

## Incidence of intestinal parasitism in mithun (*Bos frontalis*)

S. Rajkhowa, K.M. Bujarbaruah, C. Rajkhowa<sup>1</sup> and Kapenlo Thong

National Research Centre on Mithun (ICAR),  
Medziphema, Jharnapani,  
Nagaland-797 106, India

### Abstract

Faecal samples from mithun of Arunachal Pradesh, Manipur, Mizoram and Nagaland were examined for the presence of intestinal parasites. Systematic studies on the incidence of intestinal parasites in mithun (irrespective of strain) revealed that the number of animals found positive for parasitic infections was 70.27%. Overall incidence of different parasites recorded was strongyles (54.05%), *coccidia* sp. (13.51%), *Fasciola* sp., *Fascioloides* sp. and *Dictyocaulus* sp. (10.81%), *Schistosoma bovis* (5.40%), *Schistosoma indicum* (2.70%) and *Paramphistomum* sp. and *Moniezia expansa* (5.40%). When the incidence of parasitic infections was compared, the mithuns from Nagaland were found to be 100% infected followed by those from Mizoram (66.70%), Manipur (60.00%) and Arunachal Pradesh (55.60%). The rate of infection was found to be higher in young animals (1-3 months) and the parasites mostly recorded in young animals were *Eimeria* sp., *Strongyloides papillosus* and *Toxocara vitulorum*.

**Keywords:** Incidence, Intestinal parasitism, Mithun.

### Introduction

Gastrointestinal nematode infections are insidious in nature with a long residual effect and are potential source of economic losses to livestock productions in India. In spite of significant production loss, the problem is neglected due to its chronic and insidious nature (Sanyal, 1996). As mithun is considered to be a crossbred between gaur (*Bos gaurus*) and domestic cattle (*Bos indicus*) and they are also kept under environmental conditions similar with cattle, so there is every possibility that they may also suffer from parasitic diseases similar to those recorded in cattle. But information on the intestinal parasitism in mithun is scanty and merits investigation. Therefore, the present study was undertaken to find out the incidence of intestinal parasitism in mithuns from different states.

### Materials and Methods

Faecal samples from thirty seven (37) mithuns from four states (Arunachal Pradesh-9; Nagaland-9; Manipur-10 and Mizoram-9) managed under uniform housing and feeding systems, belonging to Medziphema Farm of NRC on mithun, Nagaland were collected during a period of December, 1999 to November, 2000. All the animals under study were provided with concentrate feeds. In addition,

animals were allowed for free grazing on pasture lands for 7-8 h/day. Fresh samples were examined for gastrointestinal parasites qualitatively, as well as, quantitatively. A part of each faecal sample was used for egg counts. The number of eggs per gram of faeces (EPG) was estimated (Stoll, 1923). All the remaining faecal samples were pooled and used for coproculture at 27°C. The infective larvae were harvested and used for larval identification (Soulsby, 1965). Data were analyzed, as per the method of Snedecor and Cochran (1994).

### Results and Discussion

The present study revealed that the overall incidence of intestinal parasitism in mithuns was 70.27% and the overall incidence of different parasites recorded is presented in Table 1.

The occurrence of *strongyle* infection was very high throughout the study but the intensity in EPG was different in different seasons. The different *strongyle* parasites recorded in the study were *Oesophagostomum radiatum*, *Bunostomum phlebotomum*, *Trichostrongylus* sp., *Nematodirus* sp., *Haemonchus placei*, *Mecistocirrus* sp. and *Cooperia* sp. The common nematode larvae recovered were of *Oesophagostomum radiatum*, *Trichostrongylus* sp. and *Bunostomum phlebotomum*. The overall mean monthly EPG ranged from 325 to 1080 with a peak during June to August (Table 2).

<sup>1</sup>ICAR Research Complex for NEH Region, Nagaland

Table 1: Overall incidence of different parasites recorded in mithuns

Parasite	Incidence (%)
Strongyles	54.05
<i>Eimeria</i> sp.	35.13
<i>Toxocara vitulorum</i>	18.91
<i>Strongyloides papillosus</i>	18.91
<i>Capillaria</i> sp.	13.51
<i>Fasciola</i> sp.	10.81
<i>Fascioloides</i> sp.	10.81
<i>Dictyocaulus</i> sp.	10.81
<i>Schistosoma bovis</i>	5.40
<i>Schistosoma indicum</i>	2.70
<i>Paramphistomum</i> sp.	5.40
<i>Moniezia expansa</i>	5.40

