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Prevalence of endoparasites in pig in Chittagong, Bangladesh

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ABSTRACT

The aim of the study is to investigate the prevalence of endoparasites of pigs in Bangladesh. The study was conducted in different areas of Chittagong district from May to August, 2014. Fecal samples were collected from 86 pigs and examined by using direct smear and Stoll's ova counting techniques. All animals were found infected with one or more species of parasites. Five species were identified, namely *Schistosoma* sp (24.41 %), *Fasciolopsis* sp (66.27%), *Ascaris* sp (70.93%), *Strongyloides* sp (38.37%) and *Balantidium* sp (52.32%). The prevalence of gastrointestinal parasites in relation to age and sex were examined. Data showed that there was no significant ($p>0.05$) difference among piglets, growers and adults. No significant difference was observed in infection rates between male and female ($p>0.05$). EPG/CPG/OPG was calculated and ranged from 100-1500. It is concluded that gastrointestinal parasites were prevalent in pigs in the study area. However, further investigation is needed to find out possible impact of parasitic infestations of pigs on public health.

Keywords: Prevalence, parasitism, endoparasites, pig, Bangladesh.

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INTRODUCTION

In global perspective, pigs are used for production of meat and bristles (Long et al., 1990). Pork is an important source of protein in western countries (Hossain et al., 2011). In Bangladesh pigs are reared in some areas, such as in Chittagong Hill districts, Narayangonj, Mymensingh, Tangail, Naogaon, Dinajpur and Barisal districts by some ethnic communities for household consumption (Islam et al., 2006).

The indigenous pig predominates to smallholders where it is kept under the free range system and thrives on low planes of nutrition. These pigs are primarily scavengers, utilizing food scraps thrown away by people. The roaming of pigs favors the uptake of internal parasitic eggs, making the pigs particularly susceptible to infestation with internal parasites. Moreover, the warm and humid conditions of the tropics and the inadequate treatment of local pigs against parasitic diseases invariably cause them to carry heavy burdens of gastrointestinal nematodes. Pigs can harbor a range of parasites and diseases that can be transmitted to humans. These include trichinosis, taeniasis, cysticercosis and fasciolosis. Gastrointestinal parasites occur frequently in domestic pigs in all kinds of production systems and all around the world. Because pigs are omnivores and eat any kind of food, including dead insects, worms, tree bark, rotting carcasses, garbage, kitchen waste and even human excreta. Swine raised in intensive operations are less prone to gastrointestinal infection however; the large round worms (*Ascaris* sp), whipworms (*Trichuris* sp) and the nodular worms (*Oesophagostomum* sp) are often found in such operation (Weng et al., 2005; Eijck and Borgsteede, 2005). Nevertheless, they have generally received much less attention than other ruminant endoparasites. The main reason is presumably that most common porcine endoparasites very seldom cause clinical disease

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and therefore remain largely unrecognized by farmers.

The major helminth species in temperate pig production include *Ascaris suum*, *Trichuris suis* and *Oesophagostomum* sp. Despite the common subclinical course of infections, pigs infected with one or more of the above mentioned species have reduced food utilization and growth rate (Hale and Stewart, 1979; Hale et al., 1981, 1985). Sometimes larval migration of *Ascaris suum* results in substantial liver condemnations (reviewed by Roepstorff et al., 2011). They have also been associated with depressed immunity in infected animals leading to decreased ability to fight off infection, thereby predisposing them to concurrent infections with pathogens (Intervet, 2011).

Some porcine parasites can be transferred to humans, especially farmers directly or indirectly. *Ascaris suum* and *Trichuris suis* are zoonotic parasites and closely related to *Ascaris lumbricoides* and *Trichuris trichiura* which infect 1221 and 795 million people worldwide, respectively (De Silva et al., 2003). Pigs infected with gastrointestinal parasites is widely reported from all corners of the world and shown to be influenced by the type of pig management practiced. Poor husbandry practices along with extensive management are reported as risk factors of infection of pigs with GI parasites. In view of the above, it is assumed that helminthiasis is one of the major problems for the pig, but no attention has been paid to study the prevalence in pigs in Bangladesh. Considering the above facts, the present study was undertaken to investigate the prevalence of gastrointestinal parasitic infestations in pigs in Chittagong, Bangladesh.

