



Occurrence of *Achlya* species in Eutrophic Fresh Water Culture Fishes of Tiruchirappalli District, Tamil Nadu, India

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Abstract

Even though fish culture has expanded on a large scale worldwide, disease outbreaks have threatened to decrease the profitability of this industry. Among the various infections, *Achlya* species appears to be one of the most common fungal infections. Hence, the present study was attempted to analyse the common *Achlya* species that are found in the fresh water systems of eutrophic culture pond in Tiruchirappalli, Tamil Nadu. Results indicate that there were four species of *Achlya*. Among the various fishes, carps appeared to be most prone to multiple infections of *Achlya* while *Clarias batrachus* the least prone to infections. Among the various *Achlya* species, *A. prolifera* dominated and was isolated in all the species of fish.

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Introduction

Fresh water fishes are an important source of protein for people of many countries (Hussain *et al.*, 2011; Rubbani *et al.*, 2011) and fish culture a commercially important industry worldwide. However, in most countries, disease outbreaks have threatened profitable and viable aquaculture operations throughout the world (Saraswathi *et al.*, 2015).

Today, fungal infections are second only to bacterial diseases in economic importance (Ramaiah, 2006). Among the fungi, infections caused by *Achlya* have been reported by numerous workers (Chidambaram, 1942; Gopalakrishnan, 1964; McGarey *et al.*, 1990; Khulbe and Sati, 1981; Khulbe, 2000; Chauhan *et al.*, 2013; Saraswathi *et al.*, 2015). Hence, a study was attempted to identify the various *Achlya* sp. and their presence in various fish in aquatic systems found in Tiruchirappalli, Tamil Nadu, India.

Materials and Methods

A total number of 261 fishes were randomly collected from different water bodies of Tiruchirappalli District, Tamil Nadu, India and brought to the laboratory in sterilized polythene bags for further examination.

The fishes were kept in aquaria with continuous aeration. The fishes were observed to note external symptoms.

To avoid bacterial contamination, all the glassware, instruments and media were sterilized. Streptomycin sulphate (100 mg/ml) was also used in the media. Inoculation was done in Laminar flow in sterilized conditions.

The agar plates were incubated at $18 \pm 2^\circ\text{C}$ for the growth of culture. Growth of colonies were observed in 3-4 days. For full growth of colony, plates were kept for 6-8 days.

Preparation of Pure Cultures

Pure cultures were prepared by picking up small tuff of mycelium and grown on agar media.

For the development of zoospores and reproductive structures, cultures were prepared on baits. Petri plates were filled with 20-30 ml sterilized tap water, small piece of media with fungi were kept in these plates and baited with different baits (Soybean seeds and jowar seeds) at temperature ($18 \pm 2^\circ\text{C}$).

Identification of the Isolates

All pure cultures were examined for colonial growth, morphological features and microscopical characteristics. For identification, slides were prepared from each colony by taking small tuff of mycelium and stained with Lactophenol cotton blue. The slides were observed under microscope. Identification of fungi was carried out on the basis of keys (Coker, 1923; Johnson, 1956; Khulbe,

1993, 2001). Fishes were identified by the keys of Jhinghran (1982) and Qureshi and Qureshi (1983).

Results and Discussion

The various *Achlya* sp. that were identified in the system during the period of study are presented in Table-1. As evident from the table, four species of *Achlya* were identified in the system. In the present study, a total of 261 fishes belonging to seven species were identified. The species-wise infection of fishes in terms of percentage are presented in Table-2. As evident from the table, the percentage of infection was found to vary from a low of 8.2% (*Anabas*) to a maximum of 20.9% (*Catla*). Among the four species of *Achlya* that could be isolated, *A. prolifera* was found to be the most common species as it was isolated in all the species of fish that were examined. Saraswathi *et al.*, (2015) also suggested that *A. prolifera* was the most common species to be isolated from fishes in her study in a fresh water system at Pudukkottai, Tamil Nadu.

Table.1 Mycotic infected fishes isolated from Eutrophic ponds of Tiruchirappalli District

S. No.	Species of Fishes	Fungal infection in %
1.	<i>Catla catla</i>	20.9
2.	<i>Cyprinus carpio</i>	18.1
3.	<i>Cirrhinus mrigala</i>	13.6
4.	<i>Labeorohita</i>	10.1
5.	<i>Clarias batrachus</i>	8.2
6.	<i>Anabas testudineus</i>	19.4
7.	<i>Mystus vittatus</i>	9.7

Table.2 *Achlya* species isolated from the eutrophic fresh water culture fishes

S. No.	<i>Achlya</i> Species	Percentage of infected fishes
1.	<i>A. prolifera</i>	29.7
2.	<i>A. americana</i>	8.2
3.	<i>A. speculata</i>	5.8
4.	<i>A. conspicua</i>	4.7
5.	<i>A. prolifera</i> + <i>A. americana</i>	23.4
6.	<i>A. prolifera</i> + <i>A. americana</i> + <i>A. speculata</i>	17.8
7.	<i>A. speculata</i> + <i>A. conspicua</i>	10.4

The number of diseased fishes and the percentage of infection of each species is presented in Table-3. In the present study, among the various species of *Achlya*, *A.*

conspicua was found to be the least dominant as it was found only in 4.7% of infected fishes. Examination of the fishes revealed that many fishes had multiple infection.

However, these multiple infections were mostly found in the carp species. Among the various carps, *Catla catla* recorded maximum multiple infections followed by *Cyprinus carpio*, *Cirrhinus mrigala* and *Labeo rohita*, *Mystus vittatus* recorded a higher infection of *A. proliferata* and *A. Americana* while *Anabas* appeared to be more prone to *A. speculosa* and *A. conspicua*. Among the various species, *Clarias batrachus* was least prone to infections.

Earlier, Saraswathi *et al.*, (2015) also reported that carps are more prone to *Achlya* multiple infections. However, she recorded maximum multiple infections in *L. rohita*, while in the present study, it was *Catla catla*. Nevertheless, in the present study also it was carps which were prone to multiple infections. As to the differences noticed in the present study and the earlier studies, it can be suggested that it might be due to different environmental conditions, as well as the physiochemical variations in the system in addition to the different varieties of fish used in the study. Nevertheless, it is clearly evident that *Achlya* species are common in the systems of these regions and hence the local people and fishermen should be made aware of the situation.

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