



The Prevalence and Intensity of Gastro-Intestinal helminths in Equine in North Darfur, Sudan

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Abstract: A survey of equines (horses and donkeys) arriving at water points and markets in El Fasher, North Darfur state, Sudan was carried out during the period October 2011 and May 2012 to study the prevalence of gastrointestinal helminth parasites. A total number of 1400 animal (900 donkeys and 500 horses) were examined for gastrointestinal helminths. The overall prevalence with helminth parasites was 24.6%. 5% of the horses and 35.5% of the donkeys examined were proved to harbour gastro-intestinal nematodes. In donkeys and horses, the overall mean egg per gram (epg) count was 642.2 ± 38.0 and 352.0 ± 73.3 with a range of 100-2900 and 100-1700 (epg), respectively. The animals harbouring mild infection reported the highest incidence of 69.7% (donkeys) and 84% for horses, while moderate infection reported 15.6% (donkeys) and 8% for horses; and 14.7%, 8% for severe infection in donkeys and horses respectively. The most dominant genera of gastro-intestinal nematodes were *Strongylus spp*, *Cyathostomes spp*, *Trichostrongylus spp*, and *Strongyloides westeri*.

Keywords: horses, donkeys, gastrointestinal nematodes, North Darfur, Sudan

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Introduction

In Sudan, as well as in neighbouring countries, donkeys are used to transport goods between farms and markets. In remote rural areas, as in Darfur states, where modern means of transportation is not available, and also during rainy season, the contribution of donkeys in facilitating marketing of agricultural products is of great importance (Pearson, 2000). Donkeys have reduced the domestic burden of rural people, especially women, and have created employment and income generating opportunities for many people (Pearson, 2000).

Earlier reports of Kheir and Kheir (1981);

Eisa *et al.*, (1979), and El Dirdiri *et al.*, (1986) demonstrated that donkeys commonly harbour gastrointestinal parasites such as large and small strongyles, ascarids, pin worms, bots, and stomach worms, from different parts of Sudan. Different reports of Seri *et al.*, (2004), Sawsan *et al.* (2008), Ahmed (2008), and Fangama (2013) stated the current state of helminth infestation in Khartoum state, South Darfur state as well as Gedarif state.

Despite these comprehensive surveys of the prevalence and distribution of different helminth species little information is available on the prevalence of infection in equines in North Darfur state.

The aim of this study is to report on the prevalence of equine helminthosis in El Fasher, North Darfur state, Sudan.

Materials and Methods

Site of the study: The study was conducted in El Fasher, North Darfur state, Sudan. The survey was carried out at water points as well as market places, during the period October 2011 to May 2012.

A total number of 1400 animals (500 horses and 900 donkeys) were sampled for fresh faecal samples directly from the rectum, or sometimes picked up off the ground if the animals were seen to void faeces, and the sample could be picked up immediately. The samples were immediately submitted to the Veterinary Research laboratory, Ministry of Animal Resources and Fisheries, El Fasher. Egg count was done using modified McMaster technique (Anonymous, 1986) and the eggs were identified according to Soulsby (1982).

Intensity of infection: The severity of the infection was as obtained from the number of egg per gram of faeces (epg) (Soulsby, 1982) as follows: < 500 eggs/gram of faeces = Mild infection, 500 – 1000 eggs/gram of faeces = Moderate infection, and > 1000 eggs/ gram of faeces = Severe infection.

Statistical methods: data were expressed as percentages and mean \pm standard error of mean.

Results

In the current study a total of 1400 donkeys and horses were examined for gastrointestinal helminthes parasites. The overall prevalence of infection with gastro-intestinal nematodes was 24.6%. Out of 500 faecal samples collected from horses only 25 samples were found positive (5%), while 35.5% of the donkeys examined (900) were found to be infected with helminth parasites (Table, 1).

As shown in table (2), 51.3% of the infected donkeys were harbouring single infection while the rest harbor mixed infection. In horses, 92% of positive only harbour single

infection, while 8% harbour mixed infection.

