



Research Article

PARASITES OF THE GRUNT POMADASYS JUBELINI IN THE NEW CALABAR-BONNY RIVER, RIVERS STATE, NIGERIA

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ABSTRACT

Pomadasys jubelini collected twice monthly from June 2011 to May 2013 from the New Calabar-Bonny River were examined for parasites. The fish species sampled were caught using calabashes, traps, gill nets and hooks and lines. No ectoparasite was found on the outer surface of the fish, while the only endoparasite found was the *Cymotho aexigua* in the mouth of the fish. Out of the 202 samples obtained only 46 (22.77%) had parasites. The tongue-parasite *C. aexigua* was found to parasitize *P. jubelini* in the New Calabar-Bonny River.

Keywords: *Cymotho aexigua*, New Calabar-Bonny River, Parasites, *Pomadasys jubelini*, Tongue.

INTRODUCTION

All aquatic ecosystems, natural and artificial, fresh water and brackish waters can harbor parasites therefore fishes in such water bodies could be affected with parasites. Parasites; both ecto and endo parasites are not seldom to fishes. These parasites are often found in predatory fishes and using other fish species as host (Paperna, 1996). Fish is a good source of protein for man as well as food for the brain, excellent in nutritive value, rich in minerals and vitamins. Its protein is easily digestible and favorably consumed among groups and classes of consumers (FAO, 1996). Isopods are parasitic to fish. They are often found to infest fishes of the marine environment especially the warmer waters. These isopods feed on their host blood and hemolymph. They have mouth parts tough enough to penetrate, tear up and chew desired body parts that are filled with blood vessels or blood sinuses. The isopods are easily swallowed and fill up the gut of the fish. Isopods are intermittent feeders, they drain their host causing discomfort and obstructing daily activities, they can be a major drain on the host, frequently affecting reproductive performance and sometimes affecting growth rate (Rameshkumar & Ravichandran, 2014). Therefore it is said

that parasitism is a key factor to fish health and mortality. The knowledge of fish parasite is essential for fish management, ecological studies, community health, aquaculture and environmental management studies. Aquaculture and fishing has remained a major economic activity of many communities in riverine regions of Nigeria where over 35 million people depend wholly or partly on the fisheries sector for their livelihood (FAO 1996). Recent researchers such as (Ogbeibu *et al.*, 2014; Petney, 1997; Rameshkumar & Ravichandran, 2014) have made advances in the study of fish parasites, in Nigerian water bodies and overseas stating that fish parasites are said to be bio-indicators of pollution. These researches have revealed a high accumulation potential of different parasite taxa and successfully identified them as useful channels to assess chemical pollution. Parasites are very capable of accumulating chemicals (e.g. metals) to very higher levels. They are able to bio-concentrate pollutants in trace levels in the environment and make them detectable and quantifiable using conventional analytical techniques (Nachev & Sures, 2016; von Dohlen, *et al.*, 2019). However, there remains a large vacuum in the knowledge of fish diseases and pathology in Nigerian waters, thus, a study of fish and their

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parasites in the New Calabar-Bonny River area will provide data on the fish species negatively affected the levels of parasitic infection and interaction of the organisms in the rivers around us.

MATERIALS AND METHODS

Study area

The study area is located at the upper limit of the New Calabar-Bonny River near Port-Harcourt metropolis, Rivers State, Nigeria. It is located between latitude 4°36' and 4°55'N and longitude 6°45' and 7°72'E. Three stations were selected along the river for the purpose of this study based on the salinity of the river as reported by (Deekae & Henrion, 1993). The stations are located at Choba, Iwofe and Abonema wharf. The Choba section of the River is more fresh water, the fresh water flows in to it at certain periods of the year from streams and rivers. The Iwofe area is brackish, and Abonema wharf is an inter-tidal zone which is predominantly ocean water, constituting more of salt water.

Field sampling

Fish were purchased from catch landings of pre-arranged fishermen using gill nets, hooks, traps and calabashes. Fish samples were collected from the three stations monthly for twenty-four (24) months, from June 2011 to May 2013. The fish were transported in an insulated box containing ice chips, to the Fisheries Laboratory, Department of Fisheries and Aquatic Environment, Rivers State University of Science and Technology, Port-Harcourt. Fish were identified using text and keys by Agbugui, (2013).

