

Fungi Associated with *Barilius Spp.* In Tagwai Dam, Minna, Niger State

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Abstract

A study of fungal infestation and occurrences on *Barilius Spp.* In Tagwai dam, Minna, was examined from March, to June, 2002 the fungi isolated and identified from the body (Scale skin, gills and fins) are *A. niger*, *A. flavus*, *A. parasitus*, *A. fumigatus*, *A. versicolor*, *A. nidulans*, *A. terreus* *Absidin Spp.*, *Fusarium Spp.*, *Mucor Spp.*, *Rhizopus Spp.*, *Microsporium canis*, *Penicillium viridicatum*, *Syncephalastrum Spp.* and *Trichophyton gallinae*. Fungi growth was determined and measured by direct cell count using stuart colony counter. The frequency rate of the fungi revealed that *Aspergillus niger* has the highest percentage frequency (31%) while *A. terreus* and *Microsporium canis* has the least (0%) of occurrence on the skin and gills. The infestation by these pathogens could affect human being, effort should be intensified to reduce or eliminate their infestation.

Introduction

Nigeria is blessed with inland water bodies covering about 12.5 millions hectares and about 20 million hectares of swamps, lagoons and estuaries, which can be used for fish farming (Ita, *et. al.*, 1985), information on the parasites of fish becomes particularly important as these parameters may affect fish production. There is a relative susceptibility of different fish species to infection (Baldwin, *et. al.* 1967). One of the problems faced in the production of fish is the outbreak of disease(s). Disease is defined as the definite morbid process with characterized trend and symptoms, which may affect a whole or parts of the body. Cases of human disease due to fish consumption are comparatively rare despite the potential risk. However, chances of disease transmission are now high due to increased pollution and expansion of aqua cultural activities.

In Nigeria, the report on fungal disease of fish is scanty. The earliest work reported on fish parasites was that of Awachie (1966) who documented fish parasites of the Kainji reservoirs. Ugwuzor (1987) also reported a survey of helminth parasites of fish from the Imo River, of the total number of fish examined he encountered a low (7.7%) level of infection. Abubakar and Tsadu (2003) also reported the occurrence of some fungi on selected commercially important fishes in Minna, Niger state. The rate of fish spoilage due to fungal infestation is also common and high in the markets. There is therefore the need to investigate the sources of the infestation.

The study was conducted to determine the fungal species infesting *Barilius spp* in Tagwai dam in Minna, Niger State and to determine the rate of infestation of different parts of the fish body.

Materials and Methods

Forty (40) fresh fish samples of *Barilius Spp.* was randomly selected and purchased from fishermen at Tagwai dam, Minna, Niger state thrice in a month for a period of four months (March to June). The fish samples were transported in a sterile polythene bags covered with foil paper under ice blocks to the Department of Microbiology Federal University of Technology, Minna where it was preserved before experimental analysis was carried out on them.

Microbial analysis: Samples of specimens were taken from skin/scale, gills and fins of *Barilius Spp.* They were examined for fungi contamination by swabbing the different part

of the body with a sterile (normal-saline) soaked swab, and inoculating the PDA plates with the swabs as suggested by Ogbulie *et. al* (1998). The plates were then autoclave at room temperature for 72 hours. The growth was measured by direct microscopic count by the use of stuart colony counter, (1988) model.

Characterization and identification of Isolate

Fungal isolates were characterized and identified based on morphological features and comparison with other known taxa as described by Ogbulie *et al* (1998).

Statistical analysis

One way of analysis of variance was used to compare the fungal load on the three (3) parts of the fish body. The percentage frequency of occurrence was also calculated.

Results and discussion

The study revealed that different parts of *Barilius Spp.* harboured different types of fungi this is in agreement with the findings of Eyo and Balogun (1992) who reported that fungal infestation is a major limitation of good quality in fish processing especially in areas where the relative humidity is always high.

The results obtained shows a significant occurrence of *A. niger*, *A. flavus*, *A. parasitiosus*, *A. terreus*, *M. canis*, *A. fumigatus*, *A. varicolor*, *A. nidulans*, *A. terreus*, *Absidia spp*, *Fusarium Spp.*, *Mucor spp*, *Rhizopus spp*, *Microsporium canis*, *Penicillium viridicatum*, *Syncephalastrum Spp.* and *Trichophyton gallinae*.

