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PREVALENCE OF GASTROINTESTINAL HELMINTHES OF SMALL RUMINANTS IN AND AROUND BISHOFTU

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Abstract: a cross-sectional study was conducted from March to May 2019 with the aim of determining the prevalence of gastrointestinal helminthes of sheep and goats in and around Bishoftu. A totally 206 faecal samples were collected from small ruminants (134 sheep and 72 goats). Out of the total examined small ruminant 69.4% were found harbor different genera of helminthes in which 89/134 (66.4%) of the sheep and 54/72(75%) of the goats were infested with GIT parasites. Although the difference was statistically insignificant ($P > 0.05$), the infection rate of gastrointestinal tract (GIT) parasites was higher in goats than sheep. The helminthes parasites identified in small ruminant of the study area were *Strongyles, Strongyloides, Trichuris* and *Monezia*. Overall strongyle type eggs dominated the spectrum of infections; where by 104(50.5%) small ruminants were positive for *strangyles* infection. In this study species, age and sex score are important risk factors associated with gastrointestinal parasites in the study area but found statistically insignificant ($P > 0.05$). The overall prevalence of gastrointestinal helminthes in the study area indicates GIT helminthosis are important health and productivity problems and risk of economic losses due to its high prevalence and occurrence of parasitism.

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1. INTRODUCTION

Small ruminants have a great potential to affect the socioeconomic development of the majority of African rural communities. Increasing small ruminant production can boost farm income by generating cash income that can be used to purchase inputs for other production activities hence improves the quality of life of the people of the sub-Saharan Africa (UNECA, 2012). Ethiopia possesses an estimate of 28.89 million sheep and 29.7 million goats (CSA, 2016) which are well adapted to local climatic and nutritional conditions and contribute greatly to the national economy. Sheep and goat are integral to the livestock production systems in crop-livestock mixed agriculture in the highlands and in the pastoral and agro-pastoral livestock production.

Sheep and goats are the most numerous of man's domesticated livestock and are especially important in more extreme climates of the world. Over two-thirds of the total population of sheep and goats occur in the less developed countries where they often provide major contribution to farming enterprises (Tony, 2007). Despite the large number of sheep and goats population in Ethiopia the economic benefits remain marginal due to prevailing diseases, poor nutrition, poor production systems, reproductive inefficiency, management constraints and general lack of veterinary care. Sheep and goats represent an important component of the farming system; because they require smaller investment, have shorter production cycles, faster growth rate and greater environmental adaptability than cattle (Lebbie, 2004; Anon, 2005). In the subsistence sector farmers and pastoralists depend on sheep and goats for much of their livelihood (Hirpa and Abebe, 2008).

Sheep and goats under intensive and extensive production systems are extremely susceptible to the effects of wide range of helminthes (Abebe and Esayas, 2001). Impacts of helminthes could be reduced through implementation of appropriate control strategies that require knowledge of epidemiology and ecology of parasites under local conditions (Boomker *et al.*, 1994; Biffa *et al.*, 2007). Moreover, it is important to know

which groups are present in a flock or herd in an area or region for effective control measures (Urquhart *et al.*, 1996).

Helminthes are invertebrates characterized by elongated, flat or round bodies. Flatworms (platyhelminths) include flukes (trematodes), tapeworms (cestodes) and roundworms (nematodes). Further subdivision is designated by the residing host organ (e.g. lung flukes and intestinal roundworms). Helminthosis of sheep and goat is among the endoparasite infections that are responsible for economic losses through reduced productivity and increased mortality (Perry et al., 2002). The loss through reduced productivity is related to reduction of food intake, stunted growth, reduced work capacity, cost of treatment and control of helminthosis (Pedreira *et al.*, 2006) and losses from clinical and sub-clinical level including losses due to inferior weight gains, lower milk productions, condemnation of organs and carcasses at slaughter and mortality in massively parasitized due to parasitic diseases were documented (Regassa *et al.*, 2006).

Gastrointestinal (GI) helminth parasites are a major problem in most small ruminant production systems worldwide due to their impact on production and the cost of control measures undertaken by livestock producers. The problem of GIT parasitism is of particular importance throughout the developing world since nutritional resources available to small ruminant livestock are often inadequate and, as a consequence, natural immunity is compromised resulting in low productivity and high mortality (Perry *et al.*, 2002). Worldwide parasitic Helminthes are major cause of losses in productivity and health problem of goat and sheep and are usually associated with huge economic losses especially in resource poor region of world (Cernanska *et al*., 2005).

