Mycopath (2008) 6(1&2): 71-73

Brief Article

Air-borne mycoflora of Rohtas Fort

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Abstract

Air-borne fungal spores were collected on two different culture media viz malt extract agar (MEA) and potato dextrose agar (PDA), from five different sites of Rohtas Fort, Chakwal, Pakistan. A total of seven fungal species belonging to three different genera namely *Alternaria, Aspergillus and Drechslera* were isolated. *Aspergillus niger* was found to be the most prevalent (25.75%) fungal species followed by *Alternaria alternata* (24.08%), *Aspergillus fumigatues* (21.73%), *Aspergillus candidus* (12.37%), *Drechslera spicifer* (5.68%), *Drechslera* sp.(5.35%) and *Drechslera neergaardii* (3.34%). Greater number of fungal colonies was obtained on MEA than on PDA culture medium.

Key words: Air-borne, mycoflora, Rohtas Fort.

Introduction

The knowledge of air-spora not only contributes to the understanding of their abundance and seasonal variations, but is also helpful in forecasting the epidemics of crop plants (Waggoner, 1960). Aerobiologists are mainly concerned with release, dispersion and deposition of spores, interaction of spores with each other, pollution, environmental factors and their impact on plants, animals and human beings (Srivastava, 1991). The various aspects of air-spora in relation to the development of plant disease has previously been studied by Stakman (1946). In an agricultural country like Pakistan, located in the sub-tropical/semi-temprate region, with four season (spring, summer, autumn, winter), the study of air-spora is as essential as any other branch of phytopathology, because majority of the plant pathogenic fungi are wind dispersal. They Air-borne spores cause various health hazards in man and other organisms. Clinical investigations show air-borne fungal spore cause eczema. (Tilak, 1987), onchomycesis, otomycosis (Gupta and Singh, 1985, Wadhwabe and Srivastava, 1984) and dermatophytsis (Domsch *et al*., 1980). Similarly Chauham (1992) found that in jaipure-India, out of 46 fungal genera, 21 were allergic. The present investigations aim at finding the fungi in the air over Rohtas Fort Distict Chakwal, Punjab, Pakistan.

Materials and Methods

Five sampling sites were selected at Rohtas Fort, District Chakwal, Pakistan in June, 2008 on a sunny and hot day. Two types of media viz. malt extract agar (MEA) and potatoes dextrose agar (PDA) were employed to trap the fungal spores from air over Rohtas Fort. Petriplates of each of the two media were exposed for a period of 4-5 minutes at an altitude of five feet. Each treatment was replicated three times. Exposed petriplates were incubated at 30 ^{o}C at Fungal Culture Bank of Pakistan, Institute of Mycology and Plant Pathology University of the Punjab, Lahore, Pakistan. After an incubation period of seven days fungal colonies were counted, and identified. Identification was carried out following Cook (1963), Domesch *et al*., (1980) and Tilak (1989). All the data was statistically analyzed by applying analysis of variance followed by Duncans Multiple Range Test to separate the treatment means (Steel and Torrie, 1980).

Results and Discussion

A total of seven fungal species belonging to three different genera namely, *Alternaria, Aspergillus* and *Drechslera* were isolated during the present investigations from five different sites of Rohtas Fort. The isolated fungi include *A. fumigatus, A. candidus, A. niger, A. alternata, D. neergaardii, D. spicifer,* and *D. species.* The higher number of fungal colonies was counted on MEA than on PDA culture medium. (Table 1 & 2).

Among identified fungi *A. niger* was found to be the most prevalent fungal species with 45 colonies on MEA and 32 on PDA culture medium (Table 1 & 2). It was followed by *A. alternata and A. fumigatus* with maximum number of colonies i.e. 37 and 35, respectively, on PDA culture medium (Table 2). Similarly *A. niger* (Bajwa *et al*., 1997), *A. niger, A. alternata* (Ahmed, 2008) and *A. fumigatus* (Nasim *et al*., 1998, Nazir *et al*.,

2007) has been reported as most frequent fungal species during summer season.

Three species of *Drechslera* viz *D. neergaardii, D. spicifer* and *Drechslera* sp. were also isolated during present study. These findings are not in line with the finding of workers (Tasneem 1971; Samina 1975; Bajwa *et al*., 1995; 1997; Shah *et al*., 1995, Nasim *et al*., 1998; Ahmed, 2008). These variations in the composition of air-borne mycoflora of different areas may be due to the variation in environmental factors at sampling sites. Pasanen (1990) has reported profound variations in composition of aeromycoflora in urban and rural areas.

It is evident from the results of present study that inter and intra site variations in terms of colony count of different fungal species were found significant in most of the cases at site 1 to 5 on both the culture media (Table 1 and 2). Previously during similar studies variations with respect to colony number were also remained significant. The total colony count of *A. niger* and *A. alternata* was significantly higher in comparison of all other fungal species on MEA and PDA respectively. Higher colony count of these fungi has also been reported previously. Similar to earlier reports, higher number of fungal colonies was isolated on malt extract than on potato dextrose agar culture medium during this study. (Shah *et al*., 1995, Bajwa *et al*., 1997, Nasim *et al*., 1998, Ahmed, 2008).

Table 1: Air-borne mycoflora of Rohtas Fort on Malt Extract Agar medium.

Fungal species	No. of fungal colonies at different sampling sites					Total fungal colonies
	Site 1	Site 2	Site 3	Site 4	Site 5	
Aspergillus fumigates	7 b-g	3 f-i	8 a-f	0 i	12 ab	30 AB
A. candidus	6 d-i	0 i	0 i	7 b-g	7 b-g	20 BC
A. niger	13 a	5 d-i	7 b-g	11 a-c	9 a-e	45 A
Alternaria alternata	10 a-d	3 f-i	5 d-i	5 d-i	12 ab	35 AB
Drechslera neergaardii	1 hi	0 i	0 i	0 i	4 e-i	5 C
D. spicifer	3 f-i	1 hi	2 f-i	6 d-i	7 b-g	12 BC
Drechslera sp.	4 e-i	1 hi	2 f-i	0 i	0 i	7 C
Total fungal colonies	44	13	24	29	44	154

Values with different letters in upper case (capital letters) show significant difference between total numbers of colonies of different fungal species in a column.
Values with different letters in lower case (small letters) show significant difference in vertical columns as well as in horizontal rows as determined by DMR Test at P≤0.05.

Table 2: Air-borne mycoflora of Rohtas Fort on Potato Dextrose Agar medium.

Fungal species	No. of fungal colonies at different sampling sites					Total fungal colonies
	Site 1	Site 2	Site 3	Site 4	Site 5	
Aspergillus fumigatus	8 a-d	9 b-f	8 a-d	2 d-f	12 a	35 AB
A. candidus	5 a-f	2 d-f	4 b-f	6 a-f	0 f	17 BC
A. niger	8 a-8	3 c-f	7 a-e	3 c-f	11 ab	32 AB
Alternaria alternata	11 ab	6 a-f	0 f	12 a	8 a-d	37 A
Drechslera neergaardii	2 d-f	1 ef	0 f	0 f	2 d-f	5 C
D. spicifer	4 b-f	0 f	3 c-f	2 d-f	1 ef	10 C
Drechslera sp.	3 c-f	5 a-f	1 ef	0 f	0 f	9 C
Total fungal colonies	42	21	23	25	34	145

Values with different letters in upper case (capital letters) in a column show significant difference between total numbers of colonies of different fungal species.
Values with different letters in lower case (small letters) show significant difference in vertical columns as well as in horizontal rows as determined by DMR Test at P≤0.05.

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