The Gastrointestinal Helminth Parasites of the Threadfin Fish, *Polydactylus quadrifilis* (Family: Polynemidae) in a Niger Delta Mangrove Creek, Nigeria

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Abstract: This study which is the ninth in a series to provide data on the biology and ecology of fish species of Buguma Creek, is the first to provide information on the gastrointestinal helminth parasites of the threadfin fish, *Polydactylus quadrifilis* in any Niger Delta mangrove creek, estuarine or marine ecosystem in Nigeria. Threadfin fish, *Polydactylus quadrifilis* was isolated from fish samples collected monthly from November 2004 to June 2006 at flood tides in Buguma Creek, Niger Delta Nigeria. The fish samples were caught by the use of hooks and lines and cast nets. A total of 76 specimens were examined for gastrointestinal helminth parasites. All helminth parasites observed were nematodes. The fish species had a prevalence of 15.8%, i.e., 12 infected out of 76. A total of 7 nematode helminth parasite species belonging to 6 families were recorded. Of the 7 species recorded, *Goezia sigalasi* (Ascarididae) had the highest prevalence of 6.6% while the other species had equal prevalence of 1.3%. The family, Cathostomatidae was represented by two species: *Phacochoerostrongylus* sp. and *Chapiniella* sp., while other families were represented by 1 species each.

Key words: Gastrointestinal helminth parasites, mangrove creek, nematodes, Nigeria, *Polydactylus quadrifilis*

INTRODUCTION

Marine and freshwater fishes are undoubtedly among the best potential hosts for any prospective parasite (Ravichandran and Ajithkumar, 2008). Threadfins (Polynemid fishes) occur in marine and brackish waters. They are common in estuaries and some representatives have been found in tidal rivers (Fisher et al., 1981; Edema and Osagiede, 2011).

Fish parasites and diseases constitute one of the most important problems confronting the fishery biologist today Ravichandran et al. (2007). Pathological conditions resulting from parasites and diseases assume high magnitude of epidemics under crowded and other unnatural conditions (Ravichandran et al., 2010). Data exist on the helminth parasites of marine or estuarine fishes, notable among which are De and Maity (1995), Groenewold et al. (1996), Palm (1999), Stobo et al. (2002), Hogue and Peng (2003), Bergmann and Motta (2004), Garcia et al. (2004), Cisse (2005) and Moravec et al. (2006) Extensive information is available on the ecology and biology of polynemid fishes, but there is a vast lacuna prevailing on the studies of parasite communities of polynemids. The only existing data are those of Gudivada and Vankara (2010) and Gudivada et al. (2010).

The fish species investigated in this study has been reported among the predatory fish assemblage of the study area Oribhabor and Ogbeibu (2010). The food and feeding habits of the fish community of the area has also been documented (Oribhabor and Ogbeibu, 2012). This study which is the ninth in a series to provide data on the biology and ecology of fish species of Buguma creek, is the first to provide information on the gastrointestinal helminth parasites of the threadfin fish, *Polydactylus quadrifilis* in any Niger Delta mangrove creek, estuarine or marine ecosystem in Nigeria.

MATERIALS AND METHODS

The study was conducted in Buguma Creek which is located southeast of the Niger Delta between longitude 6°47'E and 6°59'E and latitude 4°36'N and 4°59'N (Fig. 1). Detailed description of the fish sampling stations has been documented (Oribhabor and Ogbeibu, 2010).

Threadfin fish, *Polydactylus quadrifilis* specimens were isolated from fish samples collected monthly from November 2004 to June 2006 at flood tides. The fish
samples caught by the use of hooks and lines and cast nets from three stations were ice-packed, kept chilled under ice-blocks in a plastic cooler and immediately transported to the laboratory. In the laboratory, fish specimens were pooled, sorted and identified to species level using the key and descriptions of Schneider (1990).

