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SURVEY OF PROTOZOA PARASITES INFESTATION OF *Synodintis schall* COLLECTED FROM JABEL AWLIA DAM RESERVOIR AT KHARTOUM STATE

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ABSTRACT*:* The main target of the present research to conduct a survey of protozoan parasitic infestation in (Synodontis schall).collected from natural environment, study also aimed to identify the protozoan parasite of high parasitic load. 69 samples of fish were examined, 38 male and 31 female on the region of the label Awlia reservoir in the White Nile represented in (Synodontis schall) which is one of most consumed species in Khartoum state. This study was conducted in Sudan University of Science and Technology College of Animal Production Science and Technology, Department of Fisheries and Wildlife Science in the period from beginning of April to June 2014. The study revealed that the Haemogregarines was most common parasite obtained in this study with high prevalence rate followed by *Trichodina* sp, Chilodenella sp, Ich sp, in skin and gill of the mentioned fish as external protozoa. Indoparasite include Hexamita sp., Myxobolus sp., Cryptobia sp., Ichthyobodo sp., and Hennguya sp. Most found in the blood, gonad, liver and kidney respectively as internal parasite. The finding of this study showed prevalence rate of parasite in fish sample examined from skin and gill has high prevalence rate in male than female of studied fish. Also prevalence rate of parasite from internal organ has high prevalence rate of parasite in male than female of the fish study. All the result was analysis by SPSS version 16 by using t-test and the prevalence and means abundance of parasite represent by tables.

Keywords: Parasites, Protozoa, Prevalence, Synodontis Schall.

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INTRODUCTION

Fish is important to human populace in trade and economy; it is of importance in the diet of different countries especially in the tropics and subtropics where malnutrition is a major problem (Alune and Andrew, 1996; Osuigwe and Obiekezie, 2007). As the human population inevitably increases, the demand for fish as source of protein will grow (Abolarin, 1996). Fish parasites are numerous and many phyla in animal kingdom have representative that are parasitic to fish. There are by far more parasite species that infect fish than any other group of infectious disease (Blazer, 1996). Most fish in the wild are likely to be infested with parasites, but in the great majority of cases, no significant harm to the host may be ensued or identified, thus, there are only few reports of parasites causing mortality or serious damage to the fish populations, but this may be largely because such effects go unnoticed (Roberts, 2001).

The effects of parasites on fish include nutrient devaluation (Hassan et al., 2010); alteration of biology and behavior (Lafferty, 2008); lowering of immune capability, induction of blindness (Echi et al., 2009 a, b); morbidity, mortality, growth and fecundity reduction (Nmor et al., 2004) and mechanical injuries depending on the parasite species and load (Echi et al., 2009 a, b). Fishermen or consumers observe parasites in wild fish only when they are so obvious as to lead to rejection of fish (Roberts, 1995). In culture fish population on the other hand, parasites often cause serious outbreak of diseases (Kayis et al., 2009).

In general protozoa are one of the major sectors of fish parasites that have been long neglected because of its inherent difficulty in studying compared to other larger parasites (Akinsanya and Otubanjo, 2006). The relationship of protozoan to fish may be independent, commensally or parasitic (Roberts, 1995). Parasitic infection and diseases are some of the factors hindering high productivity in fish wild resources and farming (Roberts, 2001). In many instances, individuals of protozoan parasites provoke the secondary infection of other pathogens like

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viruses, fungi and bacteria and are the most dangerous parasitic group that probably causes more diseases in fish cultures than any other type of animal parasites (Akinsanya and Otubanjo, 2006).

The research was conduct to investigate protozoan parasitic infestation in (Synodontis schall) male and female collected from Jabel Awlia dam White Nile River at Khartoum State, study also aimed to identify the protozoan parasite of high parasitic load.

MATERIAL AND METHOD

Study area:

The study was carried out in Jebel Awlia Dam reservoir (JADR) located at 32˚29′07.1″ E and 15˚14′18.1″ N, 40.6 Km2 south of Khartoum; the dam elevation is 383m. It was constructed to control the flow of the Nile to aid the Aswan Dam in storing water for summer cultivation in Egypt.

