

THE IDENTIFICATION OF HELMINTHS AND COCCIDIA INFECTION FROM GOATS IN TWO FARMS IN KUALA TERENGGANU, MALAYSIA

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Abstract

Helminths and coccidia are major causative agents causing parasitic infections in livestock production. The present study aimed to determine the prevalence and intensity of gastrointestinal helminths and coccidia in goats in Terengganu, Malaysia. A total of 227 goats which consists of 107 adult goats and 120 young goats were selected randomly from two farms located in Terengganu, Malaysia. Sodium chloride flotation technique was used to identify helminths eggs and coccidia oocysts. The number of eggs per gram and faecal oocysts count were determined by using modified McMaster technique. Out of 227 goats, 221 goats were positive for gastrointestinal parasites giving the overall prevalence 97.36%. The highest prevalence was recorded for *Eimeria* (89%) followed by *Strongyloides* (46.3%), *Strongyle* (18.1%), *Monezia* (10.6%) and the lowest prevalence was recorded for *Trichuris* spp. (9.7%). *Coccidia* oocyst counts were significantly higher in young goats as compared to adult goats while the *Strongyle* and *Strongyloides* egg counts were significantly higher in adult goats compared to young goats ($P < 0.05$). The findings of this study suggested that good management practices and proper hygiene management are important to combat the infection so that there will be no case of parasitic infection among goats in the near future in Terengganu.

Keywords: Gastrointestinal parasites, intensity, helminths, coccidia, goats, Terengganu

Abstrak

Cacing dan koksidia adalah agen penyebab utama yang menyebabkan jangkitan parasit dalam pengeluaran ternakan. Kajian ini bertujuan untuk menentukan prevalen dan kekerapan cacing gastrousus dan koksidia di kambing di Terengganu, Malaysia. Sebanyak 227 ekor kambing yang terdiri daripada 107 ekor kambing dewasa dan 120 anak kambing yang telah dipilih secara rawak dari dua ladang di Terengganu, Malaysia. Teknik natrium klorida pengapungan telah digunakan untuk mengenal pasti telur cacing dan koksidia. Bilangan telur per gram dan oosista kiraan ditentukan dengan menggunakan teknik "McMaster" yang telah diubah suai. Daripada 227 kambing, 221 ekor kambing adalah positif untuk parasit usus memberikan prevalen keseluruhan 97.36%. Prevalen tertinggi dicatatkan adalah *Eimeria* (89%) diikuti oleh *Strongyloides* (46.3%), *Strongyles* (18.1%), *Moniezia* (10.6%) dan prevalen yang paling rendah dicatatkan adalah *Trichuris* spp. (9.7%). Bilangan oosista coccidia adalah lebih tinggi pada anak kambing berbanding kambing dewasa manakala bilangan telur *Strongyle* dan *Strongyloides* adalah lebih tinggi pada kambing dewasa berbanding anak kambing ($P < 0.05$). Hasil kajian ini mencadangkan bahawa amalan pengurusan yang baik dan kebersihan yang betul adalah penting untuk memerangi jangkitan supaya tidak akan ada kes jangkitan parasit antara kambing dalam masa terdekat di Terengganu.

Kata kunci: Parasit usus, kekerapan, cacing, koksidia, kambing, Terengganu

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1.0 INTRODUCTION

Parasitism is recognized as a threat to animal health around the world, resulting in economic losses globally [1]. High prevalence rates of nematodes, trematodes, cestodes, and coccidian were occurred among ruminants in most countries worldwide [2].

In Malaysia, helminth infection by *Trichostrongyle* nematodes is one of the most important causes of mortality and morbidity among livestock [3]. In 2008, a total of 1,239 helminthiasis cases among small ruminants were recorded in Perak, Malaysia [4]. Infectious diarrhea caused by helminths remain as a serious health problem and limitation to high productivity of small ruminants due to morbidity, mortality, treatment cost and lack of control measures [5].

Coccidiosis caused by *Eimeria* is recognized as a common parasitic illness of goats spreading worldwide [5]. In Malaysia, a 10-year study of disease condition on 1,063 necropsied goats in Serdang, Selangor revealed that coccidiosis is one of the major etiological agent observed in enteric cases in goats after worm infection [6].

