

Incidence of paramphistomosis in cattle and buffaloes of Uttarakhand

RAJEEV RANJAN KUMAR¹, C L YADAV², RAJAT GARG³ and STUTI VATSYA⁴

Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand 263 145 India

Received: 24 October 2009; Accepted: 5 January 2011

Key words: Faecal samples, Paramphistomosis, Uttarakhand

Several species of amphistomes have been reported in domestic animals in India (Prasad and Varma 1999). Incidence of paramphistomosis in domestic ruminants has been reported from different states of India (Varma *et al.* 1989, Manna *et al.* 1994, Hassan *et al.* 2005, Satyanarayana *et al.* 2007). Perusal of literature suggests that no detailed studies have been carried out in Uttarakhand on the epidemiology of this infection in cattle and buffaloes. Therefore, the present study was undertaken with the objective of generating sufficient data pertaining to incidence of amphistome infection in cattle and buffaloes in Uttarakhand.

A total of 39 767 faecal samples (24 487 cattle and 15 280 buffaloes) were collected from animals of various villages in tarai and hills of Uttarakhand from January 2001 to December 2007 and were examined for presence/absence of amphistome eggs by sedimentation technique (Soulsby 1982). The data thus obtained was recorded month-wise and host-wise over the period of 7 years. Besides this, fresh amphistomes were also collected from the rumen and bile ducts of buffaloes slaughtered at local abattoirs and were transported to laboratory in normal saline. Permanent whole mounts were prepared and the amphistomes were identified as per the key furnished by Dutt (1980).

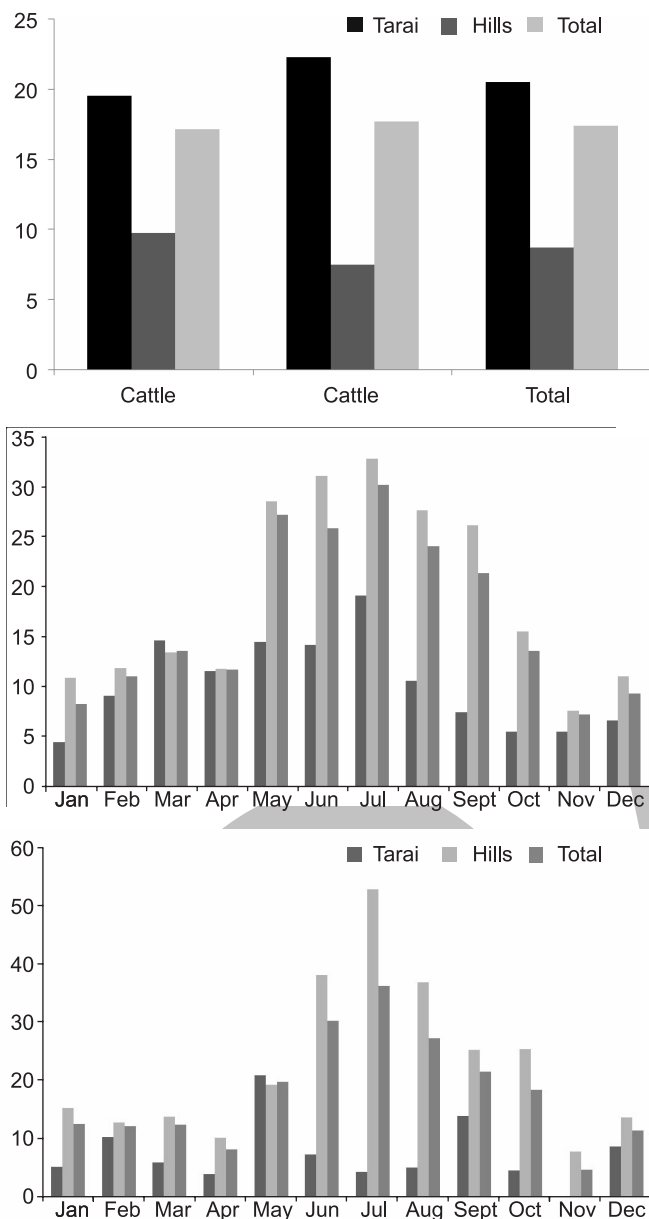
Out of the 39 767 faecal samples examined 6 894 (17.33%) were positive for amphistome eggs (Table 1). Slightly higher infection of amphistomosis was recorded in buffaloes (17.65%) than in cattle (17.14%). The result revealed the prevalence of amphistome infection throughout the year in Uttarakhand. Incidence of infection in cattle and buffaloes has decreased over the years in Uttarakhand (25.51% to 11.90% in cattle and 29.25% to 10.23% in buffaloes, during 2001 to 2007) with the lowest incidence of 10.95% in cattle and 6.32% in buffaloes during the year 2005. This decreasing trend of incidence of the infection in Uttarakhand could be attributed to increasing awareness, improved animal husbandry practices and changing in grazing pattern of the animals. It is pertinent to state that due to massive industrialization and improving socio-economic status over the years, a large number of farmers have switched over to stall feeding, thereby the incidence of infection was lower in the later years. The regional incidence of infection in cattle and buffaloes of Uttarakhand revealed that higher incidence of paramphistomosis was recorded in the animals of tarai region (20.48%) as compared to the hills (8.71%) (Fig. 1). Similarly, the animals of Kumaon hills had a higher prevalence of infection (11.17%) as compared to those of Garhwal hills (4.63%). The higher incidence of

