



## RESEARCH PAPER

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## Infestation of helminthes parasite in sheep, *Ovis aries* (L.) in district Peshawar, Pakistan

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### Abstract

Sheep, *Ovis aries* Linnaeus is lifted for fleece, meat (lamb, hogget or mutton), milk, important for wool, pelts use in agriculture, as dairy animals and as model organisms for science. A survey, occurrence of helminthes parasite in sheep in Peshawar district was conducted during September-December 2010. Helminthes Parasites have been shown to harmfully effect on milk production, reduce breeding effectiveness, reduce weight gains, decrease hair quality, reduce feed efficiency and negatively affect the immune system by decreasing the animal's ability to fight off other health problems. In this survey from 356 sheep, *O. aries* the fecal samples were collected from the different areas of Peshawar. During the diagnoses 274 sheep were positive for different internal helminthes parasite and 82 were negative. In the present study 8 species of internal helminthes parasites were identified. During study 1 specie of cestodes with 1.68% of *Moniezia expansa* and 1 specie of trematodes with 0.56% *Fasciola hepatica* were identified. There are 6 species of nematodes were reported. Among nematodes with 53.37% of *Haemonchus contortus*, the high worm load was observed. The other nematodes *Trichostrongylus vitrinus* 12.92%, *Nematodirus spathiger* 1.68%, *Strongyloides papillosus* 3.93%, *Ostertagia sp.* 2.24% and *Trichuris ovis* 0.56% were also identified. Further research is required to prevent parasitic infestation in s *O. aries*.

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## Introduction

Gastrointestinal tract (GIT) parasites are known to be extensive in animals. The direct victims caused by these helminthes parasites are attributed to keen illness and death, early butcher and elimination of some parts at meat scrutiny. Indirect losses include the reduction of productive potential such as decreased growth rate, weight loss in young growing animals and late development of slaughter stock (Hansen and Perry, 1994). Helminthes parasites of cattle contain nematodes, cestodes and trematodes. They cause the animals to be unthrifty which may contain the failure of weight, low birth weights and digestive conflict. In addition to this the animals become prone to other health problems which can lead to death. Infections are prevalent, but the bulk of animals infected with helminthes parasites show a number of little clear clinical sign what so ever, throughout their productive life. Somewhat for this reason, infections with gastrointestinal and other helminthes parasites are not given importance by the farmers (Hasnain and Usmani, 2006). *Ovis aries* are usually more prone to internal helminthes parasites as they mostly depend on grazing. The situation could be more crucial in marshy areas where the internal helminthes parasites could more easily propagate as compared to relatively dry environment. Internal helminthes parasites could cause severe damages to *O. aries* in terms of high mortality, reduced body weight gain, wool yield and birth rate (Ahmad, 1992). In order to keep the animal healthy and avoid economical losses, periodic drenching should be followed against internal helminthes parasites. Gill *et al.* (1990) also reported improvement in performance, lower I incidence of diarrhea and less worm load in *O. aries* drenched periodically against internal helminthes parasites. Chaudhry *et al.*, (1984) reported higher conception rate (80%) in *O. aries* treated for helminthes parasites as compared to untreated controls (37.5%). An increase in body weight gain by 6.5% in ewes and 15% in lambs has also been reported (Rood *et al.*, 1992). Cestodes are one of the internal helminthes parasites that could cause severe losses to *O. aries* in terms of poor performance. Most commonly prevalent species of

cestodes in *O. aries* causing heavy economic losses have been reported to be *M. expansa*, *M. benedeni* and *Avitellina centripunctata* Rudolphi (El- Mukdal, 1977; Al Khafaji and Rhaymah, 1993; Celep *et al.*, 1995). Helminthiasis is most importance in many agro ecological zones and still a serious menace to the livestock economy worldwide. Helminthes are categorized into three classes i.e. nematodes (roundworms), cestodes (tapeworms) and trematodes (flukes). Helminthes infestations may climate (Tambe *et al.*, 2011; Raza *et al.*, 2010) and close contact with infected animals and such situations amplify the economic losses (Tariq *et al.*, 2010). Many scientists have explored various aspects of the helminthes infestation in different localities of Pakistan like Raza *et al.*, 2007 and Khan *et al.*, 2010 reported its prevalence ranges from 25-92%. Objectives of the present study to find out the worm load in the sheep and to know the effect on the sheep health.

