

# Studies on prevalence of gastrointestinal parasitic infection in sheep in Kashmir Valley

Javaid A Baba<sup>1</sup>, Imran Bashir<sup>2</sup>, Mubashir Ali Rather<sup>3</sup>

<sup>1</sup>Department of Sheep Husbandry, District Sheep Husbandry Officer Ganderbal, Kashmir, Jammu and Kashmir, India, <sup>2</sup>Department of Sheep Husbandry, Veterinary Assistant Surgeon, SBF Kralpathri, Kashmir, Jammu and Kashmir, India, <sup>3</sup>Department of Sheep Husbandry, Assistant Research Officer, SBF Kralpathri, Kashmir, Jammu and Kashmir, India

## ABSTRACT

Sheep farming is an important source of livelihood and finance elevator for landless laborers, small and marginal farmers. A study on prevalence of gastrointestinal (GIT) parasitic infestation in sheep (Kashmir Valley) in relation to month, season, and year from March 2013 to October 2016 by fecal examination was undertaken. The overall prevalence of 55.18% was observed in the present study with prevalence (%) of *Haemonchus* (H)/*Nematodirus* (Ne), *Strongyloides* (S), *Moniezia* (M), *Eimeria* (E), *Fasciola* (F), *Trichostrongylus* (T), and *Trichuris* (Tr) as 22.54, 10.84, 9.11, 9.11, 0.14, 2.56, and 0.88, respectively. The year-wise analysis revealed highest prevalence (58.87%) in 2015-16, followed by (58.35%) 2013-14 and (40.88%) 2014-15. Seasonal variation revealed highest prevalence of GIT parasites in autumn (64.03%), followed by spring (53.73%), winter (51.27%) and summer (43.82%). Month wise prevalence of GIT parasites over the years was observed highest in September (73.32%), November (64.26%), May (60.06%) and least in July (37.95%) and August (32.67%). The year, season and month wise differences were highly significant ( $p < 0.01$ ).

**Keywords:** Fecal examination, Farmer, Parasites, Prevalence, Sheep

## INTRODUCTION

It is well known that the sheep rearing provides nutritional security and insurance to the farmer at the time of crisis due to crop failure. Therefore, sheep is a finance elevator for landless laborers, small and marginal farmers. Two major sources of income, meat and wool, make sheep industry a very profitable enterprise. In addition, the droppings of sheep are rich source of nitrogen, phosphorus, etc., which are used to improve soil fertility. However, a major and important limiting factor of sheep productivity is Gastrointestinal Tract (GIT) parasitic infection has a highly detrimental effect on the sheep industry. The infection caused by GIT nematodes in sheep has a worldwide distribution, with higher prevalence in temperate areas where climatic conditions favor the development of free-living stages of parasites (Martinez *et al.*, 2013). The GIT infestations are neglected in spite of cosmopolitan distribution and huge economic losses caused by them. To adopt suitable control measures for parasitic infestation and to enhance sheep production, the epidemiological pattern of parasitic fauna needs to be understood. Therefore, a study was designed to find out the prevalence of GI parasites in sheep in Kashmir Valley to develop efficient control measures.

## MATERIALS AND METHODS

The study was conducted from the month of March 2013 in Kashmir Valley. The latitude and longitude of Kashmir Valley

are 33.778°N and 76.576°E, respectively. The valley is bounded on all sides by mountains and average elevation of the valley is 5,300 feet ASL. The climate of the valley is temperate with four seasons. A total number of 6495 samples were randomly collected directly from the rectum and brought to the Disease Investigation Laboratory, Nowshera, Srinagar, in mini-polythene bags for qualitative examination. The samples were subjected to standard floatation technique as described by Soulsby (1982) to work out the prevalence of different genera of gastrointestinal parasites. The data were classified based on months (1–12 months), seasons (1–4 seasons), and years (2013–2014, 2014–2015, 2015–2016, i.e., 1–3 years). The data obtained were analyzed on % age basis in SPSS and statistical significance of different effect was obtained by non-parametric Chi-square test.

## RESULTS AND DISCUSSION

The present study revealed an overall prevalence of cestodes, nematodes, and coccidian (GI parasites) of 55.18% [Table 1].

