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SEASONAL MYCOLOGICAL ASSESSMENT FOR WATER QUALITY OF VARANASI CITY

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ABSTRACT

Seasonal variation and distribution of fungi from six different sites of water were studied for a period of one year employing baiting method and plating technique. A marked variation in mycoflora of the river has been found. Many species of aquatic fungi were obtained by baiting boiled seeds of *Cannabis sativa* and *Zea mays*. Extra-aquatic fungi were isolated by plating organic detritus on PDA+strepto-penicillin medium. Temperature and concentration of pollutant showed a marked effect on the fungal population. The drain water consists of domestic sewage also increases the fungal population. Low temperature during the winter reduces the number of fungi. Higher numbers of fungi were recorded during the spring season. The present data shows that the common fungi isolated are the species of *Achalya, Pythium, Rhizopus, Mucor, Trichoderma, Aspergillus, Penicillum, Alternaria, Cladosporium, Curvularia, Fusarium, Sclerotium and Gliocladium.Alternaria alternate, Aspergillusflavus, A. fumigatus, A. niger, Penicillium chrysogenum,* white sterile mycelia have found in higher percentage thought the year.

KEYWORDS: Water quality, Varanasi city, Fungal isolates

Fungi areubiquous in nature. They occur under different environmental conditions including in water bodies, domestic waste and sewage. Khulbe R.D. et al. (1993) isolated 35 species belonging to 19 genera of fungi from lake and drain waters. The drain water consists of domestic waste and sewage which enhance the fungal population. Temperature and concentration of pollutants showed marked effect on the fungal population. Moderate temperature during spring season favours good number of fungal species. Low temperature during winter season reduced the fungal species qualitatively as well as quantitatively. In aquatic ecosystem, the presence of extraneous organic and inorganic materials leads to significant changes in the biological components. The association of fungi is common with the plant tissues because of rich cellulose and lignin components.It is believed that extra-aquatic non-motile fungi act as the chief decomposers. These fungi come to the system along with decaying twigs and leaves and finally become a part of the sediment.A very wide and diverse type of fungi was encountered in water and floating materials which included aquatic and extra aquatic geofungi. Most of the fungi were found to be associated with floating leaves, twigs and other organic fragments. Majority of them were obtained from the surface of water which reflects their aerobic nature.Some species like *Geotrichum candidum*, *Mucor* sp. and *Penecillium chysogenum* were observed frequently and their higher number in drain water, showed their wide range of tolerance for pollution load.The importance of mycological studies of aquatic habitats has been emphasized by Sparrow (1968) and Park (1972). There are a few reports of aquatic fungi from different countries (Lund. 1934; Perrott 1960;Hughus, 1962; Alabi, 1971). Such studies received less attention from Indian workers (Dayal and Tandon, 1962, 1963; Dayal and Takar, 1966; Srivastava, 1967; Mohoharachary, 1981; Das Gupta, 1982; Venkatesha, R. et al. 1993) studied the phenology, seasonal distribution of fungi and bacteria, periodicity, influence of physico-chemical factors and their inter-relationships on aquatic phycomycetes and extra-aquatic fungi in two fresh water tanks of Mysore, Karnataka, India.

Basu G.N. et al. (1993) analyses the physico-chemical complexes of two polluted pond waters of Karimnagar District, Andhra Pradesh, India, in relation to bacteria, actinomycetes and fungi. Seasonal variation and distribution of fungi from two freshwater ponds were studied for a period of one year employing 'sector analysis' method, baiting and plating techniques (Manoharachary C. et al., 1981). A marked seasonal variationin mycoflora of the two pond waters has been found. Extra-aquatic fungi were isolated by plating organic detritus on PDA + strepto-pencillin medium.

Cooke (1976) has made some observations on the domestic sewage fungi. Church et al. (1972) noted the importance of Fungi imperfecti in

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treating food processing wastes. Cooke (1968) published a guide on the sewage and polluted water fungi. The other studies mainly focused on the biology, activity and ecology of these fungi in polluted waters, sewage and fresh water bodies (Gareth Jones, 1976; Hawkes, 1963;MadhusudanRao and Manoharachary, 1981).Extra-aquatic fungi are geo-fungi without any special device for dissemination, capable of searching out special food supply or without any special structures to aid in anchoring and resist the movement of water. These fungi reproduce possibly in aquatic environment and grow on solid organic matter in suspension or settling onto the bottom. The growth and survival of the extra-aquatic fungi mostly depend on their ability to adjust to the aquatic environment. The substrate activity, nutrition and site relationships are the important areas for the study and understanding the habitat relationship (Park, 1972).Domestic sewage also forms a special aquatic habitat with its own physico-chemical properties as it contains large quantities of organic and inorganic nutrients. Cooke(1954a

