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Original Article

Prevalence of Trypanosome Infection in *Oreochromis niloticus* and *Clarias lazera* from Fish Farms and Reservoir of Jebel Aulia Dam in Sudan

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ABSTRACT

The study was conducted to find out the prevalence of trypanosome infection in freshwater fishes *Oreochromis niloticus* and *Carias lazera*. The species *O. niloticus* was collected from the fish farm of the College of Veterinary Medicine (CVMFF) in Sudan University of Science and Technology, Wad Almamoun fish farm (WMFF) and the Reservoir of Jebel Aulia Dam (RJAD) while the species *C. lazera* was collected from CVMFF and RJAD. From each site, 40 specimens were collected for the study purpose. The prevalence of t*rypanosom*e infection in *O. niloticus* was 60%, 50% and 20% in RJAD, WMFF and CVMFF respectively. While as in case of *C. lazera* the prevalence was 30% and 0% in the host species collected from RJAD and CVMFF respectively. In case of *O. niloticus* infection was restricted to those specimens which were within the length ranges of: 18-29, 24-28, and 12-24cm collected from RJAD, WMFF and CVMFF, respectively and within the length range of 27- 45 in *C. lazera* collected from RJAD.

Keywords: Trypanosomes, prevalence, *Oreochromis niloticus*, *Clarias lazera*

INTRODUCTION

Fishes play an important role in provision of animal protein for human consumption and represent a source of subsistence for many rural fishermen. In Sudan, *O. niloticus* (Tilapia) and *C. lazera* (Garmout) together with other freshwater fishes are commonly cultured to satisfy the need for this commodity.

Similar to marine fishes (Becker and Overstreet, 1979; Khan, 1977; Lom, 1979), freshwater fishes are also exposed to infection by many haemoflagellates among which are the trypanosomes (Hansen, 2000; Davies *et al*., 2004). However, infections with trypanosomes were reported to be widely distributed in the world: in major water system of Africa (Weyon, 1908; Hoare, 1932; Baker, 1960), in the Near East (Mandal, 1977, 1980; Al- Jafery and Rahemo, 1982; Alsalim, 1985; Gupta and Gupta, 1988) as well as in northern hemisphere (Cruz and Eiras, 1997; Hansen, 2000). The infection with trypanosomes was also reported in some freshwater fishes in Sudan (Al Wasila, 1976; Idris, 1986).

This paper is aimed to find out the prevalence of trypanosome infection in two species of fishes: viz; *O. niloticus* and *C. lazera* reared in fish farms and from Reservoir of Jebel Aulia Dam (RJAD); a natural water body from which the two species were originally brought for culture in the farms.

MATERIALS AND METHODS

Fish and study sites

The fish species used in this study were *O. niloticus* and *C. lazera*. The fish *O. niloticus* was collected from two Fish farms; one belonging to the College of Veterinary Medicine of Sudan University of Science and Technology (CVMFF) and the other to Wad Al mamoun fish farm (WAFF). The fish was also collected from the RJAD, about 25 km to the south of Khartoum. However, fish *C. lazera,* was collected from CVMFF and RJAD only as it was not reared at WAFF. The measurements of these sites are approximately; 30 × 20m and about 1.5 m deep for CVMFF and 60 ×40m and about 1.5m deep for WAFF, and the surface area of RJAD is vast and varies from season to season. For each species, 40 samples were examined and each one was immediately measured for the total body length; from the tip of snout up to the end of the caudal part.

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Blood smear preparation

Blood sample from each fish was recovered by cutting and pressing peduncle (Khan *et al*., 1991).

RESULTS

The prevalence of trypanosome infection in *O. niloticus* and *C. lazera* with respect to their collection sites and body length is shown in Table 1 and 2 respectively. The present study show that the infection rate in *O. niloticus*, was 60% in RJAD, 50% in WAFF and 20% in CVMFF respectively. For *C. lazera* (Table 2), 30% were found infected in RJAD, however, no infection at all was observed in case of the *C. lazera* fish species collected from CVMFF and not a single fish was found to be infected in CVMFF, and the study also revealed that the infected fishes were found to be within the length range of 27- 45cms and the no infected within the range of 34-68.

