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Ecological study of fungi isolated from the surface water of Budhatalab (pond) of Raipur city, Chhattisgarh

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Raipur city is capital of Chhattisgarh state, situated in the fertile plains of Mahanadi. Budhatalab is one of the largest ponds of Raipur city. The quantitative and qualitative fungal composition of pond water was surveyed monthly for a year i.e. March 2005 to February 2006. A variety of fungal strains was isolated and identified from the water of Budhatalab. Out of a total 278 fungal colonies, 69 fungal species belonging to 31 fungal genera were isolated. *Aspergillus niger* was most frequent species with 91.67%, *Neoarachnotheca keratinophila* (75%) followed by *A. flavus* and *A. fumigatus* with 66.67% frequency. It was also found that maximum percentage contribution was observed for *Aspergillus fumigatus* (13.67%), which was followed by *Aspergillus niger* with a 12.95% contribution.

Key words : Ecological study, percentage frequency, percentage contribution.

INTRODUCTION

Raipur city (capital town of Chhattisgarh state) which was known as "City of Talabs" but in present scenario due to overpopulation and modernization many of them becomes highly polluted and converted into a garbage dumping area. The introduction of pollutant into the pond, increased amount of organic matters and these matters bring about changes in the micro-flora. Freshwater fungi have the ability to decompose organic materials either they are autochthonous or allochthonous in origin and consequently play an important role in nutrient cycling and energy flow in freshwater ecosystems (Bärlocher, 1992). A pond ecosystem is a biological environment consisting of all the organisms living in pond, as well as all the nonliving (abiotic), physical components of the environment with which the organisms interact such as air, water, sunlight etc (Boer and Reddingius, 1996). Different species differ from each other in terms of their requirement from their environment, and consequently also in respect of the extent to which they can tolerate the fluctuations in their environmental conditions. This range of demands and consequent range of tolerance of a species is known as its ecological amplitude. The species with high ecological aptitude (the range of demands and tolerance are wider) are adapted better to greater fluctuations in their environment (Sharma, 1990). Environment, which is actually a complex of several inter-related factors and is much dynamic (i.e. varying with time and space), works as a sieve in selecting organisms at a particular time in a particular ecosystem.

All the fungal species present in an ecosystem constitute the fungal community of that ecosystem. For the study of fungal community present in pond water, fungi are isolated from water, to understand the overall diversity among different taxonomic groups of fungi present, as well as their frequency and contribution of the fungal species in pond water of Raipur city.

MATERIALS AND METHODS

Climatic condition of study area

Budhatalab is also known as Vivekanand Sarowar (one of the largest pond) located at the center of the Raipur city. Raipur has subtropical climate. The climate during summer season (March to June) is hot and dry and temperature is ranging between 29°C-45°C (±2°C). Raipur receives an estimated 1,300 mm of rain mostly in rainy season from late June to early October and temperature is between 30-35°C (±2°C). Winter season (November to February) is moderate cool and dry and temperature

is between 5°C-20°C (±2°C).

Water sample collection

A surface water sample was aseptically collected (twice a month at fortnightly intervals) from one to two meters away from the bank, in pre sterilized bottle from different parts of pond.

Survey of fungi

During present study Potato dextrose agar (PDA) medium has been selected for isolation of pond water fungi for one year (March 2005 to February 2006).

Ecological studies of pond water fungi

Percentage frequency and percentage contribution of the fungal flora was calculated as per following formula (Prasad and Bilgrami, 1969). Frequency refers to the degree of dispersion of individual species in a particular area at a particular period in the term of percentage occurrence. Percentage contribution represents the share of a particular fungal species (as %) in the total fungal spectrum (Sharma, 1990).

$$\text{Percentage frequency} = \frac{\text{No. of observations in which a species appeared}}{\text{Total number of observations}} \times 100$$

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

RESULTS

During the present study total 278 fungal colonies of 69 different species belonging to 31 fungal genera were isolated from pond water samples. Out of 69 fungal species, 6 fungal species (10 colonies) belonged to 5 genera of Zygomycotina, 6 species (33 fungal colonies) belonged to 6 genera of Ascomycotina, maximum 55 species (231 fungal colonies) belonged to 19 fungal genera of Anamorphic fungi and 2 fungal species (4 fungal colonies) belonged to 1 genus of Mycelia sterilia were observed. (Table 1).

