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Prevalence of gastrointestinal parasites affecting pig farms of West Bengal, India

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Abstract

Gastrointestinal parasites in pigs of Kolkata and Jalpaiguri districts of West Bengal maintained under backyard and scientific management system has been studied. A total of 1074 faecal samples and 93 gastrointestinal (GI) tracts of pigs were examined for eggs and adult parasites. The intensity of the majority of parasitic infections recorded was maximum in rainy season and least in summer season. Trematode and nematode infections were maximum in semi-intensive system of management but protozoan infection was maximum in free-range system. Helminthic infection was maximum in the adults (> 2 years) and protozoan infection was higher in piglets (< 6 months). The parasites recorded comprised *Fasciolopsis buski, Gastrodiscoides hominis, Schistosoma suis, Ascaris suum, Trichuris suis, Metastrongylus* **sp.,** *Ascarops strongylina, Physocephalus sexalatus, Strongyloides ransomi, Oesophagostomum dentatum, Hymenolepis* **sp. oocysts of** *Eimeria* **spp. and** *Balantidium coli***.**

Keywords: Prevalence, Gastrointestinal parasites, Pigs.

Introduction

Rearing of pig serves as an important adjunct to the income of economically weaker sections of the rural Bengal. The habit and habitat of pigs make them prone to a variety of gastrointestinal parasitism which is likely to be influenced by the factors like age and breed of the animals, managemental systems and seasons. Moreover, most of these are not only significant in terms of their economic importance, but also for their potentiality as public health hazards (Bhattacharya *et al.*, 1971; Chandra, 1984; Sarma and Gogoi, 1986). No systematic survey of helminths and protozoan parasites of pigs of the plains and the hills of West Bengal have yet been carried out. Therefore, the present work was an attempt to study the prevalence of various GI helminthic and protozoan parasites in pigs of Kolkata and Jalpaiguri districts of West Bengal maintained under backyard and scientific management systems.

Materials and Methods

A total of 1074 faecal samples from pigs of the same breed but of different age groups of both the districts were examined. A part of each faecal sample was kept without preservative for culture of oocysts in 2% potassium dichromate solution and for larval culture, whereas the rest was preserved in 5% hot formalin for identification of various eggs and oocysts. For detection of ova, the faecal samples were examined by the standard sedimentation and floatation technique using saturated solution of common salt (Soulsby, 1982). The identification of the parasites was done on the basis of morphology of the eggs and the larvae obtained from the coproculture. Recovery of worms was made from GI tracts collected from the pig slaughter house at Kolkata. The GI tracts were excised while fresh and the worms were collected separately from each part of the GI tract in 10% formalin. The worms were identified on the basis of their morphological characters after clearing them in lactophenol. Different species of the worms were counted and recorded separately for different parts of the tract.

Results and Discussion

In 1074 faecal samples examined, altogether ova of three species of trematodes *viz.*, *Fasciolopsis buski* (Fig. 1a), *Gastrodiscoides hominis* (Fig. 1b) and *Schistosoma suis* (Fig. 1c), seven species of nematodes *viz.*, *Ascaris suum*, *Trichuris suis*, strongyle sp., *Metastrongylus* sp., *Strongyloides* sp., *Ascarops strongylina* and *Physocephalus sexalatus* and one species of cestode i.e. *Hymenolepis* sp.

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(Fig. 1d) were observed. Out of 93 GI tracts examined at necropsy, 65 were found to harbour the parasites. The data so generated have been systematically represented in Table 1.

The highest prevalence of *F. buski* and *G. hominis* were during the rainy season and these findings simulate with the findings of Roy and Tandon (1942) which might be due to abundance of snail intermediate hosts of both these trematodes during rainy season. During summer and winter seasons, lower prevalence of these two infections might have direct relationship with reduction in population of their snail vectors. A higher trend of prevalence of other nematodes including *A. suum* and strongyle sp. was observed during rainy season and a declining trend in the summer. Similar observations were made by Letkova and Hovorka (1988). Yadav and Tandon (1991), Varma *et al*. (1977) and Dev Sharma and Gogoi (1986). The higher incidence of *Ascarops*, *Physocephalus* and *Metastrongylus* sp. in rainy season than in winter and summer seasons might have direct relationship with the increased population of earth worm and beetle intermediate hosts in this season, favourabale climatic conditions for the development of eggs and larvae, and lowered body resistance of the final host resulting in more parasitic establishment in the gastrointestinal tract.

