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Prevalence of Gastrointestinal Parasitic Infections in Livestock of Manipur

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ABSTRACT

Gastrointestinal (GI) parasitic infections in animals are responsible for considerable economic losses due to mortality in infected animals, decreased milk yield and reduced weight gain. Keeping in view of importance of GI parasitism in livestock, a study on GI parasitic infections in livestock of Manipur was carried out for a period of one year started from April, 2014 to March, 2015. For this a total of 359 numbers of faecal samples, of which 149 numbers from pigs, 158 numbers from cattle and 52 numbers from buffaloes, were collected from different places of Manipur. These faecal samples were examined for the presence of parasitic eggs/oocysts for detection of GI parasitic infections. Overall prevalence of GI parasitic infections among livestock of Manipur was 34.54%. Out of these, 32.88% faecal samples of pigs, 37.34% faecal samples of cattle and 30.76% faecal samples of buffaloes were found positive for different GI parasitic infections, either single or mixed forms. Microscopical examination of faecal samples of pigs revealed presence of *Ascaris suum* (40.81%), Strongly spp. (22.44%), *Trichuris* spp. (8.16%), *Eimeria* spp. (20.40%) and *Isospora* spp. (4.08%). Mixed infections with various GI parasites were also recorded in 4.08% samples. Examination of faecal samples of cattle revealed presence of eggs/ova of Strongyle spp. (35.59%), Amphistome(13.55%), Fasciola spp. (10.16%), *Moniezia* spp. (8.47%), *Nematodirrus helvetianus* (1.69%) and *Eimeria* spp (18.64%). Mixed infections with various GI parasites were also recorded in 11.86% samples. The eggs of Stronglyspp. (50.00%), Amphistomes (37.50%) and *Fasciola* spp. (12.50%) were recorded in the faecal samples of buffaloes. *Nematodirus helvetianus*, a nematode parasite of cattle, is being reported for the first time from cattle of Manipur.

1. Introduction

Gastrointestinal (GI) parasitic infections in animals are responsible for considerable economic losses due to mortality in infected animals, decreased milk yield, reduced weight gain, condemnation of meat and hamper the profitable livestock production (Boes *et al.,*2000; Joachim *et al.,* 2001; Nsoso *et al.,*2000). It has been reported that strategic anthelmintic treatment could increase milk yield in cattle that has observed in north eastern region of India (Bandyopadhyay *et al.,* 2010). In another study it has been observed that in comparison to control animals there is an increase of 4-18% milk production in cattle in anthelmintic treated animals (Kumar *et al.,* 2006). A positive effect on average daily weight gain (15.1 to 34.7 g) in pigs following deworming schedule has been reported (Kanora 2009). Morbidity and mortality due to helminth infection in cattle and buffaloes that causes great economic losses throughout the world has been mentioned (Swarnakar *et al.,* 2015). For majority of rural people of north eastern states, agriculture is the main source of income, but rearing of livestock as an important component of mixed farming system as well as an alternative source of

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income for these people, is significant (Kumar *et al.,* 2007).But from the above discussions, it is clear that gastrointestinal (GI) parasitic infections may be considered as one of the major constraints in livestock production. The North Eastern Hill Region is a known endemic zone for the metazoan diseases of livestock (Sharma and Godara 2010). Although some reports of gastrointestinal parasitic infections in livestock from North Eastern Region of India are available (Deka *et al.,* 1995; Borthakur and Das 1998; Pal *et al.,*2008; Bandyopadhyay *et al.,* 2010; Laha *et al.,* 2013a, 2013b; Ebibeni *et al.,*2013; Laha *et al.,*2014a; Das *et al.,* 2015a, 2015b, 2015c), but very few report on prevalence of GI parasitic infections in livestock of Manipur are available (Laha *et al.,* 2014b). So, keeping in view of importance of GI parasitism in livestock and non-availability of information on prevalence of GI parasitic infections in livestock of Manipur, the study on GI parasitic infections in livestock of Manipur was undertaken to know about the prevalence of GI parasitic infections in livestock of Manipur.

2. Materials and Methods

The study was carried out for a period of one year started from April, 2014 to March, 2015. For this a total of 359 numbers of faecal samples, of which 149 numbers from pigs, 158 numbers from cattle and 52 numbers from buffaloes, were collected from different places of Manipur. The parasitological examinations of these faecal samples were done by direct smear, sedimentation and flotation methods as per standard techniques (MAFF 1986). The eggs of the helminths were identified after observing the size and morphological characteristics of eggs (Soulsby 1986) using low and high power microscope.

