SURVEY OF FRESHWATER SNAILS FOUND IN VANDEIKYA LOCAL GOVERNMENT AREA OF BENUE STATE, NIGERIA

ABSTRACT

A survey was carried out in Vandeikya Local Government Area of Benue State, Nigeria to determine availability and abundance of freshwater snails of medical importance and environmental factors affecting their availability. A total of 289 freshwater snails of four different genera were collected across 27 streams in the 7 zones in Vandeikya LGA. *Lenistis libycus* was found to be the most abundant freshwater snail species accounting for 40.83% of the total freshwater snails. M*elanoides tuberculata* was the second most abundant accounting for 29.41%, *Biomphalaria pfeifferi* accounted for 17.99% while *Bulinus globosus* was significantly lower in abundance than the other snails, accounting for only 11.77% of the total sampled snails. The effect of the nature of the substratum on the availability of freshwater snails revealed that habitats with rocky substratum favoured the presence of snails accounting for 62.7% freshwater snail ($p<0.05$). *Biomphalaria pfeifferi* and *Bulinus globosus* were the snails of medical importance identified in the study area. Freshwater snails are abundant and vastly distributed across Vandeikya LGA, Benue State.

INTRODUCTION

A research was carried out to determine the availability, abundance and distribution of freshwater snails in natural water bodies in Vandeikya. Some freshwater snails are of medical importance as they serve as an intermediate host to

trematodes in humans. Most of the diseases are prevalent in the tropics and are termed neglected tropical diseases because their economic and medical burdens affect poor people and because their effect is often ignored/neglected because it can seldom be linked directly to deaths (Abe *et al*., 2018). Schistosomiasis is a neglected tropical disease of medical importance. 93% of the current schistosomiasis burden resides in Sub Saharan Africa (Hotez and Kamath, 2009). The distribution of schistosomiasis is dependent on the intermediate snail host's distribution. Studies show that the successful schistosomiasis control programs of the past century relied on an integrated approach which included reducing the freshwater snail host (Sokolow *et al*., 2016). However, after the introduction of praziquantel 40-45 years ago, snail control was relegated to the background in control strategies as it was believed that with mass drug administration (MDA) with praziquantel control and elimination of the disease could be achieved. In places without high reinfection rates, MDA has led to a significant reduction in prevalence and infection rates but the maintenance of low transmission and complete elimination of the disease would require an integrated approach which includes control of the freshwater snails of medical importance which serve as an intermediate host to the parasite during its life cycle. Therefore knowledge of factors affecting the availability, abundance and distribution of *Bulinus* species and *Biomphalaria* species(the intermediate hosts for schistosomiasis) is necessary for successful control and the elimination of the disease in Africa line with vision 2020.

MATERIALS AND METHODS

Study area

The study was carried out in 27 streams of Vandeikya Local Government Area. Vandeikya is situated in the South Eastern part of Benue State.

Snail collection

Freshwater snails were collected in the early morning (6am-8am) and evenings (5pm-7pm) with the aid of a handheld scoop net. As the snails come out at cool hours of the day to avoid excess heat from sun rays. The snails were picked with forceps and placed in glass tubes for identification up to possible level (species/genus). The nature of the substratum weather rocky or sandy was also

observed and recorded. Students T-test was used to determine significant difference between variables.

RESULTS

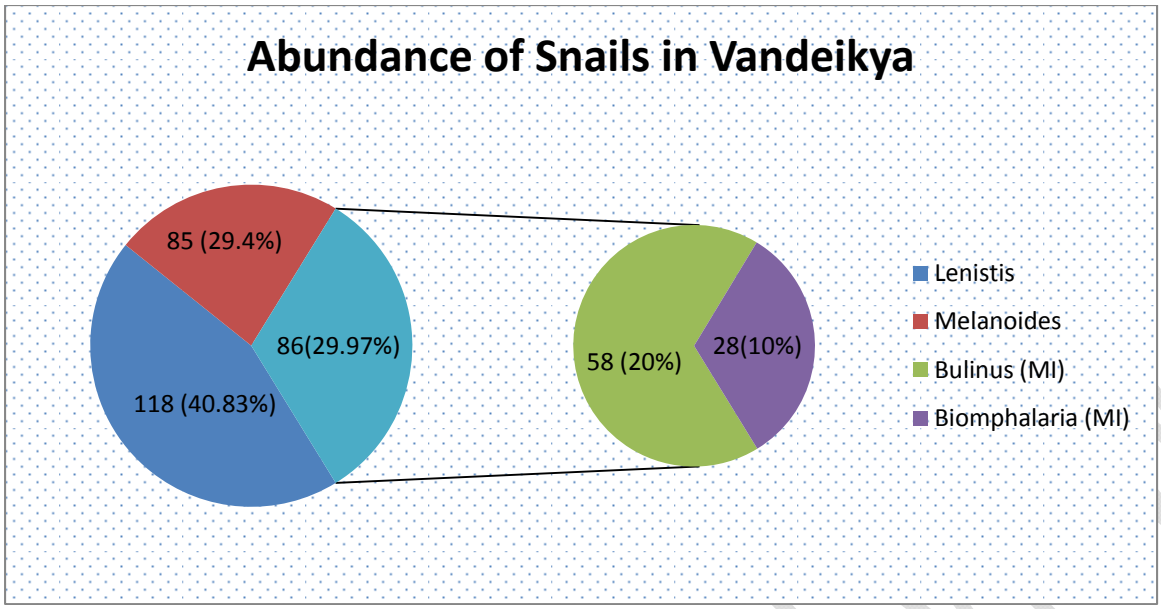
Table: The table shows the number of snails, nature of substratum and occurrence percentage