Study area

The study was cross-sectional type and the samples were collected from different places (Firingi bazaar, Sadar Ghat and Rangamati Sadar) of Chittagong. Identification and other works were done in the laboratory, Department of Parasitology, Faculty of Veterinary Science, Bangladesh Agricultural University (BAU). The study was conducted during a period from May to August, 2014.

Selection of animal

Eighty six (86) pigs were selected randomly irrespective of age and sex. The age of the pig was determined following the method described by Samad (2008). According to the age, the pigs were divided into three groups such as piglet (<7 month, n=30), growers (7-12 month, n=24), adult (>12 month, n=32). Pigs were grouped into males (n = 25) and females (n = 61).

Collection and preservation of fecal Sample

After taking all relevant information, samples (feces) were collected from selected pigs (86). About 10 grams of fecal samples were collected from freshly voided feces, directly from anus taking the hygienic measures to avoid contamination. Each sample was kept in separate polythene bag; tied carefully, numbered properly and the samples were preserved in 10% formalin. The fecal samples (with all required information) were brought to the laboratory and refrigerated at 4 degree celcius and examined as early as possible.

Examination of fecal samples

The fecal samples were processed for microscopic examination of egg, ova or cyst by direct smear method as described by Soulsby (1982). The ova / cyst of different parasites were identified according to the morphology and quantitative estimation modified Stoll's Ova Counting technique for counting the EPG/CPG (eggs /cysts per gram of feces) Following the procedure described by Urquhart et al., 1996; Soulsby, 1982.

Statistical analysis

The data were entered into Microsoft Excel and analyzed through SPSS (Version 2007).

RESULTS AND DISCUSSION

Prevalence of gastrointestinal parasites in pigs

During this study period, a total of 86 fecal samples were examined. All the samples (100%) were found to be infected with one or more species of endoparasites. Five types of endoparasites were

Table 1
Overall prevalence of gastrointestinal parasites of pig (n=86).

Name of parasites	No. Infected	Prevalence (%)	EPG Range	ME ± SE
Schistosoma sp.	21	24.41	100-300	29.41±6.44
Fasciolopsis sp.	57	66.27	100-700	103.53±12.80
Ascaris suum	61	70.93	100-500	120±12.39
Strongyloides sp.	33	38.37	100-1000	108.24±20.51
Balantidium coli	45	52.32	100-1500	228.24±33.08
Overall	86	100	100-1500	117.89±17.04

Table 2
Age related prevalence and burden of eggs of endoparasites in pigs (n=86).

Parasites	Piglet (<7 Months, N=30)		Grower (7-12 Months, N=24)		Adult (12 Months, N=32)	
	No. of infected (% Prevalence)	EPG (ME±SE)	No. of infected (%Prevalence)	EPG (ME±SE)	No. of infected(% Prevalence)	EPG (ME±SE)
Schistosoma sp.	11(36.67)	100-300 (47±13.3)	7 (29.17)	100-200 (38±13.2)	3 (9.38)	100 (9±5.2)
Fasciolopsis sp.	20 (66.67)	100-1500 (110±22.2)	10 (41.67)	100-300 (75±21.1)	26 (81.25)	100-1100 (122±21.9)
Ascaris suum	22 (73.33)	100-500 (137±22.2)	18 (75)	100-400 (142±26.9)	21 (65.63)	100-300 (96.67±15.52)
Strongyloides sp.	10 (33.33)	100-1000 (143±46.7)	10 (41.67)	100-600 (125±39.1)	13 (40.63)	100-300 (75±18.5)
Balantidium coli	16 (53.33)	100-1500 (223.33±57.3)	13 (54.17)	100-1200 (238±66.2)	16 (50.00)	100-1100 (231±50.9)
Total	30 (100)	100-1500 (132.06±32.34)	24 (100)	100-1200 (123.6±33.3)	32 (100)	100-1100 (133.33±29.59)
P-Value	P=0.519 P>0.05=Statistically Non Significant					

Table 3
Sex related prevalence and burden of eggs of endoparasites in pigs (n=86).

