بسم الله الرحمن الرحيم

Sudan University of Science and Technology

College of Veterinary Medicine

Investigation of Internal parasites of sheep In Eastern Nile Khartoum State

(Graduation Project)

التقصي عـن الطفيليات الداخلية في الضان في

شرق النيل ولاية الخرطوم

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قال تعالى :

﴿ اللَّهُ نُورُ السَّمَاوَاتِ وَالْأَرْضِ مَثَلُ نُورِهِ كَمِشْكَاةٍ فِيهَا مِصْبَاحٌ الْمِصْبَاحُ فِي زُجَاجَةٍ الزُّجَاجَةُ كَأَنَّهَا كَوْكَبٌ دُرِّيٌّ يُوقَدُ مِن شَجَرَةٍ مُّبَارَكَةٍ زَيْتُونِةٍ لَّا شَرْقِيَّةٍ وَلَا غَرْبِيَّةٍ يَكَادُ زَيْتُهَا يُضِيءُ وَلَوْ لَمْ تَمْسَسْهُ نَارٌ نُّورٌ عَلَى نُورٍ يَهْدِي اللَّهُ لِنُورِهِ مَن يَشَاء وَيَضْرِبُ اللَّهُ الْأَمْثَالَ لِلنَّاسِ وَاللَّهُ بِكُلِّ شَيْءٍ عَلِيمٌ ﴾

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بدأنا بأكثر من يد وقاسينا أكثر من هم وعانينا الكثير من الصعوبات وها نحن اليوم والحمد لله نطوي سمر الليالي وتعب الأيام وخلاصة مشوارنا بهذا العمل المتواضع

شكرا ،، لك يا شمعه أحرقت نفسها لتضئ لمن هم حولها ،، شكرا لك يا ورده فاح عبيرها وطاب شذاها ،، شكرا لك يا وره ذاد بريقها ورونقها ،،

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Abstract

Key words: Internal Parasites ,Sheep ,Easteren Nile

A total of 40 faecal samples were collected from sheep for parasitological analysis and identification of the gastrointestinal tract parasites. The sheep were also subject to clinical examination .

25 from the total sheep were found to be infected with internal parasites .The parasites identified were *Monezia spp* (16%) ,*Heamonchus spp* (12%) , *Trichostrogylus spp* (72 %) .

The range of temperature of infected sheep was fluctuating from (37.3-40℃) ,the respiratory rate was within normal rate (12-26 cycle\minute) and puls rate varied from lower to normal (45-81 wave\minute).

On conclusion three type of internal parasites were diagnosed among sheep in Eastren Nile. The rate of occurrence is considered as high as compared with previous studies .

الملخص

تم جمع 40 عينة براز من الحيوانات للتحليل الطفيلي ومعرفة الطفيليات وكذلك تمت الاختبارات السريرية

ووجد ان 25 من الضان مصاب بالطفيليات الداخلية وهي :

Monezia spp(16%) ,*Heamonchus spp* (12%) ,*Trichostrogylus spp* (72%)

وكانت درجة الحراره تتدرج من (37-40 درجة مئوية) ومعدل التنفس طبيعي وهو 12-26 دوره \الدقيقة ومعدل النبض يختلف من متدني الي طبيعي وهو 45- 81 ذبذبة \ الدقيقة . وفي الختام ثلاثة أنواع من الطفيليات الداخلية تم تشخيصها في الضان في محلية شرق النيل وهذا المعدل يعتبر عالي اذا ماقورنت بالدراسات السابقة .

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Introduction

Parasitic infection ranged from acute disease with high rate of mortality and chronic disease frequently with disease resulting in various degrees of morbidity and prematre culling to subclinical infection with sheep appearing relatively healthy but frequently performing below their full potential. Helminthiasis adversely affects ruminants, causing hematological and biochemical disturbances (Ijaz et al., 2009), anorexia, weight loss, poor reproductive performance, and even death of lambs (Hussain and Usmani, 2006).The infections are either clinical or sub clinical, the latter being the most common and of great economic importance.