The gut of each specimen was removed and preserved in a specimen bottle containing 4% formaldehyde. Each gut was cut open and the contents washed into a petridish using 4% formaldehyde. The contents were searched for nematodes under a low power (25-40 x) binocular dissecting microscope. The sorted specimens were preserved in 4% formaldehyde. Diversed species of nematodes recognized were sorted into different types and counted. Each type was mounted in Toludene blue 0 in lactophenol on a slide, covered with a clean cover slip and sealed with nail vanish. Each specimen type was photographed with format 1 microstar IV Reichert photomicroscope, model 1762. Identification of specimens to the least possible taxon was done with the aid of photographs and further examination of the specimens under the NIKON compound microscope, using taxonomic identifications in Yamaguti (1961a, b).

RESULTS

A total of 76 samples of the fish specimens were examined for gastrointestinal helminth parasites. All helminth parasites observed were nematodes.

Table 1 shows a summary of infection of the fish species by the helminth parasites. The fish species had a prevalence of 15.8%, i.e., 12 infected out of 76. A total of 7 nematode helminth parasite species belonging to 6 families were recorded. Of the 7 species recorded, *Goezia* families were recorded. Of the 7 species recorded, *Goezia sigalasi* (Ascarididae) had the highest prevalence of
Table 1: Summary of gastrointestinal helminth (nematode) infection of *Polydactylus quadrifilis* in Buguma Creek, Niger Delta, Nigeria, November 2004-June 2006

<table>
<thead>
<tr>
<th>Parasites recovered</th>
<th>No. (%) of fish infected</th>
<th>No. per host</th>
<th>Mean no. per host infected host</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family: Ancylostomatidae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Arthrocephalus</em> sp.</td>
<td>1 (1.3)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Family: Cyathostomatidae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Phacochoerostrongylus</em> sp.</td>
<td>1 (1.3)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><em>Chapiniella</em> sp.</td>
<td>1 (1.3)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Family: Heterakidae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Moaciria</em> sp.</td>
<td>1 (1.3)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Family: Oxyuridae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Laurotravassoxyuris</em> sp.</td>
<td>1 (1.3)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Family: Ascarididae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Goezia sigalasi</em></td>
<td>5 (6.6)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Family: Heterocheilidae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pseudanisakis</em> sp.</td>
<td>1 (1.3)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

N (fish sample size): 76; No. (%) infected: 12 (15.8)

6.6% while the other species had equal prevalence of 1.3%. The family, cyathostomatidae was represented by 2 species: *Phacochoerostrongylus* sp. and *Chapiniella* sp., while other families were represented by 1 species each.

**DISCUSSION**

The low prevalence (15.8%) of helminth parasites in the fish could be due to the impact of food and feeding habits of the fish Gudivada and Vankara (2010) and Johnson *et al.* (2004). The presence of isopods in the fish (Oribhabor and Ogbeibu, 2012) could be responsible for the incidence of nematode helminthes in the fish. Parasitic isopods are among the dominant groups of crustacean ectoparasites of which about 450 species are recorded as parasites of marine and freshwater fishes (Ravichandran *et al*., 2010). The physical and chemical conditions of the environment could also have militated against a high incidence of the parasites, for instance the present study was conducted in an environment with salinity of 0-21% Ogbiebu and Oribhabor (2008). Mouritsen and Poulin, 2002 posited that temperature is important as a major controlling factor of seasonal periodicity of infection. In this study, the influence of season could not be established in the distribution of the helminthes.

*Camallanus* sp. and *Procamallanus* sp. dominate infection and appear more frequent in fishes than other parasites in Nigerian rivers Okaka (1998). But in this study, *Goezia sigalasi* (Ascarididae) dominated infection in the fish species. *Camallanus cotti* was the dominant species in *Polydactylus sextarius* (Gudivada and Vankara, 2010). This study will serve as a baseline for further studies on the diversity and pathogenicity of helminth parasites of polyenid fishes in the coastal waters of Nigeria.

**CONCLUSION**

There is paucity of data on the helminth parasites of brackish and marine fish species in Nigeria. The findings of this study add to the limited information on the parasites and biology of polynemid fishes.

**REFERENCES**