Location	No of snails	Nature of substratum	Percentage occurrence
Mbaduku	84	Rocky	29.1
Mbayongo	56	Rocky	19.4
Mbagbera	18	Sandy	6.2
Ninger	8	Sandy	2.7
Ute	20	Sandy	6.9
Mbaka-Ange	41	Rocky	14.2
Mbera	62	Sandy	21.5

P<0.05

KEY:

Zones in Vandeikya	Name of 27 local streams visited in the zone
Mbaduku	Be, Afengi
Mbayongo	Mnya, Utyavereshi, Atitim, Ugbeede, Akanyi, Apirnyi, Used, Ukenge, Gigigbe
Mbagbera	Uwyaka
Ninger	Arum
Ute	Dura, Utyem
Mbaka-Ange	Nyamshe, Ugyo, Aya, Aforkper, Ukyargu
Mbera:	Uvasar, Twe, Wagh-Shu, Asuu, Wagh-Shu, Sambe, Tsambe



MI =Snails of Medical Importance for the disease schistosomiasis

Figure 1: Abundance of Snails in Vandeikya

DISCUSSION

16 out of 27 streams in Vandeikya local government had rocky substratum. In two of three locations; Mbaduku and Mbayongo, rocky substratum had a significantly high number of freshwater snails than sandy substratum. This showed that rocky substratum favours the abundance of freshwater snails. This could be as a result of the fact that snails get to be protected by the rocks from being washed off by high velocity of running river/stream water (Dida et al, 2014). Our results were in agreement with (Oloyede *et al*., 2016) who carried out a study in Ibadan, Nigeria in which the nature of substratum was found to significantly affect abundance and distribution of freshwater snails. Our results, however, did not agree with (Smoothey, 2013) who opined that abundance and distribution of snails are species specific and all snails do not have the same general substratum preference, their habitat preferences are unique.

Melanoides tuberculata snails were significantly more abundant than the other snail species in Vandeikya lga. Melanoides snails are highly invasive snail capable of outcompeting with native snails within months of introduction to a new habitat (Peso et al., 2011). They serve as intermediate hosts of the liver fluke *Paragonimus westermani* however this disease has not been reported in the area. Our results were in acceptance with the reports by (Duwa, 2017) who also reported

Melanoides tuberculata to be the most abundant freshwater snails in all 3 different parts of Jakara dam in Kano State, Nigeria.

*Bulinusglobosus*and *Biomphalaria pfeifferi* is responsible for urinary schistosomiasis and intestinal schistosomiasis respectively. Both snails were present in Vandeikya lga accounting for 86 of the 289 (29.97%) freshwater snails collected in the course of this study. No matter how few, these snails could cause significant public health problems because, within each snail, the *Schistosoma*parasite undergoes asexual reproduction. Typically just 1 snail could potentially serve as host to 1000's of cercariae because, within the snail, sporocysts give rise to daughter sporocysts (Bakry et al., 2018), until thousands of new forms cercariae (singular cercaria) brake out of the snails into the water bodies in active search of a human host.

Bulinus globosus was significantly more abundant than *Biophalaria pfeifferi* in Vandeikya. In Nigeria as a whole, urinary schistosomiasis is more prevalent than intestinal schistosomiasis. In our study, we found both *Bulinus*species and *Biomphalaria* species in the same location. This shows that the habitat's ecology in Vandeikya supports the thriving of both snail species and both diseases could be of potential public health importance in Vandeikya lga. Our results were in consonance with (Abdulkadir *et al*., 2017); (Abe *et al*., 2016) both of whom found both *Bulinus globosus* and *Biomphalaria pfeifferi* in the same location in Kaduna, Nigeria and Nasarawa, Nigeria respectively. Our results, however, did not agree with (Ikpeze and Obikwelu, 2016) who among other freshwater snails found only Bulinus species but not Biomphalaria species along the shorelines of Agulu lake in Anambra State, Nigeria.

CONCLUSION

Melanoides tuberculata,Lenistis libycus,Bulinus globosus, and Biomphalaria pfeifferi are four (4) species of freshwater snail in Vandeikya.*Biomphalaria Pfeifferi* and *Bulinus globosus* are species of medical importance for schistosomiasis. More research should be done on freshwater snails of medical importance and their environment as our understanding of freshwater snails is necessary for effective control of both the snails and the diseases to which they serve as intermediate host.

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