The parasitic helminthes of sheep are subdivided into nematodes, trematodes and cestodes.The important nematode disease of sheep is nematodirosis in young lamb and parasitic gastroenteritis (PGE) in lamb and occasionally older sheep.

The three most important sheep roundworms are *Haemonchus contort*, *Trichostrongylus* spp and *Ostertagia spp* .Worms of lesser or occasional importance include *Nematodirus* spp *Oesophagostomum* spp and *Chabertia ovina*. Liver fluke is also important in some locations. Sheep worm infections are often mixed, with dominant

species varying according to climatic zone. *H.contortus* is most important in regions with summer dominant rainfall, *Trichostrongylus* and *Ostertagia* spp are more cold- and desiccation tolerant, and hence dominate in areas with non-seasonal rainfall, and in winter rainfall areas, (Besier and Love 2003).

Sheep in Sudan play important role of need for local consumption and export to numerous country ,a total of 76.728.000 head of sheep were slaughtered in period(2000 to 2004) (MARF,2005).

Objectives:

1- To study the occurrence in internal parasites in sheep in Eastern Nile, Khartoum State.

2- Determination of the clinical picture associated with internal parasites infection in sheep.

Chapter 1

Literature Review

1.1 Distribution of important parasites

The three most important sheep roundworms in Australia are *Haemonchus contorst*, *Trichostrongylus* spp and *Ostertagia spp* .Worms of lesser or occasional importance include *Nematodirus* spp *Oesophagostomum* spp and *Chabertia ovina* . Liver fluke is also important in some locations. Sheep worm infections in Australia are often mixed, with dominant species varying according to climatic zone. . *Hcontortus* is most important in regions with summer dominant rainfall, *Trichostrongylus* and *Ostertagia* spp are more cold- and desiccation tolerant, and hence dominate in areas with non-seasonal rainfall, and in winter rainfall areas**,** (Besier and Love 2003).

1.2 Sheep in Sudan :

The estimated Sudanese national sheep flock is 49.797 million head (MARF , 2005). Sudan sheep are conventionally classified on basis of morphology and distribution into four main group : Sudan Desert , Sudan Nilotic, Sudan Arid Upland and Sudan Equatorial Upland (Macleory ,1961) . Sheep in Sudan play important role in need for

local consumption and export to numerous country ,a total of 76.728.000 head of sheep ware slaughter in period(2000 to 2004) (MARF,2005).

Ahmed and Elmalik (1997) investigated the prevalence of nematodes in sheep brought to Khartoum from different localities of Sudan, four genera of nematodes were identified , these include *H.contortus*, *Strogyloide papillosus, Oesophagostomum spp*, and *Trichostrogylus spp,* with prevalence *rate* of 56.3,36.6,3.7,and 3.4% respectively. The highest infection was observed during the rainy season 85% compared with a rate of 35.65% during the winter.

1.3 Important parasites of Sheep:

The three most important sheep roundworms in Australia are *Haemonchus contortus*, *spp* and *Ostertagia*, *circumcincta,* Worms of lesser or occasional *Trichostrongylus* importances include *Nematodirus spp*, *Oesophagostomum spp* and *Chabertia ovina*.

1.3.1 Haemonchus :

Haemonchus spp are among the most pathogenic helminth species of ruminants. *Haemonchus contortus* is mainly a parasite of sheep *Haemonchus* are most dominant in summer rainfall areas .Female worms are 18-30 mm long and are easily recognized by the 'barbers pole' appearance of the white ovaries and uteri twisting for the

length of the worm around a red blood-filled intestine. Males are 10-20 mm long and uniformly reddish-brown.

Both the developing 4th larval stages (L4s) and adults cause punctiform hemorrhages at sites of feeding on the abomasal mucosa which may be edematous. The ingesta may be reddish brown and fluid. Worms may be attached to the mucosa and free in the lumen.Clinical signs include anemia and hypoproteinemia (manifested as submandibular edema). (Love and Hutchinson 2003).

life cycle :

The life cycle is direct and females produce about 10 000 eggs per day. The L1 hatch on the pastures and infective stages can occur in as short a period as 5 days during warm, moist weather. However, development may be retarded for weeks or even months under cool conditions. Adults move freely across the abomasal mucosa and suck blood wherever they happen to be at the time. The developmental period is 18-21 days.