Parasitic Helminthes also causes immune suppression and as a result enhances susceptibility to other disease (Kumba *et al.*, 2003; Githigia *et al*., 2005). The problem is more severe in tropical countries due to very favorable environmental condition for parasitic transmission, poor nutrition of host animal and poor sanitation in facilities where animals are housed. To implement the control measures, the prevalence of helminthes by different diagnostic methods like fecal examination has to be determined. Prevention and control of the parasites that infect sheep and goats are becoming increasingly difficult to over use and improper availability of anthelminthic, which result in increasing resistance by parasites to common antihelminthics. Therefore, the

2. MATERIALS AND METHODS

2.1. Study Area

The study was conducted at the College of Veterinary Medicine and Agriculture of Addis Ababa University from March to May 2019 in Bishoftu town, Oromia region state of Ethiopia. The geographical location of Bishoftu town is located at 9°N latitude and 40°E longitudes, 47 km south-east of Addis Ababa, at altitude of 1850m.a.s.l. The area experiences a bimodal rainfall pattern with a short rainy season from March to May and a long rainy season from June to September. It has an annual rainfall of 866mm of which 84% is in the long rainy season and the remaining in the short rainy season. The dry season extends from October to February. The mean annual maximum and minimum temperatures of the area are 26°C and 14°C respectively, with mean relatively humidity of 61.3% (NMSA, 2003; ADARDO, 2007; CSA, 2015).

Figure 1: Map of study area (Bishoftu) Source: BOFED

2.2. Study population and Study design

The study was conducted from March to May 2019 in and around Bishoftu from naturally infected small ruminants that were randomly selected for coprological examination. During this study different age, sex and species from randomly selected small ruminants were included. Totally 206 small ruminants (134 sheep and 72 goats) were examined over the study period. The age was categorized in to two age group; young (<1 year) and adult (>1 year) based on owner's response and observations made during sampling (ESGPIP, 2008)

A cross sectional study design was used to determine prevalence of GIT helminthes of small ruminants in and around Bishoftu town based on coprological examination.

2.4. Sampling Method and Sample Size Determination

Simple random sampling technique was used to select study animals. Age, sex and species were considered as risk factors for the occurrence of helminthes infections in small ruminants. The sample size was determined by the formula described by (Thrusfield, 2007) accordingly, it was set at 95% Confidence level and precision of 5% so that the total sample size was determined to be 206.

$n = \frac{1.96^2 x pexp (1-pexp)}{d^2} = \frac{1.962 \times 0.84(1-0.84)}{(0.05)^2}$ = 206 sheep and goats

Where: n= sample size required

P_{exp} = expected prevalence=0.84(84%) as Roza 2018 AAU-CVMA

1.96 = the value of Z at 95% confidence interval

D = desired level of precision at 95% confidence interval

2.5. Sample collection, transportation and preservation

Fresh fecal samples approximately 10g were collected directly from the rectum of sheep and goats using hand gloves and sample placed in sampling bottles and each was clearly labeled with required animal identification species, age and sex. Samples were transported to laboratory as soon as they were collected to ensure or prevent changes in the eggs morphology. Following transportation of fecal sample laboratory analysis was carried out at the same day and the remaining samples were kept under 4^{o}C and examined up on the next days. In the laboratory, fecal samples were examined for detection of helminth parasites using standard procedures of direct fecal smear and flotation procedures eggs were identified based on their color, shape or morphology and contents (Gareth, 2009). The collected fecal samples were processed and examined under the 10x and 40 x magnifications.

2.6. Study procedure /laboratory procedure

2.6.1. Direct Fecal Smear Examination

The presence or absence of worm eggs in fecal samples using direct smear of fresh faces on microscope slide and examination under low power objective microscope is routine procedure. However, this technique is only useful to detect helminth eggs when it occurs in high concentration in faces. Other disadvantages of direct techniques include difficulty to identify them since the eggs are partially covered by debris materials and quantitative results could not be obtained although it is fast and easy technique (Hendrix, 1998).

Procedure:

- ✓ A small amount of faeces (the size of the head of a match or pea) was emulsified with 1 0r 2 drops of water or normal saline or water with glycerin (1:1)
- ✓ The emulsified material was then spreaded thinly over the slide or mix the drop with a circular motion until the specimen was approximately 1 X 1 cm. The smear must be very thin enough to see through.
- ✓ A cover slip was then placed on the smear and examined under low power of objective of the microscope.

2.6.2. Simple Floatation method

Simple flotation is a qualitative method (reveal whether parasites are present or not) for detection of nematode & cestode eggs in the faeces. Flotation is also important for concentrating eggs by means of flotation fluids with appropriate specific gravity and it is the second most common parasitological test after the direct smear. Parasitic materials like eggs, larvae & oocysts are concentrated into a smaller volume from a larger faecal sample. Simple flotation is based on the differences in specific gravity of parasite eggs, cysts, & larvae & that of faecal debris. Most parasite eggs have a specific gravity between 1.1-1.2 g/ml hence float efficiently at a specific gravity of 1.2 – 1.3. Much faecal material has a specific gravity of 1.3 g/ml doesn't float.

