International Journal of Fisheries and Aquatic Studies

ISSN: 2347-5129
IJFAS 2013; 1 (1): 18-21
Received: 09-10-2013
Accepted: 30-10-2013

Albert P. Ekanem
Institute of Oceanography, University of Calabar, PMB 1115, Calabar, Nigeria.

Victor O. Eyo
Institute of Oceanography, University of Calabar, PMB 1115, Calabar, Nigeria.

Imaobong E. Ekpo
Department of Fisheries and Aquatic Environmental Management, University of Uyo, PMB 1017-520001, Uyo

Blessing O. Bassey
Institute of Oceanography, University of Calabar, PMB 1115, Calabar, Nigeria.

Correspondence:
Albert P. Ekanem
Institute of Oceanography, University of Calabar, PMB 1115, Calabar, Nigeria.

Parasites of Blue Crab (*Callinectes amnicola*) in the Cross River Estuary, Nigeria

Albert P. Ekanem, Victor O. Eyo, Imaobong E. Ekpo, Blessing O. Bassey

ABSTRACT
A four months study was carried out to investigate the parasites of blue crab (*Callinectes amnicola*) in the Cross River estuary and the possible health implications to crabs consumers. Two hundred live crabs were collected for a period of 5 months (May to September, 2012) using plastic buckets and transported to Fish Pathology Laboratory, University of Calabar for identification and examination for both ecto and endoparasites. Scrapings from cuticle, skin and gills were examined microscopically as wet mounts for ectoparasites, while squash from internal organs (muscle and gut) were examined for endoparasites. The overall prevalence of parasites was 12.38 %; parasites recovered were *Trichodina* and nematodes scantly distributed on the skin and gut of *C. amnicola* respectively. Prevalence of parasite in relation to carapace width (cm) was highest in width class 5-9.9 cm (61.54 %) followed by 10-14.9 cm (38.46 %) and 0.00 % for 15-19.9 cm. Parasites isolated were normal intestinal and gut flora of aquatic animals. It was concluded that *C. amnicola* from the Cross River Estuary is not infested with parasites of zoonotic importance and could be recommended for human consumption.

Keywords: Blue crab, Parasites, Cross River Estuary.

1. Introduction
Crab belongs to the family of crustacean and the order decapods [1]. Crab hunting is one of the valuable components of small-scale coastal fisheries in many countries in the tropics [2].
The blue crab *Callinectes amnicola* is one of the most common swimming crabs found in brackish wetland and lagoons in Nigeria [3]. These crabs inhabit muddy bottoms in mangrove areas and river mouths [4]. It is one of the most important food organism caught in the coastal (inshore) fishery and lagoons of West Africa [5].
Amnocola was more abundant among the shell fishes caught in a Lagos Lagoon Creek and was more abundant during the rainy season (May – October). According to Chindah *et al*.[6] *C. amnicola* of the new Calabar River feeds on different food items like algae, shrimps, brachyuran bivalves, gastropods, fish, polychaetes and other plant materials.
Crab meat is a good source of protein, vitamins and essential minerals substances. It contains phosphorus, Zinc, calcium, iron and little amount of fat, especially saturated fat substances. However, it contains a high content of cholesterol and most of the health organizations in the world have suggested that people should eat no more than 300mg of crab meat per day. Hence, crabs are exploited by man for food [7].
Vogan *et al.* [8] reported on the disease of crab and also demonstrated histopathological alterations to several organ and tissue systems. Powell and Rowley [9] noted an apparent dissociation between the prevalence of shell disease and organic load (related to sewage pollution) in *C. pagurus*.
Sprague [10]; Couch [11], reviewed many microsporidian parasites, some of which are responsible for economic and ecological impacts in commercial hosts, have been described as infecting decapods crustaceans. According to Childers *et al*. [12], the prevalence of the parasite can reach 40 % and is highest in male crabs than the females.
There has been no report on the diseases or parasites of crabs from the Cross River Estuary. The objective of this study was to investigate the parasites of blue crab (*C. amnicola*) from the Cross River Estuary and its suitability for human consumption.

