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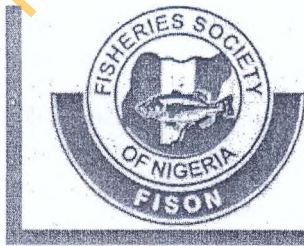
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PREVALENCE OF *Eustrongylides ignotus* IN *Poecilia reticulata* OBTAINED FROM SOME WASTEWATER DRAINS OF LAGOS STATE.

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ABSTRACT

Poecilia reticulata is a common ornamental tropical fish is found in many wastewater drains in Nigeria. Guppies feed on Oligochaetes which are intermediate hosts of *Eustrongylides ignotus* which is a parasite of *Clarias gariepinus*. The potential ban on the importation of ornamental fishes into Nigeria due to dearth of information on the parasite fauna of ornamental fishes has enhanced the demand for local species, usually sourced from the wild. Sampling was done monthly using a 2 mm mesh-sized scoop net along selected drains at Igi-Olughin Street, Basil Ogamba Street, Ahmadu Bello Road and Adenaike Alagbe Street between March, 2004 and February, 2005. The selected drains were abutting residences and varying industrial activities in each of four different local government areas of Lagos State. 60 female and 60 male samples were randomly selected from each drain for dissection and microscopy. Nematodes observed were identified using standard identification guides. Prevalence was determined as percentage infection in guppies examined. Measurements of wastewater temperature, Dissolved Oxygen (DO), pH and transparency were done according to APHA methods. Drain depth was determined using a calibrated pole. Data was analyzed using chi-square test, ANOVA and Pearson correlation coefficient. Out of 4,320 nsamples examined only 156 were infected. There was no sex-related difference in the prevalence of *E. ignotus* and no significant difference in mean monthly pH and DO across drains. The highest prevalence of 12.0% was observed in *P. reticulata* males obtained from Adenaike Alagbe Street in June, 2004. Mean monthly physicochemical parameters for drains were: temperature, 25.0 ± 1.1 - 26.0 ± 1.1 °C; DO, 7.8 ± 2.1 - 8.4 ± 1.8 mg l⁻¹; pH, 6.9 ± 0.5 - 7.3 ± 0.4 ; transparency, 3.5 ± 0.8 - 23.0 ± 3.6 cm and drain depth, 9.6 ± 2.3 - 14.8 ± 3.2 cm. The prevalence of *E. ignotus* in the *P. reticulata* obtained from the selected Streets should not prevent their exploitation for both import substitution and the export market because it is low.

INTRODUCTION

Ornamental fish are those species of fish kept alive in transparent homestead aquaria, ponds and outdoor waterfalls for their aesthetic values. These values range from their characteristic colour, shape, size, exudates and behaviour in water. Generally, there is no record encountered in literature indicating abhorrence of aquarium fish keeping as a hobby or trade by practitioners of any particular culture, religion or law in any human society (Sanders, 1990). This is partly responsible for the ease with which ornamental fish have crossed borders with utmost toleration and through which they have become ubiquitous because they have been sentimentally considered as disease-inert due to their primary aesthetic values and therefore incapable of inflicting harm on the bio-conservation of many biomes. In addition, a social school of thought considers the possession, popularity and the acceptance of ornamental aquaculture, an index of economic well-being of any human population (Sharma *et al.*, 2007). Alarmingly more important however, is the forensic link made by Hulme (2009) in the sequence between globalization and gradual loss of biodiversity, as occasioned by the continuing translocation of exotic fish species to new climes culminating in the generation of novel host - parasite relationships.

Already, Nigeria is a reputed as an unregulated source as well as attractive destination for many freshwater and marine species of ornamental fish species. *Poecilia reticulata* is an ornamental fish species with the highest record of import into the United States of America (US), but incidentally, with the highest potential of import substitution in Nigeria because it is very abundant in many wastewater drains of Lagos State, Nigeria (Anogwih and Makanjuola, 2010; Lawal and Samuel, 2010). Apart from this, the monocultural economy of Nigeria, being largely dependent on raw petroleum products for foreign exchange earnings (forex) leading to a wide balance of trade challenges with her trading partners commends the exploitation of ready alternative sources of forex revenue, albeit, the type that also has a good poverty-alleviating potential such as ornamental fish farming. However, the feeding and reproductive habits of such ornamental fish species like *P. reticulata* hold a challenge as well as opportunity for its better culture. Negatively, it feeds on fertilized eggs of other fish species laid in ponds, wastewater drains and earthen ponds. As an aggressive and voracious fish egg eater, it also cannibalizes its own young and decimates the new hatchlings of other fish species of economic importance. *P. reticulata* also feeds on Oligochaetes that are very abundant in many wastewater drains and serve as the intermediate hosts to *Eustrongylides ignotus*. Besides, Ardeid piscivores that are the final hosts of *E. ignotus* visit wastewater drains regularly to prey on *P. reticulata* (Spalding *et al.*, 1993). If local sources of *P. reticulata* will be readied for the export market as well as replace invading streams of exotic imports into Nigeria, then the standing parasite fauna of this fish would need examination for the enabling

