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Market Survey of Fish Species Infested with Parasitic Isopods, Port Harcourt, Nigeria

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Abstract

Parasitic isopods are blood-feeding ecto-parasites that cause significant economic losses to fisheries by killing, stunting growth, or damaging fishes. This research was undertaken to determine the species of local fishes infested by parasitic isopods at Creek Road market and Eagle Island waterside, Port Harcourt, Nigeria. Survey lasted for a period of four months, September-December, 2020. Seventy parasitic isopods were recovered from 64 infested fish specimens. Fish species examined included mullets (*Neochelon falcipinis*), croacker (*Pseudotolithus elongatus*), catfish (*Auris haudelotti*), red snapper (*Lutjanus* sp.), Tilapia, sardine (*Sardinella maderensis*) and Pomadasys (*Pomadasys peroteti*). Four of these fish species were infested with isopods: Red snapper (*Lutjanus* sp.), Tilapia, Sardine (*Sardinella maderensis*) and *Pomadasys peroteti*, with *Pomadasys* recording the highest infestation rate. Sixty parasitic isopods were recovered from *Pomadasys*, 7 from *Lutjanus* sp., 2 from Tilapia and 1 from *Sardinella maderensis*. These parasites were found attached to the fish body, fixed in the mouth, some were attached to the lips and others in the gills. We recommended research into the impact of physico-chemical parameters on the prevalence of parasitic isopods on fishes.

Keywords: *Cymothoa, Pomadasys, Lutjanus*, Creek Road, Eagle Island, Nigeria

INTRODUCTION

Parasitic isopods are obligate crustacean parasites that are primarily marine, which belong to the family Cymothoidae (Ahyong *et al.*, 2011). Most parasitic isopods are ectoparasites that feed on blood or hemolymph affecting reproductive performance and growth rate of infested organisms (Ugbomeh and Nwosu, 2016). Cymothoids are large isopods, ranging in size from about 10 mm to 50 mm in length. A major characteristic of this family is the larger size of the females over the males (Brandt and Poore, 2003).

Most cymothoids are highly site and host specific. The site of attachment on the host (gills, mouth, external surfaces or inside the host flesh) can also be genus or species specific. They have been isolated from several families of marine teleosts. "They have also been reported from chondrichthyan fishes, jellyfish, cephalopods, crustaceans, and amphibians (Trilles and Öktener, 2004; Ateş *et al*., 2006)".

Infested fish may suffer infection from microorganisms due to wounds on the attachment sites (Poore and Bruce, 2012). Blood loss, localized lesion and stress may reduce the growth rate and condition factor of the fish, and also, a reduced lifespan (Rameshkumar and Ravichandran, 2014). The isopods are also considered as direct agents or vectors of disease (Ravichandran *et al*., 2009). Their presence also reduces market value of fish.

Research on parasitic isopods are therefore, of grave importance in fisheries management. This research is a survey of local fishes infested with parasitic isopods in Creek Road market and Eagle Island waterside, situated in Port Harcourt, Rivers State, Nigeria.

Materials and Methods

Study Area

Two markets, Creek Road Market (4º45˙31.201''N and 7º1'35.3''E) and Eagle Island Waterside (4º 47'13·602¨N 6º58'46.14''E), both in Port Harcourt, Nigeria, were surveyed. Both locations were human and fishing settlements. Survey lasted from September to December, 2020.

Fishes were examined for parasitic isopods at both fish markets shortly after they were brought in by fishers who used different fishing gear (such as, trawls, traps, trammel nets, spearing and hook and line). Fish identification was aided by keys from Fishbase.org. The external surfaces- the body, mouth, gill chambers and fins- of each fish were examined grossly for the presence of parasitic isopods with the aid of magnifying lens at the markets. Morphometric measurements like the standard length and fork length of the fish samples were taken at the markets while some specimens were bought and transported in polyethene bags to the Parasitology Laboratory, Department of Animal and Environmental Biology, Rivers State University, Port Harcourt. The wet weight of fish samples was taken using a weighing balance. Isopods recovered from the infested fishes were stored in vials and preserved in 70% ethanol and deposited in the laboratory.