Percentage frequency of fungi

The overall most frequent species were *Aspergillus niger* with 91.67% frequency, which was followed by *Neoarachnotheca keratinophila* with 75%, *Aspergillus flavus, A. fumigates* with 66.67% frequency and *Aspergillus sydowi, A. versicolor* and *Cladosporium sphaerospermum* were moderately frequent species with 41.67% frequency (Table I). Some fungi such as *Circinella simplex, Syncephalastrum racemosum, Byssochlamus niveus, Acremonium implicatum, Aspergillus oryzae, A. phoenicis, A. ustus, Aureobasidium pullulans, Drechslera hawaiiensis, Tritiracheum oryzae* etc.were less frequent species throughout year (8.33%). Season wise observation showed that *Aspergillus niger* was 100% frequent in rainy and winter season and 75% in summer season. Two another species *Neoarachnotheca keratinophila* and *Aspergillus versicolor* were also found to be most frequent species (100%) in summer season (Table I). Some fungi such as *Syncephalastrum racemosum* of Zygomycotina, *Emericella nidulans* of Ascomycotina and *Acremonium implicatum, A. stictum, Aspergillus awamori, A. phoenicis, A. speluneus, A. stellatus, A. ustus, Aureobasidium pullulans, Trichothecium roseum, Tritiracheum oryzae* etc. of Anamorphic group of fungi were present only in summer season, some such as *Rhizopus oryzae* of Zygomycotina, *Chaetomium globosum* of Ascomycotina and *Aspergillus niveus, A. oryzae, Chrysosporium tropicum, Fusarium moniliforme, Phoma medicaganis, P. tropica* etc. *of* Anamorphic group of fungi were present only in rainy season. Whereas some such as *Circinella simplex* and *Mucor racemosus* of Zygomycotina, *Neosartoria fischeri* of Ascomycotina and *Chaetophoma quercilifolia, Cladosporium cladosporoides, Fusarium oxysporum, Penicillium purpurascens, P. rubrum* etc. of Anamorphic group of fungi were present only in winter season (Table I).

Percentage contribution of fungi

Aspergillus is the dominant genus and all most half 51.82% contribution was showed by *Aspergillus* species. Individually, *Aspergillus fumigatus* showed maximum 13.77% contribution which was followed by *A.niger* with 12.95% contribution, *Neoarachnotheca keratinophila* with 8.27%, *Cladosporium sphaerospermum* 7.19%, *A.flavus* 6.12% and *A. versicolor* with 5.40% contribution (Table I).

Yearly maximum 83.09% contribution was encountered for group Anamorphic fungi, which was followed by group Ascomycotina with 11.87%

Table 1: Showing number of fungal genera, species and colonies present in Budha Talab