2. Materials and Methods

2.1 Study Area

The crabs used in this study were collected from the Great kwa River, Calabar. It is one of the major tributaries of the Cross River Estuary. It takes its course from the Oban Hills in Aningeje, Cross River State, Nigeria. It flows south wards and discharges into the Cross River Estuary around latitude 4º45'N and longitude 8º20'E [13].

2.2 Sampling Collection

Sampling duration for this study was five months. Sampling was done twice weekly, in the morning hours. Samples were randomly collected for the study. Only mature adult crabs were collected and sorted into carapace width classes in centimeters.

Samples collected were stored in plastic buckets and transported to the Fish Pathology Laboratory of the University of Calabar for identification and examination.

2.3 Examination of Samples for Ectoparasite

Scrapings from the skin (cuticle) and gills of the crab specimen was spread on clean glass slides, covered with cover slip and examined under light microscopes for ectoparasites [14]. Some parasites were collected and fixed in 4 % Phosphate Buffered formalin (PBF) for further processing and species identification [15, 16]. Each sample was examined independently for parasites according to the protocol outlined in Obiekezie and Ekanem [17]. Cuticle scrapings and wet mounts from skin (cuticle) and gills were also examined for abundance and distribution of ectoparasites. Identification of parasites was carried out according to Yamaguti [18]; Obiekezie and Enyenihi [19]; Roberts [20].

2.4 Examination of Samples for Endoparasites

The cavity of each crab was cut opened ventrally with a pair of scissors and the internal organs removed for examination. Some organs were examined as wet mounts under the microscope while other parts were fixed in PBF for isolation and identification of parasites [15, 16].

3. Results

3.1 Prevalence of parasite in relation to Carapace Width Class (cm)

Result from the present study showed that prevalence of parasite (Table 1.) in relation to carapace Width Class (cm) was highest in width class 5-9.9cm, followed by 10-14.9cm width class while there was no record of parasite in 15-19.9cm width class. In 5-9.9cm width class, 3 crabs were infested (75.00 %) with 4 (57.14 %) parasites. In 10-14.9cm width class, only 1 crab was infected (25.00 %) with 3 (42.86 %) parasite.

Table 1: Prevalence of parasites in relation to Carapace Width Class (cm).

Carapace Width Class (cm)	No. and % of crab Examined	No. and % of crab Infected	Total No. and % of Parasite Recovered
5 –9.9	70 (33.33)	12(60.00)	16(61.54)
10 –14.9	70 (33.33)	8(40.00)	10(38.46)
15 –19.9	70 (33.33)	0(0.00)	0(0.00)
Total	**210(100.00)**	**20(100.00)**	**26(100.00)**

3.2 Parasite Type recovered in relation to Carapace Width Class (cm)

In the present study, all parasites recovered were protozoan and nematodes. In 5-9.9 cm width class, 12 trichodina and 4 nematode *Species* were recovered out of 16 (61.54 %) recovered parasites. In width class of 10-14.9 cm, 8 trichodina and 2 nematodes were recovered out of 10 (38.46 %) parasites. In 15-19.9cm width class, no crabs were infected with parasite. Table 2 shows parasite type recovered in relation to Carapace Width Class (cm).

Table 2: Type of parasite recovered in relation to Carapace Width Class (cm)

Carapace Width Class (cm)	No. and % of crab Infected	Total No. and % of Parasite Recovered	Type of parasite and No. recovered
5-9.9	12(60.00)	16(61.54)	Tichodina (12) *Nematode sp* (4)
10 – 14.9	8(40.00)	10(38.46)	Trichodina (8) Nematodes (2)
15 - 19.9	0(0.00)	0(0.00)	----------
Total	**20(100.00)**	**26(100.00)**	

3.3 Numerical Abundance and percentage incidence of parasite in relation to Carapace Width Class (cm)

Numerical abundance and percentage incidence of parasite (Table 3.) in relation to Carapace Width Class (cm) showed that in 5-9.9 cm width class, 12 Trichodina had percentage incidence of 46.15 % and 15.39 % for 4 Nematode isolated. In 10-14.9 cm width class, percentage incidence was 30.77 % obtained for 8 trichodina and 7.69 % for 2 nematodes recovered. In 15-19.9 cm width class, there was no incidence of parasite.