Table 2: Overall mean strongyle EPG counts in mithuns

Months	EPG (Mean $\pm$ SE)
January	380 $\pm$ 10.46
February	325 $\pm$ 5.24
March	468 $\pm$ 2.63
April	426 $\pm$ 6.45
May	436 $\pm$ 10.25
June	922 $\pm$ 8.24
July	1080 $\pm$ 6.23
August	1078 $\pm$ 24.50
September	546 $\pm$ 4.28
October	388 $\pm$ 4.45
November	328 $\pm$ 3.27
December	336 $\pm$ 6.12

The overall influence of age on the occurrence of intestinal parasitism in mithuns revealed that the number of animals infected was lowest (53.84%) in mithuns of above two years of age and highest (100%) in those 1-3 months old and 58.33% in animals of 4-8 months of age (Table 3). Similar findings were also reported in cattle by Gupta *et al.* (1985) and Carneiro *et al.* (1987). Parasites recorded in animals of group A and B (Table 3) were *Strongyloides papillosus*, *Eimeria* sp. and *Toxocara vitulorum*. In all affected animals of group A mixed infection with *Strongyloides papillosus*, *Eimeria* sp. and *Toxocara vitulorum* was observed.

Table 3: Influence of age on the occurrence of intestinal parasitism in mithun

Animal group (according to age)	Animals examined	Animals infected	Per cent infected	Value of $\chi^2$ , 2d.f
Gr. A (1-3 months)	12	12	100	
Gr. B (4-8 months)	12	7	58.33	7.57
Gr. C (above 2 yrs)	13	7	53.84	

The calculated value of  $\chi^2$  is greater than the table value 5.99 at 5% level of significance

The number of animals infected with *Strongyloides papillosus*, *Eimeria* sp. and *Toxocara vitulorum* decreased with increase in age of the host, but infection with strongyles increased with the increase in age of the host. The present findings are in agreement with the findings in cattle of Vercruysse (1980), Rivera *et al.* (1983), Gupta *et al.* (1985) and Pradhan *et al.* (1991). The higher incidence of *Toxocara vitulorum* infection in younger calves might be due to transcolostral infection. The occurrence of *Strongyloides papillosus* and *Eimeria* sp. infection in younger calves could be explained by the fact that infections are picked up either by their infected dams or by contamination of their drinking water, milk/feeds within the shed. In the present study, infections with strongyles and tapeworms were observed in older calves. The older calves might have picked up infections of strongylid nematode and tapeworms soon after they are left for grazing on infected pastures/fields.

Seasonal incidence of intestinal parasitism in mithuns (Table 4) showed highest (92.85%) incidence during monsoon and lowest (41.70%) in winter and high (72.72%) during the period of pre-monsoon. The egg count data revealed that June-October had high risk of gastrointestinal (GI) nematodosis and pasture contamination. The monsoon starting by the second week of June might be making the environment favourable for the development and survival of pre-parasitic stages leading to increased availability of infective larvae on pasture. High rainfall also helps in providing suitable molarity of salt present in soil which is an important factor for ecdysis (Soulsby, 1966). It also helps in larval dispersion on the herbage which increases the chance of contact between host and larvae. Similar findings were also reported in cattle by Tongson and Trovela (1976), Esterre (1985), Omara-opyene (1985) and Rajkhowa and Hazarika (2001) and in buffaloes by Bedarkar *et al.* (2000). The lowest incidence of intestinal parasitism during winter could be attributed to low temperature which also helps in arrested development of larvae in host and environment.

The overall influence of the genotype of the host on the occurrence of intestinal parasitism revealed that though

the number of animals infected was higher in Nagaland followed by Mizoram, Manipur and Arunachal Pradesh (Table 5) but on statistical analysis this difference was found to be non-significant. The higher incidence of parasitic infection in Nagaland and Mizoram could be explained by the fact that mithun in both these states were introduced from different areas suggesting thereby that they might be carrying parasitic burden previously.