## Materials and methods

### Samples collection

The collection of faecal samples was conceded out from different parts of the Peshawar district. The faecal samples were together from 356 sheep, *Ovis aries* Linnaeus among them, ram 146, ewe 148 and lamb 62. The laboratory judgment of faecal samples was performed in VRI, Peshawar. Faecal samples for parasitological examination are collected from the rectum of the animal. Some are collected from the soil where the *O. aries* are kept. Fresh faecal samples are collected from the pasture. Numerous samples are collected. Samples are sanded out as soon as possible to a laboratory.

### Procedure

Each sample is clearly labeled with animal identification, date and place of collection. Samples are packed and dispatched in a cool box to avoid the eggs developing and hatching. Samples are stored in the refrigerator (4 °C) until they are processed. For qualitative study mostly the simple test tube flotation method is used. The simple test tube flotation method is a qualitative test for the detection of nematode and cestode eggs and coccidia oocysts in the faeces.

Approximately 3 g of faeces (weigh or measure with a precalibrated teaspoon) were taken into container 1. 50 ml flotation fluid (zinc sulphate solution) was poured into container 1. Faeces were mixed (stir) and flotation fluid thoroughly with a stirring device (tongue blade, fork). The resulting faecal suspension was poured through a tea strainer or a double-layer of cheesecloth into container 2. The faecal suspension was poured into a test tube from container 2. The test tube placed in a test tube rack or stand. The test tube gently was topped up with the suspension, leaving a convex meniscus at the top of the tube and carefully was placed a coverslip on top of the test tube. The test tube was stand for 20 minutes. The coverslip was carefully lifted off from the tube, together with the drop of fluid adhering to it, and immediately placed the coverslip on a microscope slide. Then the prepared slide was examined under microscope. For identification of eggs and larvae the images were matched present on slide with the images of eggs and larvae present on the chart which is present in laboratory (Hansen and Perry, 1994).

## Results

In present survey the faecal samples were collected from different areas of Peshawar (humid and temperate) during September-December (2010). In this survey from 356 *Ovis aries* the faecal samples were collected. Among these *O. aries* 274 were positive for different internal parasite and 82 were negative. In these *O. aries* 146 ram, 148 ewe and 62 lamb were present (Fig 1). In the present study 8 species of internal parasite were identified which belongs to phylum Platyhelminthes class cestoda and trematoda and phylum Aschelminthes class nematoda. One specie of class cestoda, *Moniezia expansa* and one of class trematoda, *Fasciola hepatica* were studied. Among nematodes 6 species were identified which are *Haemonchus contortus*, *Trichostrongylus vitrinus*, *Strongyloides papillosus*, *Nematodirus spathiger*, *Ostertagia spp.* and *Trichuri spp.* *H. contortus* is a blood-sucking parasite. This parasite is a very economically damaging parasite in *O. aries* and is becoming one of the most important causes of death in these animals. *Haemonchus*

