

Study of Outdoor Aeromycoflora of Sai Temple, Amapara, Raipur District (C.G.), India

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Abstract: All microorganisms found in air, water and soil in nature and take food from organic substances and they are complete own life cycle on a specific host. The present investigation was undertaken to study the outdoor aeromycoflora of the Sai Temple, Amapara, Raipur (C.G.). The investigation period was of four months from November 2013 to February 2014. Air sampling was done at monthly interval by using petri plate method for isolation of air borne mycoflora. In this investigation total 304 fungal colonies represented 17 air borne mycoflora types were observed during the study period, in which *Cladosporium cladosporioides* (48.02%) was observed highest percentage contribution followed by *Aspergillus niger* (9.86%), *Penicillium sp.* (8.22%), *Cladosporium sp.* (6.57%) and *Aspergillus flavus* (4.93%). The most frequent species (100%) showed by *Aspergillus flavus*, *A. niger*, *Cladosporium cladosporioides* and *Penicillium sp.*

Keywords: Aeromycoflora, Outdoor, Fungal spore, Sai Temple.

I. Introduction

The fungal spores are dispersal in air from different sources and they are causes many diseases into vegetations, humans beings and animals. Air borne fungal spores are almost predominant respiratory diseases, allergens and skin diseases in the air and their concentration depend on the environmental condition such as geographical location, moisture, temperature, wind velocity and deterioration of materials. outdoor air are almost laden with microorganism such as bacteria, fungal spores, pollen grains, mites and insects whose concentrations and types vary with the time of day, weather conditions, season, geographical location (Shilpa et al., 2013). Sai temple is situated at Amapara in Raipur city. The aim of present study was to assess aeromycoflora load in outdoor environment of the Sai temple, Amapara, Raipur and this study may be useful in health problems and environment management.

II. Materials and Methods

During the survey of aeromycoflora of outdoor study of Sai temple, Amapara, Raipur was carried out for a period of four months from November 2012 to February 2013. Air sampling was carried out by using gravity petri plate method (Jadhav and Tiwari, 1994; Tiwari, 1999; Sharma, 2011). Five sterilized petri plates containing PDA media were exposed for 5 to 10 minutes in outdoor environment of the Sai temple at monthly intervals (Suerdem and Yildirim, 2009; Devi et al., 2010; Kalbende et al., 2012 and Thirumala and Nathu, 2013). The exposed petri plates were brought into lab and incubated at room temperature after that at the end of incubation period the fungal colonies were counted and identified with the help of microscopic slide and available published literature (Bernett and Hunter, 1972; Cooke, 1963; Tilak, 1989; Kalbende et al., 2012). The Percentage frequency and percentage contribution of fungal flora was calculated by the following formula (Singh, 2006; Dalal et al., 2011).

$$\text{Percentage frequency} = \frac{\text{Number of the observation in which a species appeared}}{\text{Total number of observations}} \times 100$$

$$\text{Percentage contribution} = \frac{\text{Total number of colonies of individual species in all the plates}}{\text{Total number of colonies in all species}} \times 100$$

III. Results and Discussion

During investigation period total seventeen fungal species under thirteen genus had been reported. The maximum percentage contribution showed by *Cladosporium cladosporioides* (48.02%) followed by *Aspergillus niger* (9.86%), *Penicillium sp.* (8.22%), *Cladosporium sp.* (6.57%), *Aspergillus flavus* (4.93%), *A. sp.* (3.94%), *Alternaria sp.* (3.94%), *Aspergillus fumigatus* (2.96%), *Curvularia lunata* (1.97%), *Mycelia sterilia* (1.64%), *Fusarium moniliforme* (1.64%), *Phoma exigua* (1.31%), *Unidentified sp.-II* (1.31%), *Paecilomyces varioti* (0.98%), *Rhizopus sp.* (0.98%), *Unidentified sp.-I* (0.98%) and *III* (0.65%). *Cladosporium*, *Aspergillus* and *Alternaria* were most dominant aeromycoflora of different study sites, the same type of result were also observed by Peerally and Rao, 2003 the air of Mauritius; Jothish et al, 2004 at Kovalam; Kunjam, 2007 at Raipur. *Aspergillus* and *Alternaria* were most dominant aeromycoflora reported by Shukla and Shukla, 2011 at Korba. *Aspergillus* was most dominant fungal sp. reported by Choudhary and Singh, 1991 at Kathmandu valley; Pawar, 1991 at Nasik; Mishra et al, 1999 at Bodh Gaya; Saluja et al, 2011 at Raipur.