certification of this local stock for international commercial validation. Therefore, nematodes of the ranking of *E. ignotus* in notoriety that is reputed for distorting the aesthetic values of *P. reticulata* by the massive distension of their abdomen deserve closer examination hence the study of the prevalence of this parasite in the available wastewater stock of selected drains in Lagos State. This study investigated possible sex-related differences in the prevalence of *E. ignotus* in *P. reticulata* and its possible correlation with the physicochemical parameters of the wastewater drains.

MATERIALS AND METHODS

A Street each was selected in four different local government areas of Lagos State for their variety in population density and residency types. These Streets were Igi-Olugbin Street in Bariga LGA, Basil Ogamba Street in Surulere LGA, Ahmadu Bello Road in Eti-Osa LGA and Adenaike Alagbe Street in Ikorodu LGA. Ten sampling points were identified along the length of the wastewater drains for sampling *P. reticulata* that had been previously reconnoitred there. Sampling was done with a scoop net on the field before transportation of collected samples to the laboratory. 60 males and 60 females of *P. reticulata* were sorted out in the laboratory for dissection and microscopy. A mercury-bulb thermometer was used to measure temperature, pH was measured with ARH-1 CE electronic meter, Dissolved Oxygen (DO) with an Oxyguard, transparency with a secchi disc and drain depth with a calibrated pole. Sex-related differences were tested by chi-square analyses while ANOVA was used to test for differences in the physicochemical parameters measured.

RESULTS AND DISCUSSION

A sample of *E. ignotus* obtained from *P. reticulata* in this study is as shown in Plate 1. Out of the 4, 320 samples of *P. reticulata* obtained from the wastewater drains of four selected Streets of Lagos State only 156 were infected giving a 3.6% overall infection. Chi-square analyses of the differences in prevalence of *E. ignotus* between *P. reticulata* male and female samples obtained from the four selected streets of Lagos State revealed that they were purely due to chance. However, the highest prevalence of 12.0% was observed in *P. reticulata* males obtained from Adenaike Alagbe Street in June, 2004 but followed by 9.0% in May, 2004 on the same Street. The lowest prevalence of 1.0% was obtained in *P. reticulata* male obtained from Igi-Olugbin Street in March, 2004 and Adenaike Alagbe Street in February, 2005 (Fig.1).

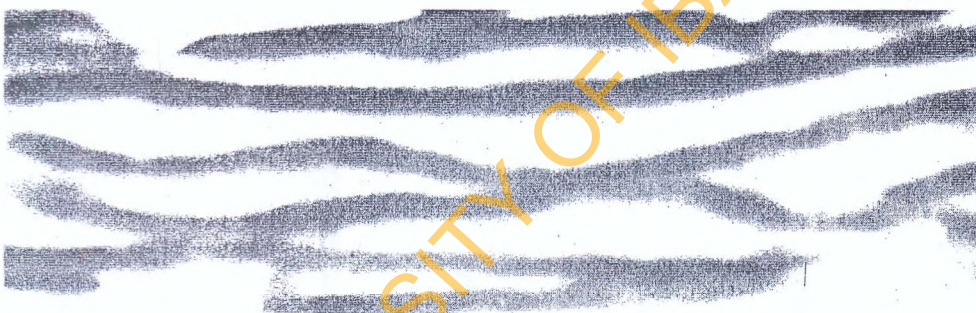


Plate 1. Dorso-lateral view of coiled *Eustrongylides ignotus* obtained from *P. reticulata* (Mag. x 160).

