

## Gastrointestinal parasitic infections in organized cattle farms of Meghalaya

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### Abstract

**Aim:** To know the gastrointestinal parasitic infections in cattle of Meghalaya, India.

**Materials and Methods:** A total of 676 faecal samples of cattle were collected for a period of two years from different organized cattle farms of Meghalaya for detection of gastrointestinal parasitic infections, using standard techniques.

**Results:** Out of 676 faecal samples examined, 191 (28.25%) faecal samples were found positive for gastrointestinal parasitic infections. The eggs of *Strongyle* spp. were found predominant (65.96 %) followed by *Strongyloides* spp. (25.13%), *Eimeria* spp. (17.80%), *Trichuris* spp. (13.08%), *Moniezia* spp. (10.47%) and *Nematodirus* spp. (2.61%). The *Nematodirus* spp. was identified as *Nematodirus helvetianus*, a first report of its kind from cattle of North-Eastern Region of India, particularly from the state Meghalaya. The eggs per gram of faeces in case of nematode parasites were ranged between 50 to 4000 and in case of coccidian infections the range of oocysts per gram of faeces (OPG) was between 50 to 1400.

**Conclusion:** Cattle maintained in organized cattle farms of Meghalaya suffers from GI parasitic infections throughout the year. It is highest during rainy season followed by cool, cold and hot season.

**Keywords:** cattle, gastrointestinal, Meghalaya, parasite

### Introduction

The infection with various types of gastrointestinal parasites in cattle is a worldwide problem [1-4]. Gastrointestinal (GI) parasitic infections may be considered as one of the major constraints in cattle production. The infection causes productivity losses through reduced feed intake and decreased efficiency in feed utilization due to subclinical or chronic infections that are responsible for economic losses [5-7]. GI parasitic infections in cattle in general cause economic losses to the livestock owner due to decreased milk production [8, 9]. The decreased milk production due to the infection of parasites may be mediated by growth hormone, type I insulin-like growth factor and prolactin, because a decrease of these hormones in serum during lactation in cows with positive EPG has been observed in a recent study [10].

The North Eastern Hill Region is a known endemic zone for the metazoan diseases of livestock [11]. Thus, several reports of gastrointestinal parasitic infections in cattle from North Eastern Region of India are available [12, 9]. But there is no report about the presence of *Nematodirus helvetianus* infection in cattle from North Eastern Region of India. Hence, in the present communication, the presence of *Nematodirus helvetianus* infection in cattle is being reported for the first time from cattle of North-Eastern Region of India, particularly from the state Meghalaya along with prevalence of different gastrointestinal parasitic infections in cattle of Meghalaya, as observed after a recent study for a period of two years.

### Materials and Methods

In the present study faecal samples of 676 numbers of cattle were collected from different organized cattle farms of Meghalaya like Indo Danish Project, Upper Shillong; Regional Cross Bred Cattle Breeding Project, Kyrdemkulai; Cattle Farm, Rongkhon (Tura) and Cattle Farm of ICAR Research Complex for NEH Region, Umiam, Meghalaya, from the period April, 2009 to March, 2011, to know the prevalence of gastrointestinal parasitic infections. Faecal samples were collected randomly and parasitological examinations of these faecal samples were done by direct smear, sedimentation, and flotation methods as per standard techniques [13]. Quantitative examination of these faecal samples was done to know the eggs per gram of faeces (EPG) by Modified MacMaster Technique [13].