3. Results and Discussion

The prevalence of GI parasitic infections after examination of faecal samples of livestock of Manipur have been presented in Table 1 and Figure 1. It could be observed from the table and figure that overall prevalence of GI parasitic infections among livestock of Manipur was 34.54%. Out of these, 32.88% faecal samples of pigs, 37.34% faecal samples of cattle and 30.76% faecal samples of buffaloes were found positive for different GI parasitic infections, either single or mixed forms. The prevalence of different gastrointestinal parasites as recorded after microscopical examination of faecal samples of pigs were *Ascaris suum* (40.81%), Strongyle spp. (22.44%), *Trichuris* spp. (8.16%), *Eimeria* spp. (20.40%) and *Isospora* spp. (4.08%). Mixed infections with various GI parasites were also recorded in 4.08% faecal samples of pigs (Table 1 and Figure 2).

Examination of faecal samples of cattle revealed the presence of eggs/ova of Strongly spp. (35.59%), Amphistome(13.55%), Fasciola spp. (10.16%), *Moniezia* spp. (8.47%), *Nematodirrus helvetianus* (1.69%) and *Eimeria* spp (18.64%) (Table 1 and Figure 2). Mixed infections with various GI parasites were also recorded in 11.86% faecal samples of cattle. The eggs of Strongly spp. (50.00%), Amphistomes (37.50%) and *Fasciola* spp. (12.50%) were recorded in the faecal samples of buffaloes.In the present study, 32.88% faecal samples of pigs has been found as positive for GI parasitic infections. Earlier, Laha *et al.* (2014b) reported 60.95 % pigs of Manipur as positive for various GI parasitic infections. This difference might be due to the difference in the period of study, numbers of samples that were examined, places of collections and managemental conditions of the animals. From other north eastern state like Meghalaya, Laha *et al.* (2014a) reported 34.00% pigs of Meghalaya as positive for various GI parasitic infections and from Nagaland, Ebibeni *et al.* (2013) reported a higher prevalence of GI parasitic infections in piglets (81.6%) and in adult pigs (61.7%). *Ascaris suum* infection in pigs has been found as predominant helminth parasites in pigs of Manipur, as observed in the present study. Earlier, Laha *et al.* (2014b) reported *A. suum* infection in pigs as predominant helminth parasites in pigs not only in Manipur, but other north eastern states also. But they have recorded a higher percentage (73.43) of *A. suum* infections in pigs of Manipur with an overall prevalence of (65.46) in north eastern states, in comparison to present study that recorded 40.81% pigs of Manipur infected with *A. suum.* Besides from Meghalaya also, Rajkhowa (1996) reported that *A. suum* infection was highest (69.3%) in young pigs. GI parasitism of a particular area may vary depending upon the period of collections, places of collections and individual or personal variations that might be responsible for the variation of *A. suum* infections in pigs of Manipur that observed in the present study. From other north eastern states, other parts of India as well as abroad, *Ascaris suum* have been reported as most prevalent parasite in pigs (Yadav and Tandon 1989; Kumari *et al.,* 2002; Deka *et al.,* 2005; Tamboura *et al.,* 2006; Tomass *et al.,* 2012). In the present study, 30.76% buffaloes have been recorded as positive for GI parasites. Mamun *et al.* (2011) reported that the prevalence of GI parasites in buffaloes is very common and quite severe, as mentioned by Patel *et al.*(2015). Swarnakar *et al.* (2015) reported the prevalence of *Strongyle* type eggs (35.41%), *Strongyloides* type eggs (0.49%), *Toxocara* species (0.099%), *Fasciola* species (4.44%), Amphistomes species (11.06%) , *Moniezia expansa* (0.64%) and *Moniezia benedeni* (0.35%) in cows and buffaloes.The prevalence of Strongyle spp. have been recorded in both cattle and buffaloes in the present study are in agreement with the study of Swarnakar *et al.* (2015) and Biu *et al.* (2009) who

also observed that *Stronglye* species as the most common parasite found in large numbers in the domestic ruminants compared to other parasites. The general prevalence rate of helminth parasites infections in buffaloes from Gujarates has been reported as 64.67% (Patel *et al.,* 2015). Higher prevalence of GI parasites in cattle (37.34%) in comparison to buffaloes (30.76%) has been observed in the present study. Similar type of findings of higher prevalence of GI parasites in cattle (75% and 67.15%) in comparison to buffaloes (70.45% and 38.70%) also observed earlier from Jabalpur and Jammu region of India (Marskole *et al.,* 2016; Mir *et al.,* 2013). Differences in feeding habit and habitats of these two species might be responsible for this difference. However, in both cattle and buffaloes, lower prevalence of GI parasites observed in the present study, as compared to earlier study done in different states of India (Marskole *et al.,* 2016; Mir *et al.,* 2013) might be due to the difference in the period of study, numbers of samples that were examined, places of collections means agro- climatic conditions of habitat of animals that favours the survival of infective stage of the parasites, opportunity of exposure to the intermediate host and managemental conditions of the animals (Marskole *et al.,* 2016). From the state Mizoram, overall helminthic infections in pigs and cattle were recorded as 22.2% and 18.5%, respectively (Deka *et al.,* 2005). *Nematodirus helvetianus*, a nematode parasite of cattle that causes severe pathologic changes in the intestine like penetration and destruction of intestinal mucosa with formation of tunnel and loss of body weight, is being reported for the first time from cattle of Manipur (Figure 4). The parasite also reported from cattle of Meghalaya (Laha *et al.,* 2013b).

