PREVALENCE AND INTENSITY OF PISCINE TRYPANOSOMES INFECTION AMONG THREE WILD FISH SPECIES; *CLARIASGARIEPINUS*, *TILAPIA ZILLI*, AND *SYNODONTISNIGRATA*, IN KEBBI STATE, NIGERIA.

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Abstract

A total of 217 fish, belonging to 3 families and 3 species were screened for piscine trypanosomes from 3 locations in Kebbi State, from May,2012- April ,2013. An overall prevalence of 15% was recorded from 3 locations ; Argungu, 11.01 %. Malisa50%and Yauri, 11.6 %. Byfish species, C. gariepinus had 13.1 %, T. zilli,4.4% and S. nigrata, 30.4 % prevalence . The trypanosomes ranges from small to medium and larger morphotypes. Prevalence and intensity follow similar pattern from one location to another and varies from one specie of fish to another. S .nigrata recoded the highest intensity rate of 60 -80, while T. zilli had the lowest of 2 – 5parasites/15 min scan. S. nigrata was observed to be more vulnerable, while T.zilli, relatively resistant to infection by the species of these trypanosomes.

Key words: Prevalence, Intensity, Trypanosomes, *Clarias, Synodontis, Tilapia*

Introduction

Trypanosomosis is a devastating disease of man and a wide range of vertebrate hosts, due to protozoan hemoflagellates, trypanosome (WHO, 1998). These parasites are ubiquitous in nature (Gibson, 2005) and are responsible for sleeping sickness in man, Nagana, Dourine and Surra, in animals, with serious socio- economic consequences due to anaemia, debilitation, abortion and death (O.I.E). In Marine and freshwater fishes, trypanosomes are responsible for one of the most important economically internal disease (Osman *et al.*, 2009), characterized by anaemia, anorexia, loss of condition and in severe cases death. Piscine trypanosomosis is cyclically transmitted by leeches (Negim, 1998., Gupta, 2006).

Though over 200 species of piscine trypanosomes were reported worldwide (Neelima and Gupta, 2012), many are considered non pathogenic (Woo and Islam, 1991).The identified pathogenic species include *T. danilewhisky*, in Europe (Woo, 1991); *T. aligaricus* in India (Neelima, 2012), *T. pseudobagri* in China (Gu, *et al.*, 2007)., *T. cynophilium* Mohammed in Egypt (Osman, *et al.*, 2009) and *T. mukasai* in Kashmir (Shahi, *et al.*, 2013). In Nigeria the only documented evidence of piscine trypanosomes was attributed to preliminary works of Audu, *et al.* (1982), Hassan *et al.*, (2007), and Muhammad, (2014). However, little work is done to associate hemo parasitism with low productivity of indigenous fish species, and severity among local fish species.

Materials and Methods

From freshwater bodies in 3 Local Government Areas of Kebbi State (Gwandu, Argungu and Yauri) a total of 217 fishes, from 3 Families, and 3 species were screened for trypanosomes from August, 2013 to February, 2014, within 3 locations: Malisa-Kawallado, in Gwandu LGA (12026' 08.66" N: 4° 42' 20.24"E); Matanfada, in Argungu LGA (12°44' 40.45" N: 4031' 10.01" E), and Yelwa, in Yauri LGA (110 35'15.22' N: 3° 18' 14.7.12'E).

From each of the sites, fish samples were purchased alive, fresh and active. Sorted out into species, in accordance with Reed *et al.* (1967). Standard length measurements were taken in cm, fish weighed in grams, assigned identification codes and recorded accordingly. Fishes were bled via caudal vein after appropriate physical restraint, using 21g disposable heparinised hypodermic needles and syringes. Blood processed for hematocrit and thin smear, according to and Woo (1970) and O.I.E (2013). Samples transported to Veterinary Parasitology laboratory, Usmanu Danfodio University Sokoto, stained with Geimsa and screened for trypanosomes according to standard procedure by O.I.E.(2013). Trypanosomes from positive slides, were photographed, and intensity determined in accordance with Gupta and Gupta (1990). Prevalence of trypanosomes, represent: Number positive/ Number examined X 100, while Intensity represent: Number of parasites/15 min. scan (Gupta and Gupta, 1990). Data analyzed using Z- test and X- square test.

Results

33 out of 129 fish, representing 15 % overall prevalence was recorded in Kebbi State, which include *Clarias gariepinus, 13.9 %, Tilapia zilli 4.4 %, and Synodontis nigrata, 30.23%*(Table 1). Similarly from the 3 locations, the highest prevalence of 37% was recorded in *S. nigrata* from Argungu; *C. gariepinus* from Malisa, 64%, and *S. nigrata* from Yauri, 25%. The lowest prevalence of 4.4% was however recorded in *T. zilli* (Fig 1). The intensity of infection recorded similar pattern with *Synodontis* (60 -80), followed by *Clarias* (12 – 20 p/15 min scan) and lowest intensity for *Tilapias (2 – 5/ 15min scan),* as observed(Table 1). The trypanosomes in *Synodontis and Tilapias* were predominantly smaller forms, while *Clarias* harboured medium to larger forms. Location –wise *Clarias* from Malisa, recorded the highest prevalence of 64%, while *Tilapias* from the same location recoded zero prevalence.