Thus, the highest frequent species (100%) were *Aspergillus flavus*, *A. niger*, *Cladosporium cladosporioides* & *Penicillium sp.* followed by *Aspergillus fumigatus* (75%), *A. sp.* (75%), *Alternaria sp.* (75%), *Cladosporium sp.* (75%), *Mycelia sterilia* (75%) and *Phoma exigua* (75%), *Curvularia lunata* (50%), *Fusarium moniliforme* (50%), *Paecilomyces varioti* (50%), *Rhizopus sp.* (50%), *Unidentified sp.-I, II & III* (50%). *Cladosporium*, *Aspergillus* and *Penicillium* were most frequent mycoflora of outdoor environment of Sai temple, Amapara, Raipur also the similar result was observed by Arora and Jain, 2003 at Bikaner. *Penicillium* was highest air borne fungi recorded by Sawane, 2010 at Nagpur. *Aspergillus* and *Alternaria* were most frequent Observed by Kulkarni, 2011 at Bhilai. *Aspergillus* and *Cladosporium* were most frequent the same result also reported by Tiwari, 2014 at Raipur.

The most occurring airborne fungal spores which contributed in large number were *Cladosporium*, *Aspergillus*, *Penicillium*, *Alternaria* and *Curvularia*. These air borne mycoflora causes many diseases into human being such as- upper respiratory tract infections, asthma, allergic, hypersensitivity reactions (Kulkarni, 2011).

Table: Airborne fungal spores of outdoor environment of Sai temple, Amapara during the Study period

S. n.	Name of fungi	Months				Total colonies	% Contribution	% Frequency
		Nov	Dec	Jan	Feb			
Zygomycotina								
1.	<i>Rhizopus sp.</i>	-	2	-	1	03	0.98	50
Anamorphic fungi								
2.	<i>Alternaria sp.</i>	4	-	5	3	12	3.94	75
3.	<i>Aspergillus flavus</i>	3	2	4	6	15	4.93	100
4.	<i>A. fumigatus</i>	4	3	-	2	09	2.96	75
5.	<i>A. niger</i>	9	4	6	11	30	9.86	100
6.	<i>A. sp.</i>	4	3	5	-	12	3.94	75
7.	<i>Cladosporium cladosporioides</i>	32	25	52	37	146	48.02	100
8.	<i>Cladosporium sp.</i>	11	04	-	05	20	6.57	75
9.	<i>Curvularia lunata</i>	-	3	-	3	06	1.97	50
10.	<i>Fusarium moniliforme</i>	-	2	3	-	05	1.64	50
11.	<i>Paecilomyces varioti</i>	1	-	2	-	03	0.98	50
12.	<i>Penicillium sp.</i>	3	9	6	7	25	8.22	100
13.	<i>Phoma exigua</i>	1	2	1	-	04	1.31	75
Mycelia sterilia								
14.	<i>Mycelia sterilia</i> (White)	1	-	2	2	05	1.64	75
Unidentified fungi								
15.	<i>Unidentified sp.- I</i>	2	1	-	-	03	0.98	50
16.	<i>Unidentified sp.- II</i>	2	-	2	-	04	1.31	50
17.	<i>Unidentified sp.- III</i>	1	-	-	1	02	0.65	50
Total		78	60	88	78	304		

