

Prevalence of Helminths in Adult Pigs in Hunan Province, China

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Abstract: Little information is available about prevalence of helminthes in pigs in Hunan Province. In the present study, the prevalence of helminths in adult pigs was investigated in Hunan Province, People's Republic of China between 2009 and 2012. A total of 690 pigs slaughtered in local abattoirs from ten representative administrative regions in Hunan Province were examined for the presence of helminths using traditional helminthological approach. The worms were examined, counted and identified to species according to existing keys and descriptions. A total of eight species of helminths were found in pigs which represent three classes. The results of the present investigation have important implications for the control of helminth infections in pigs in Hunan Province, China.

Key words: Prevalence, pigs, helminthes, Hunan Province, China

INTRODUCTION

Pigs are relevant as reservoir for parasites that can affect other domestic animals and human some of which are responsible for several zoonotic diseases. The prevalence of helminths in pigs has been elucidated in a number of investigations from all parts of the world (Nganga *et al.*, 2008). Some study showed that the *Ascaris suum* and *Trichuris suis* are high prevalence in pigs in many developing countries including China (Nejsun *et al.*, 2005). Pigs are the definitive hosts to a number of other helminths which can result in significant health problems as well as financial losses globally (Stephenson, 1994; Sargison *et al.*, 2010). In addition, it is well recognized that the helminth infections of pigs are major factors responsible for production losses in pig industry in the world (Roepstorff *et al.*, 2011).

In the past decade, Hunan Province has undergone major socio-economic development which has resulted in a huge increase in living standards and the changing of life styles. As a result, more and more pigs are intensively raised. In addition, the helminths have global distribution and their prevalence in pig herds might be underestimated so, it can cause significant health problems as well as economic losses globally (Liu *et al.*, 2010). More

importantly, many helminths can also infect human and are considered as significant pathogens (Dai *et al.*, 2009). Therefore, investigation of helminths infection in pigs has important implications for the prevention and control of these parasites in human and animals. Little information is available about prevalence of helminthes in pigs in Hunan Province (Liu *et al.*, 2009).

The objective of the present investigation was to examine the prevalence of helminths in pigs from intensive farms in Hunan Province. The results would provide foundations for the improved control of helminths infection in pigs in this province.

MATERIALS AND METHODS

Hunan Province is situated in the central Eastern part of mainland China between the Northern latitudes of 25°-30° and Eastern longitudes of 109°-114°. The climate is humid subtropical monsoon with an average annual temperature of 16-18°C. The average annual rainfall ranges from 1200-1700 mm. Hunan Province is divided in to 14 administrative regions (Dai *et al.*, 2009) with the city of Changsha as its capital.

The survey took place between 2009 and 2012. Adult farmed pigs slaughtered in local abattoirs in nine

Table 1: Geographical origins (Hunan Province, China) and number of adult pigs examined in this survey

Geographical locations	Number (%)
Mountainous area	
Chenzhou	40 (5.8)
Huaihua	20 (2.9)
Yongzhou	110 (15.9)
Shaoyang	45 (6.5)
Hilly area	12 (1.7)
Changsha	150 (21.7)
Xiangtan	30 (4.3)
Zhuzhou	35 (5.1)
Hengyang	90 (13.0)
Lake area	12 (1.7)
Yueyang	60 (8.7)
Changde	110 (15.9)
Total	690

administrative regions of Hunan Province (Table 1) were sampled randomly. The stomach, oesophagus, small intestine, liver, pancreas, lungs and the body cavities and intestines were examined for the presence of helminths.

Worm counts were performed on all washings or a proportion of total washings depending on the total number of worms present. All worm specimens were identified according to previous reports (Dai *et al.*, 2009; Liu *et al.*, 2009). The mean prevalence rate was calculated by dividing the number of infected pigs with the total number of pigs examined and expressed as a percentage.

RESULTS AND DISCUSSION

In the present investigation, a total of eight species of helminthes including one trematode, one cestode and six nematodes were found from a total of 690 adult farm pigs. They represented two phyla, 3 classes, 6 families and 8 genera. The species of worms found and their organs of predilection, prevalence and intensities of infection (ranges) are listed in Table 2. Prior to the present investigation there were no reports of prevalence of helminth infection in pigs in Hunan Province, China. In addition to those shown in Table 2 and 23 other helminth species have been documented to infect dogs in Hunan Province (Chen and Ye, 2000). Taken together, a total of 33 helminth species have been recorded in pigs in Hunan Province. The overall prevalence found in the present study was 50.2% with helminths infection which is consistent with previous results in other provinces of China (Yang and Jiang, 2000; Liu and Lu, 2002; Liao *et al.*, 2007; Xiao *et al.*, 2004) indicating the frequent circulation of helminth infection in China. The overall prevalence of helminth was similar to that reported in Canada (Gladden and Canaris, 2009) and Veneruela (Robinson and Dalton, 2009) but lower than that in Japan (Sato and Suzuki, 2006). This may be attributed to different animal welfares and husbandry practices. Some helminths

Table 2: Species, organs of predilection, prevalence and intensity of infection of helminthes in adult pigs in Hunan Province, China

Helminth species	Organs of predilection	Prevalence No. (%)	Intensity of infection
Cestoda			
<i>Cysticercus tenuicollis</i>	Mesenterium	25.7	1-32
Nematoda			
<i>Ascaris suum</i>	Small intestine	52.2	1-58
<i>Oesophagostomum columbianum</i>	kolon	32.2	1-78
<i>Strongyloides</i>	Small intestine	20.3	1-36
<i>Trichuris</i>	Blind gut	45.3	1-102
<i>Metastrongylus</i> sp.	Lung	3.6	1-28
<i>Gnathostoma</i> sp.	Gastric wall	5.2	1-5

reported previously in Hunan Province were not found in the present investigation mostly likely due to the change of husbandry practices and the increase in animal health and welfares. Only one trematode and one cestode species were found in all pigs in this province in the present study, this is not surprising because trematodes and cestodes of pigs are rare in recent years since, pigs are usually raised intensively and seldom accessible to intermediate hosts of trematodes and cestodes.

Importantly, six of the eight helminth species of pigs can also infect humans and may cause significant clinical human diseases such as trichuriasis, ascariasis and gnathostomiasis (McCarthy and Moore, 2000). The results of the survey revealed that pigs are the definitive host for a number of helminths and these helminths (*Trichuris*, *Toxocar* and *Gnathostoma* sp.) can infect domestic animals, causing major health problems in humans and significant economic impact on animals (Morgan *et al.*, 2005). Therefore, integrated control strategies and measures should be implemented to prevent and control the infection of pigs with helminths in this province thus, reducing risks for human infection with those helminths of zoonotic significance.

CONCLUSION

The results of the present survey indicated that helminth infections of pigs are highly prevalent in pigs in Hunan Province. However, this severe situation has received little attention in the past. Therefore, it is imperative to take integrated control strategies and measures to prevent and control helminth infections in pigs in this province and elsewhere in China.

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