

Investigation of gastrointestinal parasites in wild and domestic animals in Radom National Park; South Darfur State , Sudan.

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ABSTRACT: This paper describes the results of a survey of the gastrointestinal helminth parasites in the faecal matters of fourteen wildlife species and four domestic animal species collected from five sites in Radom National Park (R.N.P), South Darfour State, Sudan, namely: Radom area, Alhufra, Titrbi, Kafindibei and Kafiakingi. Out of the 1179 faecal samples examined 244 (20.7%) contained eggs of helminth parasites. Donkeys had the highest overall infection rate of helminth eggs (47.9%), while *Phacochoerus aethiopicus* (warthog) showed the lowest prevalence (2.7%). Prevalence of the parasites was highest (30.2%) in domestic animals and lowest (10.9%) in the wild ones. Kafindibei area showed the highest prevalence of 25.3%, followed by Radom area with a prevalence of 20.5%. Alhufra area showed the lowest prevalence (18.6%). The main prevalent helminth parasites were *Trichostrongylus* (13.5%) and *Strongyloides* (7.3%).

KEY WORDS: *Internal parasites, wild life, domestic animals, radom, south darfur.*

INTRODUCTION

The available information on parasitic infection among wildlife species, particularly in the Sudan, is scanty as only few published papers are available. Eisa *et al.*,⁽¹⁾ published a check-list of helminth parasites of domestic and wild animals in Sudan during the period 1902 – 1975. According to these authors, *Cysticercus tenuicollis* was reported in the *Redunca redunca* (reedbuck), monkey and *Kobus kob* (kob); *Cysticercus pisiformis* in the *Lepus capensis* (rabbit); *Trichuris spp.*, was reported in the monkey and gazelle; *Toxocara canis* was reported in *Acinonyx jubatus* (cheetah) and wild cat; *Setaria labiotopapillosus* in the *Redunca redunca* (reedbuck); *Trichostrongylus spp.*, in the *Giraffa camelopardalis*(giraffe); *Ascaris*

lumbricoides in the wild pig; *Strongyloid spp.*, in the gazelle; *Ascaris pythonis* in

the python and *Toxascaris leonina* in the *Panthera leo* (lion). All the investigated faecal samples for the above mentioned findings were collected from wildlife species kept in captivity at Khartoum Zoo. Saad and Eisa⁽³⁾ surveyed the parasites of seven hussar monkeys in which they reported the presence of three helminthes, namely; *Streptophagus pigmentatus*, *Oesophag-ostomum biforcum* and *Trichuris trichura*. They noticed that, although some wild mammals were infected by endoparasites but the animals did not show clinical signs of diseases on health deviations. In another study employing Laboratory examination of 184 faecal samples comprising 44 species of wild animals kept at Khartoum Zoo Saad *et al.*,⁽³⁾

revealed the presence of *Trichostrongylus* eggs in faeces of *Gazella dorcas* (dorcass gazelles), *Acinonyx jubatus* (cheetah), *Hippotragus equinus* (roan antelope), *Giraffa camelopardalis* (giraffe), *Gazella rufifrons* (red-fronted gazelles), *Papio cynocephalus* (Nubian baboons), *Cercopithecus aethiops* (vervet monkeys) and *Syncerus caffer* (cape buffaloes).

Free range wild animals in Sudan were not investigated for the prevalence of helminth parasites. The present study was therefore set to investigate the prevalence of helminth parasites in wildlife in the Radom National Parks.

MATERIALS and METHODS

Study Areas:

The Radom National Park is located to the south-west of Lake Kundi on the border with the Central African Republic, in the south-western corner of Southern Darfur. The park consists of an area of broken hilly country lying between two main rivers, the Adda and the Umbelasha. Radom was declared a Biosphere Reserve in 1979 by IUCN⁽⁴⁾. The vegetation is principally savannah woodland dominated by *Terminalia brownii*, *Combretum spp.*, *Anogeissus leiocarpus* and *Isobertinia doka*.

