IJBPAS, August, 2012, 1(7): 927-932

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

ISOLATION OF FUNGAL SPECIES FROM *OREOCHROMIS NILOTICUS* FROM TWO ENVIRONMENTS

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ABSTRACT

Eighty fresh samples of *Oreochromis niloticus* of family Cichildae were collected from Jable Aulia dam – Al shagara farm, University farm – Wad Al Mamon farm, (40 from the Nile and 40 from the farms), during the period April to July 2009.The spacemen's were examined for the presence of fungal contamination, based on the generic names of the isolated organisms.

The density of contamination of the total samples was found to be 54% while the density of contamination in fishes collected from Jable aulia dam 70% (which represent the natural environment) Alshagara farm 38% Sudan University farm 47% and Wad Al Mamon farm 42% (which represent the culture environment the density of contamination was found to be 42%).

The fungal organism was identified as *Saprolegnia spp, Aphanomyces spp, Achlaya spp, Asperigulus niger, pencilium spp and Rhizopupus species.*

Keywords: Fungal Infection, *Oreochromis Niloticus*, Cichildae, River Nile

INTRODUCTION

The river Nile which is longest river in the world – lies within the borders of Sudan. About 500 hundred miles constitute the Nile and least 1250 miles constitute the White Nile beside of intermittent rivers such as Atbara, Dinder and Rahad so over 4000 miles of fresh water in the Sudan is suitable habitat for fishes. In all this water there are about 123 fish species which belongs to 22 families **[1]** but only about 50 of these fish species are of economic importance

and recognized of protein for humans and as food is high quality or high nutritive value rich in amino acids , beside all the essential vitamins (A, B, D, C, E, K). The most important are (Thiamin, Riboflavin, Niacin) fats (lipids) in fish flesh are essentially – daily unsaturated with no cholesterol hence less health hazard **[2].**

Fungi are groups of organisms called heterotrophy that require living or dead matter for growth or reproduction, unlike plants there incapable of manufacturing their own nutrient by photosynthesis , Fungi are present everywhere in salt water or fresh water in cool or warm temperature in some cases **[3]**.

Fungi serve available ecological function by processing dead organic debris, however fungi can become a problem if fishes are stressed by tough temperature, poor environmental conditions, poor nutrition or injuries, these factor all together weaken the fish or damage its tissues make it susceptible to fungal infection, fungi can also prevent successful hatching when it invades fish eggs **[3]**.

All fungi produce spores, some of these spores readily spread disease in fish. The fungi spores are like a seed which is resistant to the heat, drying, disinfectants and natural defense system of fish.

Fungal diseases of fish are usually secondary being attributed to nutritional deficiencies, toxins, injury, poor water quality problems or some other infection can also prevent successful hatching when it invades fish eggs **[4]**.

[5] described the fungal filamentous growth appearance internally or externally on fishes, a wide variety of phycomycets and fungi imperfect have been associated with disease in both fresh and salt water fish.

[6] reported the signs of some fungal infections during the hot season, while water temperatures are above 25; once the infection appears in the pond within two or four days may spread among the fish and cause higher mortalities.

Research on fungal disease in relatively new but a few numbers of researches has been conducted in Sudan. This study was conduct to determine the prevalence of fungi

contaminated the *Oreochromis niloticus* also to comparison between wild fish and cultured fish in pond in contamination with fungi.

MARTIALS AND METHODS

Area of Study and Sampling

All samples of fish (*Oreochromis niloticus*) were taken from Khartoum state, from the Nile and farms. Samples were collected during the months of April to July (4 – 7) 2009. And also water samples were collected from pond surface. Total of 80 samples were collected as 40 sampless from the Nile and 40from farms.

Mycological Methods

Samples were transported to microbiology laboratory, Faculty of Applied Industrial Science, University of Juba.

Swab was taken from gill, mouth, skin, and tail of fish and cultured in PDA media then incubated at 22C^{o} for 1 -2 weeks and examined daily.

Preliminary identification depends on the color and morphology of colony and the confirmatory test of identification was done by examination of a portion of colony was added on slide to a drop of lactophenol cotton blue, (L.P.C.B) then examined microscopically.