Name of parasites	Male (25)		Female (61)	
	No. of infected (% Prevalence)	EPG (ME±SE)	No. of infected (% Prevalence)	EPG (ME±SE)
Schistosoma sp.	3 (12)	100-300 (20±12.9)	18 (29.51)	100-200 (34±7.3)
Fasciolopsis sp.	16 (64)	100-700 (112±29.6)	41 (67.21)	100-500 (102±13.3)
Ascaris suum	16 (64)	100-300 (120±22.4)	35 (57.37)	100-500 (121±14.8)
Strongyloides sp.	9 (36)	100-700 (116±40.3)	24 (39.34)	100-1000 (111±24.4)
Balantidium coli	14 (56)	100-1500 (276±75.1)	31 (50.82)	100-1200 (211±34.6)
Overall	25 (100)	100-1500 (128.8±36.06)	61 (100)	100-1200 (115.8±18.88)
P-Value	P=0.562 P>0.05=Statistically Non Significant			

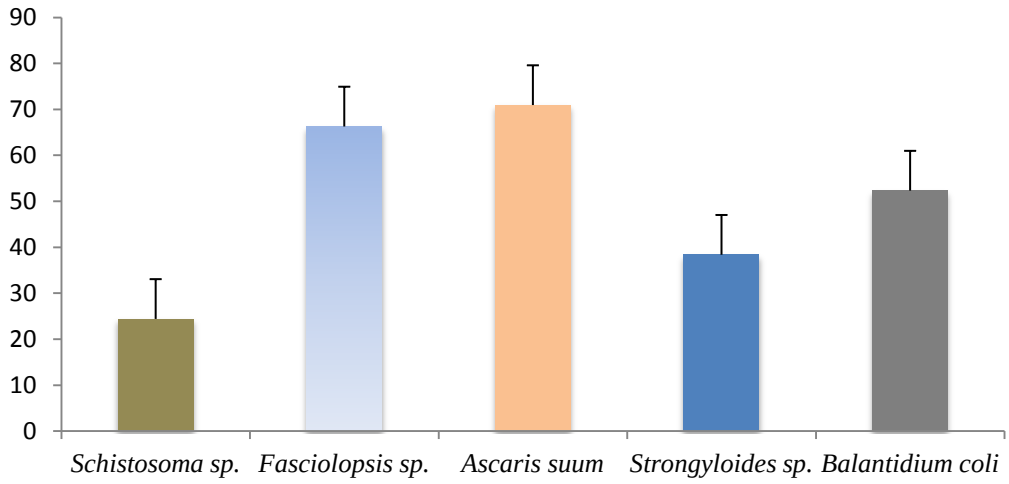

Figure 1
Prevalence of different parasitic eggs in the study population. T= Error Bar

