Prevalence of gastrointestinal nematodes in goats of jammu region

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INTRODUCTION

Goat rearing is a tribal profession of nomads (Bakerwals, Gaddies) and many other farming communities in Jammu and Kashmir. Goats contribute to the subsistence of small holders and landless rural poor. They also produce meat, milk, and fiber, skins and manure and transport power, especially in high altitudes as in Himalayas. A Gaddi breed of goat in Jammu hills can carry up to 10kg load on much steep slopes than could be negotiated by mule, the most versatile drought animal. Goats due to improper management and unhygienic conditions are suffering from various parasitic diseases. Parasitic infection ranges from acute disease frequently with high rates of mortality and premature culling to subclinical infections, where goat may appear relatively healthy but perform below their potential. IN broader sense, the factors dictating the level and extent of parasitism are climate, management conditions of pasture and animals, and the population dynamics of the parasites within the host and in the external environment. Gastrointestinal parasitism is one of the major health problems severely limiting the productivity of dairy animals, in the Himalayan and other hilly regions of India (Jithendran and Bhat, 1999). The diverse agro climatic, animal husbandry practices and pasture management largely determine the incidence and severity of various parasitic infections in grazing animals (Arambulo and Moran, 1981; Joshi, 1998; Jithendran and Bhat, 1999). Information on the prevalence and epidemiological pattern of the helminthic diseases in different climatic zones of the country provide a basis for evolving strategic and tactical control of these diseases (Jithendran and Bhat, 1999). A number of reports are available on gastrointestinal nematodes in domestic ruminants from tropical India (Thaper, 1956; Bali and Singh, 1977; Patnaik et. al., 1973; Misra et al., 1974). In Jammu and Kashmir, the occurrence of gastrointestinal roundworms has been studied by Bali (1976) and Dhar et. al. (1982) in Plains. The present study deals with the prevalence of gastrointestinal nematodes in goats of Jammu region (Jammu and Kashmir), Which lies in the North Western Himalayan region of India.

MATERIALS AND METHODS

The investigation was carried out between June 2007 and July 2008 on randomly selected goat of various age groups and both sexes from different areas of Jammu. Both local as well as exotic breeds of goat were selected for the present study.

Study area

The study area consists of different regions of outer plains of Jammu viz. Bisnah, R S Pora, Akhnoor, Negrota and Sidrah. The Jammu district is located between 74°24’ and 75°18’ east (longitude) and between 32°50’ and 33°30’ north (latitude). The district has an area of 3,097 square kilometers. More than half of the district consists of mostly treeless, semiarid hills. The temperature of the region varies from cold in winter with a minimum temperature touching even 5°C to heat wave in summers when the temperature touching even 45°C. The Jammu division of Jammu and Kashmir receives the maximum amount of annual rainfall, 1052mm. The management practices for goat rearing are old and traditional.

Laboratory procedure

A total of 680 faecal samples were collected from 5 different areas of Jammu from June 2007 to July 2008. Samples were collected fresh from the site of defecation or directly from the rectum of the host of various ages of both sexes. The samples were collected in polythene bags(4”x6”) or in properly labeled containers filled with 4% formalin and subjected to qualitative(Wills technique and centrifugal floatation method)
and quantitative (Stoll's dilution method) examination in the laboratory.

RESULTS AND DISCUSSION

Of the total 680 faecal samples examined during the present study, 493 (72.5%) were found to be positive for one or more genera of nematodes. The survey recorded the presence of total of nine nematodes, which arranged in descending order of prevalence were *Haemonchus* (84.98%), *Ostertagia* (70.58%), *Chabertia* (59.83%), *Bunostomum* (58.82%), *Trichostrongylus* (51.92%), *Nematodirus* (46.24%), *Oesophagostomum* (45.43%), *Trichuris* (37.72%) and *Marshallagia* (34.68%). (Figure 1). The *Haemonchus* and *Ostertagia* genera were the most predominant among all genera. The season fluctuation of prevalence (percent positive samples) for the given period showed that the minimum value for prevalence was recorded in Nov.-Feb./winter season. (Figure 2). Around this period from mid November to February, the goats are usually kept inside, because the green pastures are least available. The maximum valve for prevalence was recorded in July to October/ rainy season and March to June/Summer season. These are the seasons when there is plenty of rainfall and temperature is very high, and the grazing in the pastures is much pronounced. Thus, the prevalence of gastrointestinal nematodes in goat showed a marked seasonal pattern in the present study.