Floatation solutions usually have a specific gravity between 1.2-1.25 g/ml. Tap water is only slightly higher than 1 g/ml therefore; to make parasite eggs to float a liquid with a higher specific gravity called floatation solutions must be used. Nematodes, Cestodes & Oocytes float with specific gravity of between 1.10-1.20. Trematode eggs require specific gravity of 1.30-1.35 because of they are heavier. Solutions like saturated zink chloride and Potassium mercuric iodide effective but are expensive & toxic. Floatation solutions with too low specific gravity will not float many stages. Whereas a solution with too high specific gravity will cause plasmolysis osmosis, or rupture of egg and oocysts making diagnosis difficult. High specific gravity flotation solution also causes floatation of excessive debris that decreases the efficiency of the test.

Procedure:

- ➢ Take 3gm of well-mixed faecal specimen.
- ➢ Mix the specimen with one of the floatation fluid (saturated salt solution or sugar solution) of 30-50ml
- ➢ If the specimen is very coarse it is advisable to strain through a sieve to remove the large faecal particles.
- ➢ Fill the test tubes with prepared suspension until a convex meniscus is formed to the top.
- ➢ Place microscope cover slip on the meniscus making sure no air bubbles are present.
- ➢ Allow standing for 10 – 15 minutes.

- Remove the cover slip vertically, invert and place the preparation on a microscopic slide.
- Examine the preparation under the microscope starting from the lower power lens & record any protozoan cysts, eggs, or gross parasites seen within 1 hour as some eggs become distorted or water loaged & start to sink.

  Result characterization of the finding
  - *Moneizia expansa*: Irregular triangular or pyramidal shape and Vary from 55-75µm in diameter.
  - *Moneizia benedeni*: Square or cuboidal (quadrangular) in shape and ~75µm in diameter
  - *Trichuris* eggs: Lemon shaped, yellow or brown in colour and have markedly protruding bipolar plugs
  - *Strongyle* type eggs: Thin shelled and transparent, containing a morula stage within eggshell and oval or spherical in shape
  - *Strongloid* eggs: Eggs containing bidirectional movable s-shaped larvae within the shell.

