

Intestinal Parasites of the Grasscutter (*Thryonomys swinderianus* Temminck 1827) from the Kwaebibirem District of the Eastern Region of Ghana

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Abstract

The profiles of intestinal parasites of the grasscutter were investigated in 21 grasscutters collected from Kwaebibirem District in the Eastern Region of Ghana between January and April 2005. The aim of the study was to investigate the parasitic profile of the grasscutter in a forest zone and provide information for grasscutter farming. The intestinal content of the animals were examined with the aid of a hand lens, a microscope and direct smear method. The parasites identified include helminthes such as *Ancylostoma* sp., *Trichuris* sp., *Ascaris* sp., *Hymenolepis* sp. and *Schistosoma haematobium*, and protozoans such as *Giardia* sp. and *Entamoeba* sp. Almost all (95.2%) of the grasscutters were infected with *Ancylostoma* sp., the most prevalent parasite species in the study, followed by *Giardia* sp. (85.7%). More than 80% of the grasscutters were infected with at least four parasite species and 33% were infected with at least five parasite species. The study, therefore, prescribes routine treatment of grasscutters obtained from the wild before they are domesticated or added to the already domesticated ones. This will help prevent reduced productivity due to parasitic infections.

Introduction

The grasscutter (*Thryonomys swinderianus* Temminck 1827) is a rodent otherwise known as the cane rat or cutting grass, depending on the area in which it is found. It is a wild herbivore related to the African brush-tailed porcupine as well as the guinea-pig, chinchilla and the capybara (*Hydrochaeris hydrochaeris*) of South America but is endemic to Africa (Asibey, 1974; Baptist & Mensah, 1986). The main habitat and food of this animal in West Africa is grass, hence its common name, “grasscutter” or “cutting grass”, while in other parts of Africa, particularly southern Africa, where it is closely associated with cane fields, it is called the “cane rat”.

Within the West African sub-region, the grasscutter is a favourite bushmeat species

and accounts for the greater proportion of bushmeat sold in markets, and almost all tribes in Ghana and many countries within the sub-region prefer grasscutter meat to beef. It is also a source of livelihood for people who go into its production, those who hunt it from the wild and those who use its meat to prepare food for sale (Asibey, 1974; Baptist & Mensah, 1986; Ntiamoa-Baidu, 1987; Centre for Biodiversity Utilization and Development, 2004). Studies conducted during the early 1970s were aimed at the domestication of the grasscutter for large scale farming (Food and Agricultural Organisation, 1999). Thus, there are now many vibrant grasscutter farms not only in Ghana but the sub-region as a whole, as many have found domestication of the species a viable enterprise. This is because

grasscutter is less expensive to feed, as it feeds on a wide variety of plant materials.

A study in Oyo State of Nigeria confirmed the notion that infection with parasites could affect commercial production of the grasscutter. High mortalities in grasscutter colonies on farms at a peri-urban area in Accra were also attributed to helminth infection (Adekoya, 2007; Kankam *et al.*, 2009). These studies showed clearly that the role of parasitic infections in grasscutter production cannot be overlooked.

Many studies have been carried out in recent time on the parasitic profile of the grasscutter, all of which had discovered new parasites (Arene, 1986; Addo, 1998; Ofori, 1999; Simpson & Yeboah, 2001; Kankam *et al.*, 2009), indicating that many more parasites of the grasscutter are yet to be identified. The earlier these parasites were identified, the better it will be, not only for maximization of grasscutter production but also human health. A study has shown that humans may become exposed to infection by consumption of inadequately cooked infected cane rat meat, or by eating vegetables, sugar cane and fruits contaminated with excretions of carrier cane rats (Oboegbulem & Okoronkwo, 1990).

The possibility of transmission of parasites of the grasscutter to humans cannot be overlooked. This is more so as some people do not only cherish grasscutter meat but also use the content of the gut both for medicinal purposes and for food (pers. comm.). The study aimed to investigate the intestinal parasitic profile of the grasscutter in a forest district of Ghana by identifying species of parasites and investigating their prevalence.

Materials and methods

Study area

Samples were collected from Abam, Asuom and Kade, all in the Kwaebibirem District of the Eastern Region of Ghana. The Kwaebibirem District is located in the south-western corner of the Eastern Region, between latitudes 1° 02' W and 0° 35' E and longitudes 6° 22' N and 5° 75' S. On the west, it is bounded by the Birim North District, on the north-east by Atiwa and on the east by East Akim Municipality, on the south-east by Suhum Kraboa Coaltar District, to the south by West Akim Municipality, and on the south-west by the Birim South District. The District has a surface area of about 1230 km². It lies within the semi-equatorial climate zone, with a double maximal rainfall regime.