**Doi:** 10.30954/2319-5169.2.2020.4

**Submission:** 14-07-2020

**Acceptance:** 01-11-2020

**Received:** 21-07-2020

**Published:** 12-12-2020

\*Corresponding author: Dr Imran Bashir, Veterinary Assistant Surgeon, Sheep Breeding Farm Kralpathri, Department of Sheep Husbandry, Kashmir, India. E-mail: secretdeal420@gmail.com

**Table 1:** Prevalence of gastrointestinal parasitic infection in sheep in Kashmir Valley

Factor	NE	NP	H/Ne	S	M	E	F	T	Tr
Overall	6495	3584.00 (55.18)	1464 (22.54)	704 (10.84)	592 (9.11)	592 (9.11)	9 (0.14)	166 (2.56)	57 (0.88)
Year	<i>P</i> value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2013–2014	3724	2173 (58.35)	751 (20.17)	394 (10.58)	505 (13.56)	261 (7.01)	2 (0.05)	110 (2.95)	52 (1.40)
2014–2015	1847	755 (40.88)	268 (14.51)	270 (14.62)	74 (4.01)	186 (10.07)	6 (0.32)	48 (2.60)	5 (0.27)
2015–16	924	544 (58.87)	445 (48.16)	40 (4.33)	13 (1.41)	145 (15.69)	1 (0.11)	8 (0.87)	0 (0.00)
Season	<i>P</i> value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spring	2079	1117 (53.73)	443 (21.31)	286 (13.76)	210 (10.10)	181 (8.71)	2 (0.10)	20 (0.96)	14 (0.67)
Summer	1538	674 (43.82)	275 (17.88)	104 (6.76)	119 (7.74)	230 (14.95)	0 (0.00)	5 (0.33)	0 (0.00)
Autumn	1618	1036 (64.03)	278 (29.54)	152 (9.39)	142 (8.78)	118 (7.29)	3 (0.19)	48 (2.97)	8 (0.49)
Winter	1260	646 (51.27)	268 (21.27)	162 (12.86)	121 (9.60)	63 (5.00)	4 (0.32)	93 (7.38)	35 (2.78)
Month	<i>P</i> value	0.000	0.000	0.000	0.000	0.000	0.010	0.647	0.520
January	377	201 (53.32)	139 (36.87)	48 (12.73)	0 (0.00)	2 (0.53)	3 (0.80)	29 (7.69)	0 (0.00)
February	333	172 (51.65)	31 (9.31)	77 (23.12)	45 (13.51)	14 (4.20)	1 (0.30)	57 (17.12)	26 (7.81)
March	741	364 (49.12)	179 (24.16)	140 (18.89)	24 (3.24)	7 (0.94)	1 (0.13)	3 (0.40)	3 (0.40)
April	810	387 (47.78)	62 (7.65)	108 (13.33)	174 (21.48)	92 (11.36)	0 (0.00)	17 (2.10)	0 (0.00)
May	626	376 (60.06)	277 (44.25)	51 (8.15)	15 (2.40)	82 (13.10)	1 (0.16)	0 (0.00)	14 (2.24)
June	746	392 (52.55)	152 (20.38)	74 (9.92)	85 (11.39)	152 (20.38)	0 (0.00)	5 (0.67)	0 (0.00)
July	440	167 (37.95)	75 (17.05)	4 (0.91)	32 (7.27)	48 (10.91)	0 (0.00)	0 (0.00)	0 (0.00)
August	352	115 (32.67)	48 (13.64)	26 (7.39)	2 (0.57)	30 (8.52)	0 (0)	0 (0)	0 (0)
September	513	371 (72.32)	244 (47.56)	33 (6.43)	6 (1.17)	39 (7.60)	0 (0.00)	0 (0.00)	7 (1.36)
October	481	264 (54.89)	169 (35.14)	39 (8.11)	29 (6.03)	39 (8.11)	0 (0.00)	8 (1.66)	0 (0.00)
November	624	401 (64.26)	65 (10.42)	80 (12.82)	107 (17.15)	40 (6.41)	3 (0.48)	40 (6.41)	1 (0.16)
December	550	273 (49.64)	98 (17.82)	37 (6.73)	76 (13.82)	47 (8.55)	0 (0.00)	7 (1.27)	9 (1.64)

NE: Number examined, NP: Number positive, H: *Haemonchus* spp., S: *Strongyloides* spp., M: *Moniezia* spp., E: *Eimeria*, F: *Fasciola*, T: *Trichostrongylus* spp., Ne: *Nematodirus* spp., and Tr: *Trichuris*, values in parentheses are percentages

The study is in accordance with several other investigators who have reported similar findings from various parts of India with (69.70%) overall prevalence from Ladakh (Kuchai *et al.*, 2011), 78.44% from Udaipur district of Rajasthan by Neelam *et al.*, 2017, and Shah *et al.*, 2018, also reported 46.70% prevalence from Kashmir Valley. The prevalence of *Haemonchus* (H)/*Nematodirus* (Ne), *Strongyloides* (S), *Moniezia* (M), *Eimeria* (E), *Fasciola* (F), *Trichostrongylus* (T), and *Trichuris* (Tr) was 22.54%, 10.84%, 9.11%, 9.11%, 0.14%, 2.56%, and 0.88%, respectively.

