

RESEARCH NOTE

VISCERAL SCHISTOSOMIASIS AMONG DOMESTIC RUMINANTS SLAUGHTERED IN WAYANAD, SOUTH INDIA

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Abstract. This short communication reports the prevalence of visceral schistosomiasis by worm counts from the mesentery of domestic ruminants of the hilly district of Wayanad, located in Kerala, one of the states in South India. We found 57.3, 50, and 4.7% of cattle, buffaloes and goats, respectively, had visceral schistosomiasis upon slaughter at a municipal slaughter house in Kalpetta. Our findings show that the prevalence of *Schistosoma spindale* infection is very high in Wayanad in comparison to previous reports from this and neighboring countries.

INTRODUCTION

Schistosomes are members of the genus *Schistosoma* which belong to the family Schistosomatidae. Adult schistosomes are dioecious and obligate blood flukes of vertebrates. In Asia, cattle are infected with *S. spindale*, *S. indicum*, *S. nasale* and *S. japonicum* (De Bont and Vercruysse, 1998). *Schistosoma spindale* infection has been reported in India, Sri Lanka, Indonesia, Malayasia, Thailand, Lao PDR and Vietnam (Kumar and de Burbure, 1986). *Schistosoma spindale* found in the mesenteric veins of ruminants (Soulsby, 1982) causes visceral schistosomiasis.

Indoplanorbis exustus appears to be the only natural intermediate host for *S. indicum*, *S. spindale* and *S. nasale* on the Indian sub-continent (Kumar and de Burbure, 1986). About 530 million heads of cattle live in areas

endemic for cattle schistosomiasis in Africa and Asia while at least 165 million cattle are infected with schistosomes worldwide (De Bont and Vercruysse, 1997). Although little or no overt clinical signs may be seen over a short period, frequent chronic schistosome infections, in the long term, cause significant losses to the herd.

Routine diagnosis of visceral schistosomiasis relies heavily on observation of clinical symptoms and fecal examination for eggs of the parasite. These methods grossly underestimate the prevalence and thus interfere with treatment and control strategies. Hence the present study was undertaken to assess the prevalence of visceral schistosomiasis by worm counts from the mesentery among domestic ruminants of the hilly district of Wayanad, located in Kerala, one of the states in South India.

MATERIALS AND METHODS

For this study samples of mesentery of both large and small intestine were collected during evisceration and dressing of 150 cattle, buffaloes and goats in the year 2006 at a

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municipal slaughter house, located at Kalpetta in Wayanad District. Samples were collected mainly from female cattle and buffaloes and from both sexes in goats.

The individual samples were cut into small pieces, immersed in normal saline and left undisturbed for 5-6 hours. Recovered worm pairs of *S. spindale* visible to the naked eye were counted. To assess the intensity of infection of visceral schistosomiasis, the method of Sumanth *et al* (2004) was followed. An infection was considered to be mild when 1 to 20 worm pairs were recovered, moderate when 20 to 100 worm pairs were found and heavy when more than 100 worm pairs were observed.

RESULTS

The prevalence of visceral schistosomiasis in the material collected from the abattoir is presented in Table 1. The intensity of infection due to visceral schistosomiasis in the three different host is presented in Table 2.

We found a 57.3% prevalence of visceral schistosomiasis in cattle, with the majority

Table 1
Prevalence of visceral schistosomiasis.

	Prevalence of <i>S. spindale</i>			
	Cattle	Buffalo	Goat	Total
No. examined	150	150	150	450
No. positive	86	75	7	168
Percent positive	57.3	50.0	4.7	37.3

(58.1%) suffering from moderate infection. A considerable number of animals (41.8%) harbored a high intensity of infection. In the case of buffaloes, the majority suffered from mild infection (66.7%) while the rest of the animals showed moderate infection (33.3%). Even though the percentage of positivity in goats was only 4.7%, among the positive cases, 42.8% harbored a high intensity of infection. The highest number of worm pairs was 430 in a cow.

DISCUSSION

In India, schistosomes are more common in pigs and buffaloes than cattle and goats due to their wallowing behavior (Agrawal and Southgate, 2000). However, our study revealed that cattle were frequently infected in Kerala. A similar observation was also made by Banerjee (1988) who recorded a 41.2% infection rate in cattle, while buffaloes had only a 26.9% infection rate.

Even though the prevalence of schistosomiasis in domestic animals was high based on worm counts, comparatively fewer numbers of clinical cases were reported from the state. A total of 1,304 cattle, 20 buffaloes and 96 goats were clinically diagnosed as having schistosomiasis in the year 2003 in Kerala (Animal Husbandry Department, 2003). It is clear from this report that crossbred cattle of the state are more frequently diagnosed with clinical schistosomiasis than buffaloes or goats. The symptoms, morbidity and mortality of schistosomiasis are to some extent related to the intensity of infection (De Bont and Vercruyssen, 1998). In

Table 2
Intensity of infection with *S. spindale*.

Intensity of infection	Worm pairs	Number of cattle infected	Number of buffaloes infected	Number of goats infected
Mild	1-20	0	50	4
Moderate	20-100	50	25	0
High	> 100	36	0	3

the present study, the majority of cattle that were infected had moderate to heavy worm counts. The large number of bovine clinical schistosomiasis may be due to the high intensity of infection in this species. However, in the case of buffaloes, the intensity of infection is either mild or moderate, and may go unnoticed. Similar observations were recorded in recent slaughter house surveys conducted on *S. spindale* in Sri Lanka and India (De Bont *et al*, 1991; Sumanth *et al*, 2004).

S. spindale infection is not diagnosed frequently by fecal sample examination (Agrawal, 1999). Many times, the sensitivity of the fecal sample examination as a diagnostic tool, which is the most widely used technique for a field veterinarian, is questioned (De Bont *et al*, 1991).

De Bont *et al* (1991) reported 31.2% infection rate with *S. spindale* in the mesenteric veins of 901 cattle examined at a slaughter house in Sri Lanka, while 37% infection rate in domestic ruminants was reported in Bangladesh (Islam, 1975). The present study shows the incidence of infection due to *S. spindale* ruminants is very high in Wayanad, Kerala, South India in comparison with previous reports from neighboring countries.

Although little or no overt clinical signs may be recognized over the short term, the high prevalence of chronic schistosome infections do, in long term, cause significant losses to the herd. These losses are caused by less easily recognizable effects on animal growth and productivity and increased susceptibility to other parasitic and bacterial diseases (Dargie, 1980; Pitchford and Visser, 1982; Mc Cauley *et al*, 1984).

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