,b) made extensive studies on the fungi of sewage and polluted waters in USA. Similar studies were also made in other countries such as Canada (Stjerna-Pooth, 1957; Fjerdiustad, 1964, 1965, 1971) and Japan (Suzceki, 1970a, b; 1961a, b; Suzceki and Nimura, 1961). Only a few (Holtje, 1943; Cooke, 1961, 1970) have isolated a large number of different kinds of filamentous geofungi and yeast from polluted waters and sewage treatment systems.

MATERIALS AND METHODS

Water samples were collected in sterilized bottles and transported to the laboratory in ice once in each months of the year from all the six selected sites namely SamneGhat (Ganga I), AssiGhat (GangaII), Well water, Cemented tank, Hand Pump and Tap water. Fungi were isolated from different water sample by dilution plate technique (Johnson and Curl, 1972) at monthly interval (from July, 1999 to June 2000). Water sample was collected in sterilized bottle from different experimental sites. Ten ml water was taken out by sterilized pipette and was transferred into 250 ml Erlenmeyer flask containing 90 ml sterilized distilled water. Ten ml suspension was again transferred successively in 90 ml sterilized distilled water until the desired final dilution (10^7) was obtained. One ml of 10^3 and 10^4 dilutions for fungi were inoculated separately into each of 3 replicate petridishes (90 mm diameter). Twenty ml sterilized and cooled modified Martins medium were poured separately into each inoculated Petri dish for the isolation of fungi. The Petri dishes were rotated clockwise and anticlockwise to get a homogenous distribution of the suspensions into the medium. The Petri dishes were incubated at 25 ± 2^0C for fungi. The qualitative and quantitative estimation of fungi flora was observed after 7 days of incubation. The identification of fungi was done with the help of standard manuals (Thom &Raper, 1945 J.C. Gilman, 1967, Bilgrami et al., 1981, Ellis, 1976). Potato dextrose agar medium and Czapek'sdox agar medium are also used for culturing different fungi.

The number of microflora was calculated by the following formula :

$$\text{Average number of microorganisms/ml} = \frac{\text{Average number of colonies appeared in culture plate (average of three replicates)} \times \text{Dilution factor}}{\text{ml of water}}$$

$$\% \text{ frequency} = \frac{\text{Number of replicate in which species occurred}}{\text{Total no. of replicate studied}} \times 100$$

$$\% \text{ occurrence} = \frac{\text{Average no. of total colonies of a species per plate}}{\text{Average number of total colonies of all the species for plate}} \times 100$$

RESULTS

Several forms of fungal and their variability have been studied in relation to the pollution of the water bodies. Monthly per cent occurrence of the fungal species is given in Table 1-6Presence in one collection is considered as one occurrence of the fungus. A greater member of fungal species was recorded in July and Aug at site I and II, in Aug and April at site III, in Sept and April at site IV, in April & Feb at site V and in April and May at site V. A lower number of fungal species was recorded in May and June at site I, II, in Jun and Dec at site III, and IV and in Jan. July, Aug at site V and VI.

The common species recorded from I, II, III and IV the sites *Alternaria alternate Aspergillus flavus, A. fumigates, A. luchuensis A.* niger, *A.* nidulans, *A.* sulphurus, *Cladosporium cladosperioides, Curvularia lunata, Fusarium oxysporum f.*sp.*ciceri, F.oxysporum f.*sp.*lini,* Green sterile mycelium,*Penicillium* sp.*, P. rugilosum,*

P.citrinum, P. frequentans, Trichoderm aharzianum and White sterile mycelium.The common species recorded from site V and VI were *Alternaria alternata, Aspergillus flavus, A. fumigatus, A. luchuensis, A. niger* and *A. terreus*.
The fungi which were of rare occurrence at site I, II, III and IV include *Aspergillus tenuissima, A. candidus, Black sterile mycelia, Gliockadidum roseum, G. sargariensis, Penecillium purpurogenum, P. rugolosum and P. granulotum.*
The fungi which were of rare occurrence at site V and VI were *Penicillium chrysogenum,P.citrinum* and*Aspergillius nidulance.*

