

Isolation of fungi from the surface water of river

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Abstract

Water bodies play an important role in the stabilization of any civilization. India is facing a turbulent water future, as its major water source rainfall fluctuates widely, seasonally as well as regionally. Water body provides a large amount of easily accessible fresh water which is important for the stable commodity for any population. Raipur city is capital of Chhattisgarh state, situated in the fertile plains of Mahanadi River. For the study of fungal community present in river water, we have collected fungi from water, to understand the overall diversity among different taxonomic groups of fungi present, as well as their occurrence, frequency and contribution of the fungal species in the river. The quantitative and qualitative fungal composition of river water was surveyed monthly for a year i.e. March 2009 to February 2010. A variety of fungal strains was isolated and identified from the water of river. Out of a total 389 fungal colonies, 31 fungal species belongs to 20 fungal genera were isolated. *Aspergillus niger* was most frequent species with (83.33%), *Rhizopus* sp. (75%) followed by *A. flavus* and *A. fumigatus* with (58.33)% frequency. It was also found that maximum percentage contribution was observed for *Aspergillus fumigatus* (15.16%), which was followed by *Aspergillus niger* with a (09.51%) contribution.

Keywords: Ecological study, percentage frequency, river

INTRODUCTION

Water body provides a large amount of easily accessible fresh water which is important for the stable commodity for any population. Even today in Chhattisgarh as well as in Raipur, river make an easy source for irrigation, domestic uses and sometime for drinking purpose also. Water fungi play a crucial role in the freshwater ecosystem in nutrient cycling by breaking down leaves and woody substrates and also as symbionts (Bärlocher and Kendrick, 1981). Ecology deals with the various principles which govern relationships between organisms and their environment. 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 selecting organisms for growth from so many forms, as its one or the other factor becomes critical at critical stages of the life cycle of the species. All the fungal species present in an area constitute the fungal community of that area. For the study of fungal community present in pond water, we have collected fungi from water, to understand the overall diversity among different taxonomic groups of fungi present, as well as their occurrence, frequency and contribution of the fungal species in pond water of Raipur city.

MATERIALS AND METHODS

A surface water sample was aseptically collected from one to two meters away from the bank, in pre sterilized bottle from different

parts of river; in this manner that the collected water represents the entire water body. The water samples are collected twice a month at fortnightly intervals for the isolations of fungi. During present study Potato dextrose agar (PDA) media has been adopted for isolation of pond Water fungi for one year March 2009 to February 2010. At the end of the incubation period the percentage frequency and percentage contribution of the fungal flora was calculated (Hogg B. and Hudson, 1966).

RESULTS AND DISCUSSION

Out of a total 389 fungal colonies, 31 fungal species belongs to 20 fungal genera were isolated. *Aspergillus niger* was most frequent species with (83.33%), *Rhizopus* sp. (75%) followed by *A. flavus* and *A. fumigatus* with (58.33)% frequency. It was also found that maximum percentage contribution was observed for *Aspergillus fumigatus* (15.16%), which was followed by *Aspergillus niger* with a (09.51%) contribution (Fig. 2).

Fungal species recorded were representatives of the three major groups i.e. Zygomycotina, Anamorphic fungi and Mycelia sterile. It was also observed that the anamorphic group was dominated fungal group. The fungal species *Cladosporium oxysporum*, *Fusarium* Mycelia sterilia *Aspergillus*, *Penicillium*, *Curvularia*, *Cladosporium*, *Rhizopus*, *Trichoderma* were observed during the investigation period. It is found that maximum percentage contribution is observed for *A. Fumigates*, followed by *A niger*. On the contrary, minimum percentage contribution (0.25) is observed for *Aspergillus terreus* (Fig. 1).

During study it was found that, the biggest toll group Anamorphic fungi, as a whole, dominated the entire water mycoflora and present throughout year. Out of 31 fungal species which is isolated during study, the broadest spectrum of species are shown by *Aspergillus*, *Penicillium* and *Fusarium*. *Aspergillus niger*, *A.*

