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GASTRO-INTESTINAL PARASITES INFECTING OF CATTLE AND SHEEP AROUND SEMOMO DAM (ADI- QUALA, SUB ZONE) IN ERITREA

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ABSTRACT

The study was conducted to determine the prevalence and risk factors associated with cattle and sheep gastro-intestinal parasitic (GIP) infections around Semomo Dam (Adi-Quala sub-zone) during the period February to May, 2013. A total of 300 faecal samples from sheep and cattle were collected directly from the rectum and examined using standard parasitological procedures like floatation, sedimentation and McMaster techniques performed at the Central National Laboratory at (Villago) Asmara. The study revealed that the overall prevalence of gastro intestinal parasitism was 79.67% with a weighted prevalence of 82% and 77.3% in sheep and cattle, respectively. *Fasciola* was the most prevalent parasite in the area (78%) followed bystrongyles (67.34%), *Eimeria* (23.34%), *Moniezia* (11%) and *Strongloide*s (7.34%). There is apparently no significant difference in the prevalence of infection between sheep and cattle though sheep harboured heavier parasitic burdens. The prevalence of infection was suggested to be correlated with the agro- ecology of the area investigated.

KEYWORDS

Gastro-intestinal parasitic (GIP) infections, Faecal samples from sheep and cattle, Floatation, Sedimentation and McMaster techniques.

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INTRODUCTION[1-5]

Sheep and cattle are an integral part of traditional agricultural livestock production in Eritrea. As do other agro industrial investment, cattle and sheep farming yield a significant benefit with local revenues from sales of meat, milk, manure, hair and earning from foreign currency. Meat is one of the major products. Together, cattle and sheep provide a larger portion of the meat consumed and produce a considerable amount of manure which is of great

importance for fertilizing crop lands. Cattle and sheep, although both represent an important sector in the country's economy, they are exposed to various sources of production limiting factors, including parasitic disease, affecting the livelihood of a large sector of the community. Mortality, poor growth, loss of weight, reproductive failure and other conditions caused by disease can render profitable cattle and sheep production activity in to a marginal or unprofitable situation for the producer.

Gastro- intestinal parasites are living organisms that live within the digestive tract of an animal known as the host. Such parasites get some kind of benefit from the host and at the same time inflict some kind of harm to the host. Gastro- intestinal parasites of ruminants are known worldwide to be important in reducing productivity.

In Eritrea, cattle and sheep are subjected to infection with such parasites since these animals are allowed to graze freely and in the same grazing area exposed to contaminated pasture. They are also watered from water bodies that are not well managed by the people living around, thus they contaminate the water point and thus get infected when they graze around water bodies and streams especially during the dry season. Farmers are incapable of using drugs and adopting modern animal husbandry practices and they present their animals to veterinary clinics only after their animals suffer badly. Besides, some gastrointestinal parasites are zoonotic diseases serving as human health hazards.

The objectives of this study are:

1. To identify the most common gastro-intestinal parasites infecting cattle and sheep around Semomo Dam (Adi- Quala, Sub Zone).
2. To assess the parasite burden in infected animals.
3. To provide basic information that could be used in designing control strategies against these parasites.

MATERIALS AND METHODS[6, 7]

Area of Study

The study was carried out in ten villages around Semomo Dam (Adi Quala Sub zone). The region is located 80km south of Asmara. The area is 1779m above sea level and has annual rainfall 700mm and temperature with average 32^0C. The animal manage mental practice is extensive; all animals are local breed of sheep, cattle, goat and few numbers of donkeys. At the time of our research investigation the area was virtually overgrazed and the pastures were only found around the dam and the rivers around it. The animals were overcrowded while grazing, a factor that predisposes them to infection.