*contortus* is known to cause considerable blood loss with anemia being a key symptom of a heavy infection. The number of *H. contortus* was noticed 53.37% (Table 2). *Trichuris spp.* is another very important and damaging parasite in *O. aries*, especially in young animals. This parasite is most commonly encountered under “barnyard” conditions in pens or on dirt lots. *Trichuris spp.* diarrhea and some time several hundred worms can kill a young lamb. The number of *Trichuris spp.* reported in the present study is 0.56% (Table 2). The parasite of secondary concern is *Ostertagia spp.* better known as the small brown stomach worm. It also burrows itself into the lining of the abomassum. But instead of causing blood and protein loss, it causes digestive disturbances such as diarrhea and weight loss. Both the barber pole worm and brown stomach worm can cause substantial death losses in *O. aries*. *Ostertagia spp.* was founded 2.24% in the present survey (Table 2). *Nematodirus spp.* is a very important parasite of *O. aries* and most commonly is found in young animals but can be found in older animals and adult ewes. This parasite is a common cause of diarrhea and often time’s death in young animals. *Nematodirus spp.* was founded 1.68% (Table 2) in the present study. *Trichostrongylus spp.* is a very pathogenic worm that causes severe damage to the walls of the small intestine and reduces nutrient uptake. In present study 12.92% *Trichostrongylus spp.* were reported (Table 2). *Strongyloides spp.* caused bloody diarrhea, anemia and severe weight loss. In present research the number of *Strongyloides spp.* were 3.93% (Table 2).

The most common tapeworm of *O. aries* is called *M. expansa*. It is found in the intestine and grows to around 01 m long. They absorb nutrition through their cuticle. In high numbers tapeworms can block the intestine. The number of *M. expansa* in the present research is 1.68% (Table 1). *Fasciola hepatica* was also noticed in the survey which was 0.56% (Table 1). *Fasciola hepatica* infects the liver in both cattle and *O. aries* and cause fasciolosis. In present study the two type of breed of *O. aries* were examined which are Balkhi and Watani. Among 274 positive

cases 144 Balkhi and 130 Watani were diagnosed. *Haemonchus contortus* was noticed in 96 Balkhi and 94 Watani breeds. *Trichostrongylus vitrinus* was founded in 28 Balkhi and 18 Watani breeds. In 2 Balkhi and 4 Watani breeds the *Nematodirus spathiger* was identified during survey. *Strongyloides papillosus* was founded in 10 Balkhi and 4 Watani

breeds. In none of Balkhi and 8 Watani the *Ostertagia* was reported during the present study. *Moniezia expansa* was noticed in 6 Balkhi and none of Watani breeds. In 2 Balkhi and none of Watani breeds the *F. hepatica* was found. *Trichuris ovis* were identified in none of Bakhi and 2 Watani *O. aries* breeds (Table 2).

**Table 1.** Occurrence of helminthes parasite in *Ovise aries* during the present research from September-December 2010, in Peshawar district.

S.No.	Parasitic spp.	n <sub>1</sub> <sup>1</sup>	Positive	
			n <sub>2</sub> <sup>1</sup>	% age
1	<i>Haemonchus contortus</i>	356	190	53.37
2	<i>Trichostrongylus vitrinus</i>	356	46	12.92
3	<i>Nematodirus spathiger</i>	356	6	1.68
4	<i>Strongyloides papillosus</i>	356	14	3.93
5	<i>Ostertagia sp.</i>	356	8	2.24
6	<i>Moniezia expansa</i>	356	6	1.68
7	<i>Fasciola hepatica</i>	356	2	0.56
8	<i>Trichuris ovis</i>	356	2	0.56

<sup>1</sup>n<sub>1</sub>: total numbers of samples examined; n<sub>2</sub>: total numbers of positive samples

**Table 2.** Positive samples based on breed factor of *Ovise aries* during the present research from September-December 2010, in Peshawar district.

S.No.	Parasitic spp.	Balkhi	Watani	Total
1	<i>Haemonchus contortus</i>	96 <sup>1</sup>	94 <sup>1</sup>	190
2	<i>Trichostrongylus vitrinus</i>	28	18	46
3	<i>Nematodirus spathiger</i>	2	4	6
4	<i>Strongyloides papillosus</i>	10	4	14
5	<i>Ostertagia sp.</i>	0	8	8
6	<i>Moniezia expansa</i>	6	0	6
7	<i>Fasciola hepatica</i>	2	0	2
8	<i>Trichuris ovis</i>	0	2	2

<sup>1</sup>Positive samples of Balkhi breed; Positive samples of Watani breed.