The first rainy season is from May to June, with the heaviest rainfall occurring in June, while the second season is from September to October. Data obtained over the years reveal erratic annual rainfall figures, however, annual average rainfall for the District is about 1400 mm. Temperature ranges between a minimum of 26.5 °C and a maximum of 27 °C. (Ministry of Local Government and Rural Development and Moks Publications & Media Services, 2006). It is a forest area. The main occupation of the people is subsistence farming involving crops such as maize, cassava, cocoyam, yam, plantain, sugar cane, cocoa, coconut and oil-palm.

Samples of the contents of the small and large intestines of grasscutters were taken and examined. The animals were obtained from the kills of hunters directly or from chop bar operators to whom most of the animals are sold by the hunters. In all, 21

grasscutters were examined. A hand lens was used to examine the intestinal content of the grasscutters for adult parasites. Faecal matter from various portions of the intestine was also examined for oocysts or eggs of the parasites using a microscope. Smears were prepared and examined at $\times 10$ and $\times 40$ magnifications in that order. Pictures of some of the eggs found were taken using a camera mounted on a microscope to help in identification of the parasites.

Analysis of data

Prevalence was calculated for each parasite species as Number of grasscutter infected divided by Number of grasscutter examined $\times 100$.

Results

Prevalence of the parasite species

Two species of parasites were found when the faecal matter from the small intestine, large intestine and the caecum were examined for adult parasites. These were identified as *Hymenolepis* sp. and *Trichuris* sp. Of two adult *Trichuris* sp. found, one was in the caecum of one of the grasscutters and the other in the large intestine of a different grasscutter. Four adult *Hymenolepis* sp. were found in the small intestine of one of the grasscutters. In all, seven parasites were observed, including *Schistosoma haematobium* (prevalence – 66.7%) which is not an intestinal parasite. Almost all (95.2%) of the grasscutters examined were infected with *Ancylostoma* sp., the most prevalent parasite species in the study. This was followed by *Giardia* sp. (85.7%) and *Trichuris* sp. (71.4%). The rest were *Entamoeba* sp. (47.6%), *Ascaris* sp. (9.5%), and *Hymenolepis* sp. (4.8%) (Fig. 1).

Multiple infections

Two grasscutters (9.5%) were infected with six parasite species; five (23.8%) were infected with five parasite species, 10 (47.7%) were infected with four parasite species, two (9.5%) with three parasite species and two others (9.5%) were infected with two parasite species. This implies that 80% of the grasscutters examined were infected with at least four parasite species and 33% were infected with at least five parasite species. The results also show that none (0%) of the grasscutters was infected with all seven parasites or with only one. (Fig. 2).

Discussion

The results revealed that grasscutters from the wild are heavily infected with parasites that can be transmitted to their offspring and other mammals, including humans that may come into contact with them if domesticated. This poses health problems to humans. For example, *Ancylostoma* spp. cause chronic blood loss in animals including humans. Again, apart from *Trichuris* spp., which are well known to be transmitted through soil-contaminated hands, all the other species of parasites found are transmitted through contaminated food and water, and mostly cause diseases with symptoms of anaemia, diarrhoea and weight loss (Olsen, 1974; Smyth, 1996; Janovy & Roberts, 1996). *Entamoeba* spp. are also transmitted through ingestion of mature cyst through contaminated food or water. Some species, for instance *E. histolytica* infection in humans, are characterized by weight loss and can lead to bloody diarrhoea, lesions in intestinal wall and liver abscess, which will have adverse impact on human health, as