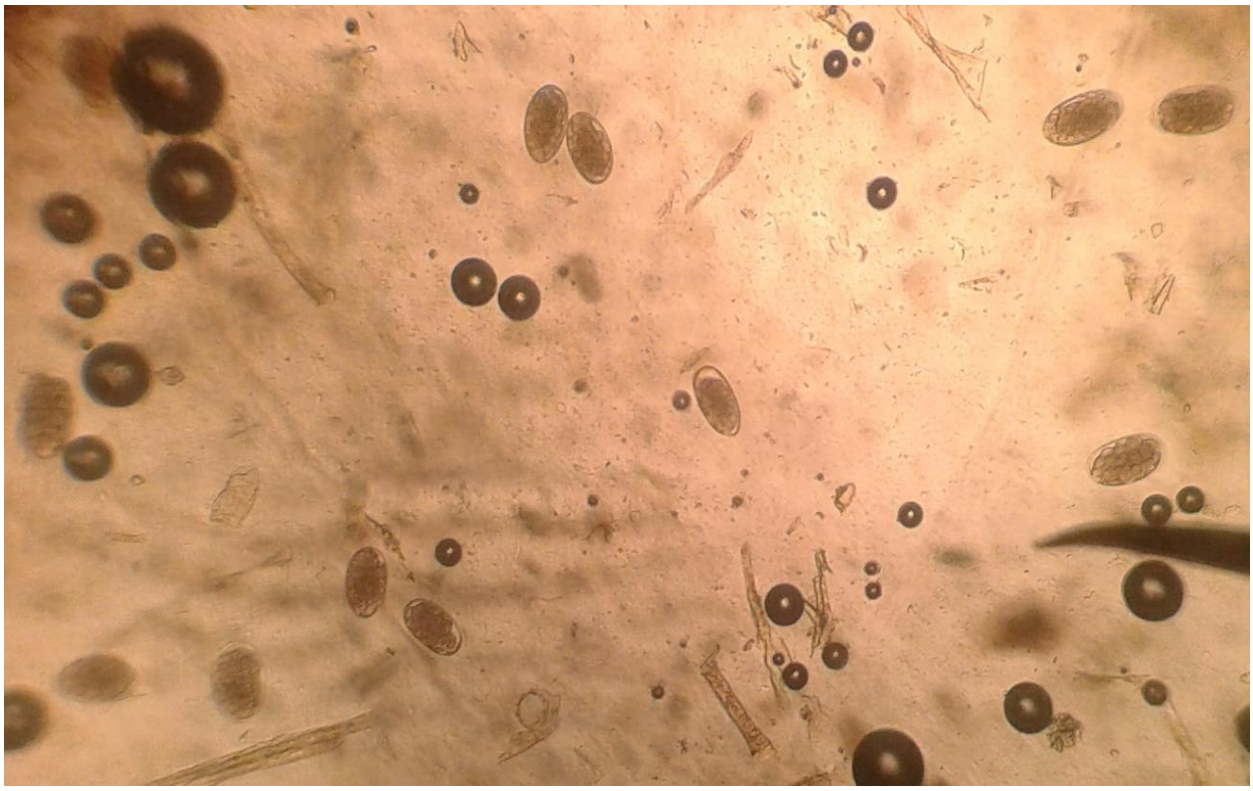

Figure 2: Typically strongyle eggs

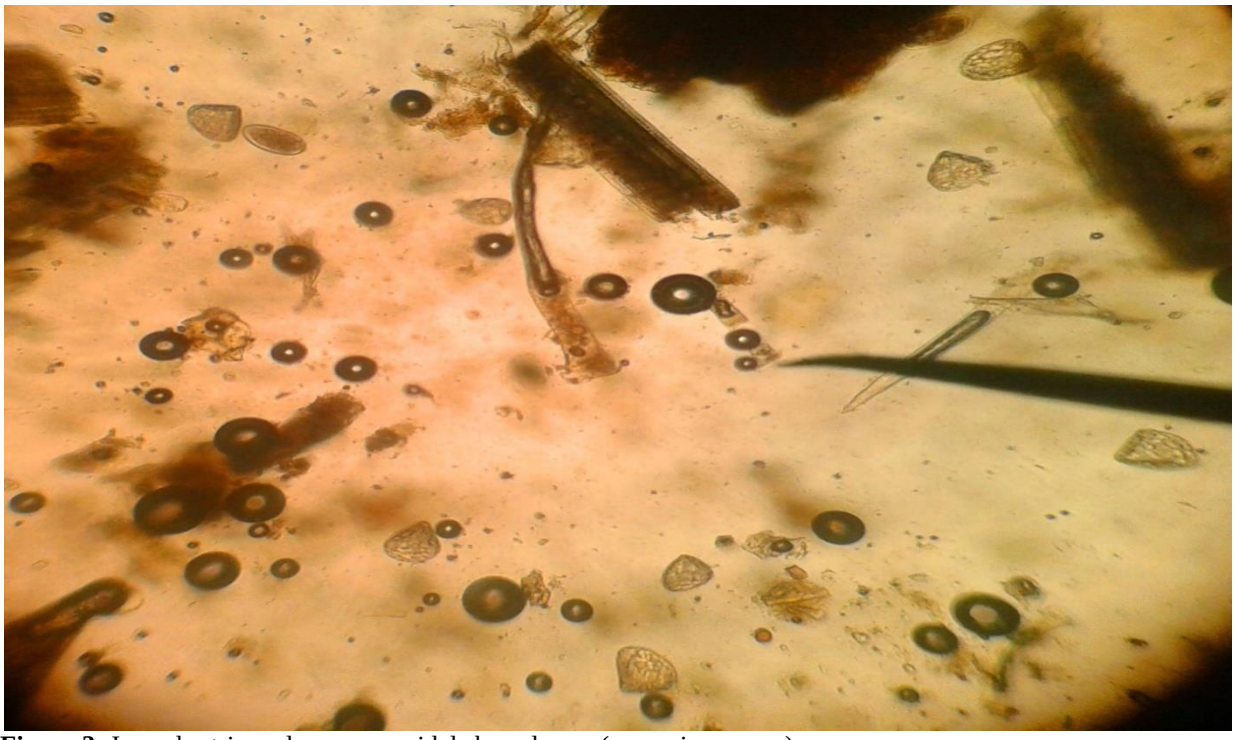

Figure 3: Irregular triangular or pyramidal shaped eggs (moneziaexpansa)