In the present survey 224 adults and 50 youngs were positive for different internal parasite. *Haemonchus contortus* was founded in 152 adults and 38 youngs. In 38 adults and 8 youngs the *T. vitrinus* was noticed. *Nematodirus spathiger* were identified in 6 adults and none of youngs. In 12 adults and 2 youngs *S. papillosus* was reported during the present research. *Ostertagia spp.* was founded in 6 adults and 2 youngs. *Moniezia expansa* was noticed in 6 adults and none of youngs. In 2 adults and none of youngs *F. hepatica* was founded. *Trichuris ovis* was noticed in 2

adults and none of youngs (Table 3). During the present survey 142 males and 132 females were positive for different types of gastrointestinal helminthes parasites. *Haemonchus contortus* was founded in 100 males and 90 females. In 20 males and 26 females the *T. vitrinus* was noticed. *Nematodirus spathiger* was identified in 4 males and 2 females during the present research. *S. papillosus* was reported in 8 males and 6 females during the present study. In 2 males and 6 females the *Ostertagia spp.* was identified. In 4 males and 2

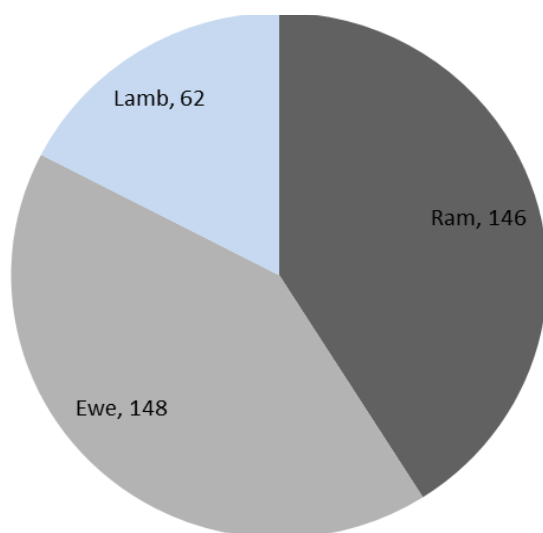
females *M. expansa* was noticed. *Fasciola hepatica* was founded in 2 males and none of females.

*Trichuris ovis* was reported in 2 males and none of females during the present survey (Fig 1).

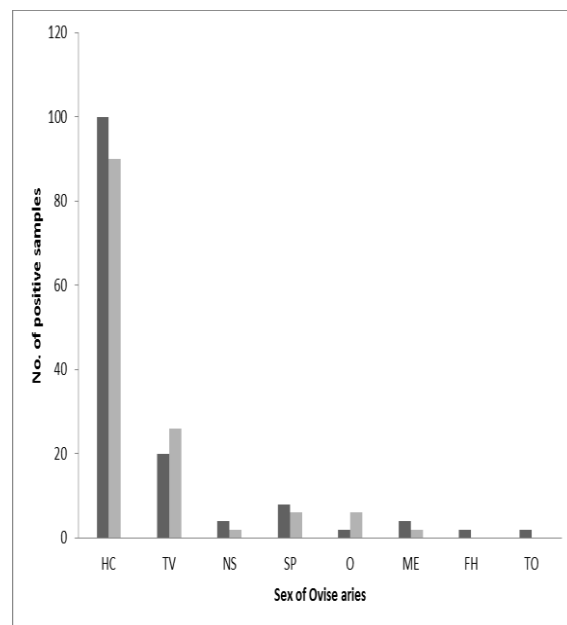
**Table 3.** Positive samples based on age factor of *Ovis aries* during the present research from September-December 2010, in Peshawar district.

