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DIVERSITY OF AQUATIC FUNGI IN DIFFERENT PONDS OF RAIPUR, CHHATTISGARH, INDIA

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Abstract

Eight aquatic fungi were identified in water samples collected from different ponds of Raipur city during the period November 2013 to October 2014. The physicochemical characteristics of the collected water samples were also taken. The fungal population showed marked vertical variations during the period of study. The study gives important information about how moulds are distributed in the water, which will be important to consider in management of water contamination problems.

Keywords

Aquatic Fungi, Raipur, Water Contamination, Physicochemical Characteristics

1. Introduction

Zoosporic fungi from different water habitats have been studied in many parts of the world by numerous researchers ((Manoharachary 1991, Kirk et al. 2001, and Aniseed et al. 2003). Aquatic fungi contribute significantly in aquatic ecosystem. The aquatic fungi play a key role in the decomposition of leaf litter in aquatic environments (Barlocher 1992). The members of Chytridiomycetes and Oomycetes are mostly aquatic and commonly known as water molds. The water molds are primarily saprophytic in nature. Generally, low to moderate nutrient

concentrations stimulate fungal activity (Gulis et al., 2006). The present work aims to study the occurrence of aquatic fungi in different ponds of Raipur city.

2. Materials and Methods

The aim of this work was to study the presence of aquatic fungi in the samples of pond water which was collected from few ponds of Raipur, Chhattisgarh. For the present investigation four ponds has been chosen. Initially, physic-chemical characteristics of pond water was studied, water samples were collected from each of the identified sampling sites at monthly intervals for a period of one year during November 2013 to October 2014 from different pond water in sterilized plastic bottles periodically. Isolation of fungi was carried out by following isolation techniques viz., Incubation and baiting techniques in the laboratory (Prasad et. al. 2009). In baiting method, sterilized broken pulses and pieces of blotter papers were used as fungal baits. The known quantity of water was taken in the sterilized petriplates, and then broken pulses and paper pieces of blotter paper were added. The plated materials were kept for incubation under laboratory conditions ($22\pm 2^{\circ}\text{C}$ temperature) for about 7 to 8 days, at the end of the incubation period the colonized fungi were found on the incubated materials. The isolates were purified by single hypha culture method. Culturing of few aquatic and extra aquatic was done in the laboratory on potato dextrose agar media for pure culturing. Identification and characterization of fungi were made with the help of aquatic fungi manual by Khulbe (2001).

3. Result and Discussion

The occurrence of the species and the percentage of occurrence of individual species are given in table 1. On genera identification, Achlya showed higher diversity with 3 species followed by Pithier with 2 species, while Dictyuchus and Saprolegnia represent 1 species each. During present study, 4 species of water molds viz., Achlya oligicantha, Saprolegnia ferax, Pythium Middletown and Pythium deliense were observed most frequent occurring species as they recovered from all the stations. On the other hand, 2 fungal species viz., Thraustotheca clavata, and Dictyuchus sterile were isolated only once and showed restricted distribution.

Table 1: Percentage Occurrence of Fungi

| Fungi | Pond 1% occurrence | Pond 2% occurrence | Pond 3% occurrence | Pond 4% occurrence | Total % of occurrence |
|------------------------------|--------------------|--------------------|--------------------|--------------------|-----------------------|
| <i>Achlya oligicantha</i> | 10 | 27 | 7.6 | 23.5 | 16.39 |
| <i>Achlya racemosa</i> | 15 | - | 15.38 | 5.88 | 9.83 |
| <i>Achlya</i> sps | 5 | 9.09 | 7.6 | - | 4.91 |
| <i>Aplanes braunii</i> | 5 | - | - | 5.88 | 3.27 |
| <i>Dictyuchus sterile</i> | 15 | - | - | - | 4.91 |
| <i>Pythium deliense,</i> | 20 | 27 | 30.76 | 29.41 | 26.22 |
| <i>Pythium middletoni</i> | 10 | 18.18 | 7.6 | 23.07 | 13.11 |
| <i>Saprolegnia ferax</i> | 15 | 18.18 | 30.76 | 23.07 | 19.67 |
| <i>Thraustotheca clavata</i> | 5 | - | - | - | 1.63 |

The most commonly occurring from, isolated 16 times was *Pythium dyelines* (26.22%). Second was *Saprolegnia ferax* (19.67%), which appeared 12 times. Among others genus *Achlya* was dominant. Table 1 also shows the distribution of all species in different ponds. Most species were common to the different ponds, but some were more restricted. Pond no. 1 showed highest diversity of water molds (9 saps.). It might be due to wide range of pH (7.4-8.75) with moderate water temperature (11.5-24.0 0C). These results are in general agreement with those reported from other studies (Warris et al. 2002). The higher fungal incidence that occurred in pond 1 was observed, may be due to unpolluted nature of water and less anthropogenic activities was encountered at this pond whereas, the lowest percent distribution of aquatic fungi was recorded in pond 2. This was may be due to the polluted nature of the water and increased anthropogenic activities at this pond.

The present investigation has obtained important information about the occurrence of fungi in different pond water. The results obtained indicate that aquatic fungi are present in all parts of the pond water. It is important to keep the amount of fungi reaching the human and animals under surveillance, because of the ability of different species to cause disease or allergy

in humans, act as contaminants in, e.g. different industry, or reduce quality of water in regards of smell and taste and colour.

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