Animal Sampling

Samples were collected from 150 cattle and 150 sheep from ten selected villages (Adi Akilo, Kutur, Debrebrhan, Oanagabien, Adi Wederki, Adi Seleo, Adi Chomay, Adi Bahro, Adi Angania and Adi Tseguar) for four months from February to May 2013. All cattle (Arado breeds) and sheep (Fat tailed highland breed) are randomly selected in each village and were sampled only once. All cattle and sheep were a mixture of weaners and adults. Fecal samples were obtained from the rectum and submitted to the Central National Laboratory at Villago in Asmara for the determination of the type of GIPs using floatation and sedimentation methods. Their parasitic burden was determined using McMaster technique.

Methods

Qualitative techniques

The Laboratory techniques we applied were those described by (Hansen, 1996)[6].

Flotation methods

The basis of any flotation method is that when worm eggs are suspended in a liquid with a specific gravity higher than that of the eggs, the latter will float up to the surface. Nematode and cestode eggs float in a liquid with a specific gravity of between 1.10 and 1.20, trematode eggs, which are much heavier, require a specific gravity of 1.30 – 1.35. The flotation solutions used for nematode and cestode ova are mainly based on sodium chloride or sometimes magnesium sulphate. In some

laboratories a sugar solution of density 1.2 is preferred.

Procedure

- Weigh 2gram of feces and mix in 15ml of saturated sodium chloride solution.
- Stir the mixture using glass rod.
- Sieve through a wire mesh and fill in to test tube.
- Centrifuge 1500-1800rpm for 3 minutes.
- Using the tip of glass rod touch the surface of tube content and transfer to clean slide and place a cover slip.
- Examine under 10x objective microscope.

Sedimentation Methods

This technique is used for demonstration of heavy parasitic eggs of treaties like *fasciola* species trematode eggs have specific gravity greater than one (specific gravity of water) during the sedimentation process the eggs of these parasites settle down.

Procedure

- Homogenize 3 g of feces with tap water and pass the suspension through a mesh sieve (250 μm). Thoroughly wash the material that is retained on this screen, using a fine water jet and discard the debris.
- Transfer the filtrate to a conical flask and allow to stand for 2 minutes, remove the supernatant, and transfer the remainder (approximately 12 -15 ml) to a flat – bottomed tube.

Quantitative techniques

McMaster method

It is an egg counting method employed after assuring that there are parasitic eggs in the feces this is expressed in grams of feces this can be used either one or two chambered Mc Master.

Procedure

- Weigh 3g of feces and add 42ml of saturated sodium chloride solution.
- Mix well with a glass rode and filter through a sieve in to a beaker.
- Fill one or both chambers of mc master slide.
- Wait four up to five minutes until the suspension floats.
- Count the number of eggs inside the chamber.
- If one chamber is used multiply the counted egg by 1oo.
- If 2 chambers are used multiply the counted egg number by 50 to find number of eggs per gram of feces.

RESULTS AND DISCUSSION

RESULTS

Examination of 300 sheep and cattle from ten selected villages around Semomo Dam revealed that 79.67% of these animals were infected with gastro- intestinal parasites (Table No.1) with an incidence of infection of 82% and 73.3%in sheep and cattle; respectively.

The highest frequency of infection was with the trematode, *Fasciola* (78%) followed by *strongyle* nematodes (67.3%), the protozoan *Eimeria* (23%), then the genus *Moniezia* (17.4%), and the nematode genus *Strongloide* (11%) (Figure No.1).

There appears to be no significant difference in the frequency of infection with the various parasites between sheep and cattle (Figure No.2).

Using the Tables provided by Thienpont et al(1979) for evaluation of parasitic burdens in sheep and cattle we come to the following results that there are variations in the numbers of animals regarding parasitic load with various parasite species encountered (Table No.2).

DISCUSSION

The result of this study shows that sheep and cattle from the research area are infected with a variety of gastrointestinal parasites. The incidence of 79.67% is evidently very high.

Over all, such high incidence may be related to the fact that both sheep and cattle in the areas under investigation are managed under extensive pastoralism; with high stocking density were large number of animals graze together during the investigation time.

