

**Research Article**

## **THE EPIDEMIOLOGY OF CAPRINE FASCIOLIASIS IN JAMMU (J&K) – INDIA**

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### **ABSTRACT**

*Caprine fascioliasis* is a major constraint to small ruminant production in Jammu and Kashmir. The present study was conducted in subtropical Jammu area of Jammu and Kashmir State to determine the prevalence of fascioliasis in goats of different age groups, sex and in seasons. In this study, livers of male and female goats were collected randomly from slaughter houses during the period of one year (2007-08). A total of 284 livers were examined of which 15 were found to having *Fasciola hepatica* (5.28% prevalence). Seasonal prevalence of infections indicated that the infection was 1.56% in spring, 3.38% in summer 3.84% in autumn and 10.84% in winter. Prevalence with respect to sex and age of the host were also recorded during the present study.

**Key Words:** *Caprine fascioliasis, Helminthiasis, Goat*

### **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. Goats due to improper management and unhygienic conditions are suffering from various parasitic diseases. Helminthiasis, especially parasitic gastroenteritis (PGE) constitutes a serious health problem and limitation to the productivity of small ruminants throughout the world due to the associated morbidity, mortality and cost of treatment and control measures (Silvestre *et al.*, 2000). 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 and 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 fascioliasis in domestic ruminants from tropical India (Gupta *et al.*, 1986; Khajuria *et al.*, 2003 Yadav *et al.*, 2007 and Hossain *et al.*, 2010). In Jammu and Kashmir, the occurrence of fascioliasis has been studied by Fatima *et al.*, (2008), Yadav *et al.*, (2006) and Kuchay *et al.*, (2011) in Plains. The present study deals with the epidemiology of fascioliasis 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 November 2007 and October 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**

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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<sup>0</sup>24' and 75<sup>0</sup>18' east (longitude) and between 32<sup>0</sup>50' and 33<sup>0</sup>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<sup>0</sup>C to heat wave in summers when the temperature touching even 45<sup>0</sup>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 284 livers were collected from 5 different areas of Jammu area of Jammu and Kashmir for the year 2007-2008. Samples were collected fresh from slaughter houses from the host of various ages of both sexes.



**Figure1:** *Fasciola hepatica* collected from infected liver

**Figure 2:** Infected liver of sheep, showing infection of *Fasciola hepatica*

Samples (livers) were incised, first along the bile duct /vein; this will permit the parasite (e.g. *Fasciola gigantica*) to escape out into the tray (Fig. 1 and 2).

**RESULTS AND DISCUSSION**

The overall prevalence, season wise distribution, sex wise distribution and age wise distribution is tabulated (Tables 1-4).

**Table 1: Incidence of Fascioliasis in goats of Jammu**

S.No	Animal	No. of animals examined	No. of animals positive	Prevalence
1	Goat	284	15	5.28%

**Table 2: Seasonal prevalence of Fascioliasis in goats of Jammu**

Summer	Autumn	Winter	Spring
3.38%	3.84%	10.84%	1.56%

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**Table 3: The prevalence of Fascioliasis in relation to Goat sex factor**

Sex	No. Examined	No. Positive	Percentage (%)
Males	197	11	5.58%
Females	87	4	4.59%
Overall	284	15	5.28%

**Table 4: The prevalence of Fascioliasis in relation to Goat age factor**

Age group	No. Examined	No. Positive	Percentage (%)
Young ones	139	9	6.47%
Adult	145	6	4.13%
Overall	284	15	5.28%

The present investigation revealed that goats of Jammu are infected with *Fasciola hepatica*. The overall prevalence during the present study was recorded 5.28%. Ours findings are in agreement with others who have reported fascioliasis in different ruminants from same and different study areas. Yadav *et al.*, (2004) reported a maximum prevalence of *Fasciola* spp. (5.15%) from bovines of R. S. Pura, Jammu. Khajuria and Kapoor (2003) from Kathua region of Jammu reported 8.11% and 5.83% as a prevalence of *Fasciola* spp. from sheep and goat respectively. Yadav *et al.*, (2006) from Jammu reported prevalence of *Fasciola* spp. as 3.08%. Pandit *et al.*, (1989) studied the epidemiology of ovine fascioliasis in sheep of Jammu and Kashmir State and observed that 30% of sheep examined were positive for *Fasciola hepatica*. Tasawar *et al.* (2007) worked out the prevalence of *Fasciola hepatica* in goats around Multan. The overall prevalence of *Fasciola hepatica* was 28.75%. Sheikh *et al.*, (2007) reported prevalence of bovine fascioliasis in Kashmir valley as 29.38±7.51%. Sharma *et al.*, (1989) reported that 51.3% of sheep and 14.8% of goats were found infected with *Fasciola* spp. in Kashmir valley.

The highest prevalence of *Fasciola hepatica* in winter and autumn followed by summer and spring are in agreement with Kuchay *et al.*, (2011) and Tamloorkar *et al.*, (2002) but against the findings of Khajuria and Kapoor (2003), Yadav *et al.*, (2004), Pandit *et al.*, (1989) who have reported maximum infection in summer and spring instead of winter and autumn. Environmental factors equally affect the fluke prevalence in all the host species. Rainfall, humidity and minimum temperature could possibly have positive relationship with fluke population while bright sunshine and maximum temperature causes evaporation faster and whatever the thin film of water on vegetation may get dried off decreasing the survival of cercaria. Rainfall helps in increasing the fluke prevalence (Tamloorkar *et al.*, 2002).

During the present study males were found to have maximum prevalence of infection (5.58%) as compared to females (4.59%). The influence of sex on the susceptibility of animals to infections could be attributed to genetic predisposition and differential susceptibility owing to hormonal control. Further experimental studies are needed to confirm the assumption. Differences in susceptibility to infection between sexes have been observed by various workers. The observed disparity may not solely be due to differences in susceptibility but may also depend on sex related variation in behavior that results in differences in exposure (Barger, 1993).

Fascioliasis was observed higher in young animals (6.47%) as compared to adult ones (4.13%). Our findings are in agreement with Ferreria *et al.*, 1981; Shah-Fischer and Say, 1989 and Kiyuu *et al.*, 2003. The animals in lower age groups were more prone to infection than the higher age groups. The lower age groups of animals found to be infected more with helminths is an important factor in the onset of infection because immunity plays a great role in the establishment of parasites in the host body. The low level of parasitism reported in adult animals is due to the development of significant immunity, which is initially low but increases with the intensity and duration of exposure of infection. When the animals cross one year of age the major part of their infection is eliminated because of development of self cure phenomenon and tend to remain relatively resistant to reinfection; however, constant exposure of some level of infection is required to maintain their resistant status.

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### **Conclusion**

It is evident from the study that comprehensive data on the impact of fascioliasis over several years is difficult and expensive to obtain. This is due mostly to the long term and chronic nature of the disease, its multiple effects on productivity and the difficulty of making an accurate diagnosis. Fascioliasis devastates the small ruminants from all areas of the world and continually drains the economic gains from the animals as is the case of Jammu area of Jammu And Kashmir State. Therefore strong measures should be made to overcome this loss.

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