DISCUSSION

The present study showed that monthly variations of the fungal population were fluctuated at different sites. Microbial population is considerably influenced by the environmental factors. The reason for decrease in number of general water fungal population in summer may be due to increase in temperature and subsequently reduction in moisture content of the atmosphere. Increase in fungal population after rainfall (Jun.-Sep.) could occur due to high moisture and moderate temperature. In temperate countries spring and autumn are found to be favourable seasons for water molds (Perrott, 1960;). However in tropical and sub tropical countries like India, maximum number of fungi have been observed either monsoon or winter (Dayal and Tondon 1962, 1963; Srivastava 1967, Misra 1982, 1983, Manohrachary and Ramarao 1981, Khulbe and Durgapal 1993) and the least during summer. Bilgrami (1990) also reported a large number of fungal species from surface water characterized by higher dissolved oxygen. Similar results have been obtained in the present study also at site I, II and III but no clear seasonal fluctuation was observed for site IV, V and IV. This may be because the site IV, V and VI are not in direct contact of rainfall. The monsoon peaks are probably due to the availability of more oxygenated water, high rainfall and surface run-off along with the nutrients. The fall in fungal species during summer could be attributed to high water temperatures and low nutrient status. The fungi listed in the table1-6 are the common saprophytes of soil and air habitats. These might have arrived as immigrants from the surrounding of non-aquatic habitats. (Park 1972, MadhusudhanRao and Manoharachary, 1981) have also drawn similar conclusions.

Table 1: Per cent occurrence of mycoflora isolated from Ganga water (Site I) (2011-2012)

Name of species	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Alternaria alternata	0.0	0.0	0.0	0.0	0.0	9.0	10.0	8.0	9.0	0.0	0.0	0.0
A. tenuissima	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0
Aspergillus candidus	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
A. flavus	9.0	10.0	6.0	8.0	9.0	4.0	0.0	6.0	10.0	14.0	12.0	0.0
A. fumigatus	30	12.0	5.0	0.0	0.0	6.0	0.0	8.0	6.0	5.0	0.0	0.0
A. luchensis	3.0	2.0	3.0	0.0	9.0	0.0	5.0	6.0	0.0	8.0	0.0	0.0
A. nidulans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	10.0	16.0

A. niger	20.0	16.0	11.0	6.0	9.0	0.0	6.0	0.0	0.0	4.0	3.0	0.0
A. sulphureus	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	9.0	13.0
A. terrus	7.0	12.0	19.0	20.0	9.0	12.0	6.0	18.0	20.0	17.0	20.0	42.0
Black sterils mycelia	0.0	0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cladosporium cladosporioides	0.0	3.0	11.0	6.0	6.0	5.0	0.0	6.0	0.0	10.0	8.0	8.0
Curvularia lunata	0.0	2.0	0.0	0.0	0.0	4.0	10.0	6.0	6.0	4.0	0.0	10.0
Fusarium oxysporum f. sp *ciceri*	3.0	6.0	5.0	0.0	9.0	5.0	0.0	6.0	14.0	18.0	12.0	0.0
F. oxysporum f. sp. *lini*	0.0	7.0	4.0	0.0	0.0	4.0	5.0	3.6	10.0	4.0	3.0	0.0
Gliocladiumroseum	0.0	0.0	0.0	0.0	15.0	5.0	5.0	0.0	5.0	0.0	0.0	0.0
Green steril mycelium	0.0	2.0	2.0	0.0	6.0	6.0	5.0	0.0	0.0	0.0	0.0	0.0
Penicillium chrysogenum	3.0	7.0	5.2	5.0	9.0	18.0	6.0	0.0	0.0	0.0	0.0	0.0
P. citrinum	3.0	7.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0
P. frequentans	7.0	4.0	5.0	6.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0
P. purpurogenum	0.0	0.0	5.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. rugulosum	3.0	6.0	4.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Penicillium sp.	0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trichoderm aharzianum	3.0	7.0	4.0	6.0	9.0	6.0	11.0	7.0	0.0	0.0	0.0	0.0
White sterile mycelium	9.0	0.0	10.0	13.0	9.0	12.0	20.0	13.0	7.0	8.0	20.0	12.0