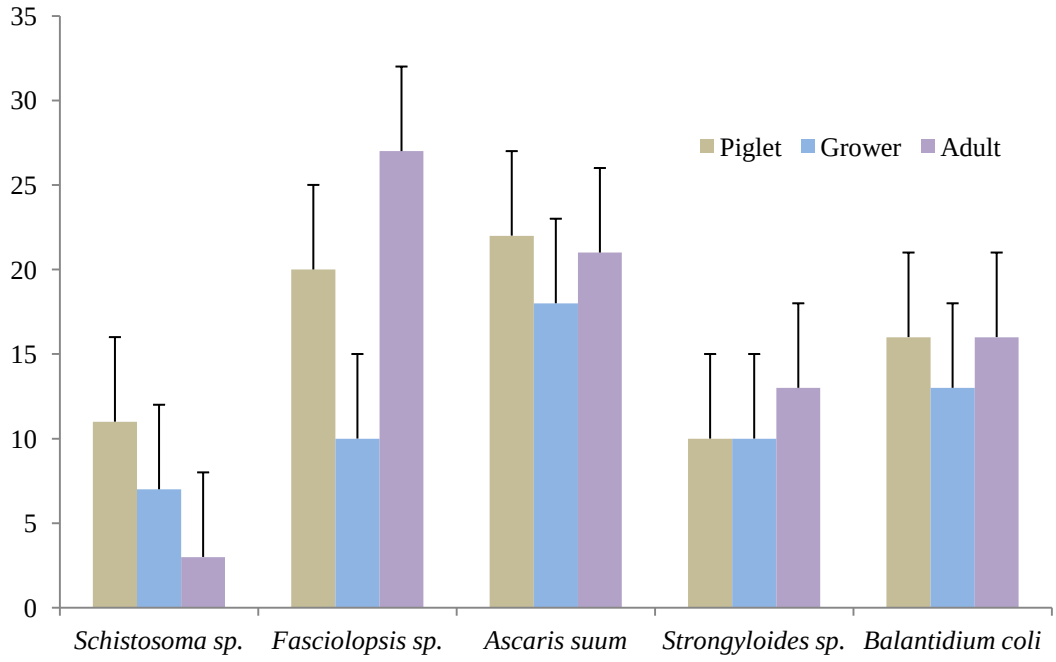

Figure 2
Age related prevalence in pigs. T= Error Bar.

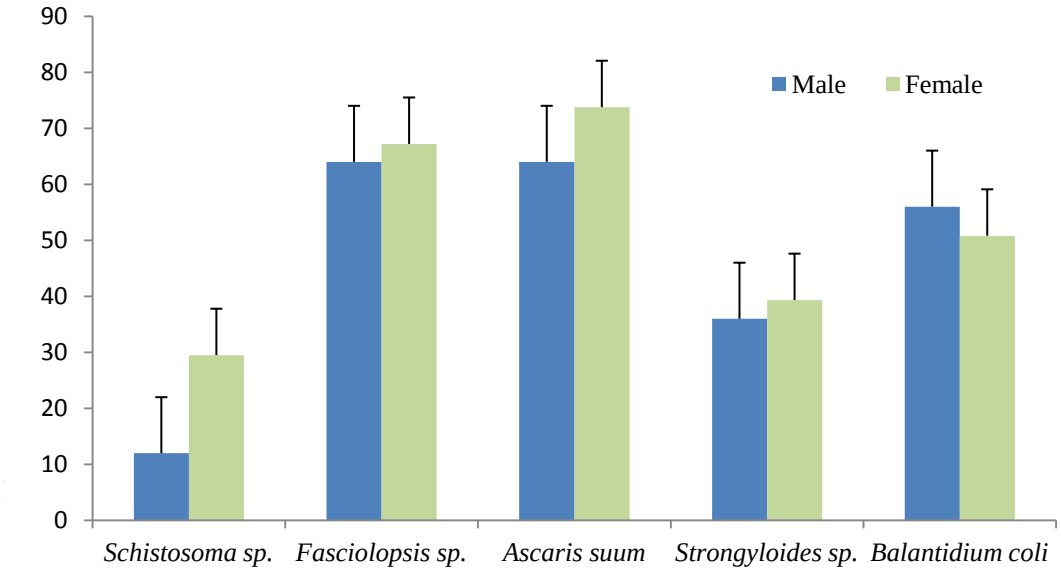

Figure 3
Sex related prevalence of gastrointestinal parasitic infection in pigs. T= Error Bar

