

Observations on the Worm Egg Counts and Their Nematode Species in Goats from the North-East District of Penang Island, Peninsular Malaysia

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ABSTRAK

Kiraan telur cacing dalam najis dan kehadiran spesis-spesis nematod pada kambing daripada tujuh kandang kambing yang kecil di daerah Timur Laut, Pulau Pinang telah dikaji. Secara amnya kiraan telur adalah tinggi, berjangka antara 500 - 2000 epg. Keadaan iklim di daerah ini adalah sesuai bagi kehidupan dan perkembangan sekurang-kurangnya lima spesis nematod iaitu *Cooperia spp.*, *Haemonchus spp.*, *Oesophagostomum spp.*, *Strongyloides spp.*, dan *Trichostrongylus spp.* Di antara kelima-lima spesis ini *Haemonchus spp.* adalah yang paling dominan.

ABSTRACT

The faecal worm egg counts and the prevalence of nematode species in goats from seven smallholder goat farms in the north-east district of Penang Island were investigated. Generally the egg counts were moderately heavy, ranging from 500 - 2000 epg. The climatic conditions of the district seemed favourable for the survival and development of at least five species of nematodes, namely *Cooperia spp.*, *Haemonchus spp.*, *Oesophagostomum spp.*, *Strongyloides spp.*, and *Trichostrongylus spp.*, of which *Haemonchus spp.* seemed to predominate.

INTRODUCTION

In recent years more attention and interest have been focused on the development of the Malaysian goat industry. However, its development has been constrained by various problems, which include nutrition, breeds, feeds and diseases. Perhaps one of the most important aspects of diseases affecting the health of the animal is worm infestation.

In a review of the trichostrongylid nematodes in the abomasum of goats (*Capra hircus*) in the tropics Rahman (1989) listed various species of nematodes commonly found in tropical goats, of which *Haemonchus spp.*, *Ostertagia spp.*, and *Trichostrongylus spp.* were dominant. Shanta (1982) listed some species of helminths frequently encountered in Malaysian goats, and found that *Haemonchus spp.*, *Trichostrongylus spp.* and *Oesophagostomum spp.* predominate. However, the prevalence of these nematodes was not reported. Ikeme *et al.* (1986) monitored the numbers of infective larvae of nematodes artificially intro-

duced into pasture. More recently, incidences of various parasites in goats have also been reported by Sheikh Omar & Chulan (1980), Sani *et al.* (1985) and Amin Babjee *et al.* (1990) from the central part of Peninsular Malaysia.

The present investigation was carried out to assess and record the prevalence of the various species of nematodes commonly found in goats in Penang Island, off the coast of Peninsular Malaysia.

MATERIALS AND METHODS

General

Seven smallholder goat farms located in the north-eastern district of Penang Island, off the west coast of Peninsular Malaysia, were selected for the study. These goat farms were located at Air Itam, Gelugor, Island Glades, Jelutong, Perak Road, Kampong Kastam and Sungai Nibong. The number of goats at each of these farms varied between 56 and 78 animals and all animals grazed freely in the surrounding areas. All goats were of

the local indigenous variety (kambing kacang) and raised solely for their meat. All animals had not been treated with any anthelmintic during the previous six months. Samples were collected once. This was carried out in the month of January 1990, which is the dry season for this part of the country.

Collection and examination of faecal samples

Faecal samples were collected from the rectum of each goat and brought back to the laboratory for examination. Faecal worm egg counts were made by the universal flotation technique (Whitlock 1948). Two replicates were counted and the mean of the two recorded. The remainder of the faecal samples was used for cultures.

Culture of faeces and examination of larvae

All faecal samples from each farm were pooled. Using a spatula, faecal samples were broken into pieces in a petri dish partially filled with distilled water. The faecal mesh was then smeared onto one side of wet filter papers cut to a size approximately 14 x 2 cm, but leaving about 4 cm at both ends of the paper free of any faecal smear. Each

piece of filter paper was then rolled and placed into a glass test-tube filled with about 3 ml of distilled water. The test-tube was then closed with a rubber stopper and incubated at 30°C for 7 days.

