Ectoparasites Associated with the Nile Squeaker (*Synodontis schall*) from Otuogori River in Ogbia Local Government Area, Bayelsa State, Nigeria

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Abstract **- The Nile Squeaker, *Synodontis schall*, is one of the valuable fish food for the inhabitants of Otuogori community, Bayelsa State, Nigeria. This study investigated the ectoparasites associated with *Synodontis schall* from Otuogori River, Ogbia Local Government Area, Bayelsa State, Nigeria. A total of 40 Samples were examined following standard laboratory techniques for ectoparasites in the skin, gill, eyes and fin. Result of this study showed that out of the 40 fishes examined, 1 (2.5%) was infected. Female fish sample with actual length ranging from 15-19.9 cm was the only infected sample with 50% prevalence. The only infected fish weighed between 50-100g. The parasites recovered were found in the skin, gills, eyes and fin, and included *Trichodina* species, *Chilodenella* species and *Gyrodactylus* species. *Trichodina* species was the most abundant parasite, recovered from the eyes, gills and skin while *Chilodenella* species and *Gyrodactylus* species appeared once in the skin and fin, respectively. However, to eliminate the risk of zoonosis, fish consumed should be properly washed with clean water and cooked. Further study on the physicochemical parameters of the river should be conducted in order to ascertain their impact on the prevalence of ectoparasites of fishes.**

Keywords- ***Synodontis schall*****, Otuogori River, *Trichodina*, *Chilodenella*, *Gyrodactylus*, ectoparasites**

I. INTRODUCTION

The Nile squeaker, *Synodontis schall*, belonging to the family Mockokidae is a species of catfish found in Africa. It is one of the valuable food fish for the inhabitants of Otuogori. This is attributed to its excellent taste and meat quality [1]. According to [1], *S. schall* is rich in moisture, dry matter, protein, lipid, vitamins, minerals and caloric value, thereby increasing its acceptability and demand by fish consumers. This species is also popularly used in tropical aquaria due to its upside-down swimming nature [2]. *Synodontis* are highly cherished in Bayelsa State and its environments because of its bony head and fleshy body, which usually attract lovers of common "pepper soup" [3].

Parasites represent one of the most hazardous threats to fish health; they attacking the fish and causing massive destruction of the skin as well as other parts of the body thereby increasing their susceptibility to secondary infections, which could result in nutritive devaluation of fish and subsequent economic loss [4]. Parasitic diseases of fish pose serious economic and public health concern in the fishing industry due to the risk of zoonosis. In most aquatic environment, ectoparasitic diseases affect the normal health and physiological conditions of fish leading to poor growth, abnormal metabolic activities and subsequently, death [5]. Increase in fish parasites may be as a result of many events including flooding, improper feacal waste disposal, and waste bin dump in the river.

Ectoparasites of some bony fish species in the Nigeria have been documented [6], [7], [8], [5], [9]. There have been many parasite studies done on *S. schall*, but there is no specific report on ectoparasites of *S. schall* from the Otuogori River in Otuogori community, Ogbia Local Government Area, Bayelsa State. Considering the abundance and economic importance of *Synodontis schall* in the catches of fishes from Otuogori River, and the dearth of information on the ectoparasites of this fish species from this river, this study tends to bridge the gap on baseline information concerning the health of fishes in this river, thereby providing adequate knowledge of the ectoparasites of *Synodontis schall*.

II. MATERIALS AND METHODS

Study Area

The study was conducted in Otuogori community in Ogbia Local Government Area of Bayelsa State. The study area is located at Latitude 4.819194 and Longitude 6.26292. The Otuogori River is a freshwater body which is a part of the lower River Nun water system that arose from River Niger and empties into the Niger Delta. Otuogori community is with mangrove forest vegetation and a tropical climate comprising of long wet season between April to November, a cold, dry and dusty harmattan period between December and January and a dry season between February and March. The major occupation of individuals within the study area is fishing, logging and subsistence farming.