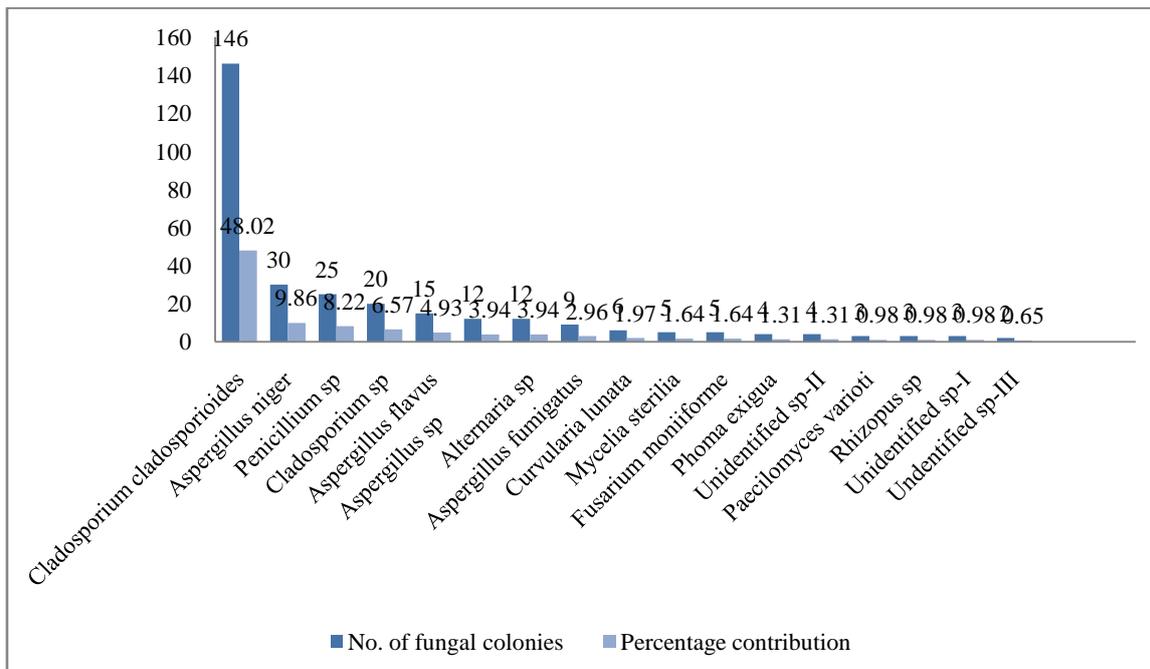


Figure 1. Percentage Contribution of Fungal Species.

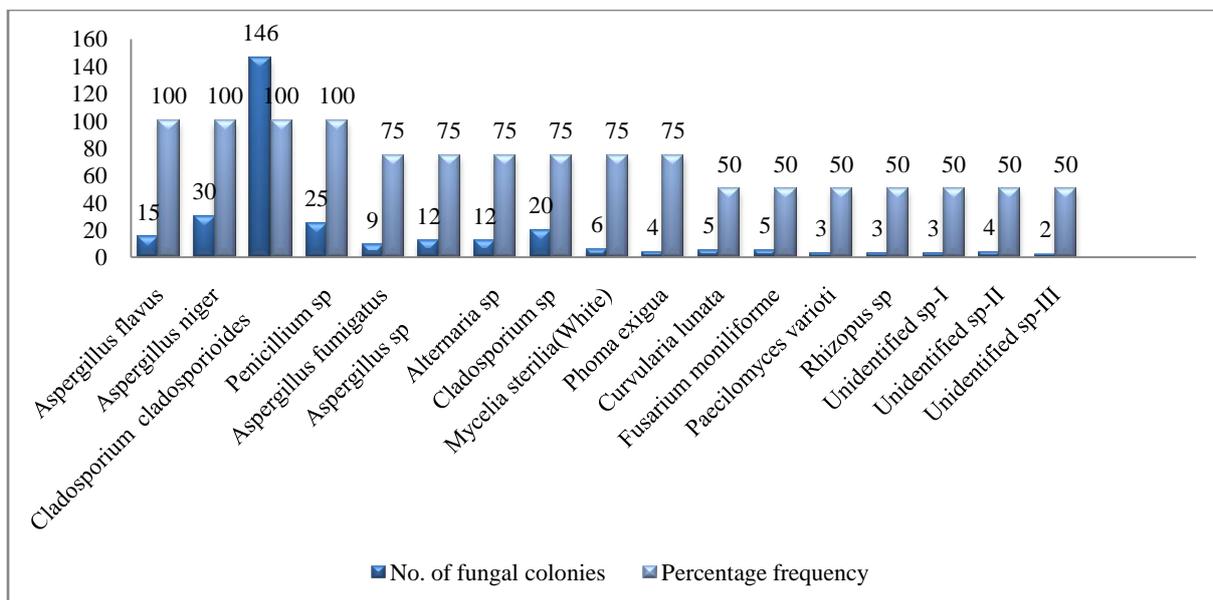


Figure 2. Percentage Frequency of Fungal Species.