Computation of Prevalence and Mean Intensity of Isopod Infestation

Prevalence and intensity of infection were calculated for the parasites according to the formula of Bush *et al*., (1997):

$$\text{Prevalence (P\%)} = \frac{\text{(Number of infected host)}}{\text{(Total number of hosts examined)}} \times 100.$$

$$\text{Mean intensity (MI)} = \frac{\text{(Total number of parasites in all infected hosts)}}{\text{(Total number of infected hosts)}}$$

Results

Seventy (70) parasitic isopods were recovered from sixty-four (64) infested fish species. Species of fish examined at both markets were mullets (*Neochelon falcipinis*), croacker (*Pseudotolithus elongatus*), catfish (*Auris haudelotti*), red snapper (*Lutjanus* sp.), Tilapia, sardine (*Sardinella maderensis*) and Pomadasys (*Pomadasys peroteti*). Four of these fish species were infested and they included: Red snapper (*Lutjanus* sp.), Tilapia, Sardine (*Sardinella maderensis*) and *Pomadasys peroteti*, but *Pomadasys* recorded the highest number of isopods. These parasites were found in different locations on these fishes. Some were found attached to the fish body, some were fixed in the fish mouth where they eat the fish tongue which gave them the name 'tongue eating parasite'; some were found attached to the lip of the fish and some were found in the gills.

Prevalence and Mean Intensity of Parasitic Isopods in Infested Fishes

At Creek Road Market, thirty-five fish specimens comprised of 28 *Pomadasys peroteti*, 5 *Lutjanus* sp. and 1 of each of *Sardinella maderensis* and Tilapia were infested with parasitic isopods. Prevalence of infection was 100% as all examined hosts of these fish species were infested. Mean intensity was one parasite per infested host (Table 1). Fishes were not available in this market in November, 2020; fish mongers claimed that the heavy rainfall that characterized the month made it difficult for fishers to successfully harvest fish.

At Eagle Island Waterside, twenty-nine fish specimens comprised of 26 *Pomadasys peroteti*, 2 *Lutjanus* sp. and 1 Tilapia were infested with parasitic isopods. In this location also, *Pomadasys* had the highest number of parasitic isopods followed by *Lutjanus* sp. and Tilapia. Prevalence of infection was 100% while mean intensity of infection was one parasite per infected host (Table 2).

Discussion

Isopods are important fish parasites of the marine environment (Papaganagiotou and Trilles, 2001). They are blood-feeding parasites which inhabit the buccal cavity, gill chamber, fins or the body surface of fish hosts. Their activities may lead to secondary infections in fish, cause stunted growth or even kill the fish (Hadfield *et al*., 2013).

Table 1: Prevalence (%) and Mean Intensity of Parasitic Isopods in Infested Fishes, Creek Road Market, Port Harcourt, Nigeria

Month	Fish Species	No. Examined	No. Infested	Prevalence (%)	Mean Intensity
Septem-ber, 2020	*Pomadasys*	13	13	100	1.0
	Tilapia	1	1	100	1.0
	Sardinella	1	1	100	1.0
October, 2020	*Lutjanus*	5	5	100	1.0
Novem-ber,	-	-	-	-	-

Decem-ber, 2020	*Pomad asys*	15	15	100	1.0
	Total	**35**	**35**	**100**	**1.0**

Table 2: Prevalence (%) and Mean Intensity of Parasitic Isopods in Infested Fishes, Eagle Island Waterside, Port Harcourt, Nigeria

Month	Fish Species	No. Examined	No. Infested	Prevalence (%)	Mean Intensity
September, 2020	*Pomadasys*	16	16	100	1.0
	Lutjanus	1	1	100	1.0
October, 2020	*Pomadasys*	2	2	100	1.0
November, 2020	*Pomadasys*	3	3	100	1.0
December, 2020	*Pomadasys*	5	5	100	1.0
	Tilapia	1	1	100	1.0
	Lutjanus	1	1	100	1.0
	Total	**29**	**29**	**100**	**1.0**

Conclusion and Recommendation

This market survey was conducted to investigate the species of local fishes that were commonly infested by parasitic isopods at Creek Road Market and Eagle Island Waterside, Port Harcourt, Nigeria. These fishes included Haemulidae (*Pomadasys* sp.), Cichlidae (Tilapia), Clupidae (*Sardinella maderensis*) and Lutjanidae (*Lutjanus* sp.), with Haemulidae recording the highest number of parasitic isopods followed by *Lutjanus* and others. The maximum number of parasites were observed in the months of September and December, 2020, while minimum number of parasites were recorded in the months of October and November, 2020.

We recommend further research into the impacts of surface water physico-chemical properties on the prevalence of parasitic isopods on fish hosts.

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