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**FIELD INVESTIGATION OF GASTRO-INTESTINAL  
NEMATODES IN HORSES AND DONKEYS IN SOUTH  
DARFUR STATE, SUDAN**

(With 3 Tables)

By

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استقصاء حقلي للإصابة بالديدان الاسطوانية المعدية المعوية في الخيول والحمير  
في ولاية جنوب دارفور - السودان

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اجري مسح حقلي لدراسة انتشار الديدان الطفيلية في الخيول والحمير. أجريت الدراسة في ولاية جنوب دارفور خلال الفترة أكتوبر ٢٠٠٦ وحتى سبتمبر ٢٠٠٧م. تم فحص عدد ١٢٥٦ حيوان (٤٤٦ من الخيول و ٨١٠ من الحمير) لمعرفة إصابتها بالديدان الاسطوانية المعدية-المعوية. وقد بلغ إجمالي نسبة الإصابة بالديدان الاسطوانية ٢٩,٢٩%، منها ١٥,٧٣% في الخيول، ٣٧,٤٨% في الحمير. اما المتوسط الإجمالي لعدد البيض في كل جرام من الروث  $589,97 \pm 986,02$ . في مدي يتراوح ما بين ٥٠ إلى ١٣٤٥٠ بيضة في كل جرام من الروث. الحيوانات التي تحمل إصابة خفيفة شكلت نسبة عالية من الحيوانات التي تم فحصها (٨١,٣٥%) بينما الإصابة المتوسطة شكلت ٨,١١% أما الإصابة العالية فقد وصلت الى ١٠,٥٤%. وقد كانت أكثر الأنواع التي تم التعرف عليها كالتالي:

*Strongylus spp, Cyathostomum spp, Trichostrongylus spp, و Strongyloides westeri*

**SUMMARY**

A field survey was conducted to study the prevalence of gastrointestinal helminth nematodes in donkeys (*Equus asinus*) and horses (*Equus caballus*). The study was conducted in South Darfur state during the period October 2006 to September 2007. A total number of 1256 animals (446 horses and 810 donkeys) were examined for gastrointestinal nematodes. The overall prevalence of gastro intestinal

nematodes was 29.29%; 15.73% of the horses and 37.48% of the donkeys examined were proved to harbour gastro-intestinal nematodes. The overall mean egg per gram count (EPGC) was  $589.97 \pm 986.02$  with a range of 50-13450 (EPG). The animals harbouring mild infection reported the highest incidence of 81.35%, while moderate infection reported 8.11% and 10.54 for severe infection. The most dominant genera of gastro-intestinal nematodes were *Strongylus spp*, *Cyathostomes spp*, *Trichostrongylus spp*, and *Strongyloides westeri*.

**Key words:** horses, donkeys, gastrointestinal nematodes, Sudan

## INTRODUCTION

In Sudan, donkeys are becoming increasingly important in view of the increased use of donkeys instead of horses in labour as drought animals as well as carrying water, and in transportation. Moreover, donkeys are used as pack beasts and in ploughing. Livestock population was reported to be about 121 million head, composed of 35.825, 44.802, 37.346, 3.031, 0.65, and 6.35 million head of cattle, sheep, goats, camels, horses and donkeys respectively (SBAR, 2000). About 30.9% of donkeys' are found in Darfur States.

Horses, ponies and donkeys are hosts to a large variety of parasites, and it is hardly possible to find any grazing animal of these equines not harbouring a number of species at any particular time (Duncan, 1983). In the Sudan, to our knowledge, very little work has been done on the parasites of donkeys (Eisa *et al.*, 1979; Kheir and Kheir, 1981; Fadia, 2000).

The main objective of this study is to study the prevalence of gastrointestinal nematodes in donkeys in South Darfur state.