The current study revealed that mild infection with helminthes was the dominant both in horses (84%) and donkeys (69.4%). Followed with moderate (15.6%) and (8%) and severe infection (14.7%) and (8%) in donkeys and horses, respectively.

In donkeys and horses, the overall mean egg per gram (epg) count was 642.2 ± 38.0 and 352.0 ± 73.3 with a range of 100-2900 and 100-1700 (epg), respectively.

Discussion

Gastrointestinal parasites are the most serious health problem of donkeys in Africa, contributing to poor body condition, reduced power output, poor reproductive performance and short lifespan (Yoseph *et al.*, 2005). Large numbers of internal parasites have been reported in a study of donkeys in five African countries including Ethiopia, Kenya, Zimbabwe, Burkina Faso, Chad and Morocco (Pandey *et al.*, 1994).

In this study the overall prevalence of nematode infection for both donkeys and horses was found to be (24.6%), this result is in close agreement with that obtained by Sawsan *et al.*, (2008) in South Darfur state (29.79%), similar results were also reported by Kheir and Kheir (1981) in Bahr El Arab (22%), also in Sennar-Sudan El Dirdiri *et al.*, (1986) reported a comparable percentage of infection with gastro intestinal diseases (27%). It is less than that reported in Nyala town (58%), this may be attributed to the large number of animal examined in this study (1400 animal) when compared to Kheir and Kheir (1981) who examined only 390 animals.

The prevalence of gastrointestinal nematodes in horses observed in this study (5%) is lower than that reported by Sawsan *et al.*, (2008) in South Darfur (15.73%), and Kheir and Kheir (1981) in Bahr El Arab (18.5%). This could be due to difference in time factor, and geographic location and there may be differences in husbandry and management. These results may indicate that horses receive good health care from

owners, and this could be related to the economic value of horse when compared to donkeys.

Results obtained in this study concerning the prevalence of helminth nematodes in donkeys (35.5%) was similar to result obtained by Sawsan *et al.*, (2008) in Nyala –Sudan (37.84%), but they were very low when compared with that reported by Seri *et al.* (2004) and Tamador *et al.*, (2011) in Khartoum state-Sudan (70.1%), and 56.7% respectively, Ahmed (2008) in Nyala-Sudan performed necropsy to donkeys and reported (97.78%) prevalence, while Kheir and Kheir (1981) reported that the overall incidence of infection with nematode parasites was found higher in town animals (58%) than in animals kept in nomadic areas (22%).

The infection with single nematode species in donkeys was higher than with multiple infections which agree with the findings of Seri *et al.* (2004) in Khartoum state and Kheir and Kheir (1981) in South Darfur. Concerning severity of infection in donkeys reported in this study, (69.7%) for mild infection, both moderate and severe shared the lower incidence with (15.6) and (14.7), respectively. These findings are comparable with that obtained by Sawsan *et al.*, (2008) in donkeys (81.25%, 7.89%, and 10.86%) for mild, moderate and severe infections respectively. Also it is higher than the values obtained by Seri *et al.* (2004) in donkeys (58.6%, 21.9%, and 19.5%) for mild, moderate and severe infections, respectively. Ayele *et al.*, (2006) in Ethiopia, reported a contradictory result with 6.2%, 3.8%, and 81.7% for mild, moderate, severe infection, respectively this may be attributed to management system as well as lack of veterinary services, and number of animals examined (339). In horses the values obtained for severity of infection were in the same line with that obtained by Sawsan *et al.*, (2008) (82, 35%, 8.82%, and 8.82%) for mild, moderate and severe infection respectively.

The mean epg count reported in this study for donkeys (642.2±38.0) was less than that

obtained by Seri *et al.*, (2004) of (1016.6 ± 363.6), this also may be attributed to the availability of veterinary services, and that the animals were of value to the owners.