Table 1. Year-wise incidence of paramphistomosis in cattle and buffaloes of Uttarakhand

Year	Cattle		Buffalo		Total	
	Examined	Positive (%)	Examined	Positive (%)	Examined	Positive (%)
2001	2712	692 (25.51%)	2338	549 (23.48%)	5050	1241 (24.57%)
2002	3335	841 (25.21%)	2718	795 (29.25%)	6053	1636 (27.02%)
2003	3451	718 (20.80%)	2994	650 (21.71%)	6445	1368 (21.22%)
2004	6193	911 (14.71%)	2769	357 (12.89%)	8962	1268 (14.15%)
2005	4810	527 (10.95%)	3447	218 (6.32%)	8257	745 (9.02%)
2006	2322	310 (13.35%)	799	106 (13.26%)	3121	416 (13.33%)
2007	1664	198 (11.90%)	215	22 (10.23%)	1879	220 (11.59%)
Total	24487	4197 (17.14%)	15280	2697 (17.65%)	39767	6894 (17.33%)

Present address: ^{1,3}Assistant Professor, ²Professor and Head, ⁴Associate Professor (e mail: stutivatsya@gmail.com), Department of Parasitology, College of Veterinary and Animal Sciences.

paramphistomosis in animals of tarai than those in the hills could be due to the lower prevalence of snails in the hills. Also, there is less availability of grazing grounds and thereby



Figs 1–3. 1. Regional incidence of paramphistomosis in cattle and buffaloes of Uttarakhand. 2. Monthly incidence of paramphistomosis in cattle in Uttarakhand. 3. Monthly incidence of paramphistomosis in buffaloes in Uttarakhand.

less exposure to metacercariae of amphistomes in the hills.

The incidence of infection was higher among the buffalo population in tarai (22.24%) as compared to cattle population (19.48%), while in the hills region the incidence was reverse i.e. higher in cattle (9.73%) as compared to the buffaloes (7.44%). This could be attributed to the differences in managerial practices in the 2 regions. It is common practice that buffaloes in tarai are let loose for grazing, similar like cattle in hills but the buffaloes reared in hills are always stall fed.