## MATERIALS AND METHODS

The current study was conducted to spot light on the prevalence and intensity of infection with gastro-intestinal helminth parasites in donkeys (*Equus asinus*) and horses (*Equus caballus*) in South Darfur state, during the period October 2006 to September 2007. A total number of 1256 animals (horses and donkeys) were sampled for fresh faecal samples; the samples were immediately submitted to the diagnostic laboratory of the Veterinary Research laboratory, Ministry of Sciences and Technology in Nyala. 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 was determined according to Soulsby 1982 as follows:

500 eggs/gram of faeces = Mild infection

800 – 1000 eggs/gram of faeces = Moderate infection

1500 – 2000 eggs/ gram of faeces = Severe infection.

**Faecal Culture and Identification of larvae:** The pooled of positive faecal samples were cultured for larval identification, and where possible 100 third stage larvae were identified as described by Anonymous (1986).

## RESULTS

As shown in table (1), the overall prevalence of infection with gastrointestinal nematodes was 29.20%. Horses showed 15.73% while donkeys showed 37.48%. In November the highest incidence of infection (41.50%) was reported, while in June showed the lowest percentage 13.92% (Table, 1). Mean  $\pm$  SD for egg per gram of faeces (epg) was  $589.97 \pm 986.02$  and the range was 50-11800 (epg) (Table, 2). Considering severity of infection, animals harbouring mild infection were dominant (81.35%), while animals with severe infection were 10.54% and animals with moderate infection were the lowest one 8.11% (Table, 3). The results of faecal Culture and Identification of larvae revealed the dominance of following helminth genera: *Strongylus spp*, *Cyathostomum spp*, *Trichostrongylus spp*, and *Strongyloides westeri*.

## DISCUSSION

From the results obtained in this study, it is interesting to note that, the overall prevalence for both horses and donkeys was 29.785% this is in harmony with the results of Kheir and Kheir (1981) in Bahr El Arab (22%) but not in Nyala town where they reported 58%, this may be referred to the large number of animals surveyed in this study (1256 animals) when compared to that of Kheir and Kheir (390 animals). In Sennar- Sudan El Dirdiri *et al.*, (1986) reported that 27% of the donkeys examined were harbouring gastrointestinal parasitic infection. In horses the prevalence noticed in this study was 15.73% while that recorded by Kheir and Kheir (1981) in Bahr El Arab was (18.5%). Prevalence of gastrointestinal nematodes in donkeys showed 37.84%, this result is very low when compared with that reported by Seri *et al.*, (2004), in

Khartoum state-Sudan (70.1%), and this may be attributed to the same explanation of Kheir and Kheir (1981) who 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 overall Mean  $\pm$  SD for egg per gram of faeces (epg) was  $589.97 \pm 986.02$  and the range was 50-11800 (epg), this is also low when compared with that of *Seri et al.*, (2004) ( $1016.6 \pm 363.6$ ) (epg), and this may be attributed to the large percentage of mild infection incidence in this study (81.35%) when compared to that of *Seri et al.*, (2004) who reported 58.6% mild infection in donkeys in Khartoum state. The highest Mean  $\pm$  SD was observed in April (hot season)  $1390.03 \pm 2401.26$  with a range of 50-11800 (epg), and the lowest was in June (rainy season)  $290.00 \pm 242.44$  with a range of 50-900 (epg). Concerning severity of infection, animals harbouring mild infection reported 81.35%, both moderate and severe shared the lower incidence (8.11% and 10.54% respectively). These findings are in harmony with *Seri et al.*, (2004) in donkeys who reported 58.6%, 21.9% 19.5% for mild, moderate and severe infections respectively. The results of faecal culture and identification of larvae revealed the dominance of following helminth genera: *Strongylus spp.*, *Cyathostomum spp.*, *Trichostrongylus spp.*, and *Strongyloides westeri*. This may be compared with the results of Kheir and Kheir (1981), where they encountered five nematode genera in donkeys in South Darfur State: *Strongylus spp.*, *Oxyuris spp.*, *Strongyloides spp.*, *Parascaris spp.*, and *Trichuris spp.* and the difference may be attributed to the changes of the bio-geographical distribution that happened during the 26 years period between the two studies.