Agro ecology was found to be important in determining levels of infection for species of parasites in the study area. The presence of marshy area, favourable habitat of intermediate host of *fasciola* with a high incidence (78%), plays a major role in the frequency of parasites to be high.

However low parasitic burden of the area could be due to;

- The unsupervised use of anthelmintic drugs might have lead to reduced parasitic burden even though the incidence was high.
- Immunity of the animals.
- Unfavourable environmental condition of that area.

Mixed infection with the various parasites is not uncommon in both sheep and cattle from the ten selected villages investigated (Table No.3 and 4).

Table No.1: Infection with Gastrointestinal Parasites in Sheep and Cattle from Ten Selected Villages around Semomo Dam, Eritrea

S.No	Animal Species	No of Animals examined	Animals infected
1	Cattle	150	123(82%)
2	Sheep	150	116(73.3%)
3	Total	300	239(79.67%)

Table No.2: Evaluation Parasitic Burden in Sheep and Cattle from Ten Selected Villages around Semomo Dam (Figures Refer to the Number of Animals)

S.No	Location	Species Sampled	Evaluation of parasitic burden in sheep and cattle from ten Villages around Semomo Dam.					
			Nematodes (*strongyle*).		Trematode (*fasciola*)		Protozoan(*Eimeria*)	
			Light	moderate	light	moderate	light	Moderate
1	Adi Akilo	Cattle	10	0	10	3	4	0
		sheep	6	4	5	6	3	1
2	Adi Angania	Cattle	8	0	8	2	2	0
		sheep	7	4	9	5	3	2
3	Adi Bahro	Cattle	7	2	10	2	0	1
		sheep	7	5	6	7	3	1
4	Adi Chomay	Cattle	6	2	10	0	4	0
		sheep	4	6	7	4	2	2
5	Adi Sloo	Cattle	8	2	14	0	2	1
		sheep	6	6	7	4	1	3
6	Adi Tseguar	Cattle	7	0	8	1	2	1
		sheep	7	2	12	1	1	4
7	Adi Wederki	Cattle	11	1	13	0	4	1
		sheep	4	7	6	4	2	0
8	Debrebrhan	Cattle	9	2	9	2	3	0
		sheep	3	6	8	4	3	1
9	Kutur	Cattle	12	0	13	1	4	0
		sheep	7	5	7	7	2	4
10	Onagaeben	Cattle	10	0	8	1	2	0
		sheep	4	4	3	9	1	2

Table No.3: Frequency of mixed infections with gastro intestinal parasites of cattle from ten selected villages

S.No	Mixed Infection	A.akelo	A.angane	A.bahro	A.chomay	A.sloo	A.tsegar	A.wederki	Debrebrhan	Kutur	Onagabieno.
1	F+E+ST+S	13.3%	0	0	6.7%	6.7%	0	6.7%	13.3%	6.7%	6.7%
2	S+F+E	13.3%	13.3%	6.7%	20%	13.3%	13.3%	26.7%	6.7%	20%	6.7%
3	S+ST+F	6.7%	0	0	0	6.7%	0	0	13.3%	6.7%	0
4	S+M+F	0	13.3%	0	13.3%	13.3%	6.7%	0	6.7%	6.7%	0
5	S+F	33.3%	26.7%	53.3%	13.3%	33.3%	46.6%	46.6%	33.3%	40%	40%

N.B, *E=Eimeria* F=*Fasciola, M=Moniezia S=strongly, ST=Strongloide.*

Table No.4: Frequency of mixed infections with gastro intestinal parasites of sheep from ten selected villages

S.No	Mixed Infection	A.akilo	A.angania	A.bahro	A.chomay	A.sloo	A.tseguar	A.wederki	Debrebrhan	Kutur	Onagabien0.
1	F+E+ST+S	0	6.7%	6.7%	13.3%	0	6.7%	13.3%	0	6.7%	13.3%
2	S+F+E	26.7%	26.7%	20%	13.3%	20%	26.7%	0	26.7%	26.7	6.7%
3	S+M+F	13.3%	26.7%	0	13.3%	26.7%	20%	13.3%	20%	13.3%	13.3%
4	S+F	26.7%	13.3%	53.3%	26.7%	13.3%	6.7%	40%	20%	33.3%	20%

