

INTENSITY OF RHABDITIS AXEI AT DIFFERENT PARTS OF GASTROINTESTINAL TRACTS OF ARCHACHATINA MARGINATA OVUM AND ACHATINA ACHATINA

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ABSTRACT

Land snails are group of invertebrate animals with soft unsegmented bodies that are enclosed in calcareous shells. The land snails have been reported to serve as hosts for various parasites including nematodes. *Rhabditis axei* is a nematode parasite that lives in the gastrointestinal tract of African giant snails, *Archachatina marginata ovum* and *A. achatina*. The intensity of *Rhabditis axei* at different parts of gastrointestinal tracts of *Archachatina marginata ovum* and *Achatina achatina* was investigated. The land snails, *A. marginata ovum* and *A. achatina* were purchased from Oja Oba market in Ado-Ekiti, Ekiti State, Nigeria. The shells of the snails were removed and their gastrointestinal tracts were examined for the presence of the intestinal nematode, *Rhabditis axei*. In all the 85 snails examined all were infected with *Rhabditis axei* and the parasite was found to occur most frequently in the rectum.

Keywords: snails, Archachatina, Achatina, Rhabditis, Ado-Ekiti, Ekiti State

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INTRODUCTION

Mollusca are the second largest phylum of the animal kingdom, forming a major part of the world fauna. The Gastropoda is the only class of molluscs which have successfully invaded land. They are one of the most diverse groups of animals, both in shape and habit. Among gastropods, land snails (subclass: Pulmonata) are one of the most numerous with almost 35,000 described species of the world. Land snails are group of invertebrate animals with soft unsegmented bodies which are enclosed in calcareous shells (Barker, 2001; Ramzy, 2009). The land snails have been reported to serve as hosts for various parasites including nematodes. Azzam (1999); Azzam and Hegab (2000) gave a comprehensive review of snails as intermediate hosts of nematodes. *Rhabditis* is among the nematodes that parasitize the land snails and this nematode was recorded to show high infectivity to different land snails, slugs and insects in laboratory (Azzam, 1998). *Rhabditis axei* was reported to lives in the gastrointestinal tracts of African giant snails *Archachatina marginata ovum*, *A.marginata saturalis*, and *A.achatina* (Odaibo et al., 2000). Awharitoma and Edo-Taiwo (2012) also observed that *Rhabditis axei* parasitized *Archachatina marginata ovum*, *Archachatina papyracea* and *Limicolaria*. *A. marginata ovum* and *A. achatina* are readily found in Ekiti State, Nigeria where they serve as proteins for people in the area. This research was initiated with the aim to investigating the intensity of *Rhabditis axei* in the different parts of

gastrointestinal tracts of *Archachatina marginata ovum* and *Achatina achatina*.

MATERIALS AND METHODS

Matured African giant land snails (*Archachatina marginata ovum* and *Achatina achatina*) were purchased from Oja Oba market in Ado – Ekiti, Ekiti State, Nigeria. The snails were identified using their shell as guide (Beguart, 1950). The snails were fed with *Talium triangulaire* and *Carica papaya* leaves and watered twice daily, in the morning and the evening before the commencement of the experiment. The shells of the snails were removed and the gastrointestinal tracts of the respective snails were dissected according to Segun (1975) for the examination of worms present. The tract was sectioned into crop, stomach, intestine and rectum. These different parts of the tract were dissected and rinsed with water into different petri dishes. Using a hand lens, the parasites present in the individual petri dishes were transferred with soft brushes into another petri dishes containing physiological saline solution. The number of parasites in each section was counted under microscope. The nematode parasite was identified as *Rhabditis axei* Cobbod, 1884 following Goodey (1963).

RESULTS AND DISCUSSION

A total number of 85 giant land snails were examined for the occurrence of *Rhabditis axei* in their gastrointestinal tracts. The snails comprised of two species; *Archachatina marginata ovum*

(40) *Achatina achatina* (45). All the snails were found to be infected with *Rhabditis axei*. Table 1 shows the total number of

Rhabditis axei recovered from different parts of the gastrointestinal tracts of all the snails examined.