Collection of Faecal Samples:

Faecal samples were collected in the period from December 2010 to December 2011. A total of 1179 faecal samples were collected from the five sites namely: Radom area, Alhufra, Titrbi, Kafindibei and Kafiakingi. The collected faecal samples placed in labeled nylon bags and fixed with 10% formaldehyde solution, were transported to Nyala Veterinary Research laboratory for examination.

Floatation and sedimentation Techniques

Two qualitative techniques, namely: Floatation and Sedimentation were used in the laboratory for separation, concentration and identification of parasite eggs and oocysts in the collected faecal samples. Both techniques were performed as described by FAO⁽⁵⁾.

Data Analysis: - Data was analysed using Chi – square analysis.

RESULTS

Domestic animals were found to harbor more internal parasites as compared to wildlife. They showed a parasite prevalence of 30.2% while wildlife had a prevalence of only 10.9% (Table 1). Within the wildlife groups, the *Madaqua guentheri* (Dikdik) represented the highest animals sampled. Conversely, the *Tragelaphus scriptus* (bushbuck) and the leopard represented the lowest species sampled (Table 2).

Table 1. Overall prevalence of internal parasites in both domestic and wildlife in the Radom, Alhufra, Titrbi, Kafindibei and Kafiakingi.

Animals type	Sampled examined	Positive sampled	Prevalences
Domestic animals	600	181	30.2%
Wildlife	579	63	10.9%

Donkeys had the highest prevalence of *Trichostrongylus* and *Strongyloides* infection (47.9%) among the domestic animals in contrast to *Phacochoerus Aethiopicus* (warthog) which showed the lowest prevalence (2.7%) of the latter two

helminth parasites among the wildlife examined in the study areas (Table 2). Helminths prevalence in Kafindibei showed the highest rate (25.3%) followed by Radom area with a prevalence of 0.5% while the lowest prevalence (18.6%) was

found in animals in Alhufra area (Table 3). Out of all internal parasites identified in the present study, *Trichostrongylus*

recorded the highest prevalence rate (13.5%) followed by *Strongyloides* with a prevalence rate of 7.3%.

Table 2. Prevalence of *Trichostrongylus* and *Strongyloides* by animals type and species in Radom National Park

Animals types	Samples examined	<i>Trichostrongylus</i> +ve samples	<i>Strongyloides</i> +ve samples	Mixed infection
a- Domestic				
Cattle	132	28(21.2%)	25(18.9%)	53(40.2%)
Sheep	138	14(10.1%)	10(7.2%)	24(17.4%)
Goats	161	15(9.3%)	8(5%)	23(14.3%)
Donkeys	169	42(24.9%)	39(23.1%)	81(47.9%)
b- Wildlife				
Warthog	75	2(2.7%)	0	2(2.7%)
Baboons	83	19(22.9%)	0	19(22.9%)
Patas monkey	37	14(37.8%)	0	14(37.8)
Velvet monkey	35	13(37.1%)	0	13(37.1%)
Leopard	12	0(0%)	0	0(0%)
Reedbuck	17	2(11.8%)	0	2(11.8%)
Cheetah	27	0(0%)	0	0(0%)
Aardvank	15	0(0%)	0	0(0%)
Dikdik	101	6(5.9%)	4	10(0%)
Rabbit	69	0(0%)	0	0(0%)
Fox	41	0(0%)	0	0(0%)
Spotted hyaena	34	0(0%)	0	0(0%)
Waterbuck	22	3(13.6%)	0	3(13.6%)

*Figures in parerthesis are persentage.

Table 3. Prevalence of *Trichostrongylus* and *Strongyloides* by area in Radom Natonal Park

Study area	No .of Samples examined	Samples examined %	No .of positive samples	Prevalence %
Radom area	352	29.9	72	20.5%
Alhufra	129	10.9	24	18.6%
Titrbi	184	15.6	35	19%
Kafindibei	225	19.1	57	25.3%
Kafiakingi	289	14.5	56	19.4%

The prevalence of *Trichostrongylus* in the two types of animals almost was closely similar. Wild animals had an overall prevalence of 10.2% (59/579), while the domestic ones had a prevalence of 16.5% (99/600).

