



Abundance of anamorphic fungi in the air of Dongargarh hill-top

K. Sharma¹ and J.N. Verma²

¹Department of Botany, Arts and Commerce Girls College, Raipur

²Department of Botany, Govt DBPG Girls College, Raipur.

ARTICLE INFO

Article history:

Received: 22 December 2011;

Received in revised form:

19 January 2012;

Accepted: 1 February 2012;

Keywords

Dongargarh,
Anamorph,
A. Niger,
Aerosols.o.

ABSTRACT

Anamorphs are common and widespread. They are among the most successful groups of moulds with important roles in natural ecosystems and the human economy. The present paper deals with the study of aeromycological study of Dongargarh hill-top with the help of petriplate method in one year one year from May 2010- April 2011. 31 fungal floras were isolated during the investigation period. Only anamorphic fungal group contributes major 24 out of 31 fungal species. It was also observed that 341 colonies of anamorphic fungi isolated out of total 389 fungal colonies. The fungal species *Cladosporium oxysporum*, *Fusarium Aspergillus*, *Penicillium*, *Curvularia*, *Cladosporium*, *Trichoderma* etc were observed.

© 2012 Elixir All rights reserved.

Introduction

Imperfect fungi, also known as anamorphic fungi. This is a purely artificial classification for fungi where the stage that produces sexual spores are not formed or is unknown. Anamorph remains a useful descriptive term for the asexual stage of fungi. During the late 1970s, Hennebert and Weresub introduced a new set of terminology whereby anamorph refers to the asexual, mitotic-spore-bearing morphological phase; teleomorph refers to the sexual meiotic-spore-bearing morphological phase; while holomorph refers to the 'whole fungus' (Hennebert and Weresub, 1979). Anamorphs are common components of aerosols where they drift on air currents, dispersing themselves both short and long distances depending on environmental conditions. When the spores come in contact with a solid or liquid surface, they are deposited and if conditions of moisture are right, they germinate. Moulds have numerous enzymes that can turn complex polymers into sugars, lipids and other simpler molecules that can be used for fuels and chemical synthesis. Although much of the research has focused on the genus *Trichoderma*, *Aspergillus* represents a huge potential for finding new enzymes that could be used to convert plant biomass into fuels and other industrially useful products (Baker et al., 2008). The present paper deals with the aerobiological survey of Dongargarh with special reference to Anamorphic fungi.

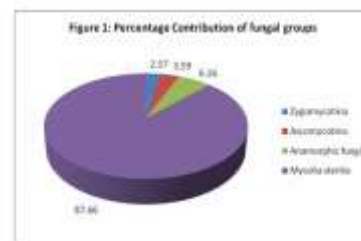
Material and method

The survey was conducted for a period of one year from May 2010- April 2011 (Twice a month for a year). Blessed with majestic mountains and ponds, Dongargarh has been derived from two words: 'Dongarh' meaning 'mountains' and 'garh' meaning 'fort'. Popular of the landmarks is Maa Bamleshwari Devi Temple on a hilltop which is 1,600 ft high. It is of great spiritual importance and a legend is associated with this shrine. For study of aeromycoflora, ten sterilized Petri plates containing PDA media are exposed 5 to 10 minute in the selected site. These exposed Petri plates brought in to the laboratory and incubated at $28 \pm 1^\circ\text{C}$ 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 Centre of Fungal Taxonomy, Delhi. At the end of the incubation period of the aeromycoflora, percentage frequency and percentage contribution of fungal flora is calculated (Tiwari P 1999).

Result 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). Only anamorphic fungal group contributes major 24 out of 31 fungal species. It was also observed during the investigation period that 341 colonies of anamorphic fungi isolated out of total 389 fungal colonies.



Trichoderma viride

It is found that maximum percentage contribution is observed for *Cladosporium oxysporum* (26.73). On the contrary, minimum percentage contribution (0.25) is observed for *Aspergillus terreus*. The members of Anamorphic fungi have shown maximum contribution throughout the year. 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. 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 (2001) 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.

Acknowledgement

Main author is thankful to university grants commission CRO Bhopal for financial support.

Reference

Arora, A. and Jain, V. K. 2003 Fungal airspora of Bikaner. Indian J. Aerobiol. 16 (1&2): P 1-9
 Aira, M. J., Rojas, T. I. and Jato, V. 2002 Fungi associated with three houses in Havana. Grana. 41: P 114 -118
 Aira, M. J., Rojas, T. I. and Jato, V. 2002 Fungi associated with three houses in Havana. Grana. 41: P 114 -118
 Baker, S.E., Thykaer, J., Adney, W.S., Brettin, T.S., Brockman, F.J., D'Haeseleer, P., Martinez, A.D., Miller, R.M., Rokhsar, D.S., Schadt, C.W., Torok, T., Tuskan, G., Bennett, J., Berka, R.M., Briggs, S.P., Heitman, J., Taylor, J., Turgeon, B.G., Werner-Washburne, M., and Himmel, M.E. 2008 Fungal genome sequencing and bioenergy. Fungal Biol. Rev. 22, 1-5.
 Hennebert, G.L., and Weresub, L.K. 1979 In: The Whole Fungus: The Sexual-Asexual Synthesis Vol. I, Kendrick, B., ed. (Ottawa, Canada: National Museum of Natural Science), pp.27-30.
 Kulshrestha, A. and Chauhan, S. V. S. 2001 Aeromycoflora of some hospitals of Agra city. Indian J. Aerobiology. 14 (1&2): P 33-35