The higher incidence of *F. buski*, *A. suum* and strongyle sp. and all other nematodes in free range system was in agreement with the earlier reports (Gibbens *et al.*, 1989; Manuel *et al.*, 1989; Safiullin and Sazanov, 1991). The prevalence of *A. suum*, *T. suis* and *Strongyloides* sp. in intensive system of management was relatively low in the present study and did not commensurate with the findings of Safiullin and Sazanov (1991) and Traldi *et al*. (1988) but it was in agreement with Borgsteede *et al*. (1991). The pigs under intensive system of management had least chance to come across with the infected materials and infective intermediate hosts. Thus they had the lowest rate of infection which was in contrast to the semi-intensive and free-range systems of management.

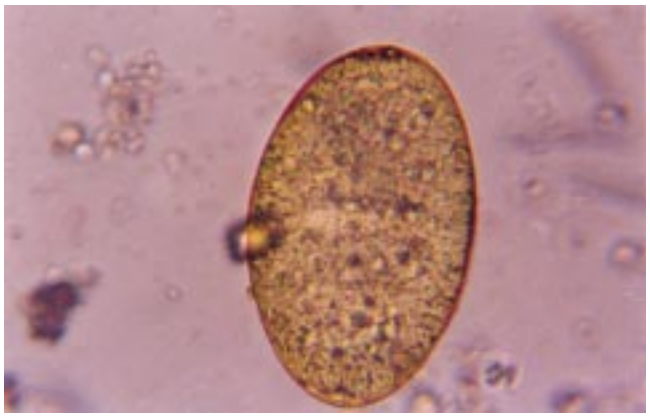

Fig. 1a: Mature egg of *Fasciolopsis buski* (x 400)

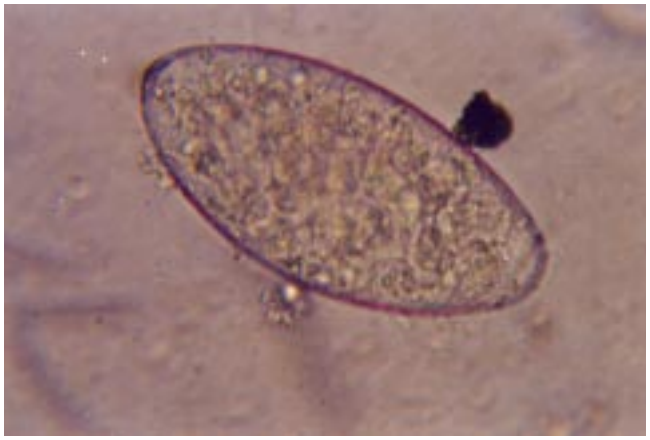

Fig. 1b Mature egg of *Gastrodiscoides hominis* (x 400)

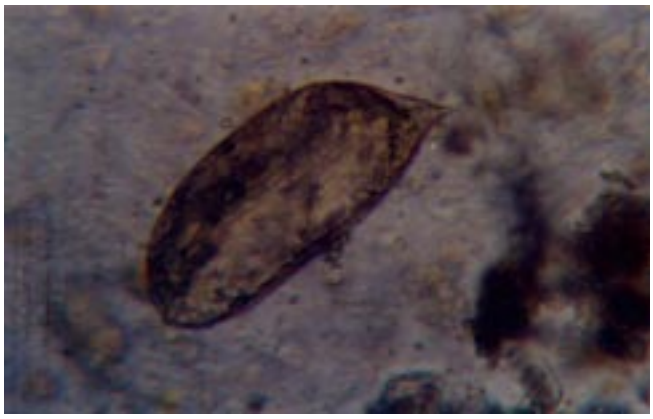

Fig. 1c: Mature egg of *Schistosoma suis* (x 400)

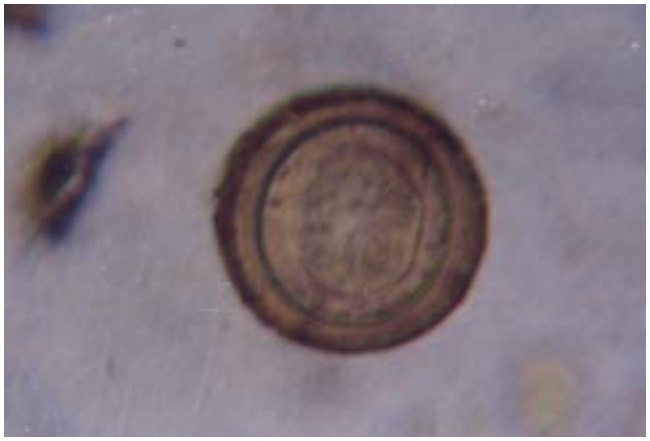

Fig. 1d: Mature egg of *Hymenolepis* sp. (x 400)

Table 1. Season, management system and age-wise prevalence of different gastrointestinal parasites of pigs

