

## Concentration and species diversity of airborne fungi of Dongargarh

\*Dr. K. Sharma

Arts and Commerce Girl's College Raipur, Pt. Ravishankar Shukla University, Raipur C.G, C-52 Sec.-1 Shankar Nagar, Raipur (C.G.) India

### Abstract

Aeromycoflora of Dongargarh was studied with the help of Petriplate method. Total 177 fungal colonies represented 18 fungal types were observed during the present investigation period. Environmental factor play an important role for the distribution of the fungal spores. Out of 18 fungal types, Maximum numbers of fungi were isolated from anamorphic group, moderate from Ascomycotina and Mycelia sterilia and minimum from Zygomycotina. The fungal species were *Cladosporium oxysporium*, *Fusarium* Mycelia sterilia, *Aspergillus*, *Penicillium*, *Curvularia*, *Cladosporium*, *Rhizopus*, *Trichoderma* species were observed. *Aspergillus niger* (18.08%). While minimum percentage contribution (0.56%) were observed for *A.sp. I*, *A.oryzae* and for *Fusarium pallidoroseum*.

**Keywords:** Fungal species, Dongargarh, Frequency

### INTRODUCTION

Diverse community of planets and animal's life has thrived on this planet for millions of years, sustained by sun and supported by soil, water and air. The early Greeks considered air to be one of the four elementary substances along with earth, fire and water. Air was viewed as fundamental components of universe. By early 1800s, Scientists such as John Dalton recognized that atmosphere was composed of several distinct gaseous biotic and abiotic particles. The air carries many kinds of dust of meteor as well as terrestrial origin, microorganism, pollen salt particles, solids impurities resulting from human activities and spores of fungi. The fungal spores are liberated in air from various sources in massive concentration and can remain airborne for a long time. Fungal spores are important source of various plants and animals diseases. Hence, its concentration should be known. The study of atmospheric constituents, living and non- living e.g. Airborne fungal spores are essential step for existence of life and over come on life threatening problems. The study of organic particles such as bacteria, fungal spores, very small insects and pollen, which are passively transported by air, is known as aerobiology.

Dongargarh the famous tourist and pilgrimage center of Rajnandagon District is surrounded by lushgreen forest and hillocks. The famous temple of **Maa BAMBLESHWARI** is on a hilltop of (1600) feet. The present work deals with the aerobiological survey of Dongargarh with environmental factors.

### MATERIALS & METHODS

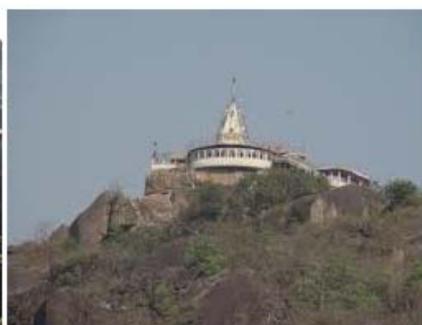
The survey shall be conducted for a period of one year from May 2010- April 2011 (Twice a month for a year).

#### Fungal sample

The fungi to be identified are collected from the different places of Dongargarh.

#### Culture Media

For isolation of aeromycoflora, PDA culture media will be used. Aeromycoflora of the given area will be observed by exposition petriplate containing PDA medium. This method also used by Tiwari P. (2008) for survey of aeromycoflora.



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\*Corresponding Author

Dr. K. Sharma

Arts and Commerce Girl's College Raipur, Pt. Ravishankar Shukla University, Raipur C.G, C-52 Sec.-1 Shankar Nagar, Raipur (C.G.) India

Email: [drktsharma@gmail.com](mailto:drktsharma@gmail.com)

At the end of incubation period fungal colonies are counted, isolated and identified with the help of available literature and finally identified by the authentic authority: National Center of Fungal Taxonomy, Delhi.

### Ecological Studies

For ecological studies, at the end of the incubation period of the indoor and outdoor aeromycoflora, percentage frequency and percentage contribution of fungal flora is calculated (Sharma K.

2001).

## RESULT AND DISCUSSION

### Seasonal Variation

Seasonal variation affects aeromycoflora of the area. Fungal spores are not equally distributed in the environment their distribution varies according to geographical location and meteorological conditions. The climate of Dongargarh city divided by three seasons; Rainy season (July–October), winter season (November– February) and summer season (March–June).

During investigation period, it is also observed that the maximum fungal species are recorded in winter season, moderate fungal species in rainy season and minimum fungal species are recorded in summer season.

### Ecological Studies

In the present study, percentage frequency and percentage contribution was also observed.

### Ground Level

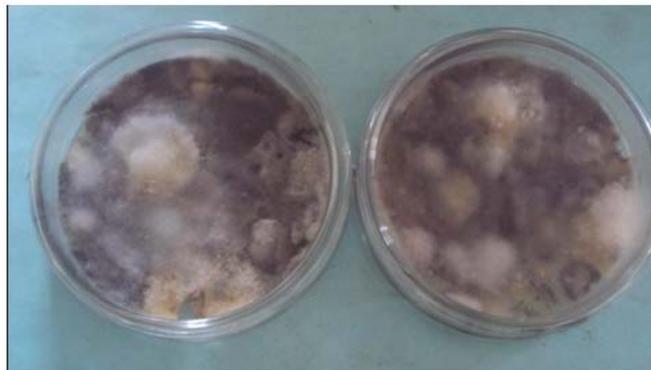
18 fungal floras were isolated from sampling site (Table 1). During the investigation period maximum percentage contribution showed by *Aspergillus niger* (18.08%), *Aspergillus flavus* (14.69%), *Aspergillus versicolor* (12.43%), *Cladosporium sp* (09.6%), and

*Aspergillus fumigates* (09.04). Moderate percentage contribution showed by *Rhizopus sp.* (07.91%), *Emericella nidulans* (03.95%). While minimum percentage contribution (0.56%) were observed for *A.sp. 1*, *A.oryzae* and for *Fusarium pallidoroseum*.