![Figure 1 Prevalence of gastrointestinal nematodes in goats](image1)

Age wise distribution of gastrointestinal nematodes in goat was also recorded in present study. 0 to 1 year of age group was found more infected (98.2%). The nematode infection was found less in older groups. This is because Kids have little innate ability to resist infection and worm numbers slowly build up in their gut. Mature animals remain substantially resistant to serious infection, although maintenance of immunity requires regular exposure to parasites. Table 1.

The present study indicates that the infection with gastrointestinal nematodes is a frequent phenomenon among the goat of Jammu region as reported earlier by several workers (Khajuria et. al., 2003). The infection rate with gastrointestinal nematodes was 72.5% which is much higher than that reported (44.62%) by Yadav et. al., (2006) and (64.09%) by Khajuria et. al., (2003) in the Jammu region. *Haemonchus* and *Ostertagia* in the present study were most predominant among all the genera recovered. Our study has recorded nine nematode genera. The peak level of infection as recorded from April onwards is derived from over wintered larvae (*Haemonchus*, *Ostertagia*, and *Trichostrongylus*) originating from the eggs deposited in the previous autumn. These larvae undergo hypobiosis (arrested development within the host body). They resume development on the onset of favorable environment conditions like temperature and moisture (Soulsby, 1982, Michael, 1976). This contributes to what is known as the spring rise phenomenon. Higher rainfall in spring also helps in providing suitable molarity of salt present in the soil, which is an important factor for ecdysis (Soulsby, 1982). It also helps in larval dispersion on herbage, which increases the chance of contact between host and larvae (Nginyi et. al., 2001).

![Figure 2 Seasonal prevalence of gastrointestinal nematodes in goats](image2)

The low EPG of winter season could be attributed to low temperature, which helps in arrested development in host and environment (Ogunsuri and Eysker, 1979). The seasonal dynamics of nematode infection are the consequence of complex interrelationships between the goat, their husbandry and the prevailing climate. Larval numbers on pastures tend to build up through spring and summer, reaching a peak in the autumn. Remnants of this autumn peak survive over winter, and are a major source of infection of new animals the following spring.

The 2nd peak level of infection from June onwards till autumn is derived from eggs deposited in the first grazing cycle. Ingestion of sufficient numbers of larvae results in type I disease in Kids during their first summer at pasture. The present observation may initially be of great help to understand the epidemiology of gastrointestinal nematodes in goat of Jammu and will be of potential significance in planning pasture and grazing management and other prophylactic strategies for goat from the area studied.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No. Examined</th>
<th>No. Positive</th>
<th>% Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>112</td>
<td>110</td>
<td>98.2</td>
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<tr>
<td>1-2</td>
<td>108</td>
<td>102</td>
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<tr>
<td>2-3</td>
<td>84</td>
<td>74</td>
<td>86.0</td>
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<tr>
<td>3-4</td>
<td>80</td>
<td>63</td>
<td>78.7</td>
</tr>
<tr>
<td>4-5</td>
<td>73</td>
<td>48</td>
<td>65.7</td>
</tr>
<tr>
<td>5-6</td>
<td>80</td>
<td>43</td>
<td>53.7</td>
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<tr>
<td>6-7</td>
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<tr>
<td>7-8</td>
<td>67</td>
<td>24</td>
<td>35.8</td>
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<tr>
<td>Total</td>
<td>680</td>
<td>493</td>
<td>72.5</td>
</tr>
</tbody>
</table>

Table 1 Age wise distribution of GI Nematodes in goats
Acknowledgements

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References


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