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

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
- > 1000 eggs/gram of faeces = Severe infection

Statistical methods: data were expressed as percentages and mean ± 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 gastrointestinal 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 gastrointestinal 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, sever 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.

Reference


| 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 horses

<table>
<thead>
<tr>
<th></th>
<th>Donkeys</th>
<th>Horses</th>
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</thead>
<tbody>
<tr>
<td>Single infection</td>
<td>Mixed infection</td>
<td>Single infection</td>
</tr>
<tr>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>164</td>
<td>51.25%</td>
<td>156</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Donkeys</th>
<th>Horses</th>
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<tbody>
<tr>
<td>Mild infection</td>
<td>Moderate infection</td>
<td>Sever infection</td>
</tr>
<tr>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>223</td>
<td>69.7%</td>
<td>50</td>
</tr>
</tbody>
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### Table 4: Egg per gram of faeces (epg) count (Means±s.e.m) of donkeys and horses in relation to severity of infestation

<table>
<thead>
<tr>
<th></th>
<th>Donkeys</th>
<th>Horse</th>
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<tbody>
<tr>
<td>Mild infection</td>
<td>Moderate infection</td>
<td>Sever infection</td>
</tr>
<tr>
<td>Mean ± s.e.m</td>
<td>Mean ± s.e.m</td>
<td>Mean ± s.e.m</td>
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<tr>
<td>215.3±9.879</td>
<td>773.9±24.95</td>
<td>1756±55.13</td>
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</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Donkeys</th>
<th>Horse</th>
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<tbody>
<tr>
<td>Range</td>
<td>Mean ± s.e.m</td>
<td>Range</td>
</tr>
<tr>
<td>100-2900</td>
<td>642.2±38.0</td>
<td>100-1799</td>
</tr>
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الانتشار وشدة الإصابة بالديدان الطفيلية المعوية في الفصلية الخيلية
في شمال دارفور- السودان

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اجري مسح حقي للدراسة انتشار الديدان الطفيلية في الفصلية الخيلية (الحصين و الحمير) التي تواجد حول نقاط توزيع المياه و الأسواق 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 الإسطولية المعوية-الاستوائية. إجمالي نسبة الإصابة بالديدان الاستوائية بلغ 24.6%، و بلغت نسبة الإصابة في الحسنين 5% بينما كانت في الحمير 35.5%.

بالنسبة للحمير، المتوسط الإجمالي لعدد البضائع في كل جرام من الروث بلغ 642.2±38.0 بينما في الحسنين كان 352.0±73.28. في مدي يتراوح ما بين 100 إلى 2900 بضعة في كل جرام من روحة الحمير و 100-1700 بضعة في كل جرام من روحة الحسنين. الحيوانات التي تتحمل 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 الحسنين، على التوالي. أكثر الأنواع التي تم التعرف عليها كانت كالتالي: Strongylus spp, Strongyloides westeri, Cyathostomum spp, Trichostrongylus spp.