Table 1. Number of *Rhabditis axei* at the different parts of gastrointestinal tracts (GIT) of *Archachatina marginata ovum* and *Achatina achatina*

Part of (GIT)	<i>Archachatina marginata ovum</i> (N=40)	<i>Achatina achatina</i> (N=45)
Crop	15 (10.1%)	19 (11.7%)
Stomach	21 (14.2%)	48 (29.6%)
Intestine	41 (27.7%)	33 (20.3%)
Rectum	71 (48.0%)	62 (38.3%)
Total	148 (100%)	162 (100%)

Rhabditis axei parasitize the different parts of gastrointestinal tract of both *Archachatina marginata ovum* and *Achatina achatina*. The crop had the least number of the nematode in both *A. marginata ovum* 15 (10.1%) and *A. achatina* 19 (11.7%). The rectum had the highest number of the nematode in both *A. marginata ovum* 71 (48.0%) and *A. achatina* 62 (38.3%). Odaibo et al. (2000) reported site preferences in the distribution of the nematode within the snail host. The site of *R. axei* in the snail was reported to be more frequently present in the rectum than the stomach. The nematode had been reported to feed mainly on the bacteria (Odaibo et al, 2000), and this accounts for the high number of the parasites in the rectum since bacteria are mostly found in the rectum of the snails. It had been reported that the African giant snails are mostly found in moist soil that is rich in decomposing organic matter (Odaibo, 1997), and this ensures contact between

the parasites and the snail hosts. In the natural population, it would be expected that a great number of the snails would become infected with the parasites which would result into a high prevalence and intensity of infection as it is shown in the present study in which all the snails examined were infected. Nematodes form diverse associations with land snails and these ranges from paratenic relationships to parasitic or pathogenic relationships. A majority of the Metastrongyloidea (Order: Strongylida) use molluscs as intermediate hosts for which vertebrates serve as final hosts. In contrast, a majority of Rhabditoidea (Order: Rhabditida) use molluscs as definitive hosts in which the entire nematode life cycle is completed (Grewal et al., 2003). The pathologic significance of the infection in the African giant snails is unknown, but it appears that the African giant snails tolerate the infections without much difficulty.

REFERENCES

Anderson, R.C. (2000). Nematode parasites of vertebrates: Their development and transmission. Wallingford, UK: CABI Publishing.

Anderson, R. C., and A. K. Prestwood. 1981. Lungworms. Pp. 266– 317 in W. R. Davidson, F. Hayes, V. Nettles, and F. Kellogg, eds. Disease and parasites of white-tailed deer. Miscellaneous Publication No. 7. of Tall Timber Research Station, Tallahassee.

Awharitoma, A.O. Edo-Taiwo, O. (2012) *Rhabditis axei* (Nematoda: Oxyuridae) infection among terrestrial snails in Southern Nigeria. *The Zoologist*, 10:1-5 (2012)

Azzam (1999). Azzam, K.M. (1999). Production of the snail parasitic nematode *Rhabditis* sp. from different pests. *Proceedings of 1st regional symposium for Applied Biological Control in Mediterranean Countries* Cairo, Egypt, 25-29.

Azzam, 1998. Azzam K.M. (1998). First record of the snail parasitic nematode *Rhabditis* sp. isolated from Egyptian terrestrial snails and its compability to infect other pests. *Egyptian Journal of Biological Pest control* 8: 27-29.

Azzam, K. M., Hegab, A.M. (2000). Potential of the snail parasitic nematode, *Rhabditis* sp. in controlling the snail *Eobania vermiculata* (Müller) and its effect on Albino rat, *Rattus norvegicus*. *Journal of Agricultural Science Mansoura University* 25: 1825-1829.

Barker, 2001. Barker, G. M. (2001). The biology of terrestrial Molluscs. CABI publishing, New Yourk, USA: 558pp.

Beguart, J.C. (1950). Studies in the Achatininae; a group of African land snails. *Bull. Mus. Comp. Zool.*, 105:101-216

Goodey, J. B. (1963). Soil and freshwater nematodes. John Wiley and Sons, New York.

Grewal, P. S., Grewal, S. K., Tan, L., Adams, B. J. (2003). Parasitism of Molluscs by Nematodes: Types of Associations and Evolutionary Trends. *Journal of Nematology* 35 (2):146–156. 2003.

Odaibo, A. B. (1997). Snail and snail farming: Nigerian edible land snails. *Stirling-Horden Publishers* (Nig) Ltd.

Odaibo, A. B., A. J. Dehinbo, L. K. Olofintoye, and O. A. Falode. 2000. Occurrence and distribution of *Rhabditis axei* (Rhabditida; Rhabditidae) in African giant snails in southwestern Nigeria. *Helminthologia* 37:233–235.

Ramzy, 2009). Ramzy, R.R. (2009). Biological and ecological studies on land snails at Assiut, Egypt. M. Sc. Thesis, Faculty of Science, Assiut University, Egypt, 164 pages

Segun, A. O. (1975). The giant African land snail *Archachatina (calachatina) marginata* (Swainson), *Ethiope publishing corporation*, Benin City, Nigeria.