Kunjam, S. 2007 Studies of aeromycoflora of Tribal atmosphere at Panabaras region, Ragnandgaon District (C. G.). Ph.D. Thesis, Pt. R. S. U. Raipur (C. G.). Lugauskas, Albinas, Sveistyte, Laima, Ulevicius, Vidmantas 2003 Concentration and species diversity of airborne fungi near busy streets in Lithuanian urban area. Ann. Agric. Environ. Med. 10: P 233-239
 Majumdar Manas, Ranjan 2007 An assessment of the indoor mycoflora of school buildings in Kolkata. 14th Nat Conf. p33.
 Pandey, A., Palni, L. M. S. and Bisht, D. 2001 Microbiological Research. 156(4), pp 377.
 Roymon, M.G., Nafde, Seema K., Mukherjee, Arpita., Talukdar, Ayantika 2007 Identification of some commonly occurring fungi isolated from indoor air samples of common public places. 14th Nat Conf. p34.
 Saroja, P. V. and Bhagya Lakshmi, O. 2007 Mycoflora of Hyderabad - A Metro City. Abst. 14th Nat. Conf. Aerobiol., Pt. R. S. U. Raipur. E- 28: P 47
 Sharma, K. 2001 Studies of aeromycoflora in relation to leaf surface mycoflora of Ocimum sanctum Linn. plant. Ph.D. Thesis, Pt. R. S. U., Raipur (C. G.).
 Sharma K. 2009 Incidence of fungal allergens in the air at Raipur. Lab to land 1(3) 98-101
 Singh, Romesh Ksh and Singh Anilkumar N. 2009 Incidence of airborne fungal spores in the air of Ima market (Khawairamband Bazar), Imphal West, Manipur. Abstract, 15th Nat. Conf. on Aerobiology and National Symposium on "Airspora- Impact on Plant, Animal and Human Health", M. U. Imphal. APHC- 05: P 16
 Tiwari, P. 1999 Aerobiological studies of Raipur with special reference to fungal spores. Ph.D. Thesis Pt. R. S. U. Raipur (M. P.)

Table 1: Isolated Anomorphie fungi

S. No.	Name of Fungi	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
	Anamorphic fungi													
1.	<i>Aspergillus niger</i>	7	8	5	8	10	5	-	6	-	2	5	3	59
2.	<i>A. fumigatus</i>	5	5	5	1	6	-	-	-	-	-	1	3	26
3.	<i>A. nidulans</i>	1	-	-	-	-	-	-	-	-	-	2	-	03
4.	<i>A. terreus</i>	-	-	-	-	-	-	-	-	-	-	1	-	01
5.	<i>A. flavus</i>	-	2	-	-	-	2	2	2	1	1	-	-	10
6.	<i>A. flavipes</i>	-	-	1	1	-	-	1	-	-	-	-	-	03
7.	<i>A. versicolor</i>	-	-	-	1	1	2	8	8	10	7	-	-	37
8.	<i>A. oryzae</i>	-	-	-	-	-	1	-	-	-	-	2	-	03
9.	<i>A. ochraceus</i>	-	-	-	-	-	-	-	2	1	-	-	-	03
10.	<i>Acremonium scalotium</i>	-	-	-	-	-	-	1	1	-	-	-	-	02
11.	<i>Alternaria alternata</i>	-	-	-	-	-	-	1	2	1	4	2	-	10
12.	<i>Botryodiplodia theobromae</i>	-	-	-	-	2	1	2	-	1	1	-	-	07
13.	<i>Chaetomella raphigera</i>	-	-	1	-	-	-	1	-	-	2	-	-	04
14.	<i>Cladosporium oxysporium</i>	-	-	-	-	1	3	9	17	43	27	3	1	104
15.	<i>Curvularia lunata</i>	-	-	-	-	2	2	1	-	-	-	-	-	05
16.	<i>Curvularia lunata var. aerea</i>	-	-	-	1	3	1	-	-	-	-	1	-	06
17.	<i>Epicoccum purpurascens</i>	-	-	-	-	-	-	2	1	3	2	-	-	08
18.	<i>Fusarium pallidoroseum</i>	-	-	-	-	1	2	1	4	1	1	1	-	11
19.	<i>Myrothecium roridum</i>	-	-	-	-	-	-	-	-	4	1	-	-	05
20.	<i>Nigrospora oryzae</i>	-	-	-	-	-	1	1	2	3	1	-	-	08
21.	<i>Paecilomyces varioti</i>	-	-	-	-	-	-	-	-	1	-	1	1	03
22.	<i>Penicillium chrysogenum</i>	-	-	-	1	-	-	-	1	5	1	-	-	08
23.	<i>Phoma sp.</i>	-	-	-	-	-	-	-	-	7	1	-	-	08
24.	<i>Trichoderma viride</i>	-	-	-	-	-	-	-	1	2	1	1	2	07

Main Anamorphic fungi isolated from sampling site:

Aspergillus niger

B. fumigatus

B. nidulans

B. terreus

B. flavus

B. flavipes

B. versicolor

A. oryzae

A. ochraceous

Acremonium scalotium

Alternaria alternata

Botryodiplodia theobromae

Chaetomella raphigera

Cladosporium oxysporium

Curvularia lunata

Curvularia lunata var. *aeria*

Epicoccum purpurascens

Fusarium pallidoroseum

Myrothecium roridum

Nigrospora oryzae

Paecilomyces varioti

Penicillium chrysogenum

Phoma sp.