RESEARCH COMMUNICATION

Helminths and bot fly larvae of wild ungulates on a game ranch in Central Province, Zambia

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ABSTRACT

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Helminths and bot fly larvae were collected from 11 wild ungulate species on a game ranch in the Central Province of Zambia. New host-parasite records are: *Calicophoron* sp. from defassa waterbuck *Kobus ellipsiprymnus defassa* and Kafue lechwe *Kobus leche kafuensis*; *Avitellina centripunctata*, *Gaigeria pachyscelis* and *Gedoelstia cristata* from tsessebe *Damaliscus lunatus lunatus*; *Cooperia rotundispiculum* from common reedbuck *Redunca arundinum*; *Dictyocaulus filaria* from greater kudu *Tragelaphus strepsiceros*; *Dictyocaulus* sp. from tsessebe and defassa waterbuck and *Strobiloestrus* sp. from sable antelope *Hippotragus niger*. Most of the other parasites collected are first records for Zambia and thus extend the distribution ranges of several species.

Keywords: Bot fly larvae, helminths, ungulates, Zambia

INTRODUCTION

Since the first private ranches were licensed in 1989 game ranching is a growing industry in Zambia. The opportunity arose to collect parasites on one of these ranches during meat inspection of wild animals that had been shot either for venison, for trophies or because of injuries. The purpose of this investigation was to document new host-parasite records and to extend records of the distribution ranges of parasites of African ungulates. The animals' parasite burdens were not counted, but merely estimated subjectively.

MATERIALS AND METHODS

The animals were all examined on Mtendere Game Ranch (15°05´S, 28°15´E) situated approximately 20 km north of Lusaka in the Chisamba District of Central Province, Zambia. The ranch covers an area of 960 ha and lies within the miombo woodland zone of Zambia. At the time of the investigation it accommodated 18 larger wildlife species at a stocking density of one large stock unit per 4,7 ha.

Thirty-eight animals were examined between December 1995 and November 1996, comprising one Burchell's zebra *Equus burchellii*, 12 impala *Aepyceros melampus*, three tsessebe *Damaliscus lunatus lunatus*, one Lichtenstein's hartebeest *Sigmoceros lichtensteinii*, two eland *Taurotragus oryx*, three bushbuck *Tragelaphus scriptus*, four greater kudu *Tragelaphus strepsiceros*, two sable antelope *Hippotragus niger*, six defassa waterbuck *Kobus ellipsiprymnus defassa*, two Kafue lechwe *Kobus leche kafuensis*, one puku *Kobus vardonii* and one common reedbuck *Redunca arundinum*. Immediately after death their carcasses were transported to a nearby abattoir. The thorax and abdominal cavity were opened, examined for helminths and eviscerated. The gastro-intestinal tract was opened in its entirety, and its contents, together with the thoracic organs, liver, kidneys, paranasal sinuses and skins were examined for parasites

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according to standard necropsy procedures. Macroscopically visible parasites or samples of these parasites were collected and stored in 70% ethyl alcohol for later identification.

RESULTS AND DISCUSSION

The trematode and cestode species recovered are listed in Table 1, the nematodes in Table 2 and the bot fly larvae in Table 3. The tables include references to the first record of each parasite per host species in their natural environment, as well a comment as to whether this is a first record for Zambia.

Eight new host-helminth associations were recorded in this study. As only a few studies on the helminths of wildlife have ever been undertaken in Zambia, most of the findings are new for this country. Two of the bot fly larvae recovered are also new host-parasite records.

The wild ruminants generally appeared to harbour small burdens and in most cases only a few parasites were encountered in each individual. However, *Calicophoron* sp. as well as *Stilesia hepatica* was found in large numbers in the defassa waterbuck. The single Burchell's zebra examined seemed to be heavily infected with *Gastrodiscus aegyptiacus*, *Anoplocephala perfoliata* and *Strongylus vulgaris*.

It would appear as if several of the helminth species collected in this study were not particulariy host specific, as they were often found in more than one host species. The high stocking density of wildlife on the ranch would facilitate such cross-infection (Horak

TABLE 1 Trematodes and cestodes recovered from wild ungulates on a game ranch in Central Province, Zambia