However, all the findings in the survey during the whole year were affected with the extensive miss use of anthelmintics by animal's owners in the absence of veterinary authorities, where sometimes sub doses, over dosage of anthelmintics, wrong timing of de-worming and a lot of misconceptions of de-worming what shows apparent differences in the results in this study.

#### ACKNOWLEDGEMENTS

The technical assistance of Mr. Suleiman Ali Noja is greatly acknowledged. Due thanks are extended to director and the staff members of Nyala Veterinary Research laboratory.

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Table (1): Prevalence of gastro-intestinal nematodes in horses and donkeys per Month.

Month	Prevalence		
	Total	Horses	Donkeys
January	40.85	10.64	55.79
February	34.38	ND	34.38
March	25.66	5.26	46.43
April	24.35	17.86	30.51
May	17.92	20.34	14.89
June	13.92	10.64	15.63
July	33.06	9.09	37.25
August	22.86	10.00	26.00
September	21.88	18.33	24.00
October	33.33	20.83	50.00
November	41.50	50.00	42.11
December	40.74	7.69	48.53
Mean prevalence	29.20	15.73	37.48

Table (2): Mean  $\pm$  SD and range of egg per gram of faeces (EPG) in horses and donkeys infested with gastro-intestinal nematodes.

Month	Mean $\pm$ SD	Range
January	400.86 $\pm$ 640.41	50-3800
February	890.91 $\pm$ 1,231.63	50-4500
March	655.17 $\pm$ 859.65	50-3600
April	1,390.03 $\pm$ 2,401.26	50-11800
May	457.89 $\pm$ 526.32	50-1700
June	290.00 $\pm$ 242.44	50-900
July	283.75 $\pm$ 290.53	50-1600
August	340.00 $\pm$ 364.10	50-1500
September	565.71 $\pm$ 1,366.55	50-8000
October	889.29 $\pm$ 1,641.45	50-10400
November	608.49 $\pm$ 1,725.63	50-13450
December	307.58 $\pm$ 542.29	50-2400
Total	589.97 $\pm$ 986.02	50-13450

**Table (3): Severity of infection with gastro-intestinal nematodes in horses and donkeys per month**

Month	Mild%			Moderate%			Severe%		
	Total	Hor.	Donk	Total	Hor.	Donk	Total	Hor.	Donk
January	87.93	80.00	88.68	3.45	20.00	1.89	8.62	0	9.43
February	72.73	ND	75.00	18.18	ND	16.67	9.09	ND	8.33
March	68.97	33.33	73.08	20.69	33.33	19.23	10.34	33.33	7.69
April	64.29	90.00	55.56	7.14	0	5.56	28.57	10.00	38.89
May	84.21	83.33	85.71	5.26	8.33	-	10.53	8.33	14.29
June	81.82	100.0	80.00	18.18	0	20.00	0	0	-
July	92.68	100.0	94.74	4.88	0	2.63	2.44	0	2.63
August	93.75	50.00	100.0	0	0	-	6.25	50.0	-
September	77.14	81.82	75.00	5.71	18.18	-	17.14	0	25.00
October	67.86	90.00	55.56	10.71	0	16.67	21.43	10.0	27.78
November	88.52	85.71	85.71	4.92	14.29	7.14	6.56	0	7.14
December	78.79	0	78.79	15.15	0	18.18	6.06	100.0	3.03
<b>Total</b>	<b>81.35</b>	<b>82.35</b>	<b>81.25</b>	<b>8.11</b>	<b>8.82</b>	<b>7.89</b>	<b>10.54</b>	<b>8.82</b>	<b>10.86</b>

Hor = Horse Donk = Donkey ND = Not diagnosed