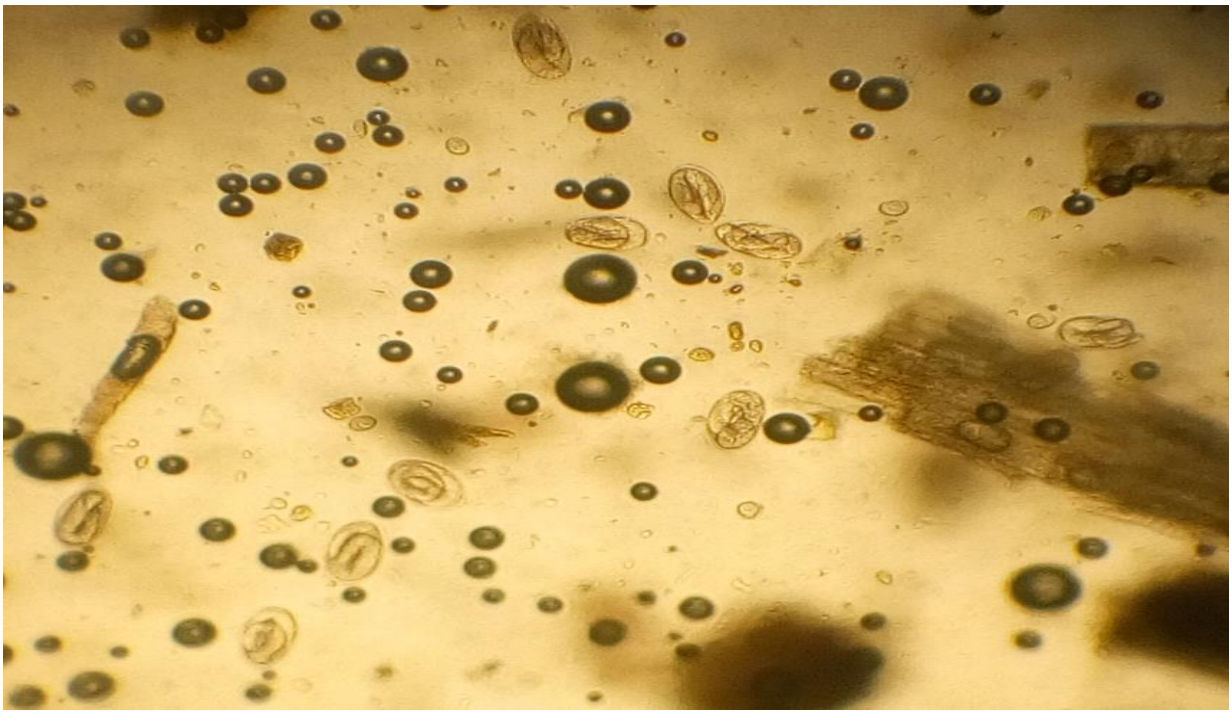

Figure 4: Movable larvae containing eggs (strongoid eggs)

2.6.3 Sedimentation Technique

Sedimentation is also a qualitative method for detecting Trematoda eggs in the faeces. Compared to nematode eggs most Trematoda eggs are larger & heavier hence this technique is used for concentrating them and concentrates both faeces & eggs at the bottom of a liquid medium, usually water but not as good as flotation in providing clear sample. Sedimentation is primarily used to detect eggs or cysts with very high specific gravity to float or for those that easily be severely distorted by flotation solutions. Is not used routinely & has its greatest use in suspected trematode (flukes) infections.

Procedure (Method 1):

- 3gms of faecal sample is mixed/ suspended in 30-50ml of H_2O
- The mixture is poured through a filter using sieve.
- The mixture is poured into the test tube.
- Centrifuge the tube at 1500-2000 RPM for 2 minutes.
- Remove the supernatant very carefully using pipette
- Resuspend the sediment with the same quantity of clean water.
- Remove the supernatant very carefully using pipette.
- Stain the sediment by adding one drop of **Methylene Blue**.
- Transfer the sediment to a microscopic slide & cover with cover slip.
- Examine under the lower magnification of microscope.

The result is that if the eggs stain yellow it is Fasciola eggs whereas Paramphistomoum eggs takes & stains blue colour or remain colorless.

2.6.4 Fecal culture and L3 identification

Faecal culture is used in diagnostic parasitology to differentiate parasites whose eggs can't be distinguished by examination of fresh faecal samples. Ova of the genera *Haemonchus, Ostertagia, Teladorsagia, Trichostrongylus, Oesophagostomum, Chabertia, Cooperia, Bunostomum* and *Gaigeria* are either difficult or impossible to differentiate without measurements and calculations that are impractical in the field. Coproculture provides a suitable environment for egg hatching and helminthes larval development in to infective larvae (L_3) from nematode eggs. So one has to culture faeces of animals and conducts larvae recovery & then undertakes identification of parasite genera or species based on the distinct morphological features of recovered infective L_3 larvae, which has its own feature for each nematode species.

Infective larvae L_3 of the common worm genera are generally more easily identified than the ova based on the distinguishing feature. The presence of larvae was assessed by using a stereomicroscope, when present; two drops of larval suspension were mixed with drop of lugols iodine on glass slide, and examined at low magnification power for identification. From each culture, the third-stage larvae (L3) was morphologically differentiated and identified according to Van Wyk (2004). Conventional characteristics for identification (total length, esophagus length, tail sheath length and the number of intestinal cells) of infective larvae from gastrointestinal nematode genera/species were microscopically examined.

Procedure

- ✓ Take about 10 gram of faeces from the strongyle type egg positive animal.
- ✓ Grind the faeces into pieces (pelleted faeces) using pistle and mortar
- ✓ Make the faeces moist and crumbly (but not wet) by adding small amount of water to moisten if too dry and if the faeces is too wet/diarrheic/ add charcoal or sterile horse or bovine faeces to stabilize its moisture content. The moisture content of the culture faeces should be equal to that of fresh sheep pellets.
- ✓ Culture the material using petridish and place it in the incubator at 27°C for 7 days or leave it at room temperature for 10-20 days to get infective larvae.
- ✓ Add water to cultures regularly every 1-2 day.
- ✓ Stirring the culture each day is very essential to inhibit fungal growth and aerate the lower layers.