No	NAME OF FUNGI	SUMMER					RAINY					WINTER							
		Mar	April	May	June	Tot.	July	Aug	Sep	Oct	Tot.	Nov	Dec	Jan	Feb	Tot	G. Tot	%frequency	% Contribution
A	*Zygomycotina*																		
1	*Absidia* sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	8.33	0.36
2	*Circinelia simplex*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	8.33	0.36
3	*Mucor racemosus*	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	8.33	0.36
4	*Rhizopus nigricans*	0	0	0	0	0	0	0	0	2	2	0	2	0	1	3	S	25	1.8
5	*R. oryzae*	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	8.33	0.36
6	*Syncephalastrum racemosum*	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	833	0.36
Total number of collonies		0	0	1	0	1	0	0	0	3	3	0	2	0	4	6	10		
Total number of species		0	0	1	0	1	0	0	0	2	2	0	1	0	4	4	?6		
Total number of genera		0	0	1	0	1	0	0	0	1	1	0	1	0	4	4	S		
B	*Ascomycolina*																		
1	*Byssochlamus niveus*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
2	*Criaetomiuin globosum*	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	8.33	0.36
3	*Emericella nidulans*	0	1	2	2	5	0	0	0	0	0	0	0	0	0	0	S	25	1.8
4	*Neoarachnotheca keratinophha*	0	2	2	1	5	2	5	3	5	15	0	1	2	0	3	23	75	8.27
5	*Neosartorie fischeri*	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	8.33	0.36
6	*Thielavia appendiculata*	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	2	16.7	0.72
Total number of colonies		0	3	4	4	11	2	5	5	5	17	1	1	3	0	5	3 3		
Total number of species		0	2	2	3	3	1	1	3	1	3	1	1	2	0	3	6		
Total number of genera		0	2	2	3	3	1	1	3	1	3	1	1	2	0	3	6		
C	*Anamorphic*																		
1	*Acremonium implicatum*	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
2	*A. recefi*	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1	3	16.7	1.08
3	*A. stictum*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
4	*Aspergillus awamori*	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	2	16.7	0.72
5	*A. carneus*	0	0	0	1	1	1	1	0	0	2	0	0	0	0	0	3	25	1.08
6	*A- flavus*	0	0	2	1	3	3	1	1	0	5	2	0	2	5	9	17	66.7	6.12
7	*A. fumigates*	18	8	4	3	33	1	1	1	0	3	0	0	0	2	2	38	66.7	13.7

contd. Table 1

8	*A. Japonicus*	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	2	16.7	0.72
9	*A luchuensis*	0	0	1	1	2	0	0	0	0.	0	2	0	0	0.	2	4	25	1.44
10	*A. niger*	1	0	3	3	7	2	2	4	1	9	6	7	2	5	20	36	91.7	13
11	*A. niveus*	0	0	0	0	0	0	1	0	1	2	0	0	0	0	0	2	16.7	0.72
12	*A. ochraceus*	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2	16.7	0.72
13	*A. oryzae*	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	8.33	0.36
14	*A. parasiticud*	1	0	0	0	1	0	0	0	2	2	0	0	1	0	1	4	25	1.44
15	*A. phoenicis*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
16	*A. speluneus*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
17	*A. stellatus*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
18	*A. sydowi*	0	0	0	0	0	0	5	2	1	8	0	1	1	0	2	10	41.7	3.6
19	*A. terreus*	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	2	16.7	0.72'
20	*A. ustus*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
21	*A. versicolor*	0	0	1	0	1	1	7	3	3	14	G	0	0	0	0	15	41.7	5.4
22	*Aspergillus* sp *I*	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
23	*Aspergillus* sp. *II*	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
24	*Aureobasidium pullulans*	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	'8.33	0.72
25	*Candida* sp *I*	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	8.33	0.36
26	*Candida* sp *II*	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	2	1-6.7	0.72
27	*Chaetophonm quercilifolia*	0	0	0	0	0	0	0	0	0	0	2	0	0	0	"2	2	8.33	0.72
28	*Chrysosporium tropicum*	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	8,33	0.72
29	*Chrysosporium* sp	0	0	0	•0	0	0	0	0	1	1	0	0	0	0	0	1	8.33	0.36
30	*Cladosporii^m cladosporoides*	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	8.33	0.36
31	*C. sphaeronpermum*	0	0	0	0	0	2	0	1	0	3	1	14	2	0	17	20	41.7	7.19
32	*Cylindrocarpon* sp	0	2	0	0	2	0	0	0	0	0	2	0	0	0	2	4	16.7	1.44
33	*Drechslera hawaiiensis*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
34	*Fusarium rr'oniliforme*	0	0	0	G	0	0	2	0	0	2	0	0	0	0	0	2	8.33	0.72
35	*F. oxysporum*	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	8.33	0.36
36	*F. solani*	0	0	0	0	1	0	0	0	1	0	0	1	1	2	3	25	1.08	
37	*Fusarium* sp. *I*	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	8.33	0.36
38	*Fusarium* sp *II*	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	8.33	0.72