RESULTS

40 samples from skin, gills, mouth were investigated in the laboratory for each sample of *O. niloticus*. The prevalence and number of infected sample in the two environments was shown in **Table 1 and 2**. The contaminant fungal species were identified as *Aphanomyctes spp, Saprolognia spp, Acchyla spp, Aspergilla niger, Denicilum spp* and *Rhizoupus species.*

Table 1: Prevalence of Contaminated and Non Contaminated Fish Species with Fungal Infections in Jebal Awlia Dam

Fish organ	Number of samples	Number of contaminant	%	Free	%
Gill	**40**	**30**	**18.8**	**10**	**6.3**
Mouth	**40**	**28**	**17.5**	**12**	**7.5**
Skin	**40**	**34**	**21.3**	**6**	**3.8**
Total	**120**	**92**	**57.6**	**28**	**17.6**

Table 2: Prevalence of Contaminated and Non Contaminated Fish Species With Fungal Infections In Culture Pond

Item	Number of samples	Number of infected	%	free	%
Gill	**40**	**17**	**10.6**	**23**	**14.4**
Mouth	**40**	**15**	**9.4**	**25**	**15.6**
Skin	**40**	**17**	**10.6**	**23**	**14.4**
Total	**120**	**49**	**30.6**	**71**	**69.4**

DISCUSSION

Mycological examination revealed that the prevalence of fungi is higher in Jebal Awlia Dam reservoir than in fish collected from different farm in Khartoum State as shown in table 1 and 2. Isolated moulds belong to the genus: *Saproloegnia Aspergillus, Penicillium*, *Rhizopus Aphanomyes* and *Achyla.*

As these isolates were recorded from apparently healthy *Oreochromis niloticus*, this was expected as almost all these fungi were categorized by **[7]** as normal mycoflora. This does mean that they cannot produce disease. However there are several reports of oomycetes as primary infections agents of fishes **[8]**.

Aspergillus species are among the saprophytic moulds widely distributed in nature causing aspergillosis. This disease is caused by potential invasive species including *Aspergillus niger*, *A. flams* and *A. nidulance*. Spergillomycosis infection have been reported from cultured tilapia and Sarotherodon spp, and identified as *A. flams* and *A. niger* **[6]**. Saprolegniosis infection may contribute to heavy mortality among fishes and wide spread in freshwater fishes ecosystem and affect wild and cultured fishes also involving living and dead eggs **[9]**. Also saprolegnia isolated from the gill contamined with fungal spores and hyphae in cultured tilapia **[10]**.

[11] reported that *Aspergillus spp* and *Penicilum spp* are ubiquitous grow and produce toxin under specific conditions. Also **[12]** showed that some *penicillum spp* grow in stored barlly maize and wheat grains which are spoilt and discharge into the river and aquatic environment.

Also **[13]** said that *Achyla* , *Saprolegnia* and *Aphanomyces* were commonly identified from fish surface . Also the same result obtained by **[14]**.

Fungal isolation in culturable fish species was less (30.6%) than non culturable species (57.6%). Also this might be due to good management and follow up of water characteristics in pond as well as the limited area of the pond which allowed easy and better contro There is evidence that exposure to environmental stressors such as temperature or pollutants can predispose fish to contamination according to **[15]**. Also **[16]** reported that during summer and dubitation caused by other factor probably render fishes susceptible to be attack by fungus.

While in Jeble Awlia reservoir due to low water flow of the White Nile especially in dry season and contamination due to waste dilution these factors influence the growth of this fungus and this environment is worse than in culture environments. The present study leads to the following recommendation:

- Avoidance of compounds discharge into environments to minimize environmental impacts on wilds and farmed fishes.
- Improving water quality and culture conditions and developing good management's practices are the key factors in preventing fungal disease.
- Care must be taken during transportation and handling of fishes to avoid contamination.
- More investigations must be carried out on other infectious agents of fish diseases such as bacteria and virus.
- The fish farmers should be enlightend on the adverse economic and public health importance of fish diseases.

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