Table 1. Prevalence of trypanosome infection in *O. niloticus* in RJAD, WMFF and CVMFF

Parameters	RJAD	WMFF	CVMFF
Number examined	40	40	40
Number infected	24	20	8
Percentage infected (%)	60	50	20
Body length range (cm)	18-29	24 -28	12 -24

Table 2. Prevalence of trypanosome infection in *C. lazera* in RJAD, and CVMFP.

Parameters	RJAD	CVMFF
No. examined	40	40
No. infected	12	0
% infected	30	0
Length range (cm)	27- 45	34 - 68

The distribution of Trypanasomiasis in both the host species with respect to their body length and collection sites is given in table 3 and 4 respectively. It was observed that the infection rate was 15%, in *O. niloticus* collected from CVMFF for the length range of 10 – 15cm and 5% in those which were 21 – 25cm in length. However, In WAFF, 40% in 21-25 and remaining 10% in 26-30 while in RJAD, 40% restricted to the length range 21-25 and 10% was found equally in the length ranges;16-20 and 25-30.

For *C. lazera* in RJAD, 20% of infection was found in the length range of 25-35cm and 10% in the fishes ranging from 36-45cm, while non-infected ones distributed equally (35%) between 26-35 and 36-45.

Table 3. Distribution of Trypanosoma infection in *O. niloticus* of different groups of body length ranges (cm) in RJAD, CVMFF and WMFF

Parameters	10 – 15 cm	16 - 20 cm	21 - 25 cm	26 - 30 cm
CVMFF infected	6	00	2	0
CVMFF not infected	18	6	8	0
WMFF infected	0	0	16	4
WMFF not infected	0	0	12	8
RJAD infected	0	4	16	4
RJAD not infected	4	00	4	8

Table 4. Distribution of trypanosome infection among C. *lazera* of different body length ranges (cm) in CVMFF and RJAD

Parameters	25 – 35	36 - 45	46 - 55	56 - 65	66 – 75
CVMFF infected	0	0	0	0	0
CVMFF not infected	4	8	2	10	16
RJAD infected	8	4	00	00	00
RJAD not infected	14	14	00	00	00

DISCUSSION

In this study, *O. niloticus* appeared to be more susceptible to infection with trypanosomes than *C. lazera*, as of 40 samples examined in each study site, 60% was found to be infected in RJAD, 50% in WAFP and 20% in CVMFP while 30% of *C. lazera* was found to be infected also in RJAD whereas none in CAMFP. High prevalence of infection in RJAD followed by WAFP could be due to the environmental conditions existing at these sites which are favorable for occurrence of leeches responsible for the transmission of the parasites (Anderson, 1988) compared to CVMFP which is probably less infested with leeches as it is well managed and routinely monitored for infection. Perhaps the absence of infection in *C. lazera* in CVMFP could strengthen this claim, being both collected from the same pond.

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Furthermore, the distribution of trypanosome infection among different length ranges could indicate this susceptibility as the infected samples were relatively smaller in body length. In this context, the total body length of infected *O. niloticus* in all sites did not exceed 30 cm as a high border range level and the highest infection rates (40%) in both sites; RJAD and WAFP occurred within the range 21- 25 cm. Moreover, viewing the distribution of length ranges for the two species of fish may indicate that small fishes were easily caught by leeches, probably, because not adapted to avoid the vector (Lue *et al*., 1999).

Comparing to prevalence of infection among various freshwater fishes world-wide, prevalence of trypanosome infection among the *O. niloticus* and *C. lazera* of this study, seem to agree with some of them as overviewed in appendix by Hansen (2000).

Conclusion, the prevalence of trypanosome infection shown in the fish ponds examined in this study as well as the RJAD could draw attention to design a control strategy to eliminate the vector and manage freshwater bodies for a better production.

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