Table 4. Influence of season on the occurrence of intestinal parasitism in mithuns

Season	Animals examined	Animals infected	Per cent infected	Value of $\chi^2$ , 2 d.f
Premonsoon (Feb-Jun)	11	8	72.72	
Monsoon (Jun-Oct)	14	13	92.85	8.15
Winter (Oct-Feb)	12	5	41.70	

The calculated value of  $\chi^2$  is greater than the table value 5.99 at 5% level of significance

Table 5. Occurrence of intestinal parasites in mithuns

Animal strain	Animals examined	Animals infected	Per cent infected	Value of $\chi^2$ , 3d.f
Arunachal Pradesh	9	5	55.60	
Nagaland	9	9	100.00	
Manipur	10	6	60.00	5.30
Mizoram	9	6	66.70	

The calculated value of  $X^2$  is greater than the table value 7.81 at 5% level of significance

As highest incidence of infection was recorded in animals of 1-3 months of age, all these infections can be reduced substantially by adapting better hygienic conditions and by keeping the newly born and young calves separate from the adult stock.

The present study also indicate that under normal conditions the animals harbour a certain degree of gastrointestinal parasitism without any clinical symptoms but worm burden reaches to pathogenic level during monsoon season. Therefore, strategic treatment seems to be the option available for the control of gastrointestinal parasitism.

### Acknowledgements

The authors are thankful to the Director, National Research Centre on Mithun for the encouragement to carry

out this study. The technical support received from Dr. Kezhavitoo Vupru is also thankfully acknowledged.

### References

- Bedarkar, S.N., Narladkar, B.W. and Deshpande, P.D., 2000. Seasonal prevalence of snail-borne fluke infections in ruminants of Marathwada region. *J. Vet. Parasitol.*, 14: 51-54.
- Carneiro, R.J., Calil, F., Pereira, E. and Lima-W-dos-santos, 1987. The behaviour of helminth infections of beef cattle of mixed ages from the region of Cerrado, Goias State, Brazil. *Arquivo-Brasileiro-de-Medicina-Veterinaria-e Zootecnia*, 39: 415-422.
- Esterre, P., 1985. Epizootiology of digestive prasic infection in cattle in Guadeloupe. *Revue-d-Elevage-et-de-Medicine-Veterinaire-des-pays-Tropicaux*, 38: 54-63.
- Gupta, R.P., Yadav, C.L. and Ghosh, J.D., 1985. Epidemiology of helminth infections in calves of Haryana State. *Agri. Sci. Digest, India*, 5: 53-56.
- Omara-Opyene, A.I., 1985. A survey of gastrointestinal parasitism in cattle under nomadic management in Marsabit district of Northern Kenya. *Bull. Anim. Hlth. Prod. Africa*, 33: 107-112.
- Pradhan, K.B., Thakur, D.K. and Sudhan, N.A., 1991. Incidence of gastrointestinal parasites in suckling calves in Ranchi. *J. Res., Birsa Agricultural Univ.*, 3: 123.
- Rajkhowa, S. and Hazarika, G.C., 2001. Prevalence of intestinal nematodes in female calves of greater Guwahati area of Assam. *Indian Vet. J.*, 78: 449-451.
- Rivera, B., Parra, D., Garcia, O. and Aycardi, E., 1983. Gastrointestinal parasites in calves in Colombia. *Trop. Anim. Hlth. Prod.*, 15: 107-114.
- Sanyal, P.K., 1996. Gastrointestinal parasites and small ruminant production in India. Sustainable parasite control in small ruminants. *ACIAR Proceedings No. 74*. pp. 109-112. (Eds): Le Jambre, L.F. and Knox, M.R., *Proceedings of a workshop, Bosor, Indonesia. April 22-25.*
- Snedecor, G.W. and Cochran, W.G., 1994. *Statistical Methods*, 8th edn. Iowa State University Press, Ames., Iowa.
- Soulsby, E.J.L., 1965. *Textbook of Veterinary Clinical Parasitology*. Vol. 1. pp. 279-305. Helminths, Blackwell Scientific Publication, Oxford, UK.
- Soulsby, E.J.L., 1966. *Biology of Parasites*. Academic Press, New York and London. p. 185.
- Stoll, N.R., 1923. Cited by Soulsby, E.J.L., 1982. *Helminths, Arthropods and Protozoa of Domesticated Animals*. 7th edn. Bailliere Tindall and Casell Ltd., London. p. 766.
- Tongson, M.S. and Trovela, V., 1976. Epidemiology of bovine parasitic gastroenteritis in the Philippines. VII. Monthly mean strongyle ova counts of calves at the Verandia ranch. *Philippine J. Vet. Med.*, 15: 49-54.
- Vercruyse, J., 1980. Gastrointestinal helminthiasis in young cattle in the Central African Republic. *Bull. Anim. Hlth. Prod. Africa*, 28: 191-194.