Monthly prevalence of the infection in cattle and buffaloes

showed that highest incidence of amphistome infection was recorded during the months of July (30.38% cattle, 36.15% buffaloes), while it was least in the month of November (7.28% cattle, 4.78% buffaloes) (Figs 2, 3). However in hills, highest incidence of infection in buffaloes (20.89%) was recorded in the month of May. Similar findings were also reported from Andhra Pradesh (Satyanarayana *et al.* 2007) and Punjab (Hassan *et al.* 2005). The reason for the higher incidence of infection in July could be attributed to the increased population of snails during the rainy season. Further, the metacercariae that get concentrated during summer months in marshy stagnant water, suddenly spread like outbreak during the showers of monsoon (Satyanarayana *et al.* 2007).

The most common species of amphistomes identified from the rumen of buffaloes slaughtered at local abattoirs were *Paramphistomum cervi*, *Cotylophoron cotylophorum*, *Fiscoederius elongatus* and *Gastrothylax crumanifer*. In addition to these, *Gigantocotyle explanatum* was also recorded from bile duct of buffaloes.

Our results revealed that cattle and buffaloes in Uttarakhand state suffer from paramphistomosis throughout the year. So, it can not be certainly treated as a casual entity. Thus, based on the incidence of paramphistomosis in different parts of Uttarakhand, there is a need to devise management strategies against this parasitic infection.

SUMMARY

Out of the 39767 faecal samples (24 487 cattle and 15 280 buffaloes) examined from animals of various villages in tarai and hills of Uttarakhand from January 2001 to December 2007, 6894 (17.33%) were found positive for various amphistome eggs. Slightly higher infection of amphistomosis was recorded in buffaloes (17.65%) than in cattle (17.14%). The incidence of infection in cattle and buffaloes has decreased over the years in Uttarakhand, with the lowest incidence in cattle (10.95%) and buffaloes (6.32%) during the year 2005. Higher incidence of paramphistomosis was recorded in the animals of tarai region (20.48%) as compared to the hills (8.71%). Highest incidence of amphistome infection was recorded during the months of July (30.38% cattle, 36.15% buffaloes), while it was least in the month of November (7.28% cattle, 4.78% buffaloes). The most common species of amphistomes recovered from the rumen of buffaloes slaughtered at local abattoirs were *Paramphistomum cervi*, *Cotylophoron cotylophorum*, *Fiscoederius elongatus* and *Gastrothylax crumanifer*. Based on the incidence of paramphistomosis in different parts of Uttarakhand, there is a need to devise management strategies against this parasitic disease.

ACKNOWLEDGEMENTS

The authors are thankful to Director, Experiment Station and Dean, College of Veterinary and Animal Sciences,

Pantnagar for the facilities provided during the course of study.

REFERENCES

- Dutt S C. 1980. *Paramphistomes and Paramphistomiasis of Domestic Ruminants in India*. Communication Centre, Punjab Agriculture University, Ludhiana.
- Hassan S, Kaur K, Joshi K and Juyal P D. 2005. Epidemiology of paramphistomosis in domestic ruminants in different districts of Punjab and adjoining areas. *Journal of Veterinary Parasitology* **19**: 43–6.
- Manna A K, Pramanik S and Mukherjee G S. 1994. Incidence of paramphistomosis in West Bengal. *Indian Journal of Animal Sciences* **63** (1): 87–9.
- Prasad A and Varma T K. 1999. On the prevalence and community dominance among paramphistomes infecting domestic ruminants. *Journal of Veterinary Parasitology* **13**: 129–33.
- Satyanarayana A, Babu A P, Kumar K U and Rao H P. 2007. A prevalence of paramphistomes in costal areas of Andhra Pradesh. *Indian Veterinary Journal* **84**: 646–47.
- Soulsby E J L. 1982. *Helminths, Arthropods and Protozoa of Domesticated Animals*. 7th edn, Pp. 766. ELBS and Baillere Tindal, London.
- Varma T K, Prasad A, Malviya H C and Dwivedi P. 1989. Incidence of paramphistome infections in ruminants at Bareilly. *Indian Journal of Animal Sciences* **59** (3): 231–34.