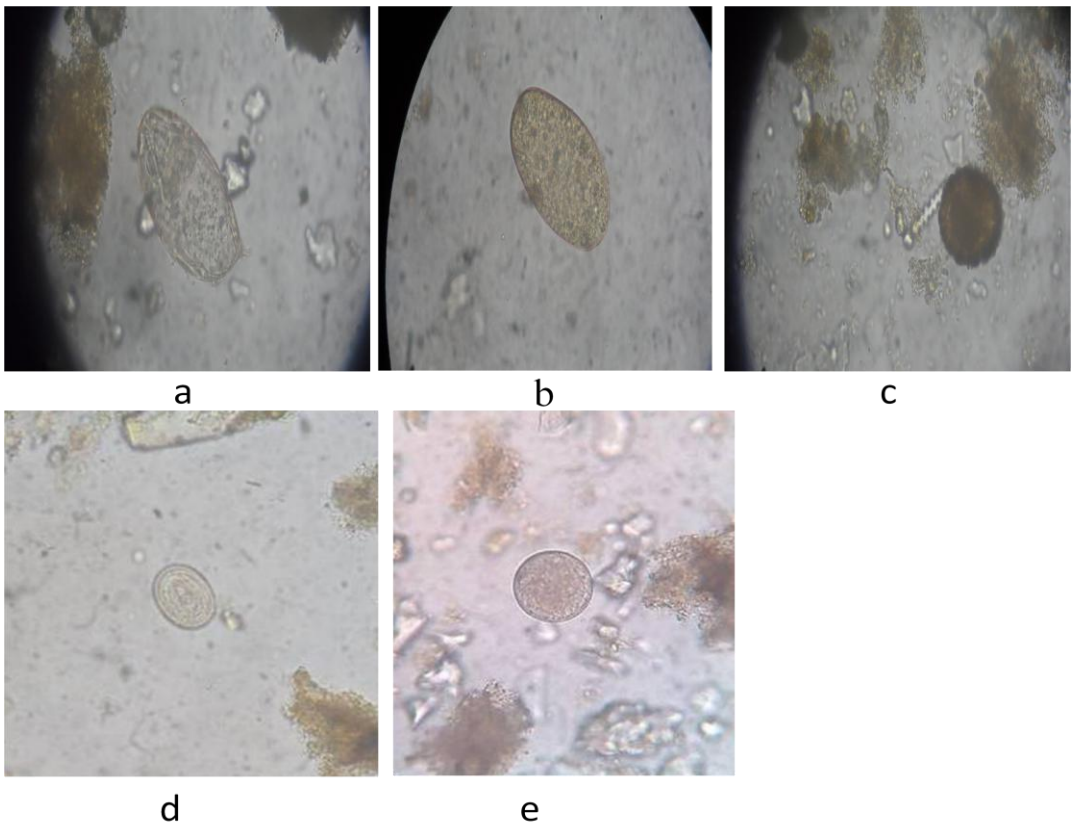

Figure 4
Egg of endoparasite of pig. a) egg of *Schistosoma* sp. b) Egg of *Fasciolopsis* sp c) Egg of *Ascaris* sp. d) Egg of *Strongyloides* sp. e) Cyst of *Balantidium* sp; view at 40X.

detected. Among them two species were trematode namely, *Schistosoma* sp. (24.41%) and *Fasciloposis* sp. (66.27%); two species were nematode *Ascaris suum* (70.93%) and *Strongyloides* sp. (38.37%); one species of protozoa, *Balantidium coli* (52.32%). In this study, EPG/CPG was ranged from 100-1500. The highest CPG was observed in *Balantidium coli* (1500) followed by *Strongyloides* sp., *Fasciolopsis* sp., *Ascaris suum* and lowest in case of *Schistosoma* sp. (300). Mean EPG/CPG ± SE, count was also higher in case of *Balantidium coli* followed by *Ascaris suum*, *Strongyloides* sp., *Fasciolopsis* sp. and lowest in case of *Schistosoma* sp. (Table 1).