Coccidiosis may cause economic losses due to high mortality and morbidity, poor growth and high costs of treatment [7]. The disease is getting severe when 4–6 months old kids and other animals are kept in overcrowding houses under stressor factor such as weaning, dietary changes, transportation, and cold or heat climate [8, 9].

In Malaysia, goat farming is one of the crucial agricultural sectors representing a major source of food to human living. The number of goats was 482,280 in 2013, being the third highest after buffalo and cattle [12]. According to data from Consumption of Livestock Products 2004-2013 reported by the Department Veterinary Services, the consumption of mutton accounts the third highest after pork and beef which recorded a total consumption of 26,990 metric tonnes per capita. This data indicates that mutton is one of the most important livestock products in Malaysia. However, parasitic infection has become the limitation in goats farming industry, which is accountable for morbidity, mortality and economic losses to farmers [13].

Previously, there was a study done in Terengganu by Khadijah et al. (2014) [13] concerning about the current status of endoparasite and ectoparasite infections in goats in Kuala Terengganu, Malaysia. However this present study is different with the previous study whereby it concerns on the comparison between the intensity of infection and different age of goats in Kuala Terengganu, Malaysia.

In fact, infection rates of many internal parasites in different age group of goats have been reported previously [10]. Age of animals is one of the main risk factor that contributes to parasitic infection among goats. The infection is more vulnerable to young

animals compared to adult ruminants due to different level of immune system [11].

Since there is a lack of data on the occurrence of parasitic infection and its association with different age of goats in Kuala Terengganu area, therefore this study is carried out to determine the occurrence and intensity of gastrointestinal helminthes and coccidia infections in goats and to determine the association between the infection and different age of goats.

2.0 METHODOLOGY

2.1 Area Description

The study was conducted between February to April 2015 in two farms, located in Mengabang Bakung and Hulu Seladang, Terengganu State, Malaysia.

2.2 Sample Collection

Ethical clearance was obtained from Institutional Animal Care and Use Committee (IACUC), International Islamic University Malaysia (IIUM) and Department of Veterinary Services, Terengganu. A total of 227 goats which consists of 107 adult goats (>2 years old) and 120 young goats (<1 and half years old) were selected randomly from two farms located in Terengganu. Fresh faecal samples were collected directly from the rectum of each goat. The faecal samples were kept in stool container, labelled and stored at 4°C until examined.

2.3 Microscopic Observation

Direct microscopic examination and sodium chloride flotation technique were used to identify eggs and oocysts based on their size, shape and morphological characteristics [14]. In sodium chloride flotation method, the parasite eggs will float to the surface of the floatation medium which has a higher specific gravity than the parasite eggs. The microscopic examination was done by using light microscope under 40x magnification. The number of eggs per gram (EPG) and faecal oocysts count (OPG) were determined by a modified McMaster technique. The floatation solution used was saturated sodium chloride [15]. The McMaster technique uses a counting chamber whereby the faecal suspension can be examined microscopically. The counting of eggs and oocyst were done through light microscope under 10x magnification.

2.4 Statistical Analysis

Statistical analysis was done by using Statistical Package for Social Science (SPSS version 16.0, SPSS Inc., Illinois, USA). Prevalence of gastrointestinal helminths and coccidia were calculated as percentage. Independent t-test was used to

compare the mean of EPG and OPG between age of goats and the different parasites.

3.0 RESULTS AND DISCUSSION

The results showed that most of the samples were positive for gastrointestinal parasites (Table 1). Of a total 227 goats, 221 goats were found positive for gastrointestinal parasites giving the overall prevalence of 97.36%. The result showed that *Eimeria* was the most predominant group found in goats with the percentage of 89% (202/227). Other species found were *Strongyloides* (46.3%), *Strongyle* (18.1%), *Moniezia* (10.6%) and *Trichuris* (9.7%).

Based on Table 2, *Eimeria* oocysts counts were significantly higher in young goats as compared to adult goats ($P < 0.05$). The egg counts for *Strongyle* and *Strongyloides* were significantly higher in adult goats as compared to young goats ($P < 0.05$). For *Trichuris* and *Moniezia* egg counts, the egg counts were higher in young goats as compared to adult but the result was not significant.

