

EFFECT OF WORM BURDEN ON FEMALE TO MALE RATIO AND EPG IN PARASITISM BY ANCYLOSTOMA CANINUM

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S U M M A R Y

The host-parasite relationship in dogs infected with *Ancylostoma caninum* was studied in 72 animals of both sexes. It was noted that the worm burden apparently had an influence on the ratios female/male, eggs per gram of feces, epg/No. parasites and epg/females. Thus, the percent of females decreases when the worm burden increases and the average number of eggs per dog increases when the worm burden is high. However, the average ratio eggs/parasites decreases when the worm burden increases. The ratios were not influenced by the sex of the host.

I N T R O D U C T I O N

In 1923 STOLL¹¹ tried to establish a correlation between eggs per gram (epg) of feces in humans infected with *Necator americanus* with the number of worms present in these humans.

HILL⁵ concluded that the epg would be of value when taken for groups of individuals. HERRICK⁴ studied some of the factors which influence egg production, particularly the duration of the infection on the mean egg-parasite ratio. SARLES^{9,10} studied the effect of the age of *Ancylostoma caninum* on egg production, and the duration of the infection and elimination of the parasites.

KRUPP⁶ studied the crowding effect in *A. caninum* infection and also that of the ratio between intestinal area per adult parasite and egg production. BATISTA Jr. et al.¹ and MILLER⁷ studied the influence of age and sex on worm burden and on the susceptibility of dogs to *A. caninum* infections. COSTA & FREITAS² studied the relationship between the epg and the intensity of the infection by *A. caninum*. ROCHE & PATRZEK⁸ studied the female/male ratio and the influence of worm burden and host age on this ratio.

M A T E R I A L A N D M E T H O D S

Seventy-two naturally infected dogs of mixed breeding of both sexes were obtained from a municipal pound. Euthanasia was performed using sodium pentobarbital. The stomach and small and large intestines were isolated then sectioned between double ligatures. These organs were opened, the contents removed and washed thru a Tyler number 48 sieve.

Parasites collected on the sieve were fixed in Railliet and Henry's acetic formaldehyde, counted and identified.

A sample of feces was taken directly from the rectum of each dog for egg count, using GORDON & WHITLOCK's technique³.

R E S U L T S A N D D I S C U S S I O N

The results obtained are shown in Table I and Figs. 1 and 2.

The grouping of dogs by classes, according to the worm density, permitted the observation that the mean percentage of *A. caninum* females tends to diminish as the intensity of the infection increases. Indeed, ROCHE & PATRZEK⁸ had determined that the worm density

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T A B L E I
Ancylostoma caninum — Worm density, percentage of females and epg

Number of worms	Dogs ♂			Dogs ♀			Dogs ♂ and ♀		
	<i>Ancylostoma</i>		EPG	<i>Ancylostoma</i>		EPG	<i>Ancylostoma</i>		EPG
	Mean	Percentage of females		Mean	Percentage of females		Mean	Percentage of females	
1 - 25	13.12	64.76	208.60	10.27	61.06	108.44	11.40	62.84	156.68
26 - 50	37.64	61.35	106.77	41.11	56.76	148.99	39.20	59.18	126.64
51 - 100	71.25	60.82	128.41	70.75	55.12	117.75	71.05	58.55	118.48
101 - +	150.20	55.52	104.80	197.25	55.13	66.07	179.15	55.25	13.417

has an influence on the mean loss of *A. caninum*, but they do not explain why more females remain in the host. They also emphasize the fact that the female/male ratio is larger when the worm density is less intense.

The mean number of eggs per dog grew larger as the worm density increased. Statistical analysis showed that there was a highly significant positive correlation ($p > 0.01$), fact that agrees with data by COSTA et al.². However, it must be emphasized that the mean egg/adult parasite ratio is influenced by the worm density. It shows a tendency to decrease as the intensity of the infection increases, but statistical analysis did not reveal a significant difference ($p > 0.02$). On the other hand, it could be reasoned that this decrease in the egg/adult

hookworm ratio was only a consequence of the decrease in female/male ratio. Nevertheless, analysis of the data did permit the corroboration of the fact that the egg/female ratio in *A. caninum* is influenced by the worm density although the difference is not significant, as has already been observed by KRUPP⁶, who determined the effect of intestinal linear area/adult parasite ratio on that of epg/female.

SARLES⁹ also documented the decrease in the number of eggs eliminated per female per day as the number of parasites in the host increased.

The sex of the host does not seem to have any influence on the female/male, epg/number of parasites and epg/female ratios in *A. caninum* infections.