Table 1. Prevalence of gastrointestinal parasitic infections in livestock of Manipur after examination of faecal samples

Species of Animals	**NumbersExamined**	**Numbers (%)Positive**	**Parasites Recorded**
Pigs	149	49 (32.88%)	*Ascaris suum*, Strongyle spp., *Trichuris* spp.,*Eimeria* spp. *Isospora* spp.
Cattle	158	59 (37.34%)	Strongyle spp., Amphistome, Fasciola spp., *Moniezia* spp. , *Nematodirrus helvetian, Eimeria* spp.
Buffaloes	52	16 (30.76%)	Strongyle spp. , Amphistomes *Fasciola* spp.
Total	359	124 (34.54%)	*Ascaris suum* , Strongyle spp. , *Trichuris* spp., *Eimeria* spp., *Isospora* spp., Amphistomes, *Fasciola* spp., *Moniezia* spp., *Nematodirrus helvetianus*

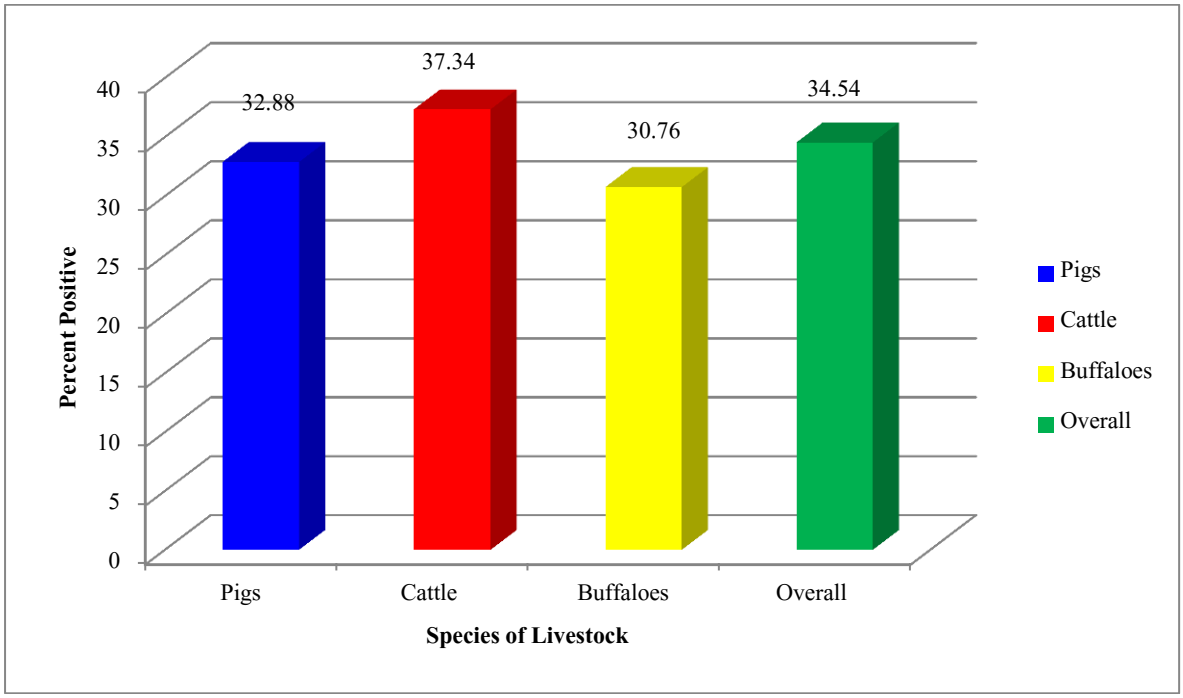

Figure 1. Prevalence of gastrointestinal parasitic infections in livestock of Manipur