During the investigation, all pigs were found infected with one or more species of parasites. Similar results were reported by Islam et al., (2013) and Ruta et al., (2009), who reported that 100% pigs were found to be infected with endoparasites in Bangladesh and Italy, respectively. On the other hand, more or less similar results were found by Dey et al., (2013), and Tamboura et al., (2006) who reported 96.4%, 94.8% and 91% prevalence, in Bangladesh, Uganda and Burkina Faso, respectively. But in the present study the value was higher than reported by Tomass et al., (2013) in Ethiopia (72%) and Tiwari et al., (2009) in Grenada (68.78%). In this study, irrespective to age and sex, overall prevalence of *Ascaris* sp. was 70.93%. The lower prevalence from the present study was found by Tomass et al., (2013) in Ethiopia (25.9%). The differences in the prevalence might be due to the differences in geographical distributions, climatic conditions, deworming status, breeds and husbandry practice in the study area.

Age related prevalence of endoparasites

In this study, all age groups were equally infected with gastrointestinal parasites. The prevalence among the age groups were statistically insignificant ($p>0.05$). The prevalence of parasites in different age group is shown in Table 2. It was revealed that, age of pig had no significant ($p>0.05$) effect on endoparasitic infection. All age groups were equally infected with endoparasites. The present study was supported by Pam et al., (2013), Tiwari et al., (2009) and Nsoso et al., (2000) who reported that the prevalence had no significant ($p>0.05$) effect on age groups in Plateau State, Grenada and Botswana, respectively. The present finding disagreed with Dey et al., (2013) who reported that there was significant ($p<0.05$) difference in age group in Mymensingh district of Bangladesh. The differences between the present and previous studies might be due to husbandry practices, number of animal examined, acquired resistance by the older group and geographical location of study area.

Sex related prevalence of gastrointestinal parasite infection

In the present study, there was no significant difference in respect of ($p>0.05$) sexes. The prevalence of identified parasites according to the sex of animals is presented in Table 3. It was recorded that the sex difference has no significance on the prevalence of the endoparasites. Pigs in both sexes were equally infected. The present study was supported by Dey et al., (2013), Pam et al., (2013) and Nsoso et al., (2000), who reported insignificant difference between sexes in Bangladesh, Plateau State and Botswana, respectively. This finding differed from the earlier study of Tamboura et al., (2006) and Sowemimo et al., (2012), who reported that the prevalence of endoparasites in relation to sex had significant effect ($p<0.05$) in Burkina Faso and Nigeria, respectively. The differences might be due to rearing system, feed habit number of animal examined etc.

CONCLUSION

It can be concluded that the identified endoparasites were prevalent in pigs in the study area. There was no significant effect of prevalence in relation to age and sex. Because there was at least one or more species of parasites found in each sample. The intensity of endoparasitic prevalence was very high in scavenging pigs. Further study is needed to determine the topographical variation, seasonal pattern of the diseases as well as different breeds of pigs.

REFERENCES

De Silva NR, Brooker S, Hotez PJ, Montresor A, Engels and Savioli L (2003). Soil transmitted helminth infections: Updating the global picture. Trends Parasitology**,** 19: 547–551.

Dey TR, Dey AR, Begum N, Akther S and Barmon BC (2013). Prevalence of endoparasites of pig at Mymensingh, Bangladesh. International Organization of Scientific Research Journal of Agriculture and Veterinary Science**,** 7: 31-38.

Eijck I, and Borgsteede F (2005). A survey of gastrointestinal pig parasites on free-range, organic and conventional pig farms. The Netherlands Veterinary Research Communications, 29: 407–414**.**

Hale OM and Stewart TB (1979). Influence of an experimental infection of *Trichuris suis* on performance of pigs. Journal of Animal Sciences, 49: 1000–1010.

Hale OM, Stewart TB and Marti OG (1985). Influence of an experimental infection of *Ascaris suum* on performance of pigs. Journal of Animal Sciences, 60: 220–225.

Hale OM, Stewart TB, Marti OG, Wheat BE and Mc Cormick WC (1981). Influence of an experimental infection of nodular worms (*Oesophagostomum* spp.) on performance in pigs. Journal of Animal Sciences, 52: 316-322.