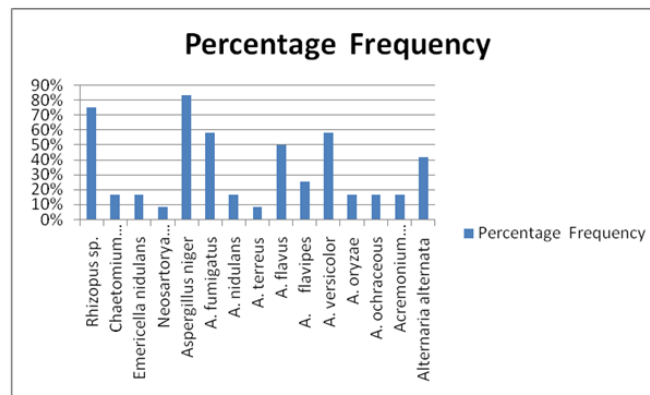
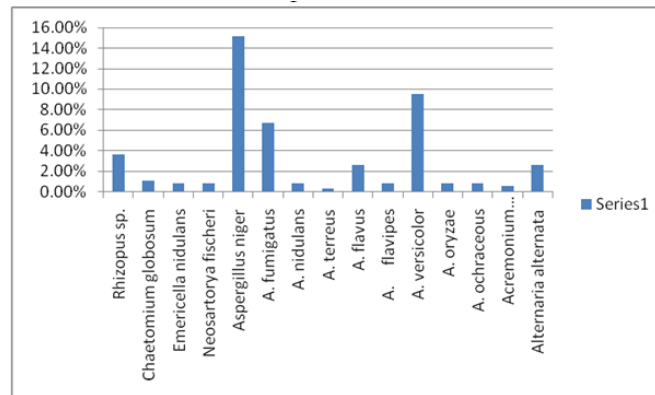
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fumigatus, *A. flavus*, *A. versicolor*, and *Cladosporium sphaerospermum*, are commonest species, show maximum percentage frequency and contribution. *Aspergillus* is one of the more commonly isolated genera in water (Arvanitidou et al 2000, Sharma & Shaista 2011 and Giorgio Brandi et al 2007). Laila A. Nasser (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 the highest fungal total count. In his

study Ruby Grover *et al.* (2007) also found that, *Aspergillus* has been found to be most speciose genera represented by seven species. As we know fungi are among the most diverse groups of living organisms on earth, though inadequately studied worldwide (Grover et al 2007). This is also true for Chhattisgarh. Because the complete surveys of fungal diversity at the species level, even for a small geographic region, can be an exhaustive task. It is well known fact that due to annihilation of our natural areas is leading to an ever-increasing decline in biodiversity worldwide.



Isolated fungal flora

REFERENCES

- Arvanitidou M., S. Spaia, A. Velegraki, M. Pezaroglou, D. Kanetidis, P. Pangidis, N. Askepidis, C. Katsinas, G. Vayonas, and V. Katsouyannopoulos, High level of recovery of fungi from water and dialysate in haemodialysis units, *Journal of Hospital Infection*, 45:225-230, (2000)
- Bärlocher F. and Kendrick B., Role of aquatic hyphomycetes in the trophic structure of streams, In: Wicklow DT, Carroll GC, eds. The fungal community: its organization and role in the ecosystem, New York: Marcel Dekker. Pp. 743-760, (1981)
- Hogg B. and Hudson H.J., Microfungi of the leaves of *Fagus sylvatica* The microfungal succession, *Transactions of the British Mycological Society*, 49: 185-192, (1966)
- Giorgio Brandi, Maurizio Sisti, Andrea Paparini, Gianluca Gianfranceschi, Giuditta F. Schiavano, Mauro De Santi, Daniele Santoni, Valter Magini, Vincenzo Romano-Spica, Swimming pools and fungi: An environmental epidemiology survey in Italian indoor swimming facilities, *International Journal of Environmental Health Research*, Vol-17, Issue-3, June 2007, pages 197 -206, (2007)
- Laila A. Nasser., Occurrence of Terrestrial Fungi in Accumulated Rainfall Water in Saudi Arabia, J. King Saud Univ., *The Journal of Agricultural Science* (1), Vol. 18, pp. 63-72, Riyadh, (2005)
- Ruby Grover, Sharma K.P., Kumar P. and Kumar S., Response of fungal community in the unpolluted and polluted (textile and distillery wastes) habitats, *Journal of Environmental Science and Engineering*, 49(2): 93-8 (2007).
- Sharma P.D., Ecology and environment, Rastogi publications, Meerut, 7th edition, (2004).
- Sharma K, Shaista Parveen Ecological Study of Fungi Isolated from the Surface Water of Dudhawa Dam Dhamtari, Chhattisgarh, India. *Journal of Phytology* 2011, 3(4): 06-08 (2011)