Survey of Helminth parasites in tow fish species Oreochromis niloticus and Clarias lazera at Khartoum State, Sudan

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Received on: 29-06-2012; Revised on: 29-06-2012; Accepted on: 06-07-2012

ABSTRACT

The aim of this study was survey of internal helminthes parasites in fish, 60 samples of fish were examined 30 samples Oreochromis niloticus and 30 Clarias lazera collected from four locations(Jebel Aulia reservoir, Elmorda fish market, Fish Research Center (Fish pond)at Elshagra and College of veterinary medicine & animal production (Fish farm), the study conducted for two month present study revealed two larval of nematodes (Contracaecum spp, and Amblyaces spp) isolated from Oreochromis niloticus and Clarias lazera. Also the species isolated one species of larvae of trematodes Clinostomum tilapiaae isolated from Oreochromis niloticus form the fish pond (fish research centre). And this results showed that the Mean different for nematodes were 4.3±3.7 and trematodes 3.5±3.2 in Oreochromis niloticus and nematodes 5±4.3 and trematodes 2±1.4 in Clarias lazera, the helminthes (nematodes, trematodes) showed the significant level at (P ≤0.05). In this study no cestodes were recovered, this may be back to seasonality, and also a few samples of fish and also the time of study (two month).

Keywords: Parasite, Helminthes, Nematode, Trematode, Cestodes.

INTRODUCTION

Fish are the most numerous vertebrates, with at least 200,000 known species, and more than 58% are found in marine environment (1) In the Sudan fish is distributed over an area about 100,000 km² of fresh water and 760 km² of marine. The total sustainable production amounts to 114,100 tones/year, the human consumption is estimated at only 1.4 kg/year, while the minimum should be 1.9 kg/year (2). Clarias lazera (Garoua) which was equally investigated in this study in capable of existing in muddy ponds and haffirs throughout the dry season, so it relatively obtainable in any part of year and is more abundant after the rainy season, the specimen of Clarias lazera may exceed one hundred centimeters in length and may approximately weigh 12-20 kg (3).

The epidemiology of disease in free-living fish population is averagely specialized in aquatic science the amount of published data, especially in developed countries is rapidly increasing since attempt have been made to use the occurrence of fish disease as an indicator to environment stress (4).

In Sudan work has done on fish parasite and epidemiology of fish disease by many researchers, helminthes parasites had attracted many researchers. However, (5-7) attempted to investigate histological changes in fish tissue due to helminthes. In most introductions the actual route of entry was not identified, however, in most instances it was connected to the introduction of Chinese or European carp (5-6). The aim of this study is survey of internal helminthes parasites of two species Oreochromis niloticus and Clarias lazera in Khartoum state.

MATERIALS AND METHODS

Fish specimens:
A total of 60 fresh water fishes 30 Oreochromis niloticus and 30 Clarias lazera were used in this study. Fish were collected at random from four sites through a period of two month which subsequently examined a live for any abnormalities or pathological changes.

Investigation Procedures:
Macroscopic examination:
Fish were grossly examined individually by the naked eye, then with a hand lens the external organs were examined for any abnormalities or pathological lesion, including the shape of body, fins, gills, eyes and lips, then fishes were measured in (cm) for the total length (from the snout to end of the caudal fin) on a measuring board (ruler).

Internal Examination:
Dissection:
Each sample fish was dissected as routine using scissors and forceps, starting with a ventral incision about one cm anterior to the anus, and proceeding inferiorly to lower jaw, then and oblique cut was made from the first incision up wards to the area mid way just under the two lateral line and proceeding inferiorly towards the operculum, the lateral flap was removed thus exposing the internal organs (7).

Macroscopic examination of viscera:
With the help of a hand lens, visceral elements i.e. intestine, liver, kidney, stomach were examined for helminthes parasites and abnormalities. A small pieces about 1-5 cm from normal and affected viscera were examined under a dissecting microscope.