N.B, *E=Eimeria* F=*Fasciola, M=Moniezia S=strongly, ST=Strongloide.*

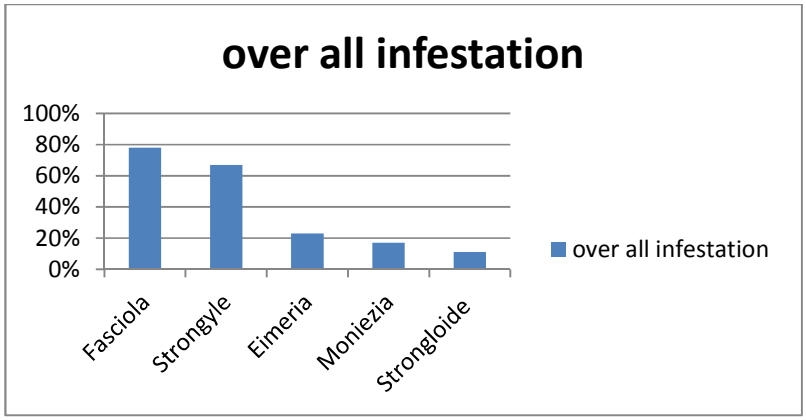

Figure No.1: Cumulative frequency of infection with gastrointestinal parasites in cattle and sheep from ten selected villages around Somomo Dam, Eritrea

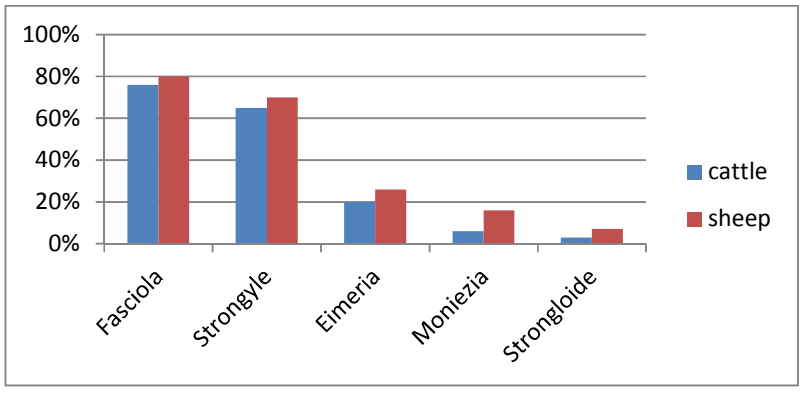

Figure No.2: Frequency of infection with various gastrointestinal parasites in cattle and sheep from ten selected villages around Semomo Dam, Eritrea

CONCLUSION

Prevention is better and cheaper than cure. Farmers do not consider the disease of gastro intestinal parasites as a serious disease as the disease is usually insidious, but the reality is to the animals suffer badly and when they reach at the lower margin of life. Here the greatest role to be played is by the Ministry of Agriculture especially the division of veterinary service should be:

- Opening clinics in all areas especially in the distant rural area.
- Having qualified individuals and assistant veterinarians stationed in the clinics.
- Encouraging farmers to visit clinics and to use anthelminthics especially before and after rainy seasons.
- Introducing effective medicines and frequent conducting efficiency tests.
- Training farmers about the causative agent, mode of transmission, preventive and control measures that should be taken against the disease.
- Providing farmers an anthelminthics as credit that will be paid later by the farmers after the recovery of their animal. This is because farmers are suspicious by nature and they will be more convinced to pay the cost after they proved that their animals recover. The objective of this credit is to familiarize farmers with the usefulness of anthelminthics and initiate them to use anthelmintic to cure their animals and later they can buy themselves without looking forward to credit.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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