contd. Table 1

39	*Geotrichum* sp	0	0	0	0	0	0	0	3	0	3	0	1	0	0	1	4	16.7	1.44
40	*Gliocladium so*	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	8.33	0.36
41	*Idriella* sp	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	8.33	0.36
42	*Penicillium griseofulvum*	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	2	16.7	72
43	*P. notatum*	0	0	0	1	1	0	0	0	0	0	1	0	1	0	2	3	25	1.08
44	*P. purpurasctms*	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	8.33	0.36
45	*P. rubrum*	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	8.33	0.72
46	*P. wgulosum*	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	2	16.7	0.72
47	*Penicillium* sp *1*	0	0	0	0	0	0	0	0	0	0	0	2	2	1	5	5	25	1.8
48	*Phoma medicaganis*	0	0	0	0	0	0	0	1'	0	1	0	0	0	0	0	1	8.33	0.36
49	*P. tropica*	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2	8.33	0.72
50	*Phomopsis* sp *1*	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	8.33	0.36
51	*Phomopsis* sp *II*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
52	*Trichoderma viride*	0	0	1	0	1	1	1	0	0	2	0	3	1	0	4	7	41.7	2.52
53	*Thchoderma* sp	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	8.33	0.36	
54	*Trichotheciu n roseum*	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2	16.7	0.72
55	*Tritiracheurri oryzae*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	8.33	0.36
	Total number of collonies	21	14	15	23	73	19	24	18	13	74	20	35	15	14	84	231		
	Total number of species	4	5	9	19	28	13	12	10	9	28	10	12	11	5	25	55		
	Total number of genera	2	S	2	6	10	8	3	5	4	12	6	7	6	3	11	19		
C	Mycellia sterile															-			
1	Mycellia striala (white)	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2	8.33	072
2	Mycellia stnala(ash)	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	2	16.7	0.72
	Total number of colonies	0	1	0	1	2	2	0	0	0	2	0	0	0	0	0	4		
	Total number of species	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	2		
	Total number of genera	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	1		
	Number of colonies	21	18	20	28	87	23	29	23	21	96	21	38	18	18	95	278		
GRAND TOTAL	Number of species	4	8	12	23	33	15	13	13	12	34	11	14	13	9	32	69		
	Number of genera	2	8	5	10	15	10	4	8	6	17	7	9	8	7	18	31		

contribution, Zygomycotina with 3.60% and finally by Mycelia sterilia with 1.44% contribution (Tables, (3, 4). The studies of group wise and season wise percentage contribution of the fungal colony to the total water mycoflora (yearly) revealed that, maximum 34.53% contributions were recorded in rainy season (Zygomycotina to the total mycoflora were 1.08%, Ascomycotina were 6.12%, Anamorphic group of fungi were 26.62% and Mycelia sterilia were 0.72%), 34.17% contribution to the total count of mycoflora were recorded in winter season (Zygomycotina to the total mycoflora were 2.16%, Ascomycotina were 1.80% and Anamorphic group of fungi were 30.22%) and minimum 31.29% contribution (Zygomycotina were 0.36%, Ascomycotina were 3.96%, Anamorphic fungi were 26.26% and Mycelia sterilia are 0.72 %) were recorded in summer season (Table 2).