Laboratory investigation:
Preliminary examination:
The body cavity of fish after the dissection was investigated for the helminthes (cestodes, nematodes, trematodes).

Parasite collection:
Helminthes parasites were collected and examined fresh, then preserved in 5% formalin, further transferred into small bottles contain 70% ethyl alcohol to which a few (0.1 ml) drops of glycerin were added to each sample.

Parasite fixation and staining:
Staining and fixation of trematodes and cestodes:
The specimen were left in fixative for a few days (2-3 days) then were stained and mounted as follows:
The worms were taken in water in descending series alcohol (50%-40%-30%) then transferred to haematoxylin stain until the specimen become purple. The stained parasites were they become dark blue, a differentiation steps follow by discarding the water and applying acid alcohol at 1% (9.9 ml ethanol + 0.1 ml of concentrated HCl) the parasites were left to differentiate for few minutes in acid alcohol,
the dehydrate parasite were cleared for 2 minutes in Xylene and after that the parasites were mounted in the slides by use of D.P.X for (1 days) and covered by the cover slip and examined under (LEITZ DIALUX 20) microscope.

**Fixation of Nematodes:**
After being in hot 70% alcohol nematodes fully stretched, two or three days later, the nematodes were removed to small watch glass containing 5ml of the following mixture:

96% ethanol ---- 95 ml
Glycerol ------------ 5 ml

The watch glass was left half closed for one day, until all alcohol had slowly evaporated, thus the parasites were in pure glycerol, after 24 hours their internal and external morphology were guide clear after clearing, nematodes, trematodes and cestodes were examine under stereo microscope and identified according to [10].

**Microscopic Examination and photography:**
A research light microscope (OLYMPUS) with plain bright field optics with a fitted Camera Olympus-01 was used for the examination of these helminthes.
Photography was conducted at the Electronic Microscope Unit in University of Khartoum.

### RESULTS
The result obtained from this study revealed that the density of trematodes (2.6) and the prevalence is (0.56) and the density of nematodes (4) and prevalence (0.8). Also the revealed that the Oreochromis niloticus is more infested by the parasites than the Clarias lazera.

**Table No. 1:** The total number of parasites penetrated fishes

<table>
<thead>
<tr>
<th>Paraphaleus (Oreochromis niloticus)</th>
<th>Garmout (Clarias lazera)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasites</td>
<td>Total +ve</td>
</tr>
<tr>
<td>Nematodes</td>
<td>7</td>
</tr>
<tr>
<td>Trematodes</td>
<td>8</td>
</tr>
<tr>
<td>Cestodes</td>
<td>0</td>
</tr>
</tbody>
</table>

![Fig. 1: The total number of parasites penetrated fishes](image1)

**Table No. 2:** The mean and St. Error

<table>
<thead>
<tr>
<th>Parasites</th>
<th>Oreochromis niloticus</th>
<th>Clarias lazera</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± Standard Error</td>
<td></td>
</tr>
<tr>
<td>Nematodes</td>
<td>4±3.7</td>
<td>5±4.3</td>
</tr>
<tr>
<td>Trematodes</td>
<td>3.5±3.2</td>
<td>2±1.4</td>
</tr>
</tbody>
</table>

![Plate No. 1: Anterior of Larvae Contraecum SP](image2)
![Plate No. 2: Esophagus of Contraecum sp](image3)
DISCUSSION

Two type of fishes, Oreochromis niloticus (30 samples) and Clarias lazera (30 samples) collected from different location in Khartoum state, were studied for internal helminthes parasites. And the study revealed that only two larvae of nematodes Contraceacum spp and Amplexceacum spp were isolated from Oreochromis niloticus and Clarias lazera from Jebel Aulia reservoir and these results agree with [11] who reported five nematodes, these were Procamallanus spiralis, Callanus sp, Metagonimphria sp and Contraceacum spp. Also [12] reported larval Contraceacum in sinus venosus and intestinal wall of Tilapia nilotica and Tilapia galilaea from the White Nile.

