SURVEY OF FUNGAL INFESTATION OF SOME FISH SPECIES FROM TAGWAI DAM, MINNA, NIGER STATE

By

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ABSTRACT

Survey of Fungal infestation of some species of fish in Tagwai dam. Minna was carried out from March to June. 2002. Fungi were isolated from the scale / skin, gills and fins. Twenty-one fungi species were identified from 18 species of fish. Microbial growth was measured by direct cell count using Stuart colony counter. Most of the fungi encountered were of the mould group and infestation occurred among all the species sampled. The infestation was predominantly by Aspergillus species and the scale/skin was most widely affected. The study showed the identified fungi in order of frequency to be as follows: Aspergillus niger, Rhizopus spp, Mmucor spp, Aspergilus flavus, Aspergillus parasitious, Aspergillus fumigatus, Microsporum canis, Penicillium viridicalum and Fusarium spp respectively. Aspergillus niger occurred on all the species of fish sampled. Barrilius spp and Chrysichrhys auratus longfilis had significantly higher ($P<0.05$) mean fungal load on their fins and gills. There was no significant difference ($P> 0.05$) in the mean fungal load in different parts of the body of other fish species sampled.

INTRODUCTION

Nigeria is blessed with inland water bodies covering about 12.5 million hectares and about 20 million hectares of swamps, lagoons and estuarine, which can be used for fish farming (Ita, et. al, 1985). Statistical survey has shown that the demand for fish in the country exceeds the supply and also the domestic production is still very low when compared with the increasing human population (Adeleke, 1999). Consequently, there is a relative susceptibility of different fish species to infection (Baldwin et al 1967). Disease outbreak is one of the problems faced in local fish production in Nigeria.

Disease is defined as the definite morbid process with characteristic trend and symptoms, which may affect a whole or parts of the body.

Causes of human disease due to fish consumption are comparatively rare despite the potential risks. However, chances of disease transmission are now high due to increased pollution and expansion of aqua cultural activities.

Awachie (1996) documented preliminary notes in the parasite of fish in the areas of the Kainji Reservoir and observed that 30% of *Sarotherodon niloticus* were infected by *Acanthocephala* while about 9% of *Clarias gariepinus* were infected by Cestodes. Ukolo (1969) reported that 40% of *Sarotherodon niloticus* were infected with trematodes. 15% had *Acanthocephala* in river Niger area. He also reported cases of heavy Cestode infections from Kainji reservoir. In eastern Nigeria, Ugwuzor (1987) carried out a survey of helminth parasites of fish from the Imo River, and encountered a low (7.7%) infection level. Abubakar and Tsadu (2003) also reported the occurrence of some fungi on selected commercially important fishes in Minna, Niger state. Niger state is blessed with large proportion of freshwater bodies as reported by Ita et.al (1985). There are about 772,243. 50 hectares of reservoirs and lakes which includes Kainji, Shiroro, Jebba and Tagwan Dam. One of the causes of fish shortage is contamination with fungi, which lead to rapid deterioration. Therefore, this study was conducted to identify fungi species occurring among fishes in Tagwai dam and evaluate the rate of infestation at different parts of the fish body.

MATERIALS AND METHOD

Fresh fish samples were randomly selected and purchased from fishermen at Tagwai Dam,

Minna, Niger state three tunes in a month for a period of four months (march to June, 2002). They were transported in sterile polythene bags covered with paper foil with ice block beside the polythene bags to the laboratory for analysis. Potato dextrose Agar (PDA) was prepared using peeled and sliced Irish potato, glucose. Agar- agar, chloramphenicol and distilled H_2O. The media was prepared according to the method of Alabi (1967). Fungal Smear from fish samples were taken by the method of Ojala (1968). The areas of the body of the fish samples (scales / skin, gills or fins) were carefully rubbed with cotton wool swab impregnated with Distilled water in test tubes according to thee method described by Ojala (1968). The mouth of the test tubes were covered with cotton wood plugs which allowed air into the medium but prevented the entry of contaminating microbes. Fungi infections were examined on three parts of the body skill/scale, gills and fins. Swabs from each part of the body were cultured in varied media concentrations in 3 replicates using factorial (3x4x3) experimental design. Fungal growth was observed for 24-72 hour and microbial growth was observed by direct cell count of the micro-organism using stuart colony counter. Fungi identification was done by observing a combination of morphological features and comparison with other known taxa using microbial identification by Ogbuile et al (1998)

The fungal load on the three parts of the body was analyzed by one-way analysis of variance.