The fungi isolated from the fish samples are in table 1. These findings compared favourably with those reported by John (1991), and Burgese (1967). These authors concluded that mould was a major problem for processed fish, especially where the relative humidity is above 70%. *A. niger* had the highest frequency of occurrence (31%) on the gill, while *M. canis* (0%) and *A. terreus* (0%) were absent on the gills and scale. It was also evident that *A. niger* had the highest percentage of occurrence on both skin (Scale) and gills with about 30.76% and 31.03% respectively. *A. terreus* and *M. canis* had least percentage of occurrence on the skin (scale) and gills of *Barilius Spp.* (Table 1).

The occurrence of different fungi and moulds on *Barilius Spp.* in Tagwai dam confirms the believe that fungi infestations are not limited to terrestrial habitats but also aquatic habitat. Fungal infestation can occur at different parts of fish body skin/scale, gills and fins. The most affected parts were the skins/scale and gills of *Barilius Spp.* (Table 2).

The occurrence of *Aspergillus Spp.* is of significant public health concern. *Aspergillus niger* and *Aspergillus flavus* have been known to be common agents of food spoilage, most especially in the tropics where their spores are widely distributed some species of these organisms are known to secrete toxins known as aflatoxins, which when ingested by man or animal mostly affect the liver. These toxins are carcinogenic, mutagenic and teratogenic to human as reported by Rubin, (1990) Pearson and Dutson (1994) and Oyeleke *et. al* (2002).

Moulds generally produce various types of spores such as conidiospores or conidia and sporangiospores or sporangia. These spores are readily spread through the air and are disseminated to new surfaces and habitats as reported by Zotola, (1986) Zottola and Smith (1990) that their spores are widely distributed in nature.

Incidence of fungal infestations on fishes may attack the eggs and fingerlings, which may lead to poor or low fish production as reported by Bhargava *et. al* (1971). Fungal infestation in fish may lead to loss of quality product, reduction in value and low income on the part of fishermen and fish traders.

Table 1: Frequency of occurrence of fungi and different parts of *Barilius spp* from Tagwai dam in Minna Niger State

Fungi isolates	Frequency of occurrence of fungi isolates		
	Skin/scale %	Gill %	Fins %
<i>Aspergillus niger</i>	8 (30.76)	9(31.03)	7(28.0)
<i>A. flavus</i>	2(7.69)	4(13.79)	4(16.0)
<i>A. parasitiosus</i>	3(11.53)	2(6.89)	2(8.0)
<i>A. Fumigatus</i>	1(3.84)	2(6.89)	1(4.0)
<i>A. versicolor</i>	1(3.84)	0	0
<i>A. nidulans</i>	1(3.84)	0	0
<i>A. terreus</i>	0	0	0
<i>Absidin Spp.</i>	0	1(3.44)	0
<i>Fusarium Spp.</i>	2(7.69)	4(6.89)	2(8.0)
<i>Mucor Spp.</i>	2(7.69)	4(13.79)	3(12.0)
<i>Rhizopus Spp.</i>	3(11.53)	2(6.89)	4(16.0)
<i>Microsporium canis</i>	0	0	1(4.0)
<i>Penicillium viridicatum</i>	1(3.84)	2(6.89)	0
<i>Syncephalastrum Spp.</i>	1(3.84)	1(3.44)	0
<i>Trichophyton gallinea</i>	1(3.84)	0	0
Total number of isolates	26	29	25

Values in brackets in the columns represent percentage of occurrence of isolates, while values outside the brackets in the column represent frequency of occurrence of isolates.

Table 2: Mean fungal load (cfu/ml) on three parts of *Barilius spp* from Tagwai dam.

Fish species	Mean fungal load (cfu/g)			
	Skin/scale	Fin	Gill	± SEM
<i>Barilius Spp.</i>	1.41 x 10 ^{3a}	0.84 x 10 ^{3b}	1.06 x 10 ^{3b}	0.19

Values with the same superscript in the same row are not significantly (P>0.05) different.

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