Table 2: Showing class wise, season wise percentage contribution to the total (yearly)-mycoflora of Budha Talab ponds water

Name of Fungal Species	Summer Season			Rainy Season			Winter Season			Yearly	
	Colony	% Contribution	% Contribution	Colony	% Contribution	% Contribution	Colony	% Contribution	% Contribution	Colony	% Contribution
Zygomycotina	1	1.15	0.36	3	3.13	1.08	6	6.32	2.16	10	3.6
Ascomycotina	11	12.64	3.96	17	17.71	6.12	5	5.26	1.8	33	11,87
Anamorphic	73	83.91	26.26	74	77.08	26.62	84	88.42	30.22	231	83.09
Mycellia sterile	2	2.3	0.72	2	2.08	0.72	0	0	0	4	1.44
TOTAL	87	100	31.29	96	100	34.53	95	100	34.17	278	100

The percentage contribution of Zygomycotina to the total water mycoflora found in summer season were 1.15%, Ascomycotina were 12.64%, Anamorphic fungi were 83.91% and Mycelia sterilia were 2.30% (Table 2;). During rainy season the percentage contribution of Zygomycotina to the total water mycoflora were 3.13%, Ascomycotina were 17.71%, Anamorphic fungi were 77.08% and Mycelia sterilia were 2.08% (Table 2;). In winter season the percentage contribution of Zygomycotina to the total water mycoflora were 6.32%, Ascomycotina were 5.26%, Anamorphic fungi were 88.42% and Mycelia sterilia were absent (Table-2).

The month wise percentage contribution of each fungal group to the total (monthly) water mycoflora was also observed (Table 3) and the maximum percentage contribution always shown by Anamorphic group of fungi, throughout year. In the month of March 100% percentage contribution observed for Anamorphic fungi group (Table 3) In the month of April, maximum percentage contribution observed for the group Anamorphic fungi (77.78%), which was followed by Ascomycotina (16.67%) and Mycelia sterilia with (5.56%) percentage contribution (Table 3). In the month of May, maximum percentage contribution observed for the group Anamorphic fungi (75%), followed by Ascomycotina (20%) and Zygomycotina (05%; Table 3). In the June and July month maximum percentage contribution were observed for the Anamorphic fungi (82.14% and 82.61%), which were followed by Ascomycotina (14.29% and 8.69%) and minimum (3.57% and 8.70%) for Mycelia sterilia group of fungi respectively (Table 3). Where as in the month of August, September, October, November and January percentage contribution observed for Anamorphic group of fungi (82.76%, 78.26%, 82.76%, 95.24% and 83.33%) and Ascomycotina (17.24%, 21.74%, 17.24%, 4.76% and 16.67%) group of fungi respectively (Table 3). In the month of December maximum percentage contribution observed for the group Anamorphic fungi (92.11%), which was followed by Zygomycotina (5.26%) and minimum for Ascomycotina (2.63%) group of fungi (Table 3). In the month of February maximum 77.78% contribution observed for the group Anamorphic fungi and minimum 22.22% for Zygomycotina group of fungi (Table 3).

Year wise percentage contribution of each fungal group to the total (yearly) water mycoflora was also observed. The results also revealed that, the maximum percentage contribution always shown by Anamorphic group of fungi, throughout year (Table 4).

Table 3: Showing monthly, seasonal and classwise percentage contribution of each fungal group to the total water mycoflora of Budha Talab (Monthly & Seasonal)

Name of Fungal Group	Summer Season					Rainy Season					Winter Season					
	March	April	May	June	Summer Season	July	Aug	Sep.	Oct.	Rainy Season	Nov.	Dec.	Jan.	Feb.	Winter Season Total	Grand
Zygomycotina	0	0	5	0	1.15	0	0	0	0	3.13	0	5.26	0	22.22	6.32	3.6
Ascomycotina	0	16.67	20	14.29	12.64	8.9	17.24	21.74	17.24	17.71	4.76	2.63	16.67	0	5.26	11.87
Anamorphic 100	77.78	75	82.14	83.91	82.61	82.76	78.26	82.76	77.08	95.24	92.11	83.33	77.78	88.42	83.09	
Mycellia sterile	0	5.56	0	3.57	2.3	8.7	0	0	0	2.08	0	0	0	0	0	1.44
TOTAL 100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	

Table 4: Showing monthly and groupwise percentage contribution of each fungal group to the total (yearly) water mycoflora of Budha Talab