Figure 3. Fungi Growth on Culture Media

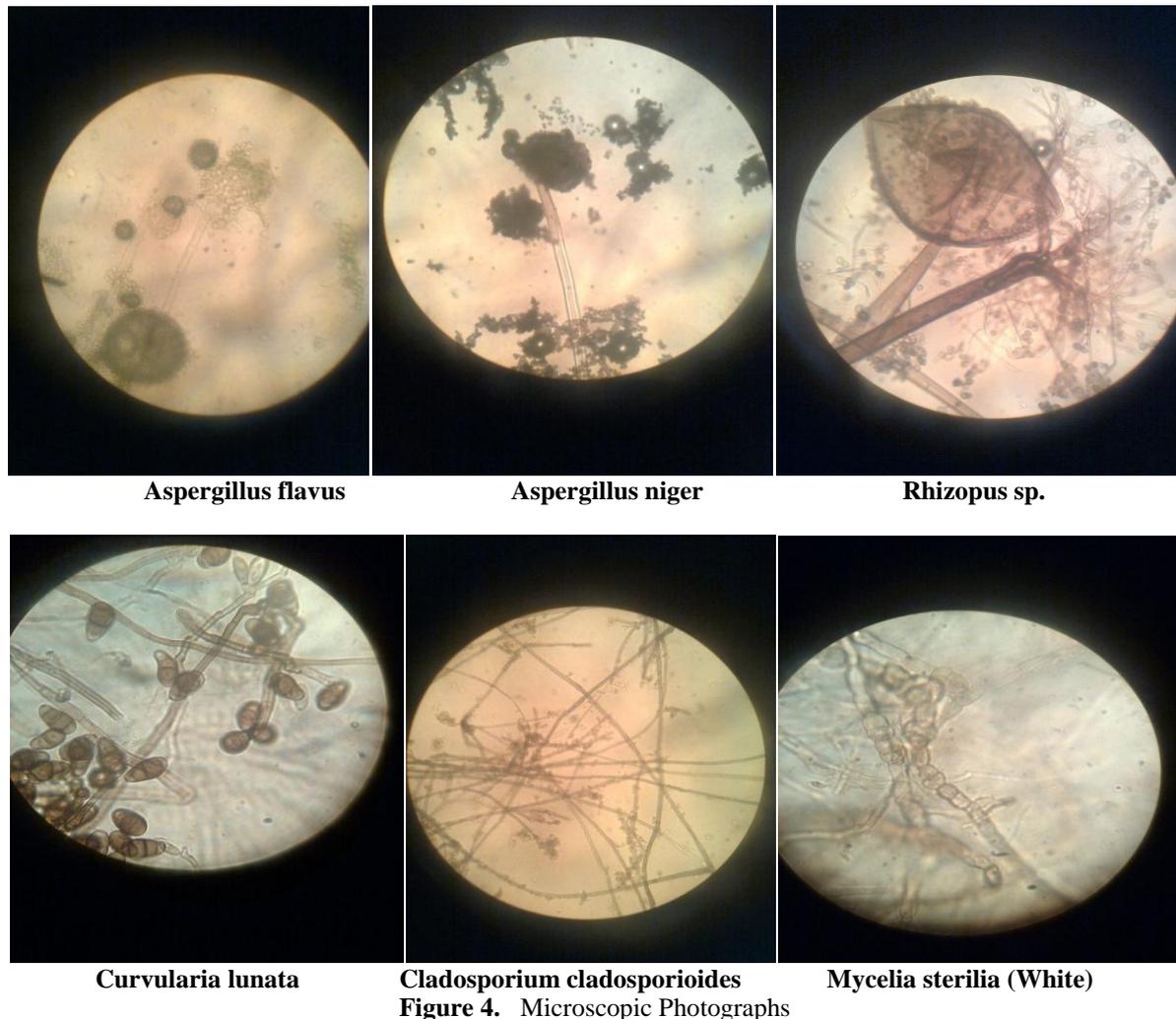


Figure 4. Microscopic Photographs

IV. Conclusion

Outdoor environment of Sai temple is connecting to G.E. road. G.E. road is a very busy road way and also that outdoor environment of Sai temple is surrounded by school, mall, fruit and vegetable markets and other shops. The highest number of air borne fungal spores like Cladosporium, Aspergillus, Penicillium, Alternaria and Curvularia were reported during investigation period in study area and these fungal spores causes various diseases into human beings .

Garbage of fruits, vegetables and other waste product are important role play to growth of fungal spores and discharge spores in the air. Discharged fungal spores dispersal through air in environment of outdoor and indoor and along with these all a huge number of devotees are daily use to visit the temple for worshipping purpose so in this temple the possibility of outdoor pathogenic fungal contamination is very high. Through this study we are trying to document many air borne pathogenic fungal sp. for the help of awareness for society.

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