Source of fish:

A total of 69 sample of (Synodontis schall) were collected from Jabel Awlia reservoir from White Nile River at Khartoum. 38 male and 31 female (each from the wild), comprising of different sizes during the summer season (April/2014 to May/2014) were bought from local fishermen catches by gill and cast net from Jabel Awlia dam in white Nile River. The total weight (g) and standard lengths of each fish were measured in centimeters (cm) using meter ruler. The sex of fish was ascertained by both morphological examination and observation of the presence of testis and ovary by dissection of the fish to expose the gonads.

Method

External examination: External examination of each of the fish for parasites was carried out from the gills and skin, using hand lens. Firstly the fishes were brought out of water and the total lengths were taken. Then a sample was taken from gill and skin with hand lens in clean slide then left to air to dry.

Internal examination: Internal examination of each of the fish for parasites was carried out from the blood, liver, kidney, gonad, spleen.

Blood smear: Firstly the fishes were brought out of water and the total lengths were taken.

The tails was cut with sharp (scissor) to obtain blood from caudal vein or artery with pressure and placed on clean slides and left to air dry.

Spleen, kidney, liver and Gounod: Firstly the fishes were brought out of water and the total lengths were mustered. The smears was taken (by clean slide) from organs and were left to air dry.

Fixation: After all that smears dried methanol was added for 10 minutes.

Staining: One Ml of Gimsa stain was mixed with 9 ML of distilled water after that one drop of the stain was added on the surface of smear for 10 minutes and then left to dry by the air.

Microscope examination: The smears were placed under light microscope (the lens x40 for out content and x100) for the identification of the protozoa parasites.

Statistical analysis

All the result was analysis by SPSS version (16) by using descriptive statistics to determine the percentage and prevalence of parasite represent by tables.

RESULT

The result obtained from this study presented in tables 1, 2, 3, 4, 5 showed that (*Synodintis schall*) fish do not show any significant external lesion or abnormality. The result also revealed *Trichodina* spp, *Ichthyophthirius* spp, *Chilodonella* spp*, Ichthyobodo* spp, *Myxobolus* spp, *Cryptobia* spp, *Hemoggarine* spp, *Henneguya* spp and *Hexamita* sp from mentioned species.

The prevalence rate of the external parasite in skin of male (*Synodintis schall*) 33.33% and Gill 27.53%. Also the prevalence rate of the parasite in skin of female (*Synodintis schall*) 30.43% and Gill 26.08%. The prevalence rate of the internal parasite in blood of male (*Synodintis schall*) 23.19%, Gonad 18.84%, liver 23.19 and kidney 20.29% respectively and the prevalence rate of the internal parasite in blood of female (*Synodintis schall*) 26.08%, Gonad 11.59%, liver 20.28 and kidney 14.49% respectively.

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Table 1 - Percentage and frequency of occurrence of protozoa parasites on*Synodintis schall*.

Synodintis schall	Number of fish examined	Number of fish parasited	Percentage of fish parasited
Male	38	28	73.9
Female	31	20	64.5

Table 2 - Percentage and frequency of occurrence of ectoprotozoa parasites on *Synodintis schall*.

Synodintis schall	Number of parasites on skin	Percentage of parasites on skin	Number of parasites on gill	Percentage of parasites on gill
Male	23	33.33	19	30.43
Female	21	27.53	18	26.08

Table 3 - Percentage and frequency of occurrence of indtoprotozoa parasites on *Synodintis schall*.

Organ	Male		Female	
	Number of parasites	Percentage of parasites	Number of parasites	Percentage of parasites
Blood	16	23.19	18	26.08
Gonads	13	18.84	8	11.59
Liver	16	23.19	14	20.28
Kidney	14	20.09	10	14.49

Table 4 - Ectoprotozoan parasites species found density and prevalence on studied fish.