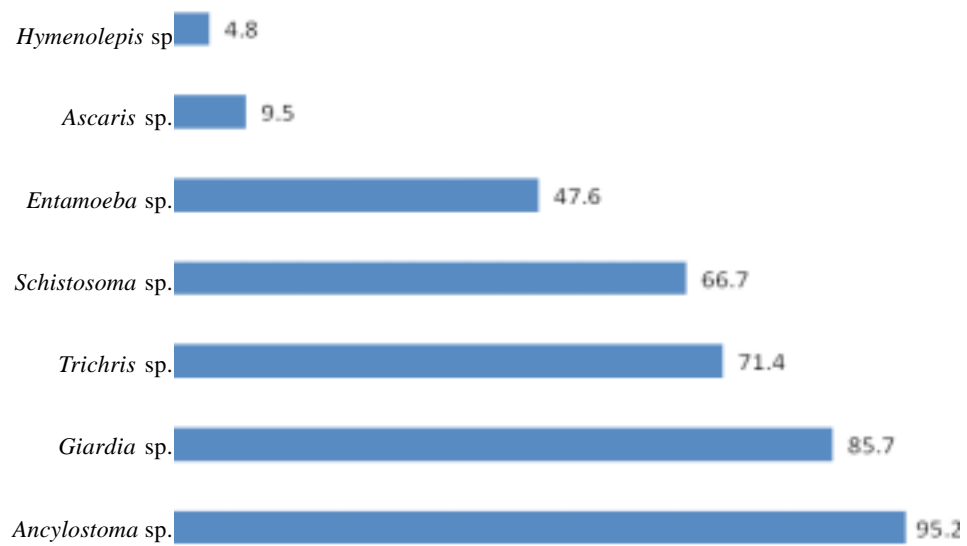


Fig. 1. Percentage of grasscutter infected with each parasite species

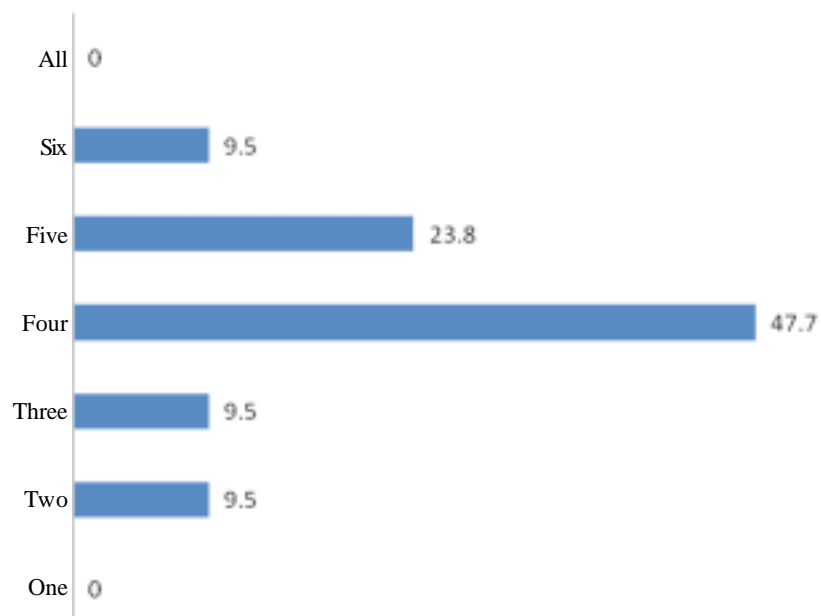


Fig. 2. Number of parasites found in each grasscutter

well as grasscutter production (Smyth, 1996; Ryan & Ray, 2004). These parasites have the potential to infect grasscutter handlers.

Human infections with *Hymenolepis* sp. are known to be rare and more of a nuisance than a pathological condition, but severe infections could become pathological (Olsen, 1974; Smyth, 1996; Cheesbrough, 1998). Many cases of giardiasis are also known to be asymptomatic (Janovy & Roberts, 1996; Smyth, 1996). However, nothing should be left to chance, and grasscutter handlers, such as hunters, traders and consumers, as well as domesticators, need to be informed about possible danger of infection with parasites of the grasscutter. This will enable them take the necessary precaution to avoid or prevent infection. The anthrax scare in the northern parts of the country (Aziz, 2005), and the current swine fever scare should be enough to make humans more vigilant with the food they eat, especially from outside the home. The use of the intestinal contents of grasscutters in soups and its use as medicine in the country (pers. comm.) should, therefore, not be encouraged since it directly exposes the consumer to infection by some of the parasites discussed in this study. Traders and consumers should also beware of where they obtain their grasscutters from.

Hymenolepis sp., *Trichuris* sp., *Ancylostoma* sp. and *Giardia* sp., identified in the study, were among parasites reported in the grasscutter in previous studies in Ghana (Addo, 1998; Ofori, 1999; Simpson & Yeboah, 2001; Kankam *et al.*, 2009). In addition, *Entamoeba* sp. and *Ascaris* sp., which have not been reported in Ghana previously, were also found. *Schistosoma haematobium* has also been identified for the first time in Ghana in the study. *Ascaris* sp. and *Schistosoma haematobium* were,

however, reported in Nigeria (Opara & Fagbemi, 2008). The differences in parasite diversity, in particular, observed in various studies suggest that different study areas may not have similar parasites. This shows that more parasites are yet to be discovered in the grasscutter. Further work should, therefore, be done countrywide in order to come up with an extensive documentation on parasites of the grasscutter. This will be of public health importance and help in educating domesticators of grasscutters on the parasites that can infect the grasscutter and possibly humans. With this information, necessary measures can be taken to ensure the safety of both animals and handlers or consumers, and, at the same time, maximize grasscutter production.

Conclusion and recommendations

Ancylostoma sp. was the most prevalent species among the parasites found in the survey. Multiple infections are common in wild grasscutters in the study area. *Ascaris* sp., *Entamoeba* sp. and *Schistosoma haematobium* are reported, for the first time in Ghana, as parasites of the grasscutter. It is recommended that stock grasscutters brought from the wild for domestication should be screened for parasites if possible, or there should be a defined routine of treatment with a broad spectrum antihelminthic and protozoal drugs before they are domesticated or added to the already domesticated ones.

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