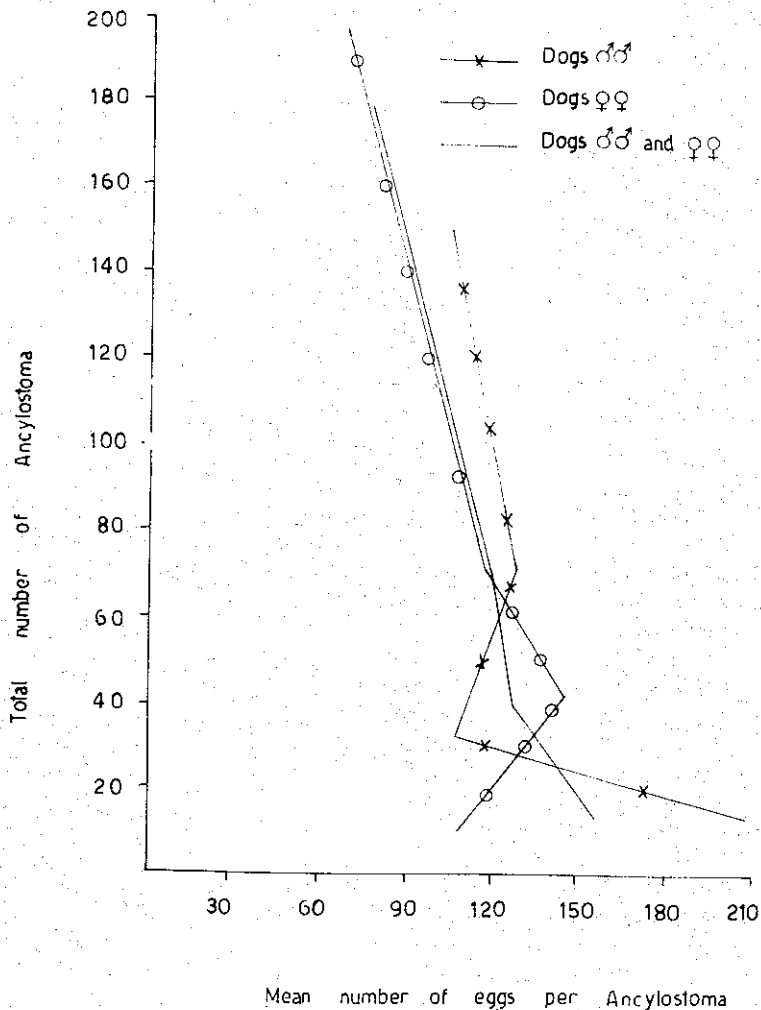


Fig. 1 — Effect of the worm density of *Ancylostoma caninum* on the mean number of eggs per parasite

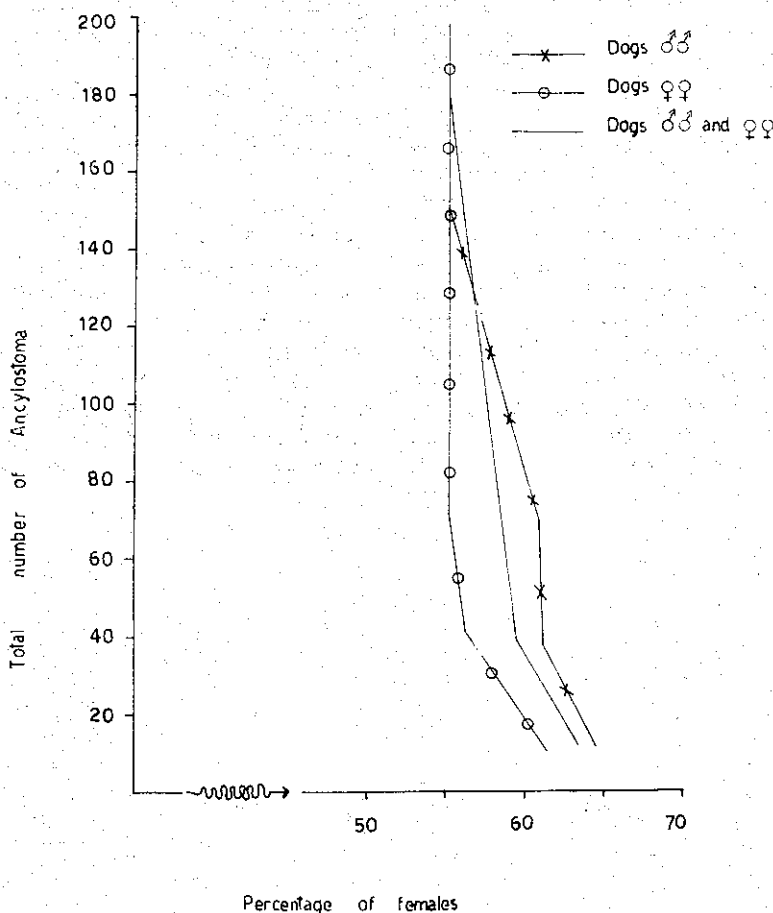


Fig. 2 — Effect of worm density of *A. caninum* on the percentage of females

RESUMO

Efeito da carga parasitária por *Ancylostoma caninum* sobre o número de ovos por grama de fezes (opg) e relação fêmea/macho

Para se obter informações sobre a relação hospedeiro/parasito, foram feitas contagens de ovos por grama de fezes (OPG), necropsiados 72 cães e colhidos todos os ancilostomídeos. Observou-se que a densidade populacional de *Ancylostoma caninum* exerce influência sobre as relações: fêmea/macho, OPG/parasitos e OPG/fêmeas do parasito. Desta maneira, a porcentagem de fêmeas decresce à medida que aumenta a intensidade da infecção; o número médio de ovos por cão aumenta com o crescimento da intensidade da infecção ($p > 0,01$); entretanto, a relação média ovo/parasito decresce com

o aumento da intensidade da infecção ($p > 0,02$). O sexo do hospedeiro não exerceu influência sobre estas relações.

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