Table 3: Numerical Abundance and percentage incidence of parasite in relation to Carapace Width Class (cm)

Carapace Width Class (cm)	No Infected	Total No. of Parasite Recovered	Type of parasite Recovered	Numerical Abundance	Percentage Incidence (%)
5 –9.9	12	16	Trichodina Nematode	12 4	46.15 15.39
10 –14.9	8	10	Trichodina Nematodes	8 2	30.77 7.69
15 –19.9	0	0	----------	-	-
Total	**20**	**26**		**26**	**100**

4. Discussions

Results from the present study showed overall prevalence of parasite as 12.38 % whereas prevalence of parasite in relation to carapace width was highest in 5-9.9 cm width class (61.54 %), followed by 10-14.9 cm width class (38.46 %), indicating that Blue crab (*C. amnicola*) between 1-10 cm are more susceptible to parasites. This finding is similar to Anderson [21]; Ekanem *et al.* [14] who reported that parasites cause diseases to fishes of lower width class (cm) in the Cross River Estuary.

Parasites in crabs have been a great concern since they often produce disease condition thereby increasing their susceptibility to other diseases, causing nutritive devaluation of crabs, a highly cherished delicacy for coastal inhabitants of Cross River. Parasitic infestation have some negative influence on commercially important crustaceans, by influencing their growth, reproduction, egg survival, longevity, and marketability [22].

The parasites isolated from *C. amnicola*.in this study were scanty protozoan (Trichodina) and nematodes which intensity poses no health risk to crab consumers. However, Jeffrey and Overstreet [23] reported heavy presence of protozoan in the skeletal muscle blue crab. This suggest that distribution of parasites varied from one habitat to the other which could be due to host parasite relationship and abiotic factors like dissolved oxygen, temperature and pH [22].

According to Jeffrey and Overstreet [23], Blue crabs were exposed to a variety of disease causing agents such as viruses, bacteria, fungi, protozoa, helminths, and other crustaceans in the Gulf of Mexico. Although most of these agents caused little or no pathological alteration in the crab host, some were responsible for a considerable alteration and mortalities in affected hosts. However, unlike dead fish that float, dead crabs generally sink; hence large mortalities often go unnoticed or underreported. The true influence of several diseases, therefore, may be difficult to assess without intensive sampling. Although the present study focused strictly on parasites of *C. amnicola*, only few parasites with no disease implications were isolated in the Cross River Estuary. The case of Gulf of Mexico as reported by Jeffrey and Overstreet [23] has confirmed that diseases of blue crabs varies from one location to the other and may be dependents on the prevailing environmental conditions [24].

The results of the present study is also supported by Deardorff and Overstreet [25] who reported the presence of symbiotic nematodes (Anisakidae) in *C. amnicola* during their investigation on parasites of blue crab in the northern Gulf of Mexico. The parasites isolated in the present study were few protozoan (Trichodinids) and nematodes with no pathological implications on their host and no health risk to crab consumers.

5. Summary and Conclusion

The blue crab, *C. amnicola* is a very popular food item in the diet of coastal inhabitants of Cross River State, Nigeria. The study shows that blue crabs from the river system were infested by few protozoan and nematodes which could pose no health risk to crab consumers. We concluded that blue crabs from the Cross River Estuary are fit for human consumption on the basis of the number and types of parasites isolated during our study.