RESULTS AND DISCUSSION

18 species of fish samples from 6 different families of fish which includes: Mormyridae, Characidae, Bagridae, Cypinidae, Claridae, and cichlidae were analyzed for fungal infestations from Tagwai Dam.

Table 1 shows the mean fungal load (cfu/ml) on skin/scale, gills and fins of fish species form Tagwai Dam which indicates that all the parts of fish analyzed carried fungal load. *Auchenoglanis biscutatus*, *Chrysichthys furatus*, *Barilus spp*, *chrysichthys nigrodigitatus* had significant ($P< 0.05$) higher mean fungal load on their skin/scale than on their fins and gills. *Hemichromis bimaculatus* had significantly higher ($P < 0.05$) mean fungal load on the gills than on their skin and fins. The mean fungal load on all the rest fishe species were not significantly different on all the three body parts ($p < 0.05$).

Plate 1- 2 shows some fish species infested with fungi. Twenty one (21) fungi species were identified from the 18 species of fish examined. table 2 shows the fungi spp and their morphological characteristics for identification.

Aspergillers niger plate 3 occurred on all the 18 species sampled. *Rhizopus spp* (plate 4) occurred on 16 species. Plate 5 and 6 shows *Aspergillus flavus* and *A. fumigatius* respectively Both of them occurred in 14 out of 18 species. *Aspergillus species* therefore had the highest cases of occurrence in the fishes of the dam

Table 3 indicates the frequency and site specifity of fungi isolated from fish species samples which revealed that isolates from the skin/scale of all species had highest number of isolates (204) followed by the gills (198 isolates) and the least was fins (188). Though the differences were not statistically significant ($P> 0.005$). *Barillus spp* had the highest number of isolates (80) followed by *Tillapia zilli* (74) and *Allestes nurse* (66).

The study revealed that different parts of the fish could harbour different types of fungi which agrees with Eyo and Balogun (1992), who reported that fungi infestation is a major limitation to good quality fish processing especially in areas where the relative humidity is always high. Alkali (1994) reported that relative humidity is usually high (about 70%) during rainy season in Tagwai Dam area where this work was carried out. The fungi isolates obtained from this study compared favourably with those reported by john (1991) from smoke dried fish from River state Nigeria and Burges (1967) from his work on fish handling and processing. Both the authors concluded that mould growth was a major problem of processed fish especially where relative humidity is above 70%. Most of fungi isolates were members of genus *Aspergillus* which as observed by Olufemi (1984) has the ability to grow under the environmental conditions of the host. Thus they are environmental conformers. The occurrence of *Aspergillus* species is of significant public health concern. A niger and A flavus have been known to be common agents of food spoilages most especially in the tropics where their spores are widely distributed easily. Some species of these organisms are known to secrete toxins known as aflatoxins which cause food poisoning and are

carcinogenetic to man and when ingested by man or animal it affects the liver and no effective therapeutic treatment has been known yet (Rubin, 1990). *Aspergilus spp* cause Aspergillosis (a disease of the lungs) (Abubakar 2001). Many human and animal diseases such as mycotic abortion. aflatoxin poisoning, allergic reaction, systemic infection are attributed to mould and fungi ingestion. Mycosis are important cause of morbidity and mortality in humans especially individuals who are immunosuppressed as a result of other diseases such as AIDS, organ transplantation, radiation and even age (Zottola, 1986). *Penicillium Spp* and *Fusarium spp* are also capable of secreting toxins like ichra toxins and penicillic acid that are dangerous to human health (Rubin 1990; Person and Duston, 1994). Various lung diseases in farmers are associated with moulds and grain dust. (zottola and smith 1990).

Conclusion

From the study, it was revealed that fungal infestation occurs among fish species in Tagwai Dam which mostly are of mould group. This research finding has shown that *Aspergillus spp* and other mould fungi can attack fish as does the *Saprolegnia*.The work also confirms that fungi infestation occurs among aquatic animals including fish just as they occur in terrestrial animals. Fish processors and consumers should be aware of the possibility of fungi disease and mycotoxins from poorly processed fish.

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