After incubation the filter paper was removed from the test-tube. The sides of the test-tube were washed with distilled water so that any larvae on the sides would be washed down to the bottom of the test-tube. One hundred larvae were obtained from each culture and identified according to the descriptions of Dikmans and Andrews (1933) and Gordon (1933).

RESULTS

Faecal egg counts in all farms were moderately high, ranging from 500 - 2000 epg; at least 4 of the farms had egg counts of more than 1000 (Fig. 1). The mean value for the total number of eggs for all the farms was 1186 eggs/gm faeces.

Five species of nematodes were recorded, although in 4 farms fewer than 5 species were recovered (Table 1). The species identified from the cultures were *Cooperia* spp., *Haemonchus* spp., *Oesophagostomum* spp., *Strongyloides* spp., and

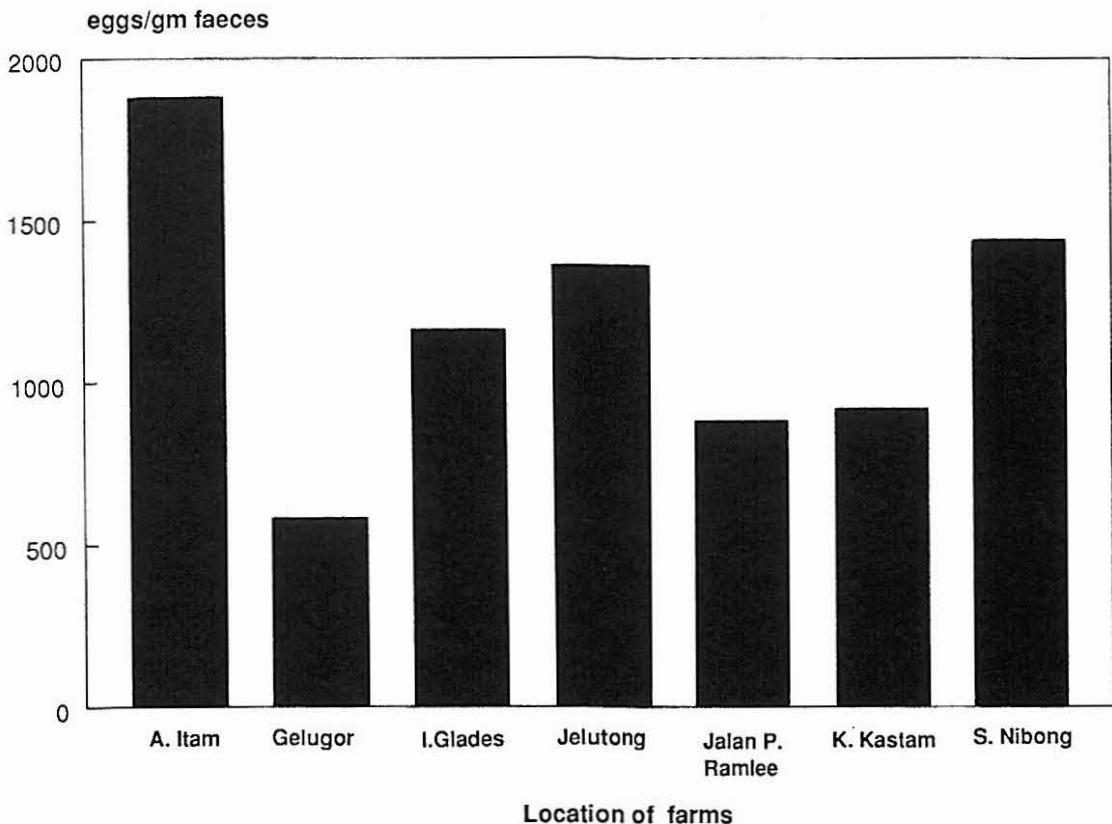


Fig. 1: Mean faecal egg counts of goats from sampling sites in the north-east district of Penang Island

TABLE 1
Percentages of various species of nematodes found in faecal samples of goats at various sampling sites in north-eastern district of Penang Island.