1.3.2 Moniezia spp

Eggs medium size, triangular, dark grey. *Moniezia* and less commonly *Thysaniezia giardi* infect sheep. These tapeworms are generally regarded as relatively harmless. However, anthelmintic combinations containing praziquantel, which is highly effective in removing

tapeworms, are actively promoted.*Moniezia benedini* and *M. expansa* are similar in appearance and may reach a length of 600cm,(Love and Hutchinson , 2003).

life cycle :

Thysaniezia spp occurs in the small intestine of sheep. It uses oribatid mites as intermediate hosts. There is only one set of reproductive organs per proglottid and the genital pore alternates irregularly. This is the only tapeworm occurring in herbivores that has frills on the proglottids; these are the paruterine organs. The worms are distributed all over southern Africa. The tapeworms are considered apathogenic and can be eliminated with the same compounds used for the *Moniezia* species. ,(Love and Hutchinson, 2003).

1.3.3 Trichostrongylus spp

Trichostrongylus spp occurs commonly in ruminants, often in association with *Ostertagia*, and also in other host species, such as horses, but appears to be relatively non-pathogenic..Adult *T.spp* are very small, slender, hair-like and reddish-brown.Females are 5-8 mm and males 4-7 mm long.

In heavy infections, aggregations of worms occur mainly in the fundus, with localised hyperaemia progressing to catarrhal

inflammation with white raised circular plaques . ,(Love and Hutchinson, 2003).

life cycle:

Eggs are passed in the faeces and after 40 days to several months an infective L1 has developed inside the egg. The eggs are ingested by the host and hatch in the abomasum or intestines. L1 burrow into the wall of the intestines to undergo their moults, return to the lumen and move down to the caecum or colon where they will reach maturity. The developmental period is 53-57 days.

Larval stages cause haemorrhages and local oedema when they penetrate the intestinal wall. These injuries are considered to cause secondary bacterial infection. The adult worms are not pathogenic, unless present in large numbers when they may cause abdominal pains, mucoid diarrhoea, anaemia, loss of body mass and rarely, death. ,(Love and Hutchinson, 2003).

1.4 Diagnosis :

1- History from the owner.

2- Clinical signs and gross pathology such as

- anorexia

- weight loss

- poor reproductive performance, and even death of lamb.

3- Laboratory aid

- the main laboratory diagnostic aid is fecal sample by direct smear, floatation and sedimentation.(**Radostits et al., 2010*)***.

Chapter 2

Materials and Methods

2-1 Study area:

Samples were collected from East Nile '' Koko zoo, Al seleat , and Al fieha''.

2-2 Experimental animal:

A total of 40 sheep were examined for the presence of internal parasites affecting gastrointestinal tract.

2-3 Clinical examination:

This included inspection of mucus membrane and skin ,and presence of oedema .Health parameters examined were temperature , pulse rate and respiration (Kelly, 1984).

2-4 Laboratory examination:

Fecal samples were collected from sheep directly from rectum and put in container. Container was labeled. Samples were transported to the Parasitological lab and fecal examination was applied.

3-5 Requirement

- Microscopic slide.
- Cover slip.
- Glass tube.
- Rack.
- Pestle and Mortar.
- Fecal sample.
- Nacl.
- Microscope.
- Centerfugue.

2-6 Laboratory examination of feces:

2-6-1 Direct Methods:

Small amount of faeces was put on glass slide , mixed with drops of saline and cover slip was put on it and observed under microscope .This method was done for detect motile larva and ova.

2-6-2 Flotation method:

Suitable amount of faeces were dissolved in saturated Sodium chloride and filtered by filter, then were put in test tube until filled and covered by cover slip. The tube was left for 20

minute, the cover slide was removed and put on slide and examined for light eggs of parasites at ten objective lens (Kelly,1986).