S.No.	Parasitic spp.	Adults	Young	Total
1	<i>Haemonchus contortus</i>	152 <sup>1</sup>	38 <sup>1</sup>	190
2	<i>Trichostrongylus vitrinus</i>	38	8	46
3	<i>Nematodirus spathiger</i>	6	0	6
4	<i>Strongyloides papillosus</i>	12	2	14
5	<i>Ostertagia sp.</i>	6	2	8
6	<i>Moniezia expansa</i>	6	0	6
7	<i>Fasciola hepatica</i>	2	0	2
8	<i>Trichuris ovis</i>	2	0	2

<sup>1</sup>Positive samples of adult's *Ovis aries*; Positive samples of young's *Ovis aries*



**Fig. 1.** The numbers of *Ovis aries* from which samples were collected during the present research from September-December 2010, in Peshawar district (n=356)



**Fig. 2.** Positive samples based on sex factor of *Ovis aries* during the present research from September-December 2010, in Peshawar district (n=274); positive samples of male; female; HC: *Haemonchus contortus*; TV: *Trichostrongylus vitrinus*; NS: *Nematodirus spathiger*; SP: *Strongyloides papillosus*; O: *Ostertagia sp.*; ME: *Moniezia expansa*; FH: *Fasciola hepatica*; TO: *Trichuris ovis*.

## Discussion

*Haemonchus contortus*, *T. vitrinus*, *S. papillosus*, *N. spathiger*, *Ostertagia sp.*, *M. expansa*, *F. hepatica* and *T. ovis* were reported during the present study. Hashem (1997), Saleh *et al.*, (2006) and Radostits *et al.*, (2010) and Osman, (2008) were also described

the same result. There were 26 out of 66 (27.5) had single infestation with one nematode parasite (10 had only *Haemonchus spp.*, 7 had only *Ostertagia spp.*, 5 had only *Trichostrongylus spp.* and 4 had only *Strongyloides spp.*). Whereas 12 animals had mixed infestation with two nematodes (3 had *Haemonchus*

spp. and *Ostertagia* spp., 2 had *Haemonchus* spp. and *Strongylus* spp., 3 had *Ostertagia* spp. and *Trichostrongylus* spp. and 4 had *Ostertagia* spp. and *Strongylus* spp.). The others 28 gastrointestinal nematodes positive *O. aries* had mixed infestation with more than 2 nematodes spp. There were 10 out of 240 samples had mixed nematodes and *fasciola* infestations. Whereas mixed nematodes and *coccidia* spp. was recovered in 15 samples. The 5 species of helminthes parasite *Haemonchus* spp., *Ostertagia* spp., *Trichostrongylus* spp., *Strongylus* spp. and *F. hepatica* were also studied during the present research, which shows similarities but there is 1 specie, *coccidia* spp. was not reported in the present study. Some species, *N. spathiger*, *M. expansa* and *T. ovis* of the present study were not found in the study of Hashem (1997), Saleh *et al.*, (2006) and Radostits *et al.*, (2010) and Osman, (2008) this may be the cause of different climate. In the present survey, *H. contortus*, *T. vitrinus*, *S. papillosus*, *N. spathiger*, *Ostertagia* spp., *M. expansa*, *F. hepatica* and *T. ovis* were noticed. Dee *et al.*, (2005) conducted a survey on Virginia *O. aries*, reported *Trichostrongylus* spp., *Haemonchus* spp., *Ostertagia* spp. and *Oesophagostomum* spp. found in Virginia *O. aries*. Both result show that there were 3 species *Trichostrongylus* spp., *Haemonchus* spp. and *Ostertagia* spp. were similar in both studies. One specie *Oesophagostomum* spp. was not found in the present study. There were 3 species, *S. papillosus*, *N. spathiger*, *M. expansa*, *F. hepatica* and *T. ovis* of the present survey were not reported in the survey of Dee *et al.*, (2005) because of two different regions where the studies were conducted. It is concluded that Most of the animals examined during the present survey had low to moderate parasitic infestation.

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