

INCIDENCE OF GASTRO-INTESTINAL PARASITES OF *Agama Agama* (Squamata:Agamidae) LIZARD IN MAIDUGURI, NIGERIA

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ABSTRACT

The Incidence of gastro-intestinal helminths of *Agama agama* lizards was investigated in Maiduguri, Nigeria using standard parasitological techniques. A total of 150 lizards were examined between the months of June and October 2014. An overall incidence of 138 (92.0%) was obtained with all found to harbor at least one or more parasites. Parasites recovered, were *Heterakis spumosa* 53(38.4%), *Enterobius vermicularis* 31(22.5%), *Taenia spp* 30(21.7%) and *Hymenolepis nana* 24(17.4%) respectively. There was no statistically significant ($p>0.05$) difference between the incidence of infection amongst sexes as the males had an incidence of 81(58.7%) and females had 57(41.3%). Mixed infection was observed in 57 (41.3%) of the samples. This study therefore reveals the gastro-intestinal parasites of *Agama* lizards in Maiduguri, Nigeria.

Keywords: Incidence, Gastrointestinal Parasites, *Agama agama*, Maiduguri, Nigeria.

INTRODUCTION

Lizards are the most widely distributed reptiles and have been able to adapt to a wide range of habitats throughout the world (Babero and Okpala, 1962).

The African lizard *Agama agama* have been reported to serve as a medium of transport and reservoir host to several protozoans and helminths (Adeoye and Ogunbanwo,2007). *Agama* lizards are reported to have a very close association with humans (Biu *et al.*, 2001). Sometimes it is seen to lick from uncovered human and livestock food and drinking water and at the same time dropping faecal wastes containing helminths and protozoan stages which could be picked

up by children, who get infected by eating of contaminated soil while playing (Biu et al., 2001; Nash, 2005). This level of close association of *Agama agama* to man and his livestock makes them vulnerable to zoonotic infections. There have been previous reports on parasites of lizards in Nigeria (Biu, et al., 2001; Adeoye and Ogunbanro, 2007; Omonona, et al., 2011), hence the need to re-access the health status of lizards in this study.

MATERIALS AND METHODS

A total of 150 yellow-necked free ranging lizards of the genus *Agama* of both sexes were randomly captured using hand nets or box-baited traps from four (4) quarters of Maiduguri namely University of Maiduguri campus, Bolori, Gomari, and Bulunkutu areas respectively. Captured lizards were euthanized in a chloroformed air tight bell jar for 15 to 20 minutes. The sex of each lizard was confirmed based on the presence of pre anal pads and roundish testes in males which are both absent in females from physical and gross examinations as described by Harris (1964). Each dead lizard was placed on dorsal recumbence onto a dissecting board. A longitudinal incision was made from the vent to the base of the neck. The gastrointestinal tract was removed by cutting across the anterior limit of the oesophagus and the posterior limit of the rectum and eviscerated using a dissecting set comprising of a thumb forceps, scalpel blade and scissors. Fresh faecal samples were collected from the gastrointestinal tract and examined for various parasitic stages using standard parasitological techniques as described by Suresh et al., (1977); Dunn, (1978); Soulsby, (1982); Biu, (2001). Data obtained were analyzed as percentile incidence and variations amongst the sex of lizards evaluated using Chi-square test and an Alpha error of less than 5% ($p < 0.05$) was considered statistically significant.

RESULTS

The incidence of the gastrointestinal parasites of *Agama agama* lizards in Maiduguri is shown in Table 1. Out of 150 *Agama agama* lizards examined, 138 (92%) were positive with the incidence of 38.4% for *Heterakis spumosa*, 22.5% for *Enterobius vermicularis*, 21.7% for *Taenia* spp. and 17.4% for *Hymenolepis nana* ($p < 0.05$). 57 (41.3%) of lizards examined had mixed infections. Table 2 shows the incidence of gastrointestinal parasites based on the sex of lizards examined. A total of 81 (57%) males were infected which was higher than the 57 (41.3%) for female lizards ($p > 0.05$)

