ISSN 2277-8330 *(Electronic)*

J.Bio.Innov3(5),pp:257-260,2014 www.jbino.com

SEASONAL CHANGES AND INCIDANCE OF AEROMYCOFLORA IN DONGARGARH HILLY AREA

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(Received on Date: Date of Acceptance:)

ABSTRACT

The objective of the studies was to determine a seasonal variation in concentrations of fungal spores due to meteorological parameters. Under this work study of aeromycoflora of hill top of Dongargarh, Chhattisgarh was done by using gravity settle plate method. The investigation period for this study was from January 2011 to December 2011. During this investigation total 31 fungal species (389 fungal colonies) belonging to 18 fungal genera were isolated. Distribution and occurrence of fungi varies according to location, season of the year and condition of the surrounding atmosphere, temperature, relative humidity and rainfall.

Keywords: *Aeromycoflora, Dongargarh, Humidity, Fungi.*

No. of Tables : 2 **No.of References :** 8

INTRODUCTION

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. 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. Aero-mycology deals with the study of air borne fungi and their spores. Fungi have both beneficial and nuisance effects on our lives. Occurrence of fungal spores in the air varied season to season remarkably because of variation of weather conditions. About 20% of the human population is easily sensitized by normal fungal spore concentrations (up to 106 spores/m3) and all fungal spores should be regarded as potentially allergenic. Numerous plant diseases such as rusts, smuts, mildews, leaf spots, etc. are caused by air borne fungi (Kendrick 2000). The study of fungal spore is of great significant due to its role in the field of human allergy, plant, Agarwal MK (1969). Because of their volume in the atmosphere and small size, fungal spores play an important role in respiratory allergies and cause a wide range of symptoms, including allergic rhinitis, asthma, chronic bronchitis, etc., (Vijay *et al*., 1991, D'Amato *et al*., 1995, Hasnain *et al*., 1998).

Dongargarh is one of the prominent pilgrim places in Rajnandgaon District of Chhattisgarh. In Chhattisgarh, study on aerobiology and air borne bio-particle has been done by many researchers. But no investigation on air borne fungi has been carried out particularly in the hilly area. The present investigation has therefore, been undertaken to study the monthly distribution pattern of mycoflora in the air of the Dongargarh hill top.

METHODOLOGY

Sampling was done monthly at noon from January 2011 to December 2011. The fungal colonies developed on the culture media were examined and identified with the help of standard mycological books and manuals. Per cent abundance and frequency of the fungal colonies was calculated (Lanjewar & Sharma 2010). Only viable fungal spores or mycelial fragments of saprophytes and facultative parasites those settled on culture media were formed colonies. A total of 389 colonies were recorded from the 120 culture plates exposed for ten minutes from the two sampling points.

RESULT & DISCUSSION

Under this work study of aeromycoflora of Bamleshwari hill top of Dongargarh, Chhattisgarh was done by using gravity settle plate method. The investigation period for this study was from January 2011 to December 2011. During this investigation total 31 fungal species (389 fungal colonies) belonging to 18 fungal genera were isolated. Out of these 31 fungal species, 1 fungal species (6 fungal colonies) belongs to 1

fungal genera of Zygomycotina, 3 fungal species (14 fungal colonies) belongs to 3 fungal genera of Ascomycotina, 24 fungal species (343 fungal colonies) belongs to 13 fungal genera of Anamorphic fungi, 3 species of (26 fungal colonies) belongs to 1 fungal genera of Mycelia sterilia were isolated (Table 1).

During the investigation period it was observed that the spore forming colonies were distributed into 18 genera *viz. Alternaria, Arthrinum, Aspergillus, Botryodiplodia, Chaetomium, Cladosporium, Curvularia, Drechslera, Emercella, Fusarium, Myrothecium, Neosartorya, Nigrospora, Paecilomyces, Penicillium, Phoma, Rhizopus* and *Trichoderma*. In accordance with Sharma (2011), anamorphic fungal genera were recorded as a dominant fungal group. Among the identified fungi *Aspergillus* was one of the most dominating genera at all the locations and months in the air of the selected site. The variation in aeromycoflora and its abundance with the present study might be due to the difference of weather condition and vegetation between the study areas (Table 2). Pathak (2012) from Madhya Prodesh, India found abundance of *Aspergillus* and *Penicillium* which were 32 and 9%, respectively by using particle sampler.

Cladosporium is the fungal genera most correlated with meteorological parameters. This may be attributed to the size and nature of conidia. *Cladosporium* produces dry conidia in chains easily carried through air. Therefore, dispersion of *Cladosporium* spores is more influenced by meteorological parameters than *Alternaria* spores (Awad 2005). In accordance with the present study, Levetin (1995) reported that members of dry-air spores (*Cladosporium*, *Alternaria* and *Curvularia*) were found in greatest contribution in the atmosphere characterised by low humidity, generally during warmer afternoon hours.

Among the fungi, found in the present investigation, *Atlernaria, Aspergillus, Cladosporium, Curvularia, Fusarium, Penicillium* and *Rhizopus* were reported as pathogenic to plants and/or human and strongly allergenic to human.

Table1: *Isolated Fungal Group*

S. NO.	FUNGAL GROUPS	NO. OF FUNGAL SPECIES	NO. OF FUNGAL GENERA	TOTAL NO. OF FUNGAL COLONIES
1	Zygomycotina	1	1	6
2	Ascomycotina	3	3	14
3	Anamorphic Fungi	24	13	343
4	Mycelia sterilia	3	1	26
TOTAL		**31**	**18**	**389**

Table2: *Monthly variation in the fungal colonies*

S. No.	NAME OF FUNGAL GROUPS	RAINY SEASON				WINTER SEASON				SUMMER SEASON			
		Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	Zygomycotina	1	2	-	-	-	-	-	-	-	-	2	1
2	Ascomycotina	-	1	-	-	2	-	2	-	1	6	2	-
3	Anamorphic Fungi	24	13	12	26	37	30	73	38	21	13	20	36
4	Mycelia sterilia	-	4	1	-	-	4	3	2	5	2	4	1
GRAND TOTAL		**25**	**20**	**13**	**26**	**39**	**34**	**78**	**40**	**27**	**21**	**28**	**38**

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