The results of present investigation reveal with various work done by researchers. Anamorphic fungal groups were recorded as dominant fungal group similar results were also recorded by Singh et al and Sharma (2009). The results obtained during present investigation are similar with work done by Pandey et al. (2001). The isolated fungal species were found to be adapted to low temperature. Arora and Jain (2003) reported *Cladosporium*, *Aspergillus* and *Penicillium* as most frequent fungi from Bikaner. Lugauskas et.al (2003) reported *Aspergillus fumigates*, *A. niger*, *Cladosporium herbarum*, *C. cladosporioides*, *C. sphaerospermum*, *Penicillium funiculosum*, *Geotrichum candidum* as most frequent fungal species at the Urban areas in Lithuania. Kulshrestha and Chauhan (2000), Kunjam (2007) and Sharma (2007) also observed that the *Alternaria*, *Cladosporium* and *Aspergillus* are the most dominant aeromycoflora in the air of different fields. Majumdar & Ranjan(2007) isolated *Aspergillus*, *Cladosporium*, *Alternaria* in Kolkata. Roymon et.al. (2007) observed *Aspergillus Cladosporium* in common public places.



*Fusarium sp.*



Fungal growth



*Aspergillus niger*

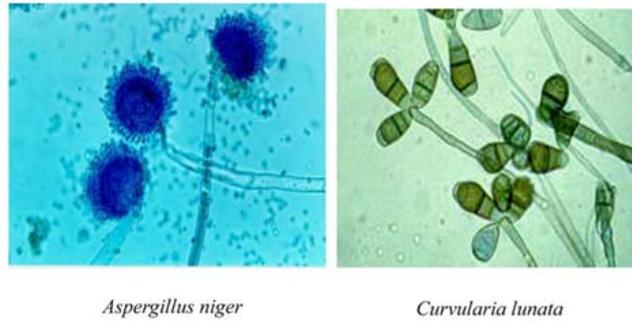
*Aspergillus niger**Curvularia lunata*

Table 1: Isolated mycoflora

S. No.	Name of Fungi	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total	Percentage Contribution	Percentage Frequency
1	<i>Aspergillus flavus</i>	1	0	9	0	3	0	1	7	2	0	3	0	26	14.69	58.33
2	<i>A. fumigatus</i>	0	5	4	3	0	0	0	0	1	1	2	0	16	9.04	50.00
3	<i>A. Niger</i>	2	1	10	0	6	3	3	0	1	3	3	0	32	18.08	75.00
4	<i>A. oryzae</i>	0	0	0	1	0	0	0	0	0	0	0	0	1	0.56	8.33
5	<i>A. versicolor</i>	0	0	1	0	0	14	0	2	4	1	0	0	22	12.43	41.66
6	<i>A. sp. (I)</i>	0	0	0	0	0	0	1	0	0	0	0	0	1	0.56	8.33
7	<i>Acremonium scatrotium</i>	2	0	0	1	0	0	0	0	0	0	0	0	3	1.69	16.66
8	<i>Cladosporium cladosporioides</i>	0	0	0	0	0	0	5	4	1	5	2	0	17	9.60	41.66
9	<i>C. sp. (I)</i>	0	0	0	0	0	0	0	2	3	0	0	0	5	2.82	16.66
10	<i>Curvularia lunata</i>	0	0	0	0	0	12	0	1	0	2	0	0	15	8.47	25.00
11	<i>Emericella nidulans</i>	0	0	3	0	0	0	0	0	0	1	2	1	7	3.95	33.33
12	<i>Fusarium pallidoroseum</i>	0	0	0	0	0	0	0	0	1	0	0	0	1	0.56	8.33
13	<i>Penicillium Chrysogenum</i>	0	1	0	0	0	0	1	2	1	0	0	0	5	2.82	33.33
14	<i>Rhizopus sp.</i>	0	0	1	0	2	3	1	1	3	1	2	0	14	7.91	66.66
15	<i>Trichoderma viridae</i>	0	0	0	0	0	1	0	0	0	1	0	0	2	1.13	16.66
16	<i>Dictyochlamydospora</i>	0	0	0	0	0	0	0	0	0	0	0	2	2	1.13	8.33
17	<i>Mycella sterilia</i> (White)	0	0	0	1	0	0	0	0	1	1	0	0	3	1.69	25.00
18	<i>Mycella sterilia</i> (Pink)	0	0	0	0	0	0	2	0	2	1	0	0	5	2.82	25.00
	TOTAL	5	7	28	6	11	33	14	19	20	17	14	3	177	100.00	

## ACKNOWLEDGEMENT

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