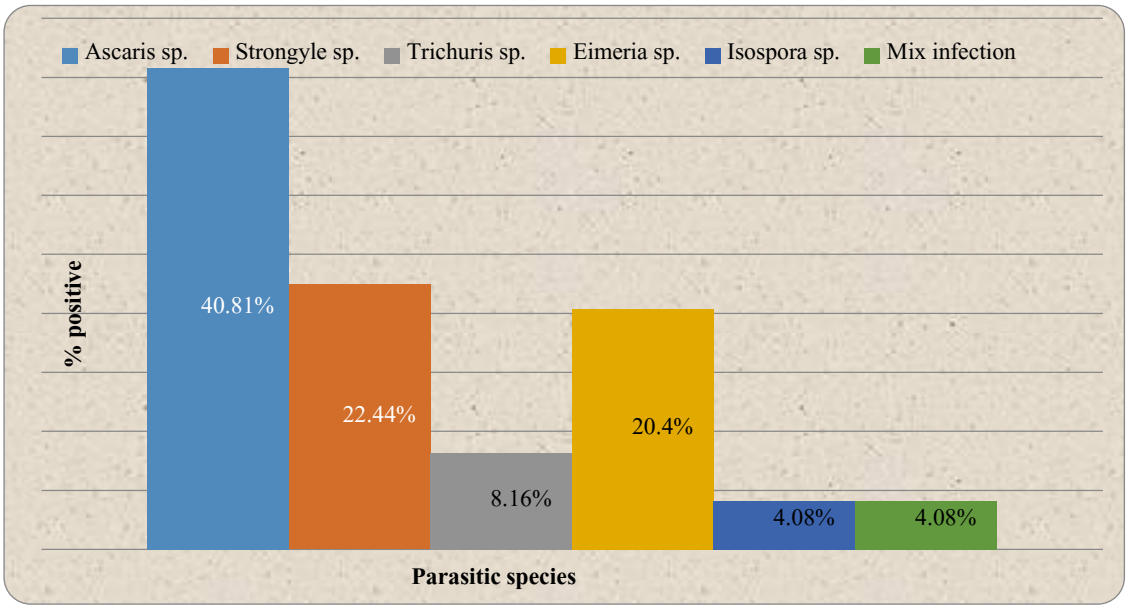

Figure 2. Species wise prevalence of GI parasitic infection in pigs of Manipur

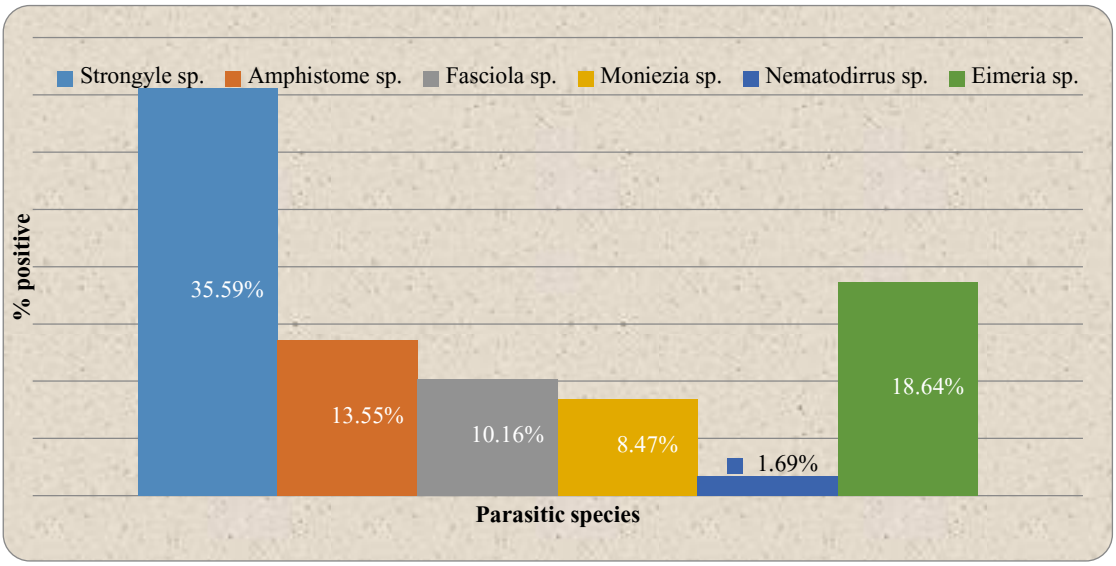

Figure 3. Species wise prevalence of GI parasitic infection in cattle of Manipur

Figure 4. Egg of *Nematodirus helvetianus* (200X)

Conclusion

It can be concluded from the present study that the livestock of Manipur suffers from gastrointestinal parasitism like the livestock of other parts of the country but by this study with of representative numbers of faecal samples, we have recorded that a moderate percentage of livestock are infected with GI parasites. This is significant because these infected animals may spread the infection to healthy animals, unless they are treated. A study with large numbers of faecal samples may give more idea about the prevalence of GI parasitism in livestock of Meghalaya.

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