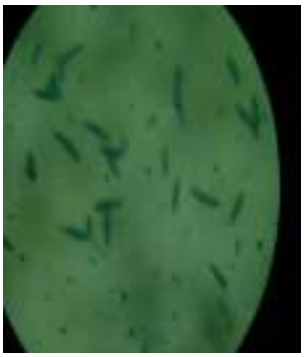


1.*Curvularia sp*



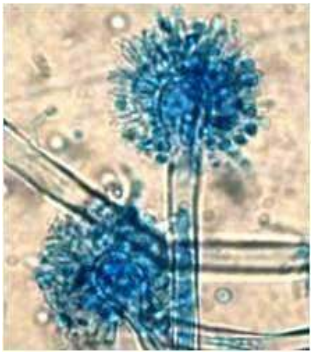
2. *Mucur sp*

3.*Alternaria sp.*

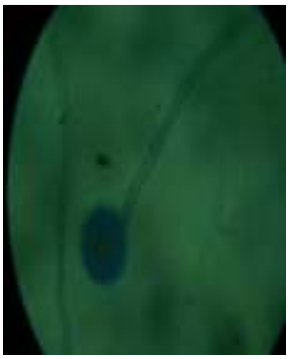


4.*Cercospora sp*

5.*Rhizopus sp*



6.and



7 *Aspergillus sp.*

Table 1: Aeromycoflora isolated from different study sites of Bhilai township (July 2015- June 2016)

Fungal Colonies obtained	Residential area			Vegetable market area			Slum area		
	Rainy season	Winter season	Summer season	Rainy season	Winter season	Summer season	Rainy season	Winter season	Summer season
PHYCOMYCEATES									
M. spinescens	+	+	-	+	+	-	+	+	-
M. racemosus	+	+	+	+	+	-	+	+	-
Rhizopus nigricans	+	+	-	+	+	+	+	+	-
R. stoloni	+	+	+	+	+	+	+	+	+
ASCOMYCEATES									
Chaetomium globosum	-	+	-	-	+	+	-	+	-
C. subteranium	-	+	-	-	+	+	-	+	-
DEUTEROMYCETES									
Alternaria alternate	+	+	+	+	+	+	+	+	+
A. brassicae	+	+	+	+	+	+	+	+	+
A. solani	+	+	+	+	+	+	+	+	+
A. flavus	+	+	+	+	+	+	+	+	+
A. fumigates	+	+	+	+	+	+	+	+	+

A. niger	+	+	+	+	+	+	+	+	+
A. nidulans	-	+	-	-	+	+	-	+	-
A. repens	-	+	-	-	+	+	-	+	-
A. sydowi	-	+	-	-	+	+	-	+	-
A. tamari	-	+	-	-	+	+	-	+	-
A. terreus	+	+	-	-	+	+	-	+	-
A. versicolor	-	+	-	-	+	+	-	+	-
Cephalosporium asperum	-	+	-	-	+	+	-	+	-
Cladosporium epiphyllum	-	+	-	+	+	-	-	+	-
C. herbarum	-	-	-	+	+	-	-	+	-
C. lignicola	-	-	-	+	+	-	-	+	-
Curvularia geniculata	+	+	+	+	+	-	+	+	+
C. lunata	-	+	-	-	+	+	-	+	-
C. tetramera	-	+	-	-	+	+	-	+	-
Cercospora spp.	-	+	-	-	+	+	-	+	-
Drechslera spp.	-	+	-	-	+	+	-	+	-
Epicoccum nigrum	-	+	-	-	+	+	-	+	-
Fusarium chlymadosporae	+	+	-	+	+	-	+	+	-
F. moniliforme	-	+	+	-	+	+	+	+	-
F. solani	+	+	+	-	+	+	-	+	-
Helminthosporium oryzae	-	-	-	-	+	+	-	+	-
Monilia sitophila	-	-	-	-	+	+	-	+	-
Oospora crustacean	-	-	-	-	+	+	-	+	-
Penicillium charlesii	+	+	+	+	+	+	-	+	+
P. chrysogenum	+	+	+	+	+	+	-	+	+
P. citrinum	+	+	+	+	+	+	-	+	+
P. glabrum	+	+	+	+	+	+	-	+	+
P. purpurrescens	+	+	+	+	+	+	-	+	+
Phoma spp.	-	-	-	-	+	+	-	+	-
Rhizoctonia solani	-	-	-	-	+	+	-	+	-
Scopulariopsis spp.	-	-	-	-	+	+	-	+	-
Stemphyllum spp.	-	-	-	-	+	+	-	+	-
Torula herbarum	-	-	-	-	+	+	-	+	-
Trichoderma glaucum	-	-	-	-	+	+	-	-	-

T. koningi	-	-	-	-	+	-	-	-	-
Trichothecium roseum	-	-	-	-	-	+	-	+	-
OTHERS									
Black sterile	+	-	-	-	+	-	+	+	-
Oranage sterile	+	+	-	-	+	-	+	+	-
White sterile	+	-	-	-	+	-	+	+	-
Yeasts	+	-	-	-	+	-	+	+	-

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