Species of nematodes	Sampling sites						
	A.Itam	Gelugor	I.Glades	Jtg.	Perak Rd.	Kastam	Sg. Nibong
<i>Cooperia</i>	4	10	5	9	0	0	8
<i>Haemonchus</i>	42	34	50	41	50	60	56
<i>Oesophagostomum</i>	13	18	15	22	8	18	13
<i>Strongyloides</i>	19	29	30	19	31	22	23
<i>Trichostrongylus</i>	22	9	0	9	11	0	0
No. of species	5	5	4	5	4	3	4

Trichostrongylus spp. The most dominant species was *Haemonchus* spp., which comprised about 45.7% of the total nematode population of goats for the whole district, followed by *Strongyloides* spp. and *Oesophagostomum* spp. which formed about 24.0% and 12.9% respectively of the worm population (Fig. 2). The least common nematodes were *Trichostrongylus* spp. and *Cooperia* spp. which comprised only 10.4% and 7.0% respectively of the worm cultures.

DISCUSSION

The results of the present study showed the mean number of eggs was moderately high. Such high numbers may be predicted to cause

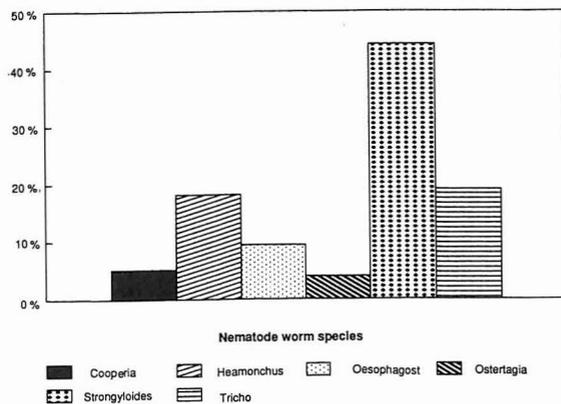


Fig. 2: Percentages of various species of nematodes in faecal cultures obtained from the north-east district of Penang Island.

poor health in goats. The study was carried out during the hot and dry season of the year when pasture growth was poor. In such an environment only a small percentage of eggs would be expected to develop into infective larvae, but presumably infections would have taken place much earlier in November and December which were quite wet months.

It is well known that the development and survival of the pre-parasitic and the infective stages of strongylate nematodes of ruminants are determined by climatic factors, notably temperature and moisture (Dinaburg 1945; Kates 1950; Gordon 1948; Crofton 1963). The north-east district of Penang Island receives a monthly rainfall of more than 90 mm and has a mean monthly temperature of about 28°C. The prevailing climatic conditions are ideal for the survival and development of most nematodes species, especially *Haemonchus* spp. and *Strongyloides* spp., which explains their high prevalence in the present study. *Strongyloides* spp. infect their host mainly percutaneously, and constant removal of excrement from the floors of the goat barns is important in controlling the parasite. However, this was not practised by the farmers of the study area, thus contributing to the high prevalence of this parasite.

Studies by Dinaburg (1945) and Kates (1950) showed that the climatic conditions for optimal transmission of *Oesophagostomum* are similar to *Haemonchus*. But its prevalence is much lower than that of *Haemonchus* (see Fig. 2), and needs some explanation; although this worm also has a

high fecundity constant (Crofton 1957), it has, however, a very long generation interval of 45 days (Crofton 1957).

High temperatures and drought have been shown to injure severely the free-living stages of *Trichostrongylus* (Crofton 1963), and therefore it is reasonable to assume that whilst *Trichostrongylus* may flourish during the wet season on the island of Penang (Rahman 1992), it proved otherwise when conditions were hot and dry. Generally, *Cooperia* has always been considered as comparatively a poor producer of eggs (Kates 1947; Crofton 1963; Nickel 1965), as shown by its low prevalence in the present study.

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