

Prevalence of Gastrointestinal Parasitic Infections in Pigs of North Eastern Region of India

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ABSTRACT

A total of 551 numbers of faecal samples of pigs were collected from four states of North Eastern (NE) Region of India namely Meghalaya, Manipur, Mizoram and Nagaland, for a period of two years, to know the prevalence of gastrointestinal parasitic infections in pigs in these four states. The examination of faecal samples of pigs revealed overall 37.77% pigs were infected with gastrointestinal parasitism with a distribution of 36.34%, 47.31%, 34.45% and 60.95% infections with mean faecal egg count in terms of eggs per gram of faeces (EPG) 1289.13, 2038.44, 475.19 and 897.26 in Meghalaya, Nagaland, Mizoram and Manipur, respectively. Amongst helminthes, over all, *Ascaris suum* infections (65.46%) were predominant in these four states followed by *Strongyle* spp. (45.96%), *Strongyloides* spp. (13.06%) and *Trichuris* spp. (16.66%). Amongst protozoa *Eimeria* spp. (34.00%) was recorded in all these four states and *Isospora* spp. (3.50%) was recorded in three states, except Meghalaya. Individually, the pigs of Manipur have been found to harbor higher percentage (52.34%) of infection with *Isospora* spp. The present study indicates *Ascaris suum* as the most prevalent helminthes in pigs in these four NE states and also indicates lowest percentage of infections with lowest EPG in Mizoram and highest percentage of infections in Manipur. Highest percentage of infection does not indicate highest EPG.

Keywords: Gastrointestinal parasite, India, North Eastern Region, Pigs, Prevalence,

INTRODUCTION

Rearing of pigs is one of the ways of livelihood of tribal population of North Eastern Region of India. The consumption of pork is increasing due to per capita income, urbanization and changes in life style and changing food habit (Wright et al. 2010). So, the population of North East may increase their income through rearing of pigs. But one of the major constraints of rearing of pigs is the gastro intestinal (GI) parasitic infections. If we look a recent study then we could see that pigs reared in backyard condition in Dimapur district of Nagaland showed a high percentage of GI parasitic infections which in case of piglets recorded as 81.6% and in case of adult pigs recorded as 61.7% with an overall infection rate 91.4%

(Ebibeni et al. 2013). Among scavenging pigs, 91% infection with gastro intestinal parasites has been reported from abroad (Tamboura et al. 2006). Gastrointestinal parasitic infections in pig's causes economic losses due to condemnation of liver, reduce growth rate and feed conversion (Stephenson et al. 1980; Hale et al. 1985). So, there is a need to study the GI parasitic infections in pigs of NE region of India. Although several authors studied the prevalence of GI parasitic infections in North Eastern states of India (Sarma and Gogoi, 1986; Yadav and Tandon 1989; Chandra and Ghosh 1989; Rajkhowa et al. 2003), but quantification of infections have not been mentioned. Besides, GI parasitic infections in animals may vary from time to time within a state, even within an area depending upon the climatic conditions of the area, availability

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of infective stages of the parasites in the pasture and management practices. Moreover, there is no summarized report from NE region of India regarding GI parasitic infections from which we can see the prevalence of GI parasitic infections in pigs in different states of North Eastern region of India at a glance. Keeping in view of the above factors, present study was undertaken to know the prevalence of GI parasitic infections in pigs in four different states of North Eastern region.

MATERIALS AND METHODS

In the present study a total of 5511 numbers of faecal samples of pigs were collected randomly from organized and unorganized pigs maintained in four North Eastern States of India namely Meghalaya, Manipur, Mizoram and Nagaland, for a period of two years (2011-12 and 2012-13), to know the prevalence of GI parasitic infections in pigs in these four states. The parasitological examinations of these faecal samples were done by direct smear, sedimentation and flotation methods as per standard techniques (MAFF 1986). To know the eggs per gram of faeces (EPG), Modified MacMaster Technique (MAFF 1986) was followed. The eggs of the helminthes were identified after observing the size and morphological characteristics of eggs (Soulsby 1986) using low and high power microscope.