Identification/ Examination of samples for ectoparasites

The identified fishes were measured to the nearest mm and checked for macro ectoparasites in the skin and gills of the fish specimen. The fishes were dissected and the gastrointestinal tract (oesophagus, stomach, intestine and rectum), lungs, liver and gall bladder were observed for encysted larval stages of parasites and other trematodes. The scraped portion on each of the organs were smeared on clean glass slides, covered with cover slides and examined under light microscopes for ectoparasites. The isolated parasites were collected and fixed in 4% phosphate buffered formalin (PBF) and as reported by then, for further processing and species identification (Paperna, 1996; Petney, 1997). Each sample was examined independently for parasites according to the protocol outlined in (Obiekezie & Ekanem, 1995). Skin scrapings and wet mounts from skin and gills were examined for abundance and distribution of ectoparasites. Identification of parasites was carried out according to (Obiekezie & Ekanem, 1995; Roberts, 2003).

RESULTS AND DISCUSSION

A total of two hundred and two (202) fishes were examined with forty six (22.77%) of them infected with parasites. The parasites isolated were all endoparasites found in the mouth of *P. jubelini*. The endo-parasite, the tongue parasite –*Cymothoaexigua* (Figure 1) belonging to the family Cymothoidae were observed. Parasites were creamish in colour and between 3cm to 6cm in length, 3cm -5cm in width and between 4g to 8g. No ecto-parasites were isolated from all the fished observed.



Figure 1. *Cymothoaexigua* in the mouth of fish.

The result of the study of the parasitic infection of *P. jubelini* in the New Calabar-Bonny River presents a 22.77% infection rate. This is a bit lower as compared to similar works such as those of (Onwuliri & Mgbemena,

1987) who recorded 60.4% infection rate for freshwater fishes from Jos Plateau, (Awharitoma & Okaka, 1999) that recorded 60.8% infection rate for cichlid fishes from Okhuaihe in Edo State, 59.2% reported by Onyedineke

et al., (2010) during their studies for fishes in the Niger River at Illushi, Edo State and George and (Inyang-Etoh *et al.*, 2018) that recorded a 43.3% of parasitic fauna of landed fishes from Qua Iboe River Estuary, South- South, Nigeria. Other researches gave lower rates of parasitic infection with an overall parasite prevalence of 17.1% in the Osse River, 6.9% in the Okhuo River, (7.7%) in the fishes examined from Imo River and 3.3% in the Great Kwa River (Ekanem *et al.*, 2011; Obiekezie & Ekanem, 1995) The low prevalence of parasites observed in the examined fish during the study duration as compared to other studies could be credited to the nature of the anatomy of this fish species. No ectoparasites were found, this could be as a result of the hard and tough nature of the scales preventing attachment. No parasite was found on the gills and skin, this observation could be credited to the constant movement of water current over the gills skin which may not support anchoring and continued existence of parasites on such locations (Aken'Ova, 1999; Boadu *et al.*, 2018; Hennessy, 1997). The intestine did not also present any parasite. This could be attributed to presence of pharyngeal teeth that can help to crush covering or shell of parasitic arthropods, isopods or copepods. This result is in agreement with the findings of George and Inyang-Etoh was *Polydactylus quadrifili*, *Pomadasys jubelini*, *P. peroteti* had no evidence of disease manifestation. Every parasitized fish had only one parasite in its mouth. No fish had more than one parasite; this might be attributed to the size the parasite, *C. exigua*, filling the whole mouth of the fish. The parasite is mostly observed taking the place of the tongue or attaching itself over the tongue, it uses its hard jointed legs to attach itself firmly into position, thus it is hardly pulled off by food intake, hard shell and abrasive scales. With the result obtained from past researchers it is evident that parasitic infection rates vary greatly from one fish species to another, one habitat to another which depends on a number of factors. These variations in the rate of parasitism could be attributed to abiotic and biotic conditions of the environments, level of pollution in the aquatic habitat which has recently been a bio-indicator. Parasitic infection may be enhanced and aggravated due to unfavourable environment which would in turn depress fish physiology and general wellbeing (Kelly *et al.*, 2010; Margolis *et al.*, 1982; Rohlenová *et al.*, 2011; Rózsa *et al.*, 2000).

CONCLUSION

It is important to note here that no other work or research revealing the parasite of *P. jubelini* has been done. This paper reveals the parasite *Cymothoa exigua* on *P. jubelini* in the New Calabar-Bonny River, Nigeria. Therefore it is recommended that the processing and preparation of *Pomadasys jubelini* from the river system should be properly handled before consumption to avoid health risk due to parasitic infestation.

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