Although, in Sudan very little attention has thus far been paid to the parasites of donkeys, the presence of large numbers of several species of helminths in the same animal as revealed in this study; it is highly likely that these parasites might exert pathological effects on donkeys. The animals are further subjected to the stress of poor nutrition and hard work which aid in the precipitation of infestation.

The present study has provided information that may facilitate planning and development of worm control programmes. Seasonal variation in helminth burdens may provide a window of opportunity when strategic dosing of anthelmintics at the start of rainy season would allow recovery of body condition when feed is abundant. Further research work is needed to investigate the state of helminthes in the different regions of the country for equines.

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Table 1: Overall prevalence of gastrointestinal helminths in donkeys and horses in North Darfur State

Donkeys				Horses				Total			
Positive		Negative		Positive		Negative		Positive		Negative	
No	%	N	%	No	%	N	%	No	%	N	%
320	35.5	580	64.4	25	5	475	95	345	24.64	1055	75.4

Table 2: Type of infestation with gastrointestinal helminths in donkeys and horse

Donkeys				Horses			
Single infection		Mixed infection		Single infection		Mixed infection	
No	%	No	%	No	%	No	%
164	51.25	156	48.75	23	92	2	8

Table 3: Severity of infection with gastro-intestinal helminths in donkeys and horses

Donkeys						Horses					
Mild infection		Moderate infection		Sever infection		Mild infection		Moderate infection		Sever infection	
No	%	No	%	No	%	No	%	No	%	No	%
223	69.7	50	15.6	47	14.7	21	84	2	8	2	8

Table 4: Egg per gram of faeces (epg) count (Mean±s.e.m) of donkeys and horses in relation to severity of infestation

Donkeys			Horse		
Mild infection	Moderate infection	Sever infection	Mild infection	Moderate infection	Sever infection
Mean ± s.e.m	Mean ± s.e.m	Mean ± s.e.m	Mean ± s.e.m	Mean ±s.e.m	Mean ±s.e.m
215.3±9.879	773.9±24.95	1756±55.13	228.6±30.97	600±0.0	1400±300.0

Table 5: Egg per gram of faeces (epg) count (Mean±s.e.m) in donkeys and horses infested with gastro-intestinal helminths.

Donkeys		Horse	
Range	Mean ± s.e.m	Range	Mean ± s.e.m
100-2900	642.2±38.0	100-1799	352.0±73.3

الإنتشار وشدة الإصابة بالديدان الطفيلية المعدية المعوية في الفصيلة الخيلية في شمال دارفور - السودان

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اجري مسح حقلي لدراسة انتشار الديدان الطفيلية في الفصيلة الخيلية (الحصين و الحمير) التي تتواجد حول نقاط توزيع المياه و الاسواق في الفاشر، ولاية شمال دارفور خلال الفترة أكتوبر 2011 و حتى مايو 2012. تم فحص عدد 1400 حيوان (500 من الحصين و 900 من الحمير) لمعرفة إصابتها بالديدان الاسطوانية المعدية-المعوية. إجمالي نسبة الإصابة بالديدان الاسطوانية بلغ 24.6%، و بلغت نسبة الإصابة في الحصين 5% بينما كانت في الحمير 35.5%. بالنسبة للحمير، المتوسط الإجمالي لعدد البيض في كل جرام من الروث بلغ 642.2 ± 38.0 بينما في الحصين كان 352.0 ± 73.28 . في مدي يتراوح ما بين 100 إلي 2900 بيضة في كل جرام من روث الحمير و 100-1700 بيضة في كل جرام من روث الحصين. الحيوانات التي تحمل إصابة خفيفة شكلت نسبة عالية من الحيوانات التي تم فحصها 69.7% (الحمير) و 84% (الحصين) بينما الإصابة المتوسطة شكلت 15.6% و 8% أما الإصابة العالية 14.7% و 8% بالنسبة للحمير و الحصين، علي التوالي. أكثر الأنواع التي تم التعرف عليها كانت كالتالي: *Strongylus spp*, *Strongyloides westeri* و *Cyathostomum spp*, *Trichostrongylus spp*,