Table 2 :Per cent occurrence of mycoflora isolated from Ganga water (Site II) (2011-2012)

Name of species	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.
Alternaria tenuissima	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.0	31.0	16.0	16.0	0.0
Aspergillus flavus	6.0	0.0	40.0	0.0	0.0	20.0	0.0	17.0	20.0	20.0	18.0	0.0
A. fumigatus	40.0	20.0	16.0	13.0	0.0	39.0	8.0	8.0	0.0	6.0	0.0	15.0
A. luchensis	6.0	11.0	10.0	11.0	0.0	16.00	0.0	0.0	5.0	10.0	13.0	15.0
A. nidulans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	10.0	16.0
A. niger	6.0	16.0	10.0	22.0	0.0	0.0	8.0	9.0	0.0	7.0	0.0	0.0
A. terrus	8.0	13.0	21.0	23.0	9.0	11.0	7.0	18.0	23.0	21.0	23.0	45.0
Cladosporium cladosporioides	0.0	4.0	13.0	7.0	9.0	6.0	0.0	6.0	0.0	14.0	9.0	0.0
Curvularialunata	0.0	5.0	0.0	0.0	0.0	6.0	14.0	6.0	8.0	5.0	0.0	12.0
Fusarium oxysporum f. sp ciceri	3.0	9.0	8.0	0.0	9.0	6.0	0.0	6.0	16.0	19.0	9.0	0.0
F. oxysporum f. sp. lini	0.0	9.0	9.0	0.0	0.0	7.0	14.0	6.0	16.0	14.0	9.0	0.0
Gliocladium roseum	0.0	0.0	0.0	5.0	15.0	6.0	8.0	0.0	8.0	0.0	0.0	0.0
Green steril mycelium	0.0	4.0	3.0	7.0	8.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Penicillium chrysogenum	5.0	8.0	7.0	8.0	9.0	20.0	7.0	0.0	0.0	0.0	0.0	0.0
P. citrinum	3.0	8.0	0.0	0.0	0.0	2.0	6.0	0.0	7.0	5.0	0.0	0.0
P. frequentans	8.0	4.0	7.0	7.0	6.0	0.0	0.0	7.0	0.0	6.0	0.0	0.0
P. purpurogenum	2.0	0.0	7.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. rugulosum	3.0	8.0	7.0	8.0	0.0	0.0	4.0	6.0	0.0	0.0	0.0	0.0
Penicillium sp.	0.0	6.0	7.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trichodermaharzianum	5.0	9.0	6.0	7.0	8.0	5.0	14.0	6.0	2.0	0.0	0.0	0.0
White sterile mycelium	4.0	0.0	3.0	10.0	5.0	8.0	19.0	9.0	5.0	2.0	16.0	8.0

Table 3 :Per cent occurrence of mycoflora isolated from well water (Site III) (2011-2012)

Name of species	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.
Alternaria tenuissima	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0	40.0	0.0	19.0	0.0
Aspergillus flavus	7.0	11.0	49.0	0.0	0.0	0.0	20.0	24.0	20.0	19.0	20.0	0.0
A fumigatus	53.0	24.0	0.0	10.0	0.0	44.0	5.0	7.0	0.0	7.0	0.0	14.0
A. luchensis	9.0	16.0	9.0	10.0	0.0	18.0	0.0	0.0	6.0	9.0	20.0	34.0
A. nidulans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	17.0
A. niger	14.0	15.0	9.0	19.0	0.0	0.0	5.0	9.0	0.0	7.0	0.0	0.0
A. terrus	0.0	0.0	0.0	0.0	0.0	0.0	41.0	19.0	0.0	5.0	0.0	0.0
Black strile mycelium	0.0	0.0	0.0	0.0	0.0	18.0	14.0	0.0	0.0	0.0	0.0	0.0

Cladosporiumcladosporioides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	14.0	19.0	20.0	0.0
Curvularia lunata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	15.0	5.0	14.0
Gliocladium sagariensis	0.0	0.0	0.0	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Green sterile mycelium	11.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Penicilliumchrysogenum	7.0	9.0	9.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. citrinum	0.0	8.0	0.0	0.0	0.0	0.0	16.0	13.0	0.0	0.0	0.0	0.0
P. purpurogenum	0.0	0.0	0.0	10.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. granulatum	0.0	0.0	15.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trichoderm aharzianum	0.0	8.0	8.0	40.0	25.0	0.0	0.0	0.0	6.0	5.0	0.0	0.0
White sterile mycelium	0.0	0.0	0.0	0.0	9.0	18.0	0.0	0.0	9.	7.0	8.0	20.0