External protozoa	No.of parasites observed	Percentage of parasites observed
Costia sp	12	17.39
Tricodina sp	10	14.49
Chilodenella sp	8	11.59
Ich sp	2	2.89
Apiosoma sp	0	0

Table 5 - Indoprotozoan parasites species found density and prevalence on studied fish.

Internal protozoa	No.of parasites observed	Percentage of parasites observed
Haemogregarines sp	20	28.98
Myxobolus sp	9	13.04
Cryptobia sp	4	5.79
Hennguya sp	3	4.34
Hexamita sp	1	1.44

DISCUSSION

The result of this study shed a light on (*Synodintis schall*) which consider low price and available fish in wet and dry season. The result of investigation indicated the total number of protozoan parasite count of fresh water fish show variation between the samples which examined from the male and female of (Synoditis schall) collected from Jebal Awlia reservoir.

One fish species *Synodintis schall* (38 samples) male and (31 samples) female collected from Jabel Awlia Dam in Khartoum state were studied for external and internal protozoa parasites. The study revealed that the Haemogregarines was most common parasite obtained in this study. These result is agree with result of Davies and Johnston (2000) who reported that Haemogregarines are apicomplexan protozoa, broadly distributed among vertebrate hosts, including fishes.

Results also revealed that *Trichodina* sp., *Chilodenella* sp., *Ichthyobodo* sp., *Ich* sp., have high infection in fish mentioned in skin and gill. These results agree with Schaperclaus (1991) who said that Trichodinia are mobile ciliates often found on gills, fins and skin of many fish species. *Trichodina* sp., recorded from the present study showed high prevalence and density as external parasite. This result is agreement with Shammat (1989) who detected *Trichodina* sp., in skin and gill mucus with 8% in White Nile River and 12% in the pond from Tilapia sp. Also Paperna (1980) reported that heavily infection with external protozoan: *Trichodina* sp., *Costia* and *Chillodonella* sp., in *Tilapia* sp. collected from dam reservoir at Port Elizabeth at South Africa.

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Finding of this study reveals that *Chillodnella* sp infection has high prevalence. These result is confirm by the result of Das (2003) who reported that *Chilodonellids* are small ciliated protozoans found worldwide as free-living species on both invertebrate and vertebrate hosts.

In case of external protozoa the result obtained from this study showed that *Ich* sp. infection with high prevalence rate. This result is in same line with Schäperclaus (1991) who reported that the causative agent of *Ichthyophthiriasis* or *Ich*, is one of the most important pathogenic parasites of cultured fish. Indoparasite include *Hexamita* sp., *Myxobolus* sp., *Cryptobia* sp., and *Hennguya* sp. Most found in the blood, gonad, liver and kidney respectively as internal parasite in prevalence and density. Also *Hexamita* sp. was encountered in the study which agree with Wakita (2005) who reported that the highest infection rate was seen in spring (81%), followed by summer (72%), autumn (60%) and winter (48%).

Myxobolus sp., *Cryptobia* sp., and *Hennguya* sp obtained from this study with high prevalence respectively in the studied fish. This result is similar to result of Woo and Wehnert (1983) who's suggested that haematozoic species were derived from free-living Pro cryptobia via ecto parasitic species that lived on the body surface of fish, the haematozoic Cryptobia were linked to flagellates that lived in the digestive tract of fish. Both hypotheses agree that the haematozoic and non-haematozoic species are very closely related. Lom and Dykova (2006) recorded that up to now, 2180 *Myxosporean* species assigned to a total of 62 genera have been established. In Africa, approximately 200 species of *Myxosporidia* are known today, affecting freshwater as well as brackish or marine fishes (Abakar-Ousman et al., 2006). Reed et al. 2003, Abakar-Ousman et al. (2006) reported that Henneguya of freshwater fishes In Africa, are represented by 25 species.

The finding of this study showed prevalence rate of parasite in fish sample examined from skin and gill has high prevalence rate in male than female of studied fish. Finally result obtained from this study showed that the prevalence of parasite from internal organ has high prevalence rate of parasite in male than female of the fish study.

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