2-6-3 Sedimentation Method:

A suspension of fecal sample in suitable amount were dissolved in distal water and put in tube, then centrifugation for 5 minutes (Cole,1986).Small quantity from sediment was put on microscope slide and covered with cover slip for examination of trematode (heavy eggs).

Table(1); Source of faecal samples.

Location	Number
Koko farm	10
Al fieha	10
Al sealat	20

Chapter 3

Results

The number of sheep infected with internal parasite were 25 cases{62,5%} concentrated mainly in Eastern of Nile farms. The percentage of infected animal according to sex were {32%} males ,{68%} females. The percentage of the species of parasite according to sex as following :*Tricostrongylus spp* {16%}in male ,{84%}in female ,*Monizia* {12%}in male,{8%} in female ,*Haemonchus SPP* {4%} in male ,{12%}in female. Table{1,2,3,4,5}.

The animals were examined clinically and all parameters were assessed the temperature ranged from {37-40c̊},respiratory rate ranged from {12-21c/m} ,and pulse rate ranged from {40-90w/m}. Others associated clinical signs were reduction in growth rate ,reduction in milk production ,weakness ,some were emaciated ,and others with diarrhea and all cases had rough hair coat.Table (2).

The primary identification of parasitic infestation were done by laboratory examination of fecal sample by the three methods of parasitology which included: direct method , flotation ,and sedimentation method .Table (2).

Generally the eggs varied in number according to severity of infection ,and varied in shape and size according to species of parasite affected the animal. in *Moniezia spp* the eggs were triangular ,in *Trichostrogylus* were round .

Table (2):Summary of the sex,age, clinical parameters and species of parasite isolated from examined sheep:

NO	Sex	Age	Pulse w\m	Respiratory c\m	Temprture C	Type of parasites
1	Male	4 month	47	17	39,8	*Positive for strongylus spp*
2	Female	4 years	67	18	40,5	*Positive for Trichostrogylus spp*
3	Female	3 years	62	23	39,4	*Positive for Trichostrogylus spp*
4	Female	5 years	57	13	40,5	Negative
5	Female	4 month	74	22	39,2	Negative
6	Female	2 years	59	16	37,3	*Positive for Trichostrogylus spp*
7	Female	1 year	72	19	38,1	Positive for Trichostrogylus spp
8	Female	3 years	74	17	39	Negative
9	Female	4 years	69	15	38,3	*Positive for Trichostrogylus spp*
10	Male	7 months	64	25	37,5	*Positive for Trichostrogylus spp*
11	Male	4 years	50	24	39	*Positive for Trichostrogylus spp*
12	Female	3 years	79	12	37,6	Negative
13	Female	4 years	63	18	39	Negative
14	Female	4 years	65	26	38	*Positive for strongylus spp*
15	Female	5 years	72	22	39	Negative
16	Female	3 years	45	23	38,7	Negative
17	Female	5 years	48	19	37,3	*Positive for haemonchuscontortus spp*
18	Female	1,5 years	81	20	38,4	Positive for *Haemonchus spp*
19	Female	4 years	54	21	39	Positive for *Haemonchus spp*
20	Male	4 years	70	17	38,5	Positive for *H aemonchus spp*
21	Female	4 years	68	12	39,1	Positive for *Trichostrogylus spp*

Table (2) – continues

22	Female	3,5 years	64	19	39,5	Positive for Trichostrogylus
23	Female	4 years	70	15	39,5	Positive for *Trichostrogylus*
24	Male	4 months	54	13	39,7	Negative
25	Male	4 months	67	19	38,7	Positive for *monizia spp*
26	Male	2,5 year	74	20	39,2	Negative
27	Female	4 years	70	21	38,7	Negative
28	Female	6 years	76	22	39,6	Negative
29	Female	5 years	77	19	39,6	Negative
30	Male	1,5 years	64	16	39,2	Positive for *monizia spp*
31	Male	2,5 months	66	21	40,5	Negative
32	Female	4 years	79	18	39,5	Negative
33	Female	4 year	72	22	37,5	Positive for *Trichostrogylus spp*
34	Female	3 months	66	24	38,2	Positive for *monizia spp*
35	Female	2 year	76	21	39,5	Negative
36	Female	7 years	68	16	39	Positive for *Trichostrogylus spp*
37	Female	4 years	72	19	39	Positive for *Trichostrogylus spp*
38	Female	4 month	76	23	38	*Positive for Trichostrogylus spp*
39	Male	7 month	70	17	39	Positive for Trichostrogylus spp