Table 4: Per cent occurrence of mycoflora isolated from Tank water (Site IV) (2011-2012)

Name of species	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**
Alternaria tenuissima	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	45.0	11.0	9.0	0.0
Aspergillus flavus	12.0	16.0	20.0	0.0	0.0	0.0	11.0	22.0	20.0	19.0	21.0	0.0
A fumigatus	62.0	29.0	20.0	25.0	24.0	40.0	11.0	19.0	0.0	0.0	15.0	15.0
A. luchensis	4.0	6.0	8.40	0.0	0.0	0.0	0.0	7.0	9.0	5.0	6.0	30.0
A. nidulans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	9.0	12.0
A. niger	15.0	24.0	0.0	25.0	24.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
A. terrus	0.0	0.0	8.0	0.0	0.0	0.0	60.0	19.0	0.0	14.0	0.0	0.0
Black strile mycelium	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	13.0	0.0	0.0	12.0
Cladosporiumcladosporioides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.0	24.0	24.0	0.0
Curvularia lunata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	8.0	9.0	0.0
Gliocladium sagariensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0
Green sterile mycelium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0
Penicillium chrysogenum	8.0	16.0	17.0	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. citrinum	0.0	8.0	8.0	12.0	14.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0
P. purpurogenum	0.0	0.0	0.0	11.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. granulatum	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White sterile mycelium	0.0	0.0	10.0	0.0	24.0	20.0	0.0	11.0	0.0	11.0	12.0	15.0

Table 5: Per cent occurrence of mycofloraisolated from Hand Pump water (Site V) (2011-2012)

Name of species	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**
Alternaria alternata	0.0	0.0	0.0	0.0	25.0	50.0	0.0	16.0	43.0	29.0	20.0	0.0
Aspergillus flavus	0.0	0.0	0.0	67.0	0.0	25.0	0.0	16.0	14.0	14.0	20.0	20.0
A fumigatus	50.0	67.0	0.0	0.0	0.0	0.0	0.0	17.0	14.0	14.0	20.0	0.0
A. luchensis	0.0	33.0	40.0	0.0	0.0	0.0	0.0	17.0	0.0	0.0	20.0	20.0

A. nidulans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
A. niger	50.0	0.0	20.0	0.0	0.0	0.0	0.0	17.0	0.0	29.0	20.0	40.0
A. terrus	0.0	0.0	0.0	0.0	0.0	25.0	50.0	0.0	0.0	14.0	0.0	0.0
Penicilliumchrysogenum	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P. citrinum	0.0	0.0	20.0	0.0	25.0	0.0	50.0	0.0	14.0	0.0	0.0	0.0
P. frequentans	0.0	0.0	0.0	33.0	50.0	0.0	0.0	17.0	0.0	14.0	0.0	20.0

Table – 6 Per cent occurrence of mycofloraisolated from Tap water (Site VI) (2011-2012)

Name of species	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**
Alternaria alternata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0	20.0	25.0	50.0
Aspergillusflavus	0.0	0.0	34.0	0.0	0.0	0.0	0.0	34.0	25.0	0.0	0.0	0.0
A. fumigatus	67.0	50.0	33.0	0.0	50.0	50.0	50.0	33.0	0.0	0.0	0.0	0.0
A. luchensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0
A. niger	0.0	25.0	33.0	33.0	50.0	50.0	0.0	0.0	50.0	0.0	25.0	0.0
A. terrus	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	25.0	0.0
Penicillium chrysogenum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	25.0	0.0
P. citrinum	0.0	0.0	0.0	33.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White sterile mycelium	33.0	0.0	0.0	34.0	0.0	0.0	50.0	33.0	0.0	40.0	0.0	0.0

CONCLUSION

The presence of all these fungi can be traced back and connected to the availability of solid organic matter in suspension and also in the form of dissolved nutrients. Thus, the germinated conidia utilize the above nutrients, grow slowly and produce a typical conidia. The extra-aquatic fungi isolated in the present study may have sporadic activity as decomposers. It is also observed that these fungi have the potential to adopt themselves to the polluted environment. The present data further strengthens the above observation. *Aspergillus*was present at all the selected sites.

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