Helminths of the African giant rat

(\textit{Cricetomys gambianus} Waterhouse) in Zaria, Nigeria

by M. A. IBRAHIM, R. A. OGUNSUSI, N. NWUDE and Y. ALIU

* Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria.

**INTRODUCTION**

The African giant rat was successfully domesticated for its meat in Nigeria (1). Since then the Nigeria National Wildlife conservation Committee has recommended its domestication and breeding to supplement meat protein available to the populace (11). The giant rat has also got great potential for use as a laboratory animal (1, 5), and has been shown to be a good host for the laboratory passage of \textit{Schistosoma mansoni} (13) and \textit{Trypanosoma evansi} (5). Extensive study of the diseases and pathologies of the giant rat, both in the wild and in captivity is, however, a necessary pre-

---

---
the southern part. This paper reports on the gastro-intestinal helminths of wild giant rats in the Zaria area of northern Nigeria.

MATERIAL AND METHODS

Giant rats

The 29 African giant rats used in this study were captured during the rainy season (May to October, 1981) from Bomo village and from the Main Campus of the Ahmadu Bello University, Zaria. They were housed separately in locally constructed wooden cages whose floor and ceiling were made of wire mesh. The cages were raised on wooden legs and were kept in the animal room of the Department of Veterinary Physiology & Pharmacology, Ahmadu Bello University, Zaria. Commercial mice cubes (*) and water were supplied ad libitum. They were identified by marks on their tails and cages.

Faecal sampling

Fresh faecal pellets from each of 29 giant rats were obtained by squeezing them out of the rectum into labelled plastic tubes. The samples were collected and examined within 24 hours after capture and once a week subsequently for a month. Recovery of helminth ova was done by floatation using 33 p. cent zinc sulphate at a specific gravity of 1.180.

Recovery of helminths

Fourteen wild giant rats were sacrificed by severing the jugular vein after mechanical stunning. The stomach, small intestine, caecum and large intestine were removed and placed in separate petri dishes. Worms were collected from the lumen and mucosae using a dissecting microscope (*) at ×10 magnification. Heminth specimens were fixed in either 70 p. 100 alcohol or 3 p. 100 formalin.

RESULTS

Faecal examination

Twenty-three (79.31 p. 100) of the 29 giant rats examined shed thinshelled, ellipsoidal Heligmonina eggs, while 26 (89.66 p. 100) shed the eggs of Heterakis. One giant rat 3.45 p. 100) shed Aspiculuris eggs, while 3 (10.35 p. 100) shed Trichuris eggs. Three giant rats shed tiny, thinshelled embryonated eggs which were not identified. Seventeen of the giant rat (58.62 p. 100) shed coccidia oocysts.

Worm recovery

The results are presented in table I.

<table>
<thead>
<tr>
<th>Serial N°</th>
<th>Heligmonina thomnomysi (Small intestine)</th>
<th>Heterakis spumosa (Cecum and Colon)</th>
<th>Trichuris muris (Cecum)</th>
<th>Inermicapsifer sp. (Small intestine)</th>
<th>Meggittina baeri (Small intestine)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>13</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Incidence: 92.86 p.100 92.86 p.100 7.14 p.100 78.57 p.100 28.57 p.100

Legend : + = harboured worms ; - = No worms recovered.

(*) American Optical Company, Instruments Division, Buffalo, N.Y. 14215.
Nematodes

_Heligmonina thamnomysi_ were recovered from the anterior 4th of the small intestine of 13 out of 14 giant rats. _Trichuris muris_ was recovered from the caecum of one giant rat, while 13 of the giant rats showed _Heterakis spumosa_ in their caeca and colon.

Cestodes

_Inermicapsifer_ species, probably _I. congolensis_ and _Meggittina baeri_ were found in the small intestine of 11 and 4 respectively of the 14 giant rats examined.

**DISCUSSION**

The results of this study indicate that the incidence of helminthiasis in wild _Cricetomys gambianus_ in the rainy season in Zaria is 100 p. 100. The helminths involved are _Heligmonina thamnomysi, Heterakis spumosa, Trichuris muris, Aspiculuris tetraptera, Inermicapsifer congolensis, Meggittina baeri_ and an unidentified nematode, probably a lungworm or a _Strongyloides_ species.