Harvest L3 larvea

They were harvested by filling the culture jar with water, allowing it to stand for a few minutes to allow the air to escape from the culture, adding water to the jar until the water meniscus protrudes above the lip of the jar, placing an overturned Petri dish over the mouth of the jar and keeping the Petri dish in position whilst the jar is inverted (Eckert 1960; Borgsteede & Hendriks 1974). Water was then added to the Petri dish and the rim of the jar is lifted slightly from the bottom of the Petri dish. The preparation is left for a few hours for L_3 to migrate into the water and to settle, before the water in the Petri dish is removed with a pipette for larval identification and counting.

Larva preparation for identification

A drop of larval suspension is deposited on a glass microscope slide and the larvae killed with iodine solution that is pre-diluted to a level where it takes a few minutes before the L_3 become darkly stained. The reason

for this is that it is more difficult to observe internal structures of larvae (such as the shape of the oesophagus that is important in some cases) and also to differentiate free-living nematodes from L_3 of *Bunostomum* and *Gaigeria* spp. (which rapidly stain almost uniformly brown over their entire length) from the majority of the others, in which the cranial part of the larva initially stains considerably less intensively than the rest.

Examination and identification of 3rd stage larvae

- Few drops of the suspension of larvae are placed on a microscope slide
- Then add a drop of Gram's iodine solution (1 gm iodine, 2 gm KI, and 300ml distilled water).
- Mix the two drops very well & cover gently with cover slip. Iodine is used to kill larvae.
- Then each larvae is examined in turn & recognized & identified by the characteristics given in the identification keys presented as follows:

Larval identification

Morphological identification of L_3 of most parasitic nematodes is based principally on examination of the caudal and cranial extremities, although other features such as the length or shape of the oesophagus or cranial refractile spots are important in some genera. Note, however, that once exsheathed, L_3 of relatively few genera can be differentiated. Even when a space has formed between the cranial tip and the sheath of an aging larva, the characteristic shape of the head appears distorted and more squared than usual, thus increasing the chances of incorrect identification.

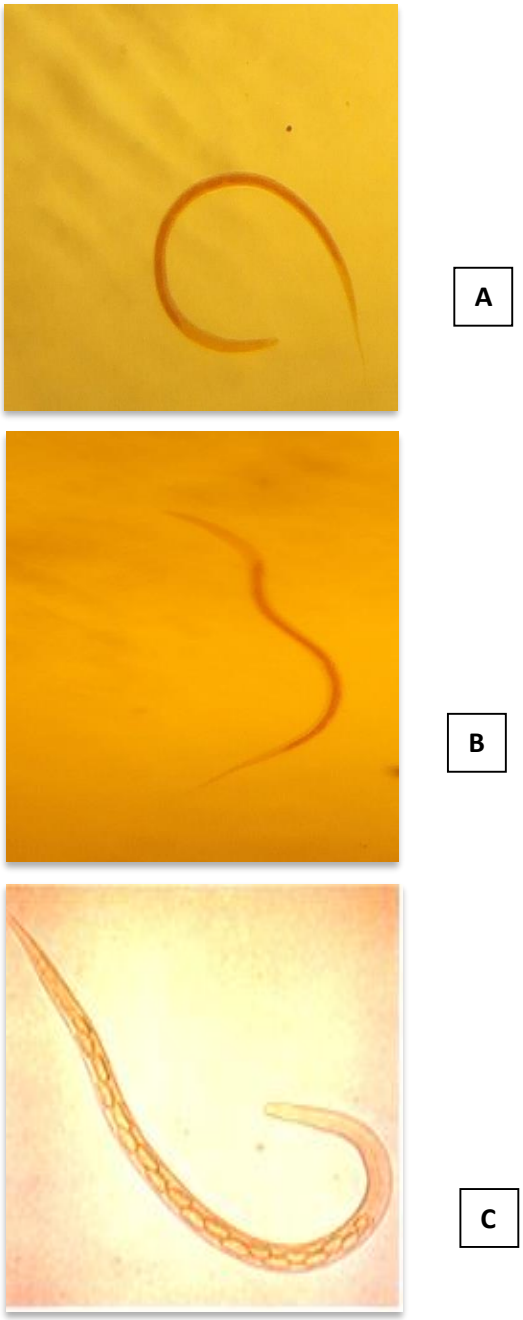

Figure: 5: different larval stages of parasites**. A.** Trichostrongylusspp. Rounded head cranially, pale esophagus and tail part isnot uniformly stained by the iodine, it tapers so sharply and resembles the point of a sharpened wooden pencil, nofilament caudally. **B.** *Haemonchus* spp. the head is bullet shaped, after staining with iodine it has pale esophagus and tail part and short filament caudally. **C.** *Oesophagostomum* spp. Square shaped head in shape, pale esophagus (broadcranial end) caudal end with filament Larva, 32 pentagonal gut cells lumen of gut wavy.