Table(3): Number and percentage of parasites isolated from sheep:

Type of parasite	Number isolated	Percentage from infected animals {%}	Percentage from total samples{%}
Trichostrongylus spp	18	72	45
Haemonchus spp	4	16	10
Moniezia spp	3	12	7,5

Table (4):The percentage and number of species of parasite isolated

Species	male	Female	Percentage in male%	Percentage in female%	Total percentage%
Strongylus spp	4	12	16	48	64
Monizia spp	3	1	12	8	20
Haemonchus spp	1	3	4	12	16

Table(5):The percentage of animal infected by parasite according to sex:

Sex	Number of diseased animals according to sex	Percentage according to sex %
Male	8	32%
Female	17	68%
Total	25	100%

Chapter 4

Discussion

Gastrointestinal parasite infections are a world-wide problem for both small- and large-scale farmers. Infection by gastrointestinal parasites in sheep can result in severe losses. Economic losses are caused by gastrointestinal parasites in a variety of ways: they cause losses through lowered fertility, reduced work capacity, involuntary culling, a reduction in food intake and lower weight gains, treatment costs, and mortality in heavily parasitized animals (Hansen and Perry 1994).

The various species of endoparasites recovered during the present investigation have been reported by various researchers in different parts of the world (Nwosu *et al*. 2007 and Raza *et al*., 2007). The prevalence recorded in the present study was lower than that reported earlier (81.17%, 62%) by Pandit *et al*. (2003) and Raza *et al*. (2007), respectively. The results of the present study are similar to the studies reported by Nwosu *et al.* (2007).

The rate of helminths infection in sheep varies in different parts of the world. A variety of factors like grazing habits, level of education

and economic capacity of the farmers, standard of management and anthelmintic used can influence the prevalence of helminths.

Sex wise observations revealed that the prevalence of gastrointestinal parasites was more in males ($P<0.05$) than females. The results of the present study are supported by Kanyari *et al*. (2009), who found females, were more resistant to infection than males after puberty, although there were no differences before puberty. Raza *et al*. (2007) reported the same that ram were more susceptible to gastrointestinal parasites parasite as compared to ewe. Barger (1993) reviewed the effect of host sex on resistance levels. These differences were observed around or after puberty, and no difference was observed prior to puberty. He also reported that these differences may be due to a stimulatory effect of estrogens on immune responses and that androgens may actually have an opposite effect (Bilbo and Nelson, 2001).

In our study the females were more infected than male 72%, 28% respectively.

Regarding to the relation between gastrointestinal infestation and age, the rate of infestation was highest among young animals and decrease with age. This result is in agreement with that recorded by Dikov and Nekipelova (1984).This may be attributed to the

development of immunity against gastrointestinal nematodes, while the rate of fasciola increases with the age. This might be due to the fact that young animals have less chance to take the infestation than adults as most breeders keep them indoors fed on concentrate and fresh water (Abd El-Tawab 1998).

In the present investigation *Moniezia spp* was more in young animals , while other species were more in adult animals. (Radostits et al., 2010*)*.

Conclusion:

1-Different types of parasites were diagnosed in sheep in Eastern Nile.

2-The infectious rate reached 62.5% which is considered high rate .

3-The three main parasites detected were *Monesia spp* 16%, *Heamonchus spp* 12 % , *Trichostrogylus spp* .

Recommendation:

1-Prophylactic control of internal parasites should be done routinely.

2-Hyaginic measures should be implemented in all the farms.

3- More research needs to be done to confirm the present results.

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