Yearly prevalence was Observed highest in 2015–2016 (58.87%) followed by 2013–2014 (58.35%) and 2014–2015 (40.88%). Seasonal variation revealed highest prevalence of GI parasites in autumn (64.03%), followed by spring (53.73%), winter (51.27%), and summer (43.82%), month-wise prevalence of GIT parasite over the years reported highest in September (72.32%), November (64.26%), May (60.06%), and least in July (37.95%) and August (32.67%). The year, season, and month wise difference were highly significant ( $P < 0.01$ ).

The present study revealed that the infection status by the various GIT parasites was very high. The high prevalence of GIT parasites observed in the present study may be attributed to favorable climatic conditions of Kashmir Valley for parasitic survival and lower immunity of recently developed Kashmir Merino sheep. The sheep found in Kashmir are

Kashmir Merino cross bred developed around 1960 for good quality fine wool, have lower adoptability (Rather *et al.*, 2019) to region hence higher prevalence of GIT parasites was observed. Other factors such as close ground grazing habit of sheep and relatively less cleanliness may also contribute. The highest prevalence in Autumn may be attributed to the lack of adequate forage (or pasture) coupled with intensive management programs resulting in increased herd density, leading to increased flock or herd parasitism. Under unfavorable environmental conditions (extremely cold winter and hot summer) that are harmful to survival and development of the free-living larval stages outside the host, the fourth-stage larvae will go into a state of arrested development (or hypobiosis) in the GIT mucosa and remain in that state for 3–4 months. Changes in the weather (Autumn and Spring) lead to favorable environment which initiates the end of hypobiosis and thus increases the prevalence of parasitism (Pugh and Baird, 2012).

Pasture management is also one of the important factors to determine the GIT parasitic load. Overcrowding of pasture causes high stocking rate leading to overgrazing, which increases both the contamination of the pasture and the rates of exposure to infective larvae. Concurrent malnutrition or lower protein intake also predisposes to greater GIT parasitism (Pugh and Baird, 2012).

## CONCLUSION

The present study revealed that the infection status by the various GIT parasites was very high with high significant ( $P < 0.01$ ) difference between year, season, and months. Therefore, it is concluded that geographical and climatic conditions of this region favor GIT parasitic infestation. The animal husbandry practices, housing, and pasture management also contribute to variation of parasitic infestations. Further studied to estimate the economic impact of GIT parasitic should be undertaken. Farmers rearing Kashmir Merino should follow sheep calendar devised by the Department of Sheep Husbandry (Kashmir) and antihelminthics drenching should be done after fecal examination.

## REFERENCES

Kuchai, J.A., Chishti, M.Z., Zaki, M.M., Ahmad, J., Rasool, M., Dar, S.A. and Tak, H. 2011. Prevalence of nematode parasites in sheep of Ladakh, India. *J. Agric. Extens. Rural Dev.*, 3, 229-231.

Martinez-Valladares, M., Martínez-Perez, J.M., Robles-Perez, D., Cordero-Perez, C., Famularob, M.R., Fernandez-Pato, N., Castañón-Ordóñez, L. and Rojo-Vázquez, F.A. 2013. The

present status of anthelmintic resistance in gastrointestinal nematode infections of sheep in the northwest of Spain by *in vivo* and *in vitro* techniques. *Vet. Parasitol.*, 191, 177-181.

Neelam, K.F., Sanweer, K., Bincy, J., Subha, G. and Vikas, K. 2017. Studies on prevalence of helminth infection in small ruminants in Udaipur district (Rajasthan). *J. Entomol. Zool. Stud.*, 5, 1679-1683.

Pugh, D.G. and Baird, A.N. Sheep and Goat Medicine. 2<sup>nd</sup> ed. Library of Congress Cataloging-in-Publication Data. pp. 106-107.

Rather, M.A., Shanaz, S., Ganai, N.A., Bukhari, S., Hamadani, A., Nabi, N.N., Yousuf S., Baba, A., Raja, T.A. and Khan, H.M. 2019. Genetic evaluation of wool traits of Kashmir Merino sheep in organized farms. *Small Rumin. Res.*, 177, 14-17.

Shah, M.M., Maqbool, I., Manzoor, A., Shabnum, N., Rather, T. and Ahanger, S.A. 2018. Seasonal prevalence of gastrointestinal parasites in sheep of Kashmir valley. *J. Entomol. Zool. Stud.*, 6, 534-536.

Soulsby, E.J.L. 1982. Helminths, Arthropods and Protozoa of Domesticated Animals. 7<sup>th</sup> ed. ELBS and Baillere Tindal, London.

**How to cite this article:** Baba JA, Bashir I, Rather MA. 2020. Studies on Prevalence of Gastrointestinal Parasitic Infection in Sheep in Kashmir Valley. *Int. J. Bioinform. Biol. Sci.* 8(2), 15-17.