Hossain ME, Chakma S, Khatun MM, Hasanuzzaman M, Miah MY and Biswas MAA (2011). Production systems of swine in the rural areas of Rangamati and Khagrachari Districts of Bangladesh. Bangladesh Journal of Animal Sciences, 40(1-2): 28-33.

Intervet 2011: www.intervetusa.com.

Islam MS, Khan MSI, Kader HA, Begum MR, Akter S and Hassan MN (2013). Study on helminthes parasites of pig in Barisal and Patuakhali Districts. Bangladesh Journal of Progressive Science and Technology, 11(1): 121-124.

Islam A, Majumder S, Anisuzzaman, Rabbi AKMA and Rahman MH (2006). Helminthiasis in pigs in Bangladesh in relation to age and management systems. Bangladesh Veterinary Journal, 40: 27-37.

Long JBD, Shleifer A, Summers LH and Waldmann RJ (1990). The Journal of Political Economy, 98(4): 703-738.

Nsoso SJ, Mosala KP, Ndebele RT and Ramabu SS (2000). The prevalence of internal and external parasites in pigs of different ages and sexes in Southeast District, Bostwana. Onderstepoort Journal of Veterinary Research, 67: 217-220.

Pam VA, Daniel LN, Bata SI, Udokaninyene AD, Hassan AA, Kemza SY, Igeh CP and Ogbu KI (2013). An investigation of haemo and gastrointestinal parasites of pigs in some parts of Langtang North Local Government Area of Plateau State. Journal of Veterinary Advances**,** 3(2): 79-86.

Roepstorff A, Mejer H, Nejsum P and Thamsborg SM (2011). Helminth parasites in pigs: new challenges in pig production and current research highlights. Veterinary Parasitology, 180 (1-2): 72-81.

Ruta M, Anna K, Pēteris K, Edgars L, Dace K, Evija E, Daina IMR, Keidāns P, Liepiņš E, Keidāne K, Eihvalde E, Ikauniece D 2009: Parasitic infestation of animals in deer gardens in Latvia. Acta Biologica universitatis Daugavpiliensis**,** 9(1): 109 –114.

Samad MA (2008). Animal Husbandry and Veterinary Science, pp. 244-245.

Soulsby EJL (1982). Helminthes, Arthropods and Protozoa of Domesticated Animals. 7th Edition,. Baillere, Tindall, London. pp. 707-735.

Sowemimo OA, Asaolu SO, Adegoke FO and Ayanniyi OO (2012). Epidemiological survey of gastrointestinal parasites of pigs in Ibadan, Southwest Nigeria. Journal of Public Health and Epidemiology, 4(10): 294-298.

Tamboura HH, Banga-Mboko H, Maes D, Youssao I, Traore A, Bayala B and Dembele MA (2006). Prevalence of common gastrointestinal nematode parasites in scavenging pigs of different ages and sexes in Eastern Centre Province, Burkina Faso. Ondersteport Journal of Veterinary Research, 73: 53-60.

Tiwari KP, Chikweto A, Belot G, Vanpee G, Deallie C, Stratton G and Sharma RN (2009: Prevalence of intestinal parasites in pigs in). Grenada, West Indies. West Indian Veterinary Journal, 9 (1): 22-27.

Tomass Z, Imam E, Kifleyohannes T, Tekle Y and Weldu K (2013). Prevalence of gastrointestinal parasites and *Cryptosporidium* sp. in extensively managed pigs in Mekelle and Urban Areas of Southern Zone of Tigray Region, Northern Ethiopia. Veterinary World**,** 46: 433-439.

Urquhart GM, Armour J, Duncan JL and Jennings FW (1996). Veterinary Parasitology, Blackwell Science Limited. 2nd Edition pp. 242-251.

Weng YB, Hu YJ, Li Y, Li BS, Lin RQ, Xie DH, Gasser RB and, Zhu XQ (2005). Survey of intestinal parasites in pigs from intensive farms in Guangdong Province, People's Republic of China. Veterinary Parasitology**,** 127(3-4): 333–336.