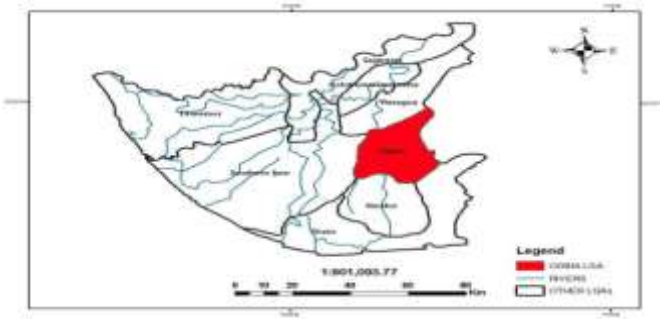

Fig. 1 Map of Bayelsa State, showing Ogbia Local Government Area

Sample Collection and Identification

A total of 40 live samples of *Synodontis schall* were bought from fishers along the riverbanks upon their return from morning fishing. The fish samples were immediately transferred individually to well aerated mini-fish tanks containing river water and transported to the Laboratory of the Department of Biology, Federal University Otuoke, Bayelsa State, Nigeria, for further analysis. Identification of *S. schall* was based on identification keys given by [10]. Differentiation of sexes was based on external features (anal opening) and internal features such as gonads [11].

Morphometric Measurement

The morphometric characters measured were standard length, actual length and body weight. Measurements of these parts were made using methods of [12] with slight modification. The standard length was measured after removal of the head and caudal fin with a measuring board to the nearest 0.1cm while the actual lengths of the fishes were measured with the aid of a measuring board from the snout to the base of the caudal fin to the nearest 0.1cm and digital electronic weighing balance was used to determine wet body weight.

Examination of S. schall for Ectoparasites

Individual fishes were placed on a dissecting board covered with aluminum foil. Cotton wool was used to swab the skin surface and the fin while the gills and the eyes were removed by dissection. The gills and eyes obtained from each fish sample were cut into bits and placed in a sterile petri-dish; 10ml of formal saline solution was added into each of the petri dishes containing each organ and allowed to stand for 5 minutes after which they were examined for parasites and cyst. Similarly, the cotton wool used to swab the skin surface and fins was soaked in 10ml formal saline for 5min and allowed to settle before decanting the residue using gauze. The residue was used to make a smear on a clean sterile glass slide and air-dried. Two drops of iodine solution was added and the slide was allowed to air-dry. The slide was then covered with a coverslip and mounted on a light microscope at ×10 and × 40 magnifications for viewing and identification.

Data Analysis

The raw data was entered into Microsoft excel data sheets and analyzed, expressing it in terms of frequency and percentage.

III. RESULTS

One (2.5%) of the 40 fish samples examined was infected. Out of the 20 male samples examined, none was infected, while 1(5%) out of the 20 female fish sample examined was infected (Table 1).

Table 1: Prevalence of Ectoparasites Infection on the Fish Samples Based on Sex.

Gender	No. Examined	No. infected (%)
Males	20	0 (0)
Females	20	1 (5)
Total	40	1 (2.5)

Female Fish sample with actual length ranging from 15-19.9 cm was the only infected sample with 50% prevalence, while parasites were not recovered from fishes within the range of 20-24.9cm and 25-29.9cm actual lengths (Table 2).

Table 2: Prevalence of Ectoparasites Infection on Fish samples Based on Actual Length.

Actual Length (cm)	No Examined (%)		No infected (%)		Overall Total Infected (%)
	Female	Male	Female	Male	
15.0-19.9	2 (10%)	0	1(50%)	0	1 (50%)
20.0-24.9	12(60%)	10 (50%)	0	0	0
25.0-29.9	6 (30%)	10 (50%)	0	0	0
Total (%)	20	20	1 (5%)	0	1 (2.5%)

The weight of the fish samples showed that 13 of the fish samples examined weighed between 50-100g, out of which only one (1) was infected with a prevalence of 7.69%. Those that weighed between 101-150g and 151-200g had no infection (Table 3).