### Results

Monthwise prevalence of gastrointestinal parasitic infection in cattle of Meghalaya for the total period of study has been presented in Table-1. It could be observed from the table that out of 676 faecal samples, overall 191 (28.25%) faecal samples were found positive for gastrointestinal parasitic infections. Yearwise, 22.98% and 31.30% infections were recorded during 2009 -10 and 2010-11, respectively. The different species of gastrointestinal (GI) parasites which were found after examination of faecal samples has been depicted in Table-2. The eggs of *Strongyle* spp. were found predominant (65.96%) followed by *Strongyloides* spp. (25.13%), *Eimeria* spp. (17.80%),

Table-1. Monthwise prevalence of gastrointestinal (GI) parasitic infection in cattle of Meghalaya from April 2009 to March, 2011

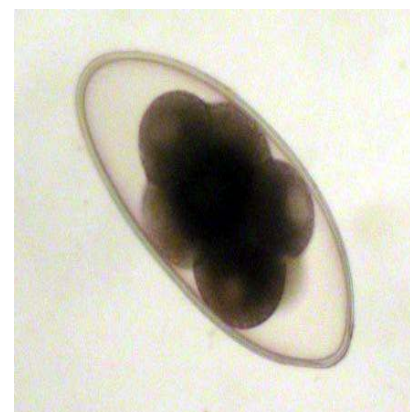
Month	2009-10		2010-11		Total	
	Sample examined	No. positive	Sample examined	No. positive	Sample examined	No. positive
April	23	2 (8.69%)	37	10 (27.02%)	60	12 (20.00%)
May	16	3 (18.75%)	38	12 (31.57%)	54	15 (27.77%)
June	22	7 (31.81%)	36	16(44.44%)	58	23 (39.65%)
July	18	7(38.88%)	34	16 (47.05%)	52	23 (44.23%)
Aug	20	10(50.00%)	38	16 (42.10%)	58	26 (44.82%)
Sept	26	7 (26.92%)	29	8 (27.58%)	55	15 (27.27%)
Oct	16	5 (31.25%)	33	9 (27.27%)	49	14 (28.57%)
Nov	21	3 (14.28%)	37	11(29.72%)	58	14 (24.13%)
Dec	20	4(20.00%)	30	9 (30.00%)	50	13 (26.00%)
Jan	23	4(17.39%)	37	8 (21.62%)	60	12 (20.00%)
Feb	19	3(15.78%)	36	9 (25.00%)	55	12 (21.81%)
March	24	2(8.33%)	43	10 (23.25%)	67	12 (17.91%)
<b>Total</b>	<b>248</b>	<b>57 (22.98%)</b>	<b>428</b>	<b>134 (31.30%)</b>	<b>676</b>	<b>191 (28.25%)</b>

Table-2. Species wise prevalence of GI parasites in cattle after examination of faecal samples

Species	2009-10		2010-11		Total	
	No. positive	% positive	No. positive	% positive	No. positive	% positive
Strongyle spp	36	63.16	90	67.16	126	65.96
<i>Strongyloides</i> sp.	5	8.77	43	32.08	48	25.13
<i>Eimeria</i> sp.	7	12.28	27	20.14	34	17.80
<i>Trichuris</i> sp.	0	0.00	25	18.65	25	13.08
<i>Moniezia</i> sp.	12	21.05	8	5.97	20	10.47
<i>Nematodirus helvetianus</i>	0	0.00	5	3.73	5	2.61

Table-3. Seasonwise prevalence of GI parasitic infections in cattle of Meghalaya

Seasons	Sample examined	No. positive	% positive
Rainy (May to September)	277	102	36.82
Cool (October to November)	107	28	26.16
Cold (December to February)	165	37	22.42
Hot (March to April)	127	24	18.89

Figure-1. Egg of *Nematodirus helvetianus* (200X)

*Trichuris* spp. (13.08%), *Moniezia* spp. (10.47%) and *Nematodirus* spp. (2.61%). The *Nematodirus* spp. was identified as *Nematodirus helvetianus*, after observing the size of the eggs, as eggs of *Nematodirus helvetianus* is large and could be differentiated from other Trichostrongylid species eggs by its size [14] (Fig.1). The faecal egg count (FEC) of nematodes was ranged between 50 to 4000. The range of oocysts per gram of faeces (OPG) was between 50 to 1400.