2.7. Statistical analysis

All the data that were collected (age, sex, species and degree of parasitic infection) entered to MS excel sheet and analyzed by using SPSS version 20. Descriptive statistics was used to determine the prevalence of the parasites and Chi-square test ($\chi 2$) was used to look the significant difference between age, sex and species of the host with parasites. In all the analyses, confidence level was held at 95% and $P<0.05$ were set for significance.

3. RESULTS

From the overall 206 small ruminants (72 goat and 134 sheep) examined, 143 (69.4%) were infected with single or multiple gastrointestinal parasites. From the totally examined small ruminant 75% goat and 66.4% sheep were infected with single or multiple parasites. The major helminth parasites identified from the small ruminants of study area were 50.5% *Strongyles*, 6.8% *Strongloides*, 1.9% *Trichuris*, and 10.2% *Monezia* (Table 4).

3.1. Prevalence parasites by species

The overall prevalence of GIT parasites in goat and sheep of the study area was 54/72(75%) and 89/134(66.4%) respectively. Though the infection rate of gastrointestinal tract (GIT) parasites was higher in sheep than goats, the difference was statistically insignificant ($P > 0.05$) (Table 1)

Table 1: Prevalence of small ruminant gastrointestinal helminthes with species of animas

Species	No. examined	Number positive				
		Strongyle*	Strongloid*	Trichuris*	Monezia*	Total
Caprine	72	39(54.2%)	7(9.7%)	0(0%)	8(11.1%)	54(75%)
Ovine	134	65(48.5%)	7(5.2%)	4(3%)	13(9.7%	89(66.4%)
Total	206	104(50.5)	14(6.8)	4(1.9%)	21(10.2%)	143(69.4%)

* Statistically insignificant ($P > 0.05$)

3.2. Prevalence of parasites by Sex

Prevalence of GIT parasites in female and male animal of the study area was 44/65(67.7%) and 99/141(70.2%) respectively. There was not statistically significant variation in the prevalence of parasites was recorded between male and female small ruminants of the study area ($p>0.05$) (Table 2).

Table 2: Prevalence of small ruminant gastrointestinal helminthes by sex

	No. examined	Number positive				
		Strongyle*	Strongloid*	Trichuris*	Monezia*	Total
Female	65	34(52.3%)	3(4.6%)	2(3.1%)	5(7.7%)	44(67.7%)
Male	141	70(49.6%)	11(7.8%)	2(1.4%)	16(11.3%)	99(70.2%)
Total	206	104(50.5)	14(6.8)	4(1.9%)	21(10.2%)	143(69.4%)

* Statistically insignificant ($P > 0.05$)

3.3. Prevalence of Parasites by Age

The prevalence of GIT parasites in young and adult small ruminants of the study area was 43/60(71.7%) and 100/146(68.5%) respectively. Statistically significant difference was never recorded ($p>0.05$) in the overall prevalence of parasite infestation between young and adult small ruminants of the study (table 3).

Table 3: Prevalence of small ruminant gastrointestinal helminth parasites by age

	No. examined	Number positive				
		Strongyle*	Strongloid*	Trichuris*	Monezia*	Total
Young	60	32(53.3%)	7(11.7%)	1(1.7%)	3(5%)	43(71.7%)
Adult	146	72(49.3%)	7(4.8%)	3(2.1%)	18(12.3%)	100(68.5%)
Total	206	104(50.5)	14(6.8)	4(1.9%)	21(10.2%)	143(69.4%)

* Statistically insignificant P > 0.05

3.4. Prevalence of parasites by egg type

Prevalence of GIT parasites by the egg type were recorded in four egg types (strongyle type egg 104(50.5%, strongloid 14(6.8%), trichuris 4(1.9%) and monezia 21(10.2) in the study area. From those eggs the dominant number was nematode eggs especially strongyle type egg 104(50.5) and the prevalence of cestodes were lower (monezia (21(10.2%). Significant difference was never recorded between the prevalence of all egg types p>0.05. (Table 4)

Table4: prevalence of GIT helmenth parasites by egg type

Egg type	No. examined	No. positive	Prevalence
Strongyle *	206	104	50.5%
Strongloid *	206	14	6.8%
Trichuris *	206	4	1.9%
Monezia *	206	21	10.2%
Total	206	143	69.4%

* Statistically insignificant (P >0.05)

4. DISCUSSION

The present study revealed the overall prevalence of GIT helminth parasites of small remnants to be 69.4% in which goats and sheep showed 75% and 66.4%, respectively. This result was comparatively lower than the result of Keleme work *et al.* (2016) who reported 88.67% which sheep and goat showed 91.41 and 86.20%, respectively in and around dire dawa, Bedada et al. (2017) who reported 87.8% which revealed that 92.2% of the goats and 82.2% of the sheep in select pastoral and agro-pastoral areas of Afar Region, Ethiopia. Tefera et al. (2009) reported 91.9% (91.3% sheep and 93.8% goats) and Mulugeta *et al.* (2011) who reported 91.32 and 93.29% in sheep and goat in and around Bedelle (South western Ethiopia). The difference among others could be due to differences in agro-ecology, management of the animals and breed of the animals and could be related with variation like season of study, age and stage of infestation and treatment of animals (Donald and Waller, 1982).