Our findings showed that the overall prevalence of gastrointestinal parasites in goats from Terengganu was 97.36% (221/227). The present finding is in agreement with the previous reports by Sangvaranond et al. [10], Singh et al. [16] and Zainalabidin et al. [17] who found high prevalence of gastrointestinal parasites in goats with the percentage of 96.37%, 94.48% and 92.57%, respectively. The high prevalence of gastrointestinal parasites observed in goats might be due to the poor management system including poor nutrition, lack of anthelmintic treatment and little pasture rest period [18].

In the present study, the result revealed that *Eimeria* was the most predominant group found in goats. Similar result was found in a previous local study done in Perak which showed that *Eimeria* infection was higher than helminths in sheep and goats with the percentage of 92.57% (162/175) [17]. Furthermore, the present finding is in line with the previous studies by Terefe et al. [19], Gebeyehu et al. [20] and Mokhtaria et al. [5] who reported that higher infection rate of *Eimeria* than helminths in goats with the percentage of 100%, 67.6% and 77%, respectively. It was found that the higher infection rate of *Eimeria* in goats may be due to the ability of coccidia oocyst to endure unfavourable environmental conditions than helminths' eggs [21].

Current findings showed that *Strongyle*, *Strongyloides*, *Trichuris* and *Moniezia* were the helminths identified in this study. The most prevalent helminth found was *Strongyloides* with the percentage of 46.3% (105/227). The present finding corroborates with the study done by Hassan et al. [22] who reported high prevalence of *Strongyloides* in goats with the percentage of 51.74%. The high prevalence of helminths in goats maybe attributed to the grazing activities on pastures contaminated

with third stage infective larvae of parasitic nematodes [23]. Additionally, warm and moist climate condition throughout the year encourages the development of gastrointestinal nematodes in Malaysia [13].

The present study showed that adult goats were significantly carrying heavy *Strongyle* and *Strongyloides* eggs burden than young goats ($P < 0.005$). Based on the previous studies done in Malaysia, [4,13,17] most of the reports did not discuss on the intensity of parasites with different age of goats. However, the findings of this study coincide with other previous reports [20, 24] that showed heavy worm burden in adult goats than in younger goats. Our findings could be due to intermittent relaxation of immunity at post periparturient periods as suggested by Urquhart [14]. However, the present study do not agree with a previous study by Mokhtaria et al. [5] who claimed that higher *Strongyle* egg counts in young goats as compared to adult goats.

Based on the present study, the OPG counts for *Eimeria* in goats were significantly higher in young goats than adult goats ($P < 0.005$). The result is consistent with the previous studies which reported a higher intensity of *Eimeria* in young goats than adult goats [16, 25]. It is possible that the number of oocysts shed decreased as the animal matured as suggested by Mokhtaria et al. [5]. The decreased of oocyst shed in adult goats can be due to the development of an immunological resistance which is associated to host age and exposure to the parasites [16].

Table 1 Overall the prevalence of different gastrointestinal parasites in all goats (N=227)

Parasites	Number of faecal samples positive	Percent infected (%)
<i>Strongyle</i>	41	18.1
<i>Strongyloides</i>	105	46.3
<i>Trichuris</i>	22	9.7
<i>Moniezia</i>	24	10.6
<i>Eimeria</i>	202	89

Table 2 Mean counts for *Eimeria* oocyst and gastrointestinal helminthes egg per gram in young and adult goats

Parasites	Young (N=120)		Adult (N=107)		P value
	Mean EPG	Mean OPG	Mean EPG	Mean OPG	
<i>Strongyle</i>	5.42 ± 20.29*		60.75 ± 186.08*		0.001
<i>Strongyloides</i>	141.67 ± 294.511*		535.98 ± 855.002*		0.000
<i>Trichuris</i>	13.75 ± 42.98		9.35 ± 69.75		0.573
<i>Moniezia</i>	75.42 ± 413.58		2.80 ± 20.41		0.071
<i>Eimeria</i>		1264.58 ± 2027.0*		538.32 ± 837.13*	0.001

p value of less than 0.05 (*) was considered statistically significant (* $P < 0.05$).

4.0 CONCLUSION

In conclusion, based on the findings, there were helminths and coccidian infections in goats in Terengganu. The findings suggested that control and prevention measures should be taken in order to reduce the gastrointestinal parasitic infections among goats. It is very important to control the infection since goats infected with parasites may serve as potential reservoirs of the infection to other animals and humans especially animal handlers.

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