

Regular Article

# Incidence of airborne fungal spores in the air of hill top

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**ABSTRACT:** Aeromycoflora of Dongargarh was studied with the help of Petriplate method. Total 389 fungal colonies represented 31 fungal types were observed during the present investigation period. Out of 31 fungal types, Maximum numbers of fungi (24) were isolated from anamorphic group, (03) from Ascomycotina and Mycelia sterilia and minimum (01) from Zygomycotina. The fungal species were *Cladosporium oxysporium*, *Fusarium* Mycelia sterilia, *Aspergillus*, *Penicillium*, *Curvularia*, *Cladosporium*, *Rhizopus*, *Trichoderma* species were observed. It is found that maximum percentage contribution is observed for *Cladosporium oxysporium* (26.73) *Aspergillus niger* (15.16), *A. versicolor* (9.51), followed by *A. fumigatus* (6.68). On the contrary, minimum percentage contribution (0.25) is observed for *Aspergillus terreus*.

**Key words:** Hilltop, fungal species, Dongargarh

## Introduction

Atmosphere is a gaseous envelope surrounds the earth with sufficient gravity and protects earth's life. Earth is the only planet we know that has air and water without them the earth would be unable to sustain life. 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 meteorite 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. Aerobiology is an interdisciplinary branch of science which works with closely linked disciplines like microbiology, ecology, meteorology, environmental sciences, medicines and conservation sciences. The present paper deals with the aerobiological survey of Dongargarh with environmental factors.

## Materials and Methods

Dongargarh the famous tourist and pilgrimage center of Rajnandagon District is surrounded by lushgreen forest and hillocks. The famous temple of Maa Bameshwari is on a hilltop of 1600 feet.

### Survey of aeromycoflora

For study of aeromycoflora, ten sterilized Petri plates containing PDA media are exposed 5 to 10 min. in outdoor and indoor of museum area. These exposed Petri plates brought in to the laboratory and incubated at 28±1°C for incubation period. 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, 2001) with the help of the following formula:

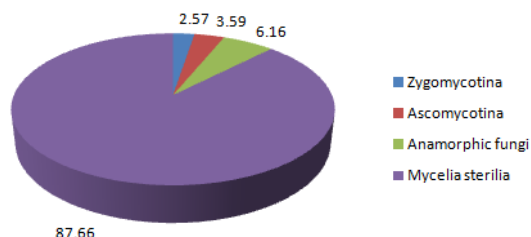
$$\text{Percentage frequency} = \frac{\text{Number of observation in which a species appeared}}{\text{Total no. of observation}} \times 100$$

$$\text{Percentage contribution} = \frac{\text{Total no. of colonies of a species in all observations taken together}}{\text{Total no. of colonies}} \times 100$$

## Results and Discussion

31 fungal floras were isolated from sampling site (Table 1). Fungal species recorded were representatives of the three major groups i.e. Zygomycotina, Anamorphic fungi and Mycelia sterilia. It was also observed that the anamorphic group was dominated fungal group. (Fig-1). The fungal species were *Cladosporium oxysporum*, *Fusarium*, Mycelia sterilia, *Aspergillus*, *Penicillium*, *Curvularia*, *Cladosporium*, *Rhizopus* and *Trichoderma* species were observed. It is found that maximum percentage contribution is observed for *Cladosporium oxysporium* (26.73) *Aspergillus niger* (15.16), *A. versicolor* (9.51), followed by *A. fumigatus* (6.68). On the contrary, minimum percentage contribution (0.25) is observed for *Aspergillus terreus*. 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 Sharma (2009) at Raipur. Arora and Jain (2003) reported *Cladosporium*, *Aspergillus* and *Penicillium* as most frequent fungi from Bikaner. Lugauskas et al. (2003) reported *Aspergillus fumigatus*, *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). Roymon et al. (2007) observed *Aspergillus Cladosporium* in common public places. *Aspergillus sp.* was observed throughout the study period similar result was also reported by Tiwari et al. (2006). Anamorphic fungi recorded as the most contributed fungal group throughout the study period similar result also recorded by Tiwari et al. (2006).

Fig. 1: Percentage contribution of fungal groups



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Table 1 Isolated fungal flora of Dongargarh

S. No.	Name of Fungi	Total	Percentage Contribution	Percentage Frequency
Zygomycotina				
1	<i>Rhizopus</i> sp.	14	3.59%	75%
Ascomycotina				
1	<i>Chaetomium globosum</i>	04	1.02%	16.66%
2	<i>Emmericella nidulans</i>	03	0.77%	16.66%
3	<i>Neosartorya fischeri</i>	03	0.77%	8.33%
Anamorphic fungi				
1	<i>Aspergillus niger</i>	59	15.16%	83.33%
2	<i>A. fumigatus</i>	26	6.68%	58.33%
3	<i>A. nidulans</i>	03	0.77%	16.66%
4	<i>A. terreus</i>	01	0.25%	8.33%
5	<i>A. flavus</i>	10	2.57%	50.00%
6	<i>A. flavipes</i>	03	0.77%	25.00%
7	<i>A. versicolor</i>	37	9.51%	58.33%
8	<i>A. oryzae</i>	03	0.77%	16.66%
9	<i>A. ochraceous</i>	03	0.77%	16.66%
10	<i>Acremonium scalotium</i>	02	0.51%	16.66%
11	<i>Alternaria alternata</i>	10	2.57%	41.66%
12	<i>Botryodiplodia theobromae</i>	07	1.79%	41.66%
13	<i>Chaetomella raphigera</i>	04	1.02%	25.00%
14	<i>Cladosporium oxysporium</i>	104	26.73%	66.66%
15	<i>Curvularia lunata</i>	05	1.28%	25.00%
16	<i>Curvularia lunata</i> var. <i>aeria</i>	06	1.54%	33.33%
17	<i>Epicoccum purpurascence</i>	08	2.05%	33.33%
18	<i>Fusarium pallidoroseum</i>	11	2.82%	58.33%

19	<i>Myrothecium roridum</i>	05	1.28%	16.66%
20	<i>Nigrospora oryzae</i>	08	2.05%	41.66%
21	<i>Paecilomyces varioti</i>	03	0.77%	25.00%
22	<i>Penicillium chrysogenum</i>	08	2.05%	33.33%
23	<i>Phoma sp.</i>	08	2.05%	16.66%
24	<i>Trichoderma viride</i>	07	1.79%	41.66%
	<i>Mycelia sterilia</i>			
1	<i>Mycelia sterilia</i> (white)	13	3.34%	41.66%
2	<i>Mycelia sterilia</i> (Black)	03	0.77%	25.00%
3	<i>Mycelia sterilia</i> (Pink)	08	2.05%	41.66%
		389		

### Acknowledgement

Senior author is thankful to university grant commission CRO Bhopal (M.P.), India for financial support.

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