This overall prevalence finding was comparatively higher than the result of Admasu *et al.* (2014) reported 56.25% with 58.71% and 50.83% prevalence in sheep and goats, respectively in Kuarit district North West Ethiopia; Negasi *et al.* (2012) who reported 48.21% (56.25% and 35.33% in sheep and goats, respectively) in and around Mekelle town, and Ayana and Ifa (2015) who reported 49.2% with 47.8% and 53.3% in sheep and goats, respectively in and around Ambo town of Central Oromia, Ethiopia. This difference in prevalence in different ecological region could be explained by the existence of favorable climatic conditions that support prolonged survival of infective larvae stage. Additional factors like sample size, management system (that is, overstocking of the animals, grazing of young and adult animals together with poorly drained land) could also contribute to the different prevalence.

The current sex based prevalence of GIT parasites in female and male animal of the study area was 44/65(67.7%) and 99/141(70.2%), respectively. This result was higher than the result of Ayana and Ifa (2015) who reported 50.0% and 48.3% in male and female animals, respectively, Negasi *et al.* (2012) reported 53.35% and 34.58% in female and male respectively in and around Mekelle town Northern Ethiopia and Husen *et al.* (2018) reported 51.49% males and 56.59% females in and Around Tullo District in Western Harerghe Zone, Eastern Ethiopia. This sex based prevalence Finding is comparatively lower than the results of Bedada et al. (2017) reported female and male animal of the study area 88.13% and 87.16%, respectively, in select pastoral and agro-pastoral areas of Afar Region, Ethiopia. This difference in prevalence in different areas could be explained by the difference in climatic conditions, host susceptibility to infections, habit of grazing and the

ability of adaptation to environmental factors and predisposing conditions.

The prevalence of GIT parasites in young and adult small ruminants of the study area was 43(71.7%) and 100(68.5%), respectively. This result was comparatively lower than result of Bedada et al. (2017) who reported young and adult was 83.78% and 90.2%, respectively, in select pastoral and agro-pastoral areas of Afar Region, Ethiopia and higher than result of Negasi *et al.* (2012) who reported 54.90% was young and 45.83% was adults in and around Mekelle town, Northern Ethiopia.

Prevalence of GIT parasitic eggs were recorded in four egg types: *strongyle* type egg 50.5%, *strongloid* 6.8%, *trichuris* 1.9% and *monezia* 10.2% in the study area. This result was disagreed with result of Bedada et al. (2017) reported 49.2% *Strongyles*, 28.5 *Strongyloides*, 25.4% *Trichuris*, 20.3% *Paramphistomum*, 8.8% *Ascaris*and 8.8% *Monezia*in Select Pastoral and Agro-pastoral Areas of Afar Region, Ethiopia. The current prevalence of *monezia* parasites was higher, *strongyle* egg types were agreed, *strongloid* and *trichuris* were lower and the other types of parasites were absent in these current findings. This difference of prevalence of different egg types could be defined by the difference in epidemiological occurrence of parasites, environmental factors like season, resistance to weather condition and host susceptibility of different breeds in different areas.

5. CONCLUSION AND RECOMMENDATIONS

In the present study, the overall prevalence of gastro intestinal nematodes was 69.4% both in sheep and goats. The overall prevalence of gastrointestinal helminth parasites in the study area indicates GIT helminthosis to be important health and productivity problem and risk of economic losses due to its high prevalence and occurrence of parasitism. The predominant GIT helminth parasite identified were *strongyles*, *strongyloides*, *trichuris* and *monezia* species.

Small ruminants with poor management practice of mixed farming that grazing with many other animal species causing in the uptake of higher numbers of infective larvae was showed high risk of pasitism

Therefore based on the above conclusion the following recommendations are forwarded:

- Awareness creation should be conducted for animal owners for regular deworming of sheep and goats.
- Definitive diagnosis should be conducted and facilities and required materials for the laboratories should be fulfilling to conduct the diagnosis efficiently and effectively.
- Provision of good management practice of animals, adoption of intensive farming and interspecies mixing of animals.
- Epidemiological study should be conducted to promote sustainable, effective, strategic and prevention of parasitic infection in sheep and goats

6. REFERENCES

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