Factor	No. of animals examined	Total positive	*Trematodes*			*Nematodes*							*Cestode*	*Protozoa*	
			F. buski	*G. hominis*	*S. suis*	*A. summ*	*T. suis*	Strongyle sp.	*Metastrongylus* sp.	*Strongyloides* sp.	*A. strongylina*	*P. sexalatus*	*Hymenolepis* sp.	*B. coli*	Oocyst of coccidia
A. Summer	252	102 (40.47)	38 (15.07)	27 (10.71)	36 (14.28)	48 (19.04)	14 (5.55)	43 (17.06)	28 (11.11)	12 (4.76)	7 (2.7)	9 (3.57)	- -	78 (30.95)	84 (33.33)
B. Winter	391	176 (45.01)	94 (24.04)	71 (18.15)	61 (19.69)	85 (21.73)	49 (12.53)	94 (24.04)	56 (14.32)	52 (13.29)	18 (4.6)	24 (6.1)	- -	155 (39.64)	153 (39.13)
C. Rainy	431	283 (65.66)	168 (38.97)	124 (28.77)	156 (36.19)	164 (38.05)	79 (18.32)	189 (43.85)	132 (30.62)	96 (22.27)	43 (9.97)	55 (12.76)	17 (3.94)	263 (61.02)	251 (58.23)
A. Intensive	80	31 (38.75)	- -	- -	- -	11 (13.75)	5 (6.25)	21 (26.25)	4 (5.00)	17 (21.25)	- -	- -	- -	27 (33.75)	23 (28.75)
B. Semi-intensive	159	83 (53.20)	48 (30.18)	32 (20.12)	34 (21.38)	38 (23.89)	16 (10.06)	53 (33.33)	28 (17.61)	39 (24.52)	7 (4.40)	9 (5.66)	- -	72 (45.28)	64 (40.25)
C. Free range	835	462 (55.32)	252 (30.17)	190 (22.75)	235 (28.14)	258 (30.89)	121 (14.49)	252 (30.17)	184 (22.03)	104 (12.45)	61 (7.30)	79 (9.46)	17 (2.03)	397 (47.54)	401 (48.02)
A. 0-6 months	198	148 (74.74)	14 (7.07)	4 (2.02)	8 (4.04)	80 (40.40)	17 (8.58)	89 (44.94)	53 (26.76)	47 (23.73)	- -	- -	- (58.08)	115 (69.19)	137
B. 6 months-2 year	217	123 (56.68)	58 (26.72)	42 (19.35)	53 (24.42)	74 (34.10)	28 (12.90)	63 (29.03)	45 (20.73)	34 (15.66)	24 (11.05)	31 (14.28)	3 (1.38)	108 (49.76)	96 (44.70)
C. > 2 year	659	291 (44.15)	238 (34.59)	176 (26.70)	208 (31.56)	153 (23.21)	97 (14.71)	174 (26.40)	118 (17.90)	79 (11.98)	44 (6.68)	57 (8.64)	14 (2.12)	273 (41.42)	254 (38.54)

Figures in parenthesis represent per cent

In the present study, *F. buski*, *G. hominis* and *S. suis* infections were recorded even in animals below 6 months of age which contradicts the findings of Rajkhowa (1996). However, with the increase in age, the incidence of these trematode infections has also increased which was in agreement with Chandra (1984). The zoonotic significance of *F. buski* has been reported among 39% of children in borders of India and Bangladesh (Muttalib and Islam, 1975). This is quite alarming when related with the presence of about 33.9% infection in pigs of the present study. The prevalence of nematode infections, as well as, the protozoan infections, *viz.*, coccidia and *B. coli* was higher in the younger age group, which has substantiated the findings of Marti and Hale (1986) and Rajkhowa (1996). The suckling habit of the young pigs and increased susceptibility due to young age might have contributed to the higher incidence of such infections in this age group. A good number of the faecal samples (2.12-3.94%) were found to be positive for taenid eggs. But on examination of GI contents no worms were recovered. In the present study, this has been identified as *Hymenolepis* sp. eggs considering their coprophagous habits with human stool. But we could not assure that the pigs did not harbour infection with host specific cestodes. Out of 1074 faecal samples 17 (1.58%) showed the presence of *Hymenolepis* eggs, however, none of the 93 GI tracts examined revealed this cestode. Thus this observation might be attributed to the pseudoparasitism as a consequence of coprophagus and scavenging habit of the pigs. However, the status of pigs as a possible host of this cestode needs to be studied further.

Finally when performance criteria of these piggery are considered, total parasitism would certainly reflect direct effect on sow productivity and feed conversion efficiency resulting in poor performances of the pigs under the free range system of management than semi-intensive and intensive systems.

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