Host and helminth species	Number of animals infected	First record	New record for Zambia
Burchell's zebra (1 animal)			
Gastrodiscus aegyptiacus	1	Le Roux 1932	No
Anoplocephala perfoliata	1	v. Linstow 1901	Yes
Impala (12 animals)			
Calicophoron sp.	1	Ortlepp 1961[a]	Yes
Stilesia hepatica	0	Meeser 1952	Yes
Cysticercus sp.	1	Meeser 1952	No
Moniezia benedeni	2	Hudson 1934	Yes
Tsessebe (3 animals)			
Calicophoron sp.	1	Eduardo 1982a, b	Yes
Avitellina centripunctata	1	This paper	Yes
Eland (2 animals)			
Moniezia benedeni	1	Hudson 1934	Yes
Bushbuck (3 animals)			
Stilesia hepatica	1	Fuhrman 1909	Yes
Greater kudu (4 animals)			
Fasciola gigantica	1	Condy 1972	No
Sable antelope (2 animals)			
Calicophoron sp.	1	Ortlepp 1961[a]	Yes
Defassa waterbuck (6 animals)			
Calicophoron sp.	6	This paper	Yes
Fasciola gigantica	1	Stunkard 1929	Yes
Stilesia hepatica	6	Baer & Fain 1955	Yes
Kafue lechwe (2 animals)			
Calicophoron sp.	1	This paper	Yes
Fasciola gigantica	1	Gallagher *et al.* 1972	No
Schistosoma sp.	1	Le Roux 1932	No

[a] *C. calicophorum*

1980). The presence of *Haemonchus contortus* on the ranch warrants attention as it is established in five host species. It is a bloodsucking parasite that can be pathogenic even at low levels of infection. *Haemonchus* sp. infection was suspected as the main cause of mortality in sable antelope in Zimbabwe under particularly moist conditions (Grobler 1981). Another potentially lethal parasite is *Fasciola gigantica*, which has been incriminated in mortalities in several wildlife species (Hammond 1972; Condy 1972; Knottenbelt 1990). However, in the present study only three animals were infected. Despite repeated intensive searches involving all water sources on the ranch for the fresh water snail *Lymnaea natalensis*, the principle intermediate host of this fluke in southern Africa, only two empty shells were found

TABLE 2 Nematodes recovered from wild ungulates on a game ranch in Central Province, Zambia

Host and nematode species	Number of animals infected	First record	New record for Zambia
Burchell's zebra (1 animal)			
Cylicocyclus insigne	1	Le Roux 1932	No
Draschia sp.	1	Mönnig 1928[a]	No
Strongylus vulgaris	1	Leiper 1909	Yes
Impala (12 animals)			
Cooperioides hamiltoni	1	Mönnig 1932b	Yes
Cooperioides hepaticae	4	Ortlepp 1938	Yes
Cooperioides sp.	3	Mönnig 1932b[b]	Yes
Gaigeria pachyscelis	1	Meeser 1952	Yes
Haemonchus contortus	1	Meeser 1952	Yes
Tsessebe (3 animals)			
Agriostomum cursoni	1	Mönnig 1932a	Yes
Dictyocaulus sp. females	2	This paper	Yes
Gaigeria pachyscelis	1	This paper	Yes
Impalaia sp. females	1	Boomker 1977[c] Gibbons *et al* 1977	Yes
Lichtenstein's hartebeest (1 animal)			
Haemonchus contortus	1	Le Roux 1934	No
Eland (2 animals)			
Cooperia rotundispiculum	1	Boomker 1991	Yes
Haemonchus contortus	1	Mönnig 1933	Yes
Oesophagostomum sp.	1	Mönnig 1932b[d]	Yes
Greater kudu (4 animals)			
Agriostomum gorgonis	1	Le Roux 1934	No
Cooperia rotundispiculum	1	Boomker *et al.* 1991	Yes
Dictyocaulus filaria	1	This paper	Yes
Elaeophora sagitta	3	Mönnig 1926	Yes
Haemonchus contortus	1	Veglia 1919	Yes
Defassa waterbuck (6 animals)			
Dictyocaulus sp. females	1	This paper	Yes
Kafue lechwe (2 animals)			
Haemonchus contortus	1	Le Roux 1930	Yes
Reedbuck (1 animal)			
Cooperia rotundispiculum	1	This paper	Yes
Setaria bicoronata	1	Yeh 1959	Yes

[a] *D. megastoma*
[b] *C. hamiltoni*
[c] *I. tuberculata*
[d] *O. walkeri*

TABLE 3 Bot fly larvae recovered from wild ungulates on a game ranch in Central Province, Zambia

Host and bot fly species	Number of animals infected	First record	New record for Zambia
Burchell's zebra (1 animal)			
Gasterophilus haemorrhoidalis	1	Zumpt 1965	No
Gasterophilus meridionalis	1	Zumpt 1965	No
Gasterophilus nasalis	1	Zumpt 1965	No
Gasterophilus pecorum	1	Zumpt 1965	Yes
Gasterophilus ternicinctus	1	Zumpt 1965	No
Tsessebe (3 animals)			
Gedoelstia cristata	1	This paper	Yes
Oestrus variolosus	1	Zumpt 1965	No
Sable antelope (2 animals)			
Strobiloestrus sp.	1	This paper	Yes
Kafue lechwe (2 animals)			
Strobiloestrus sp.	1	Zumpt 1961[a]	No

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(Zieger 1998). It is possible that some *F. gigantica* were introduced onto the ranch with their mammal hosts during the initial game stocking programme in 1990/1991. If indeed there are no intermediate snail hosts on the ranch, the infection could be self-limiting.

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