Name of Fungal Group	Summer Season				Rainy Season				Winter Season				Grand
	March	April	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb. Total	
Zygomypotina	0	0	0.36	0	0	0	0	1.08	0	0.72	0	1.44	3.6
Ascomycotina	0	1.08	1.44	1.44	0.72	1.8	1.8	1.8	0.36	0.36	1.08	0	11.87
Anamorphic	7.55	5.04	5.4	8.27	6.83	8.63	6.47	4.68	7.19	12.59	5.4	5.04	83.09
Mycellia sterile	0	0.36	0	0.36	0.72	0	0	0	O	0	0	0	1.44
TOTAL	7.55	6.47	7.19	10.07	28.27	10.43	8.27	7.55	7.55	13.67	6.47	6.47	100

DISCUSSION

The fungi isolated from ponds were mainly sporoforms. These organisms are of terrestrial origin because they are common in edaphic environment (Kevin, 1998). Sparrow (1960) assured that these are likely to originate from air or washed with rainwater and finally reach into water. Precipitation runoff in the recharge zone should therefore be expected to play a critical role in the transport of fungal species into pond water (Pace, 1991).

Wherever adequate moisture, temperature, and organic substrates are available, fungi are present (El-Hissy and El-Nagdy, 1982). During study it was found that, the biggest toll group Anamorphic fungi as a whole dominated the entire water mycoflora and were present throughout year and this is also in agreement with previous study (Hyde and Jones, 2002). Fungi belonging to Zygomycotina group were absent in the month of March, April, June to September,November and January, whereas the fungi belonging to Ascomycotina were absent only in March and February months.

Out of 69 fungal species which is isolated during study, the broadest spectrum of species are shown by *Aspergillm* (20 species), *Penicillium* (6 species) and *Fusarium* (5 species). *Aspergillus m'ger, A. fumigatus, A. flaws, A. versicolor, Neoarachnotheca keratinophila and Cladosporium sphaerospermum,* are commonest species, showing maximum percentage frequency and contribution. These species were fairly common in Nile water (El-Hissy and El-Nagdy, 1982; Badran, 1986), waste waters stabilization pond (Hiremath *et al,* 1985) and in swimming pools also (Giorgio *et al.*, 2007). This is in agreement with the result of Arvanitidou *et al.* (1999 and 2000) and Ruby Grover *et al.* (2007) that *Aspergillus* is one of the more commonly isolated genera in water. Laila (2005) also found that the genera *Aspergillus* (9 species out of 45 species, 166 colonies out of 400 fungal total counts) and *Penicillium* (7 species, 68 colonies) had the greatest diversity of the isolated species, as well as they showed the highest fungal total count. Cubbon (1976) also found that species of *Aspergillus* and *Penicillium* are extremely ubiquitous in cavernous environments, and appear to colonize all types of organic debris. Nair (1972) and Chile (1993) also reported that *Aspergillus* and *Cladosporium* are two universal biopollutants and *A. fumigatus, A. niger, A. flavus* and *A. terreus* are common allergens. *Aspergillus* species have high ecological aptitude and are adapted better to greater fluctuation of their environment. Their spores are commonly found in air, water, soil, plant debris, rotten vegetation, manure, sawdust litter, bagasse litter, animal feed, on animals and indoor air environment and are thermotolerant (Deryck, 2006). *Aspergillus fumigatus* has adapted to survive and grow under a broad range of environmental conditions contributing to ubiquity of the species and it has an ability to grow at temperatures up to 52-55°C (Yun *et al.,* 2004). Environmental conditions such as low temperature and high humidity are favourable for *C. cladosporoides and Penicillium* growth and they have ability to produce large number of spore (Kwon *et al.,* 2003).

Despite the fact that fungi are the most diverse groups of living organisms on earth but very little knowledge is available about these organisms (Hawksworth, 1997; Rossman *et al.,*1997). This is also true for Chhattisgarh. Knowledge about the fungal community of an ecosystem is an important asset; they help in the recycling of nutrients as the primary decomposers of litter in many ecosystems (Hawksworth, 1997).

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