Discussions

The overall prevalence of 15.2 % observed in this study, is indeed lower than 35% reported by Hassan *et al.* (2007), from Lekki, Island: 30 % reported for Okavango Delta, Botswana (Smit *et al.* 2004), and even the higher values recorded for Sokoto and Zamfara States (Muhammad, 2014). The trypanosomes observed from fishes ranges from smaller forms in *S. nigrata and T. zilli* , from Argungu, to medium and larger forms in *S. .nigrata and C. gariepinus* from Yauri and Argungu respectively. *T. zilli* from Malisa are devoid of the parasites.

These observations suggest the presence of trypanosomes in fish from all waterways of Africa, in conformity to earlier claim by Baker (1960), and Muhammad (2014). The pattern of prevalence of piscine trypanosomes in this study, differ in different fish spp. from either Sokoto or Kebbi States, while prevalence was higher in Sokoto (39.4%) and *Zamfara States* (37.3%). The corresponding value in this study was (13%). The predominantly larger forms of trypanosomes as observed in *Tilapias* from Sokoto and Kebbi States, suggested different species of trypanosome (Muhammad, 2014).

The differences in prevalence could possibly be associated with population of vector and rate of flow of the water medium. Rivers at Argungu and Yauri are fast flowing and devoid of vegetation cover, for breeding by leeches.

While significant difference ($P < 0.05$) in prevalence was recorded in between fish species, no significant difference ($P > 0.05$) was observed in prevalence and intensity of infection. Similarly no significant difference ($P > 0.05$) associated with either the size, or sex of the fish. The mean intensity of parasitemia was higher for *S. nigratas,* followed by *C. Gariepinus* and least for *T. zilli* in these locations (Table 1),suggesting higher vulnerability of *S. Nigrata* than either *T. zilli* or *C. gariepinus* respectively.

Conclusion

Water bodies in Kebbi State were infested with leeches and trypanosomes were observed among wild fish species. The highest prevalence and intensity of piscine trypanosome infection was observed in *S. nigrata,* that harboured smaller forms of the parasite, hence considered more vulnerable than *T. zilli and C. gariepinus.*

Acknowledgements

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Table 1. Specie Prevalence and Intensity of Trypanosomes in Fish.

Fish Specie	No. Examined	Mean Wt.g±(SD)	No. Positive	Prevalence %	Intensity:No./15 min. scan
C. gariepinus	129	68± 50.2	18	13. 95	12 - 20
T. zilli	45	66.2 ± 42.7	2	4. 44	2 - 5
S. nigrata	43	34.4 ± 32.7	13	30. 23	60 - 80
Total	**217**		**33**	**15. 20**	

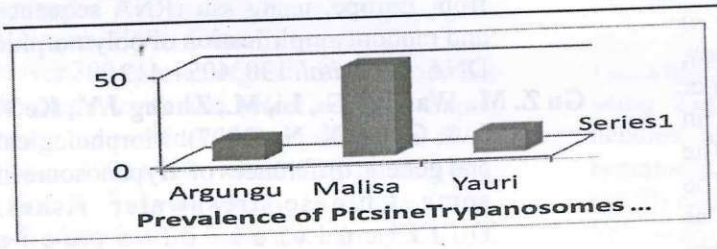

Fig. 1 Prevalence of trypanosomes by location

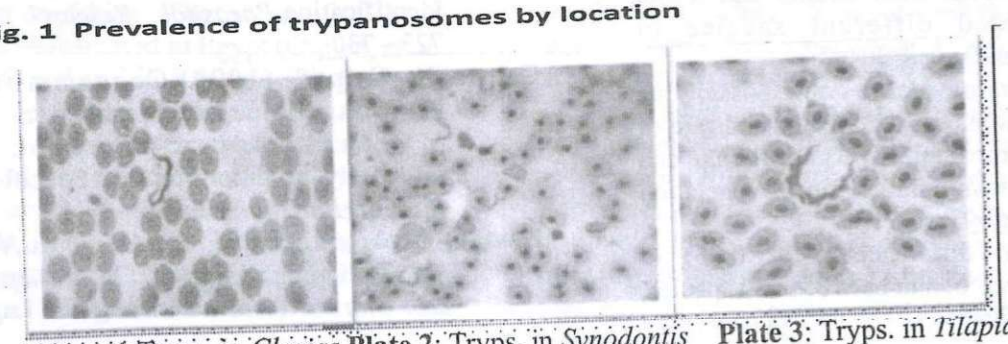

Plate 1:Tryps. in *Clarias* **Plate 2**: Tryps. in *Synodontis* **Plate 3**: Tryps. in *Tilapias*