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GASTROINTESTINAL NEMATODE PARASITES OF SMALL RUMINANTS

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ABSTRACT

The main gastrointestinal nematodes that parasitize sheep and goat are *Haemonchus contortus*, *Trichostrongylus* spp., *Oesophagostomum* spp and *Trichuris* spp. The gastrointestinal nematodes that cause pathogenicity in small ruminants vary from one geographical area to another. The most prevalent species in the temperate climate regions are *Cooperia oncophora* and *Ostertagia ostertagi*. The rapid increase in anthelmintic resistance in case of *Haemonchus contortus* combined with changing global climate conditions have posed a serious threat to the domestication of small ruminants.



INTRODUCTION

Gastrointestinal parasites are major cause of mortality and morbidity of domestic animals. They cause both clinical and subclinical parasitism, thereby causing significant economic losses. The financial losses can be in the terms of growth, productivity and increased susceptibility to other pathogenic infections. Domestic ruminants have major contribution in economy of a nation. In most parts of the world the farmers and agriculturists are still dependent economically on dairy farming.

Gastrointestinal parasitism may cause lowered food intake, weight loss, reduced milk production, decreased wool production, increased treatment cost and mortality in the affected domestic animals. All the domestic ruminants viz., sheep (*Ovis aries*), goats (*Capra hircus*), buffaloes (*Bubalus bulalis*) and cattles (*Bos taurus*) suffer from the diseases caused by gastrointestinal parasites. Epidemiological studies conducted by several workers in different geographical areas of world have shown the prevalence of gastrointestinal parasites in domestic ruminants. Gupta et al, 1987, Gadahi et al, 2009, Dikshit et al, 2012, Singh et al, 2015, Zainaladin et al, 2015, Lathamani et al, 2016, Zvinorova et al, 2016, Islam et al, 2017, Sivajothi and Reddy, 2018 and Win et al, 2020 conducted epidemiological studies to access the rate of prevalence of gastrointestinal parasitism.

Small ruminants

Small ruminants are grazing mammals such as goat and sheep. The animals are among the first animals domesticated by man and are raised for milk, meat, wool and skin. There is significant growth in population of small ruminants in India during the last three

decades (Dikshit et al, 2012). As per 19th livestock census, conducted in 2012, the population of small ruminants in India was 200.24 million. As per census data of 2019, India's small ruminants' population increased to 223.2 million, comprising 74.3 million sheep and 148.9 million goats. According to the data published by Ministry of Fisheries, Animal Husbandry and Dairying in 2022, the goats and sheep population in the country showed an increase of 10.1% and 14.1% respectively over the previous census.

Parasites of the abomasum

The parasites inhabiting the abomasum part of stomach of ruminants include *Haemonchus contortus* (Barber's pole worm or large stomach worm), *Trichostrongylus axei* (small stomach worm), *Teladorsagia circumcinata*, *Ostertagia trifurcata* (medium or brown stomach worm) and *Mecistocirrus digitatus*.

The nematode worms of the abomasum cause ulceration of gastric mucosa leading to gastritis. These parasites erode the lining of abomasum with the help of sharp structure present at their anterior end. Buccal lancet of *Haemonchus contortus* is an example of these structures (Singh, 2000 and 2013 and Singh & Johal, 2001).

Haemonchus contortus is prevalent in tropical and subtropical parts of the world causing great losses to the economy. *Trichostrongylus axei* is more common in temperate zones of the globe. *Teladorsagia circumcinata* and *Ostertagia trifurcata* are common in these colder parts of the world which have wet winters. *Mecistocirrus digitatus* is restricted to the tropical climates.

Parasites of small intestine

Trichostrongylus colubriformis, *T. vitrinus* and *T. rugatus* are parasites of small intestine

causing weight loss, anorexia and persistent diarrhea. *Strongyloides papillosus*, *Bunostomum trigonocephalum* and *Gaigeria pachyscelis* are also found in different parts of small intestine of sheep and goat. *Nematodirus battus* found in small intestine causes marked dehydration and profuse diarrhoea. *Gaigeria pachyscelis* is a voracious bloodsucker, thereby causing heavy losses. *Anchotheca (capillaria) longipes*, *Moniezia expansa*, *Moniezia benedeni*, *Moniezia caprae* and *Thysanosoma actinioides*, also inhabit the small intestine of small ruminants.

Parasites of large intestine

Oesophagostomum columbianum, *Chabertia ovina* and *Trichuris ovis* are the nematode worms inhabiting the large intestine. *Oesophagostomum columbianum* (nodular worm) cause diarrhoea and the faeces of the infected host contain excess mucus and streaks of blood. *Chabertia ovina* also cause severe pathogenicity viz. Congestion, ulceration and small hemorrhages. It severely damages the mucosa of the colon. Heavy infections of *Trichuris* spp may cause hypoproteinemia.

Table 1: List of Gastrointestinal parasites of small ruminants

S.No	Name of Parasite	Infected Body part of the host
1	<i>Haemonchus contortus</i>	Abomasum of stomach
2	<i>Trichostrongylus axei</i>	Abomasum of stomach
3	<i>Teladorsagia circumcincte</i>	Abomasum of stomach
4	<i>Ostertagia trifurcate</i>	Abomasum of stomach
5	<i>Mecistocirrus digitatus</i>	Abomasum of stomach
6	<i>Trichostrongylus colubriformis</i>	Abomasum of stomach
7	<i>Trichostrongylus vitrinus</i>	Small Intestine
8	<i>Trichostrongylus rugatus</i>	Small Intestine
9	<i>Strongyloides papillosus</i>	Small Intestine
10	<i>Bunostomum trigonocephalum</i>	Small Intestine
11	<i>Gaigeria pachyscelis</i>	Small Intestine
12	<i>Nematodirus battus</i>	Small Intestine
13	<i>Moniezia expanse</i>	Small Intestine
14	<i>Moniezia benedeni</i>	Small Intestine
15	<i>Monezia caprae</i>	Small Intestine
16	<i>Thysanosoma actinioides</i>	Small Intestine
17	<i>Aonchotheca longipes</i>	Small Intestine
18	<i>Oesophagasmum columbianum</i>	Large Intestine
19	<i>Chabertia ovina</i>	Large Intestine
20	<i>Trichuris ovis</i>	Large Intestine

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