Erythrocebus patas, (Patas monkey) had the highest prevalence (37.8%) (14/37), white *aethiopicus*(Warthog)showed the lowest prevalence (2.7%) (2/75). Animals species such as *Lepus capensis* (Rabbits), *Canis adustus* (Foxes) , *Crocota*

crocota (Spotted hyaena) and *Tragelaphus scriptus* (Bushbuck) showed no infection at all, (Table 2). Domestic animals species generally harbour more *Trichostrongylus* than wild animals. Moreover the primates *Cercopithecus aethiops* (Velvet monkeys) and *Erythrocebus patas* (Patas monkeys) recorded the highest prevalence of

Trichostrongylus than all other animal species examined. Animals in Radom area, Kafiakingi and Kafindibei showed the highest prevalence of *Trichostrongylus* infection (14.5%, 14.5% and 14.2%, respectively). While those in Alhufra, on the other hand, displayed the lowest prevalence (10.1%) (Table 4).

Table 4. Prevalence of *Trichostrongylus* by area in Radom National Park

Study area	No. of samples tested	No. of positive samples	Prevalence (%)
Radom area	352	51	14.5
Alhufra	129	13	10.1
Titrbi	184	20	10.9
Kafindibei	225	32	14.2
Kafiakingi	289	42	14.5

The prevalence of *Strongyloides* species in domestic animals (13.7%) was significantly higher than their prevalence in wild animals (0.7%). Donkeys however, showed the highest prevalence (23.1%), among all animals species examined. It worth mentioning that all wild animals' species, a part from Dikdik, showed no infection with *Strongyloides*. Animals in Kafindibei showed the highest prevalence (11.1%) followed by those in Alhufra (8.5%) and Titribi (8.2%) while those in Radom area (6%) and Kafiakingi (4.8%) showed the lowest prevalence

DISCUSSION

The present study revealed that of the many gastrointestinal tract (GIT) nematodes, *Trichostrongylus spp.*, and *Strongyloides spp.*, represented the highest and most prevalent helminth parasites in both wildlife and domestic animals. In the traditional management of demostic animals in the study areas, sheep and goats

graze together, besides cattle and donkeys, which might explain the higher prevalence of helminth infection among domestic animals compared to wildlife This parasitological study showed that both domestic and wildlife animals also share the same parasite species with different levels of infection The prevalence of *Trichostrongylus spp.*, reported in present study, is in agreement with that reported, in faeces of *Gazella dorcas* (dorcass gazelles), *Acinonyx jubatus* (Cheetah Indian), *Hippotragus equines* (roan antelope) *Giraffa camelopardalis* (giraffe), *Gazella rufifrons* (red-fronted gazelles), *Papio cynocephalus* (Nubis baboons) , *Cercopithecus aethiops* (vervet monkeys) and *Syncerus caffer*. (cape buffaloes) kept at Khartoum Zoo (Sudan)⁽³⁾. This was also reported in guenons of western Uganda by Thomas *et al*; ⁽⁶⁾. The present study reported that *Trichostrongylus spp.*, were the most predominant parasite in *Erythrocebus*

patas (Patas monkey) in Radom area and Kafiakingi. The domestic animals had highest prevalence rate than wild animals. This may be due to the fact that *Trichostrongylus* is mainly a ruminant parasite.

High prevalence of *Strongyloides spp.*, were reported in Sennar by El Dirdiri *et al.*, ⁽⁷⁾. Who showed that 27% of the donkeys examined were harbouring these endoparasites as well as other gastrointestinal parasites Kheir and Kheir⁽⁸⁾ reported a prevalence of 37.8% in Donkeys in Bahr El Arab. This results is very lower than that (71.1%) reported by Seri *et al*, ⁽⁹⁾, The difference may be due to variation in geographical location of the two studies. The present study also recorded *Strongyloides spp.*, as the most predominant parasite of donkeys in Kafindibei. The domestic animals had higher prevalence rate than the wild animals because the genus *Strongyloides* had a wide range of domestic animal hosts including man. The high prevalence of *Trichostrongylus spp* and *Strongyloides spp.* recorded in domestic animals in the study areas shows the need to design and implement a control policy of helminth parasites in wild animals in line with the control in the domestic ones in Radom National Park.

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