RESULTS AND DISCUSSION

The over all prevalence of GI parasitic infections in pigs of these four states has been presented in Table 1. It could be observed that overall 37.77% pigs were infected with GI parasitism. Amongst

Table 1: Overall prevalence of GI parasitic infections in pigs of NE Region of India (2011-12 & 2012-13)

No. of sample examined	Nos. Positive	% Positive
5511	2082	37.77
<i>Ascaris suum</i>	1363	65.46
Strongyle spp.	957	45.96
<i>Strongyloides</i> spp.	272	13.06
<i>Trichuris</i> spp.	347	16.66
<i>Eimeria</i> spp.	708	34.00
<i>Isoospora</i> spp.	73	3.50

helminthes, over all, *Ascaris suum* infections (65.46%) were predominant in these four states followed by Strongyle spp.(45.96%), *Trichuris* spp.(16.66%) and *Strongyloides* spp. (13.06%). Amongst protozoa *Eimeria* spp.(34.00%) and *Isoospora* spp.(3.50%) was recorded. State wise and species wise prevalence of GI parasitic infections in pigs of NE Region of India have been presented in Table 2 and Figures 1 and 2. It could be observed that 36.34%, 47.31%, 34.45% and 60.95% GI parasitic infections in pigs have been recorded in Meghalaya, Nagaland, Mizoram and Manipur, respectively. The mean faecal egg counts in terms of eggs per gram of faeces (EPG) of pigs of Meghalaya, Nagaland, Mizoram and Manipur, were

Table 2: State wise and species wise prevalence of GI parasitic infections in pigs of NE Region of India (2011-12 & 2012-13)

	Meghalaya (n=4598) No. positive (%)	Nagaland (n=317) No. positive (%)	Mizoram (n=386) No. positive (%)	Manipur (n=210) No. positive (%)
Total	1671	150	133	128
Positivity	(36.34)	(47.31)	(34.45)	(60.95)
<i>Ascaris suum</i>	1129 (67.56)	85 (56.66)	55 (41.35)	94 (73.43)
Strongyle spp.	816 (48.83)	63 (42.00)	33 (24.41)	45 (35.15)
<i>Strongyloides</i> spp.	239 (14.30)	12 (8.00)	0 (0.00)	21 (16.40)
<i>Trichuris</i> spp.	300 (17.95)	23 (15.33)	16 (12.03)	8 (6.25)
<i>Eimeria</i> spp.	559 (33.45)	45 (30.00)	61 (45.86)	43 (33.59)
<i>Isoospora</i> spp.	0 (0.00)	2 (1.33)	4 (3.00)	67 (52.34)
EPG	1289.13	2038.44	475.19	897.26

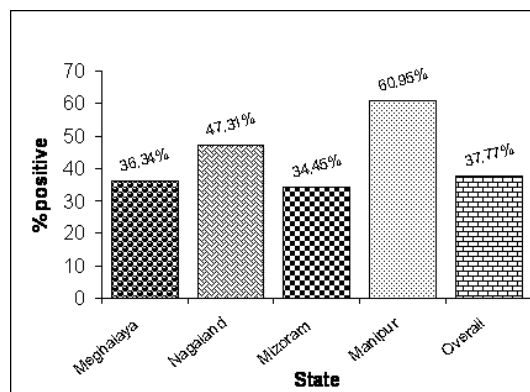


Fig. 1: Overall prevalence of GI parasitic infections in pigs of NE Region of India (2011-12 & 2012-13)

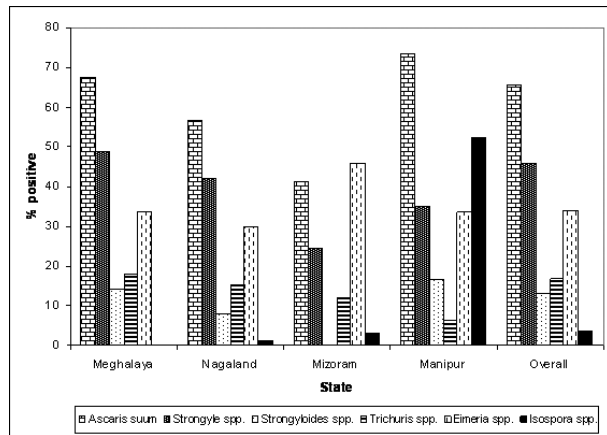


Fig. 2: State wise and species wise prevalence of GI parasitic infections in pigs of NE Region of India (2011-12 & 2012-13)