6. Reference

1. Dorrit RL. Barnes RD, Walker WF. Zoology SAVNDERS College Publishing Philadelphia 1999; 1008.
2. Chande AI, Mgaya YD. The fishery of *Portunus pelagicus* anspecies University of Portunid Crabs along the Coast of Daves Salm Tanzania. Western Indian Ocean Journal of Maine Sc 2003; 2(1):75-84.
3. Abbyikalio NJ. Notes on Crabs from the Niger Delta, 1982 Defelice RC, Eldredge LG, Cariton VT. Non-indigenous invertebrates, 2001.
4. Lawal-Are AO, Kusmikji R. Size composition growth pattern and feeding habits of the blue crab *Callinecles amnicola* (drochedburne) In the Badagy Lagoon Nigeria. J Sci Res Dev 2000; (4):117-126.
5. Chindah AC. Tawai CCB, Ifechukwude KA. The food and feeding habits of the swimming crab *Calinectes amnicola* (Portunidae) of the New Calabar River Nigeria. J Appl Sc Environment 2000; (4):51-57.
6. Schneider W. FAQ Species identification sheet for fishery purpose. Field guide to the Commercial Marine resources of the Gulf of Guinea. FAQ, Rom 1990; 268.
7. Vogan CL, Coasta-Ramos C, Rowley AF. A historical study of shell disease syndrome in the edible crab cancer pagurns. Diseases of Aquatic Organisms 2001; (47):209-217.
8. Powell A, Rowley AF. Unchanged prevalence of shell disease in the edible crab cancer pagurus four years after decommissioning of a sewage outfall at langland Bay, Uk. Diseases of Aquatic Organism 2005.
9. Sprague V. Classification and Phylogeny of the microsporidia. In: Bulla LA, Chen TC; editors. Comparative Pathobiology, systematic of the Microporidia 2, New York: Plenum Prerss 1977, 1-510.
10. Couch JA. Diseases caused by protozoa. In: Povenzano AJ, Editor. The Biology of Crustacean 6, Pathobiology, New York: Academic Press 1983, 94-98.
11. Childers RK, Reno PW, Olson RE. Prevalence and geographic range of *Nadelspora cancei* (microspora) in Dungeness crab cancer magister. Cross Rivers web of Science 1996; 24:135–142.
12. Akpan ER. Influence of meterological and hydrographic factors on the water quality of Calabar River Nigeria. Tropical environment Res 2000; 2(1):101-111.
13. Ekanem AP, Eyo VO, Sampson AF. Parasites of landed fish from Great Kwa River Calabar Cross River State Nigeria. International Journal of Fisheries and Aquaculture 2011; 3(12):225-230.
14. Paperna I. Parasites infection and disease of fishes in Africa. CIFA Technical paper, 1980.
15. Paperna I. Parasites infections and diseases of fishes in Africa An update. CIFA Technical Paper 1996; (31):157-170.
16. Obiekezie Al, Ekanem D. Experimental infection of *Heterobranchus longifilis* (Teleosti. Claridae) with *Tichodina marikitae* (ciliophoer: peri trichida). Aqua Liv Res 1995; (8):439–443.
17. Yamagutis I. Nematodes of vertebrates. Sys. Helminth. New York, Interscience Publishers Inc 1961; 1:2-61.
18. Obiekezie AI, Enyenihi UK. Henneguya Chysichthyo Sp. (Protza:

myxozoa) from the gills of the estuarine catfish, chysicthys nigrrodigitatus (lacepede) in the Cross River Estuary Nigeria. J Afr Zool 1988; (102):33-42.
19. Roberts RJ. Fish pathology. Edn 3, Hagerman, Idaho 2000; 472.
20. Anderson DP. Fish immunology. In: Diseases of fishes Stanisias. F. Sneiszko. F. & Axelrod (eds.) H. R. F. H. publication Inc. New Jersey 07753, USA, 1974.
21. Kuris AM, Lafferty KD. Modelling crustacean fisheries Effects of parasites on management strategies. Canadian Journal of Fisheries and Aquatic Sciences 1992; (49):327-336.
22. Jeffrey SD, Overstreet RM. The Blue Crab Diseases Parasites and Other Symbionts Faculty Publications from the Harold W. Manter Laboratory of Parasitology 2003; 426.
23. Anderson RC. Nematodia parasites of verterbrates, their development and transmission. C.A.B international Willingford 1992; 99.
24. Deardorff TL, RM Overstreet. Review of *Hysterothylacium* and *Iheringascaris* (both previously=*Thynnascaris*) (Nematoda: Anisakidae) from the northern Gulf of Mexico. Proceedings of the Biological Society of Washington 1981; (93):1035-1079.