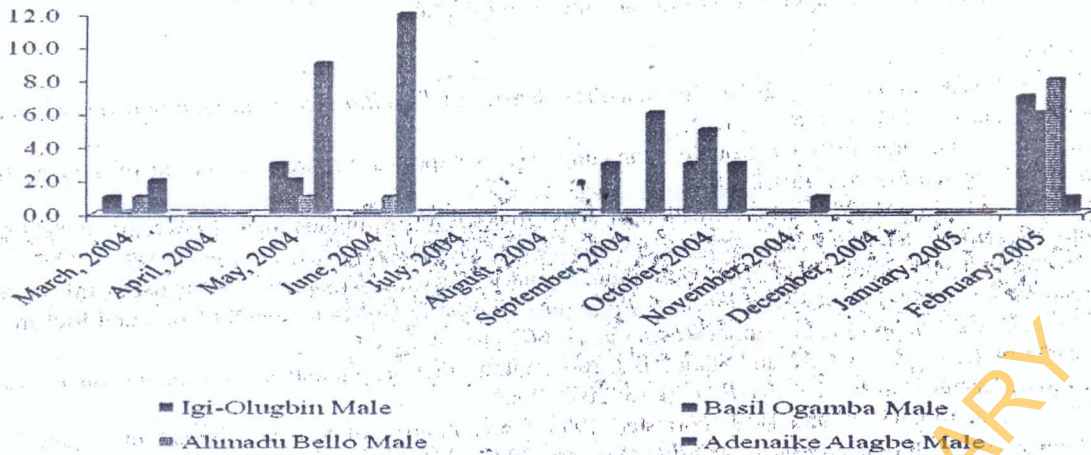


Fig. 1: Prevalence of *Eustrongylides ignotus* in *Poecilia reticulata* male obtained from four selected Streets of Lagos State.

In the case of *P. reticulata* females, the highest *E. ignotus* prevalence of 11.0% was observed in May, 2004 at Igi-Olugbin Street and this was followed by 8.0% observed in *P. reticulata* females obtained in June and October, 2004 at Adenaike Alagbe Street. The lowest prevalence of 1.0% was observed in September, 2004 at Basil Ogamba Street, October, 2004 at Igi-Olugbin Street and November, 2004 at Adenaike Alagbe Street (Fig. 2). Generally however, for *P. reticulata* male, there seems to be a clustering of *E. ignotus* clustering at the height of rains between May, 2004 and June, 2004; toward the end of the rain season between September and November, 2004 and before the onset of rains in February, 2005 (Fig.1). In contrast, for *P. reticulata* females, the onset of rains at February, 2005 and height of rain season between March and June, 2004 were the months with appreciable *E. ignotus* prevalence suggests that, although, no statistical sex-related difference exists in prevalence, the feeding or breeding habit *P. reticulata* females during rains may predispose them to preying on oligochaetes that are more abundant during rains.

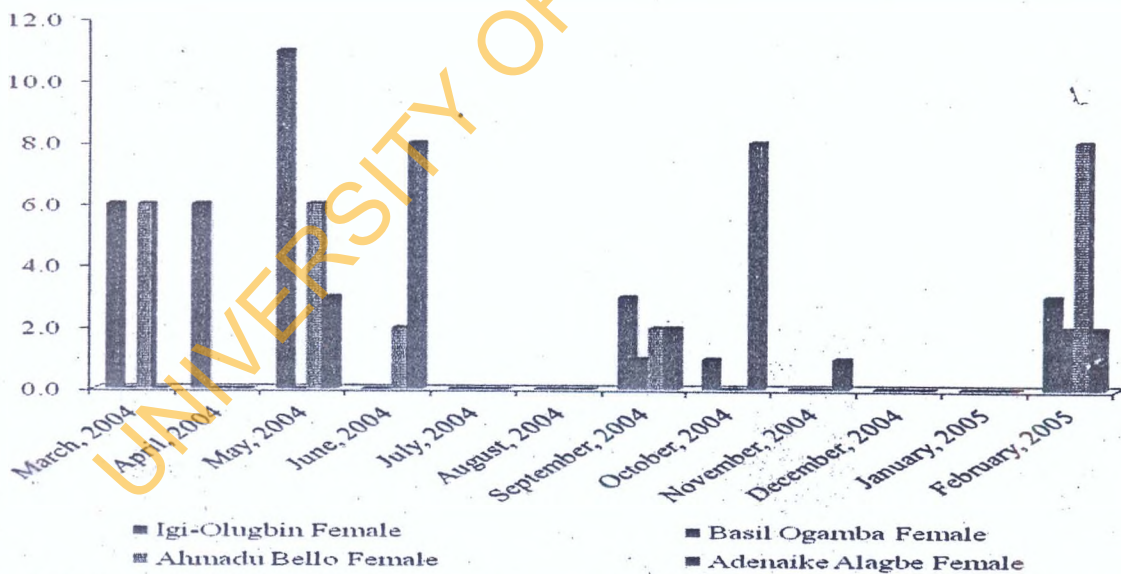


Fig. 2: Prevalence of *Eustrongylides ignotus* in *Poecilia reticulata* female obtained from four selected Streets of Lagos State.

CONCLUSION

The prevalence of *E. ignotus* in *P. reticulata* obtained from the four selected Streets should not prevent further exploration of this stock for both import substitution and the export market.

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