Table 1: Incidence of gastrointestinal parasites of lizards in Maiduguri

| Parasites isolated | No. of lizards examined | No.(%)of lizards infected |
|--------------------------------|-------------------------|---------------------------|
| Overall | 150 | 138(92.0) |
| <i>Enterobius vermicularis</i> | | 31(22.5) ^a |
| <i>Heterakis spumosa</i> | | 53(38.4) ^b |
| <i>Taenia spp</i> | | 30(21.7) ^a |
| <i>Hymenolepis nana</i> | | 24(17.4) ^c |
| Mixed | | 57(41.3) |

NB: Column values with different superscripts are statistically significant (p<0.05)

Table 2: Incidence of gastrointestinal parasites based on the sex of lizards examined

| Parasites Isolated | No. (%) of lizards infected | |
|--------------------------------|-----------------------------|----------|
| | Male | Female |
| <i>Enterobius vermicularis</i> | 20(24.7) | 11(19.3) |
| <i>Heterakis spumosa</i> | 29(35.8) | 24(42.1) |
| <i>Taenia spp</i> | 17(20.9) | 13(22.8) |
| <i>Hymenolepis nana</i> | 15(18.5) | 9(15.8) |
| Mixed | 25(30.9) | 32(56.1) |
| Total (n=138) | 81(58.7) | 57(41.3) |

DISCUSSION

The results of this study have indicated an overall incidence of 92%. This could be said as very high and very similar to previous reports by Adeoye and Ogunbanwo (2007) in Lagos, Nigeria. This has been attested to their habit of free ranging (Biu *et al*, 2001), and that helminthiasis appears to be related to the diet of Saurian reptiles (Sanchis *et al*, 2000) especially those helminths with an indirect life circle involving arthropods (Martin and Rocha, 2004) as *Agama agama* is primarily insectivorous (Harris, 1964; Crews *et al*, 1983). Parasites recovered were *Enterobius vermicularis*, *Hymenolepis nana*, *Taenia spp*. and *Heterakis spumosa*. Similar records were made by Murray *et al.*, (1990); Biu *et al.*, (2001). Martin and Rocha, (2004) reported that nematodes are more often, followed by trematodes and cestodes and this relies on large size, wide

ranging diet and exposure to intermediate hosts, and that parasite abundance is also influenced by host sex and age, host condition and physiology, vector biology and host density (Schall *et al*, 2000; Sol *et al*, 2000; Dowell, 2001; Salked and Schwarzkopf, 2005). *Enterobius vermicularis* is a zoonotic parasite causing intense itching, restlessness, insomnia, inattention, lack of cooperation, a feeling of shame and inferiority in humans; and a chronic salphingitis in lizards (Soulsby, 1982). *Hymenolepis nana* and *Taenia* are also of public health importance causing taeniasis in man and animals. Though *Heterakis spumosa* was isolated, their roles in public health has not been indicated recently, but are largely parasites of animals and poultry, hence lizards found around human habitation could be potential sources of infection. This study has shown that male lizards had an insignificantly higher incidence compared to that of female. This is similar to the findings by Uller and Olsson, (2003); Roberts *et al*, (2004); Fadiel *et al*, (2005); Adeoye and Ogunbawo (2007) who proffered that male lizards are a more active sex, and could possess a higher level of intensity of infection than female conspecifics, and that the immunosuppressive effects of testosterone which appears in the early mating period makes them more susceptible to parasitic infection, but contradicts that of Omonona *et al*, (2011) in Ibadan that females had a higher level of infection than male lizards especially in pregnant females where the development of eggs requires a huge amount of energy and metabolites which could not be allocated to defense against parasites. However, Amo *et al*, (2005) reported that sex is not a factor in helminth infestation of *Agama agama*, since the feeding habit is similar to both sexes and they seem to invest more in reproduction than in defense against parasites. In conclusion, the *Agama agama* is reported to serve as transport and reservoir host to human parasites, and thus is of public health concern, so efforts should ensure their health, and strict hygiene by individuals towards avoiding them and their contaminated environs.

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