Also [13] reported two larval nematodes Contraceacum sp. and Amplexceacum sp. isolated from Oreochromis niloticus from Jebel Aulia reservoir.

Also [14] studied the parasite of nine species of fresh water fishes from south Khartoum, she found the following species of nematodes larvae Contraceacum sp, Procamallana laevicauchus, Spiromallana spiralis, Cacallana sp and Spirurana sudanensis. These finding indicate that the host range and consequently host specificity of Amplexceacum and Contraceacum larvae is more extend, in this respect [15] stated that potentially all fresh water fish are susceptible to larval nematodes.

Also this study recovered the presence of one larvae of trematodes Clinostomum tilapiae isolated from Oreochromis niloticus from fish ponds at Elshagra (Fisheries Research Center). These finding agree with [6] who reported two species of digenetic trematodes Clinostomum sp. and Clinostomum tilapiae from Oreochromis niloticus from Jebel Aulia reservoir.

Demonstrated that genus of Clinostomum and Meteoroids troubled farmed fish in south East Asia [15] described anew trematodes Astioterma reniferum from the intestine of cat fish Clarias lazera collected from Nile near Khartoum.

Reported the presence of metacercaria in the buccal cavity of O. niloticus with prevalence rate of 6-29 and density of infection ranged from 1-20 cysts per fish at Khashm Elgirba reservoir [5].

Also the present study showed that Clarias lazera was found to be had lower prevalence rate and density of parasite although [16] Claimed that two third of all known trematodes are parasites of fish. Also [6] stated that these parasites are apparently specific to tilapias. However, [17] and [5] who investigated helminthes infection in four species of fish in K. lazera did not isolate a single digenetic trematodes and of the latter fish species. Moreover [13] reported that the natural host of C. tilapiae was the night heron (Nycticorax nycticorax) and the African darter (Anhinga rafa). It had been noticed that these two species of birds

Plate No. 3: Posterior end of Contraceacum SP
Plate No. 4: Anterior end of Amplexceacum sp
Plate No. 5: Posterior end of Amplexceacum sp
Plate No. 6: Ventral Sucker of Clinostomum tilapiae
Plate No. 7: Oral Sucker of Clinostomum tilapiae
Plate No. 8: Larvae Of Clinostomum Tilapiae
Plate No. 9: Pyloric Ceca Clinostomum Tilapiae
Plate No. 10: Unidentified egg Nematoda
Plate No. 11: Unidentified egg of Nematoda
Plate No. 12: Unidentified egg of Nematoda
Plate No. 13: Unidentified egg of Nematoda
were found in the area around ponds which could act as hosts for this parasites.

No adult or larval cestodes were encountered in the two studied species Oreochromis niloticus and Clarias lazera. [10] Found larval cestodes in the intestine of Oreochromis niloticus and [12] recorded cysticercus larvae on the hepatopancreas of Tilapia niloticus obtained from Jebel Aulia location. According to [13] the absence of adult cestodes in the gut of various tilapias is due to the feeding habit of fish especially these which feed algae. In this respect [10] reported that the larval development of Polychocephorum cestodes of African fish was thus far not isolated in case of Clarias these result differ from the finding of [12] who found two types of cestodes in C. lazera Polychocephorum clarias and Polychocephorum polypteri and [13] who claimed the absence of any pathogenic consequences even in heavy infection due to cestodes and this be back of the few sample of fish (60 samples ) and short period of collection which about two month. Also understandable that the climate at this period is not conductive for the growth of helminthes especially cestodes

CONCLUSION

In this study the presence of internal helminthes has been recorded in many samples of two type of fish Oreochromis niloticus and Clarias lazera at Khartoum state. Two type of larval nematodes and one trematodes were recovered from this study while no cestodes were isolated during the period of study.

REFERENCES:


Source of support: Nil, Conflict of interest: None Declared