#### Discussion

In the present study it has been observed that cattle maintained in the organized farms of Meghalaya suffer from GI parasitic infections throughout the year and infections are common to them. If we see the season wise prevalence as mentioned in Table-3, then we could observe that higher prevalence of GI parasitic infections has been observed in rainy season (36.82%) followed by cool (26.16%), cold (22.42%) and hot (18.89%) seasons. Here it could be mentioned that, unlike most of the states of India, where three seasons

like summer, rainy and winter have been observed, the state Meghalaya has four distinct seasons i.e. the rainy season from May to early October, the cool season from early October to November, the cold season from December to February and the warm season or hot season from March to April ([www.bharatheritage.in/meghalaya/weather.htm](http://www.bharatheritage.in/meghalaya/weather.htm)). High moisture content along with temperature prevailed during rainy season favours the growth and development of larvae is the reason behind the highest prevalence of GI parasitic infections during rainy season, as also observed earlier [15]. The pick up of higher level of infection by ingestion of larvae during late rainy season continued to develop mature worm during cool season, might be responsible for higher prevalence of infection during next cool season. Devoid of optimum moisture and temperature for development of larvae in the pasture during cold and hot season, could be the reason of lower and lowest prevalence during cold and hot seasons respectively.

There are several reports of GI parasitic infections in cattle from India. A high prevalence of infection

(66.29%) has been reported from Western Vidarbha Region [15]. From Jaipur, high prevalence of GI parasitic infections in cattle/buffalo (40.35%) and low prevalence (11%) in cattle have been reported [16,17]. In comparison to cow calves, lower prevalence of GI parasitic infections in adult dairy animals has been reported from Punjab. The overall prevalence of GI parasitic infections in cow calves from Punjab has been reported as 61.40% [18] where as the GI parasitic infection in adult dairy animals (cattle and buffalo) from the same state reported as 37.97% [19]. The hot and humid zone of West Bengal experienced a high prevalence of GI parasitic infections (76.17%) in cattle [20]. Various reasons like different agroclimatic conditions, managemental practices and age of the animals could be the reason of variation of percentage of GI parasitic infections in cattle in different regions of India, as mentioned by earlier worker [9]. In the present study it has been observed that infections with various types of Strongyle spp. were predominant over other GI parasitic infections, supported by the findings of earlier workers [16,19,21].

There are reports of prevalence of GI parasitic infections in cattle from North Eastern Region of India where a prevalence of 31.53% reported from Sikkim [12] and 41.18% reported from Meghalaya [9]. But none of them could able to report the presence of *Nematodirus helvetianus* infections in cattle. *Nematodirus helvetianus* is found to capable of producing severe pathologic changes in the intestine like penetration and destruction of intestinal mucosa with formation of tunnel. It has been reported that calves experimentally infected with *Nematodirus helvetianus* showed 32.9% to 72.4% less weight depending upon numbers of larvae infected [22]. The parasite has been reported from other countries [23-26]. Recently, *Nematodirus filicollis* infection has been reported in goats from Sikkim [27]. But, so far our knowledge is concerned, there is no report of *Nematodirus helvetianus* infection in cattle of North East Region of India and this may be consider as a first report of *Nematodirus helvetianus* in cattle from North-Eastern region of India, particularly from the state Meghalaya.

This study revealed that the overall prevalence of gastrointestinal parasites of cattle is 28.25% which is to some extent lower in comparison to earlier workers [8,12], may be due to follow of deworming schedule in organized cattle farms. In a recent study of Sikkim [21], almost similar percentage of cattle (27.48%) were found as infected with GI parasitic infections, as reported in the present study. Although several authors reported the prevalence of various trematodes infections in cattle from India [21,28], but in the present study we could not observed any trematode infections in these cattle, might be due to stall fed nature of these farm animals.

#### Conclusion

It can be concluded that the cattle maintained in

organized cattle farms of Meghalaya suffers from GI parasitic infections throughout the year. It is highest during rainy season followed by cool, cold and hot season.

#### Author's Contribution

All authors contributed equally. All authors read and approved the final manuscript.

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#### Competing interests

Authors declare that they have no competing interests.

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