_Heligmonina thamnomysi_ was originally reported from _C. gambianus_ and from _Thamnomys rutilans_ from the Central African Republic (6) and has been reported from _C. gambianus_ in Tanzania (12) and from _Thamnomys rutilans_ and _Graphiurus hueti_ in the Central African Republic (8). Nigeria is a new geographical record for _Heligmonina_.

_Meggittina baeri_ (Syn. _Catenotaenia baeri, Skrjabinotaenia baeri_) was originally described from the ‘house rat’ and from ‘native granary rat’ in Zimbabwe (14). It has been reported from _Thamnomys rutilans_ in the Central African Republic (8). A related cestode, _Skrja-

binotaenia cricetomydis_, was described from _C. gambianus_ in Nigeria (10). Nigeria is a new geographical record and _C. gambianus_ a new host record for _M. baeri_.

We have come across no reports on the occurrence of _Inermicapsifer_ in Nigeria, but the genus occurs widely among rodents in Africa. Human infections with _I. madagascariensis_ have been reported from _Trichuris mu-

ruris_ was recovered from the caecum of one giant rat, while 13 of the giant rats showed _Heterakis spumosa_ in their caeca and colon.

We have come across no reports on the occurrence of _Inermicapsifer_ in Nigeria, but the genus occurs widely among rodents in Africa. Human infections with _I. madagascariensis_ have been reported from _Reunion_ (3), _Zimbabwe_ (7), _South Africa_ (16), _Zambia_ (19) and _Tanzania_ (2). _Inermicapsifer_ sp. was reported from a 2 year old boy in _Kenya_ (18) and _I. cubensis_ was reported from a young woman in _Cuba_ (17). The genus is also of veterinary importance. _I. hyracis_ was reported from a Guinea-fowl and _Inermicapsifer_ sp from a wild dog (15).

Differences appear to exist in the helminths of giant rats and their importance in southern and northern Nigeria. DIPEOLU and AJAYI (4) and IKEDE and AJAYI (11) did not report _Inermicapsifer, Meggittina, Heligmonina_ and _Trichuris_ among giant rats in Ibadan, while _Hymenolopis_ does not appear to occur in the same host in Zaria. _Heterakis spumosa_ is important in both locations while _Aspiculuris_ occurs more in giant rats in Ibadan.

**ACKNOWLEDGEMENT**

We are grateful to Drs. ARLENE JONES and LYNDA GIBBONS, of the Commonwealth Institute of Parasitology, St. Albans, United Kingdom, for their assistance in identifying some of the helminths.

This study was part of a search of the local rodent population for a suitable nematode for use as a laboratory model, and was funded by the International Livestock Centre for Africa (I.L.C.A.) Sub-Humid Programme, Kaduna, Nigeria, and I.L.C.A. Training, Addis Ababa, Ethiopia.

**RESUMEN**

IBRAHIM (M. A.), OGUNSUSI (R. A.), NWUDE (N.), ALIU (Y. O.). - Helmintos de la rata gigante de África en el norte de Nigeria, no se habiendo notado ninguna observación hasta ahí.

Buscó los huevos de helmintos en las muestras de heces de 29 ratas gigantes salvajes cogidas en Zaria, y los helmintos en 14 otras ratas autopsiadas. 100 p. 100 de los animales tenían helmintosis. Se evidenciaron huevos de _Heligmonina thamnomysi, Heterakis spumosa, Trichuris muris, Aspiculuris tetraptera, oocistos de coccidias y un nemático no identificado en las heces de 79,31, 89,66, 10,35, 3,45, 58,62 y 10,35 p. 100 respectivamente de las 29 ratas examinadas.

Se encontraron respectivamente _H. thamnomysi, H. spumosa, T. muris, Inermicapsifer congolensis_ y _Meggittina baeri_ en 13, 13, 1, 11 y 4 de las ratas autopsiadas.

_Palabras claves : Helmintos - Rata gigante de África - Nigeria._
REFERENCES

1. AJAYI (S. S.). Domestication of the african giant rat. Ibadan, Department of Forest Resources Management, University of Ibadan, 1975.