Table 3: Prevalence of Ectoparasite Infection on the Fish Samples According to Body Weight

Body weight (g)	No Examined (%)		No infected (%)		Overall Total infected (%)
	Female	Male	Female	Male	
50-100	7(35%)	6(30%)	1(14.29 %)	0	1(7.69%)
101-150	9(45%)	9(45%)	0	0	0
151-200	4(20%)	5(25%)	0	0	0
Total (%)	20	20	1(5%)	0	1(2.5%)

Three parasites' species were recovered from the infected fish sample and included *Trichodina* species, *Chilodenella* species and *Gyrodactylus* species. *Trichodina* species, being the most abundant parasite (60%), was found in the eyes, gills and on the skin of the infected fish. *Chilodenella* species (20%) was found only on the skin. In same vein, *Gyrodactylus* species occurred once in the fin and accounted for 20% of the total parasites. The skin of the infected fish sample was noted to be the most affected site with two different parasites (*Trichodina* species and *Chilodenella* species) (Table 4).

Table 4: Distribution of Ectoparasite Species on the Body Parts of Infected Fish

Parasites Found	Predilection Site	No. Recovered (%)
Trichodina species	Eyes, gills, skin	3(60)
Chilodenella species	Skin	1(20)
Gyrodactylus species	Fin	1(20)

IV. DISCUSSION

This study recorded a low prevalence (2.5%) of ectoparasites among 40 samples of *Synodontis schall* examined (20 males

and 20 females). This is lower than 61% and 48.82% reported by [13] and [14] respectively. The difference in prevalence could be as a result of difference in the fish species, location, number of samples examined and environmental factors like seasonal variations. The only infected sample in this study was a female fish. This is in line with [15] observation that infection with parasite was higher in female (15.63%) than male (11.11%). The weight of the fishes in this study however did not play significant role in parasite infestation as neither was the sex, as only 2.5% of the sampled fish was infested. The actual length of the only infected fish was within the low range of 15.0-19.9 cm. [7] observed that fish of a low class size are more susceptible to parasites because they have a weaker immune system compared to fishes of higher size class. [15] opined that fish length is directly correlated to age and body size.

In the present study, the infected fish was found to have three parasite species (*Trichodina* species, *Chilodenella* species, and *Gyrodactylus* species). This observation agrees with the reports of [14] and [16] who noted that fishes rarely get infected by a single parasite. This could be because most aquatic environments provide favourable conditions for the proliferation of these parasites. While *Chilodenella* species and *Gyrodactylus* species were restricted to specific areas of the fish, *Trichodina* species had a wider distribution, occurring on the skin, gills and eyes of the infected fish. [16] also observed that *Trichodina* species was widely distributed on the gills, fins and skin. Parasites were reported to be mostly seen on the skin than the eyes, fin and gills in this study, indicating that the skin of *S. schall* is a more favorable external organ for ectoparasites being that it comes directly in contact with the aquatic environment. However, the risk of transmission to man will be extremely low because skin surfaces, eye, fin and gills of most fishes are properly washed as it's a routine way of preparing fish before consumption. According to [17], the distribution of parasites in fish hosts is always aggregated or dispersed, meaning that most parasites in a population may be found in a small number of hosts and most potential hosts maybe infected or uninfected. In this study, most of the fish specimens examined were uninfected.

V. CONCLUSION AND RECOMMENDATIONS

The results of this study showed sparse infection with ectoparasites on the sampled *Synodontis schall* harvested from Otuogori River, Ogbia Local Government Area, Bayelsa State, Nigeria. The skin showed more parasites prevalence than other body parts. It is recommended that other fish species from the river should also be examined for ectoparasites and research on the physicochemical parameters of the river should be conducted in order to ascertain their impact on the prevalence of ectoparasites of fishes.

CONFLICT OF INTEREST

No conflicts of interests exist.

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