1289.13, 2038.44, 475.19 and 897.26, respectively. Except Mizoram, *Strongyloides* spp. was recorded in other three states. Among protozoa *Eimeria* spp. was recorded in all these four states and *Isospora* spp. was recorded in three states, except Meghalaya. Individually, the pigs of Manipur have been found to harbor higher percentage (52.34%) of infection with *Isospora* spp. Although in a recent study, Ebibeni et al. (2013) reported a high prevalence of GI parasitic infections in piglets (81.6%) and in adult pigs (61.7%) in Dimapur district of Nagaland. But in the present study comparatively less percentage of infections (47.31%) recorded in Nagaland might be due to the fact that they studied only on pigs maintained in backyard condition and also due to an even sample size. They studied on very small numbers of pigs. Among scavenging pigs, as high as 91% infection with gastro intestinal nematodes also reported (Tamboura et al. 2006). In another study, 97.6% pigs have been found as infected with one or more gastrointestinal parasites in Cameroon (Tchoumboue et al. 2000), which is definitely much higher than the present study. The overall prevalence of GI nematodes in pigs as 84.2% with mean EPG 2355 have been reported from abroad (Kagira et al. 2012). From West Bengal, overall 52.23% pigs were found to infect with different GI parasitic infections (Dutta et al. 2005). A report from Jammu revealed much higher percentage (80.64%) of GI parasitic infections in pigs (Khajuria et al. 2010). Kumari et al. (2002) reported 60.62% GI parasitic infections in pigs of Bihar. In earlier studies in Meghalaya, 68.38% pigs

(Yadav and Tandon 1989) and 47.85% pigs (Chandra and Ghosh 1989) were found infected with one or more species of GI nematodes. But in the present study comparatively less percentage of pigs (36.34%) were found to be infected with GI parasites in Meghalaya might be due to variation of places of collections, long interval of time period of collections and consciousness of farmers about the use of anthelmintics or antiparasitic agents. A lower percentage of infection (22%) in Mizoram in comparison to present study (34.45%) reported earlier (Deka et al. 2005). In support of the present study, *Ascaris suum* has been found to be most prevalent parasite in pigs as reported earlier in India (Yadav and Tandon 1989; Kumari et al. 2002; Deka et al. 2005) as well as abroad (Tamboura et al. 2006; Tomass et al. 2012). The prevalence of intestinal parasites in pigs as 68.78% without the presence of *Ascaris suum* also reported from Grenada, West Indies (Tiwari et al. 2009). Among these four states lowest percentage of infections with lowest EPG was recorded in Mizoram. The housing method of pigs followed by the farmers of Mizoram is different from the housing patterns of pigs of other NE states. In Mizoram, the floor of the house constructed in an elevation with wooden or bamboo made floor preventing dumping of faecal materials in the floor. This floor remained without contact with ground, which prevent the picking up of the infective stages of parasites directly from ground. In this study highest percentage of infection was recorded in Manipur (60.95%) but these pig showed a lower mean EPG in comparison to Meghalaya and Nagaland which indicates highest percentage of infection does not correlate with highest EPG, that is supported by Tamboura et al. (2006) who also observed that high prevalence of nematode parasites was not correlate with high EPG.

CONCLUSION

As per the present study, overall moderate percentage of pigs of NE states have been found to be infected with GI parasites in comparison to most of the studies done in India and abroad. Still, formulation of appropriate and cost effective strategies to control these GI parasitic infections in pigs of NE Region is very much needed to take the benefit of pig rearing as well as to check the spread of infections.

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