

# *Fasciola Hepatica* and other Helminths in Goats in Puerto Rico<sup>1</sup>

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## ABSTRACT

Fecal examination of 769 goats taken in 1981 from 48 farms in 30 municipalities located throughout Puerto Rico, showed 10 helminths to be common in these goats. The study showed 1.43 percent of these to be positive with *Fasciola hepatica* eggs. The other helminth eggs found and percent rates of infection were as follows: *Oesophagostomum columbianum* 65.67, *Haemonchus contortus* 56.31, *Bunostomum trigonocephalum* 46.94, *Chabertia ovina* 24.57, *Trichostrongylus capricola* 15.60, *Ostertagia circumcincta* 14.43, *Trichuris ovis* 10.14, *Moniezia expansa* 6.39, and *Cooperia curticei* with 2.21 percent. The intensity ranged from 5 eggs per gram of stool sample as in the case of *F. hepatica* to 1,500 eggs per gram in *T. capricola* samples. Moreover, 68.7% of the goats sampled showed concurrent infections of two to eight different parasite species per goat.

## INTRODUCTION

There are few reports on *F. hepatica* in goats in Puerto Rico (11). Bagué in 1921 (1) observed fascioliasis in swine and cattle and found only one goat infected. Volkenberg (15, 16, 17, 18, 19) reported finding *F. hepatica* in cattle, goats, and horses living in the wetlands of the Island. This was reviewed by Hillyer (11).

Most of the reports on animal fascioliasis in Puerto Rico refer to this parasitism in cattle. Chiriboga et al. (3, 4) and de León et al. (5, 6, 7) described fascioliasis in cattle particularly in the area of Arecibo. Frame and Bendezú (8, 9) reported that the number of infected cattle slaughtered at the slaughterhouses had risen from 7.5% in 1948-49 to 31.75% by 1976 (12). A subsequent study of nearly 3000 dairy cows from 40 farms throughout the Island showed 65% of these to be positive for *F. hepatica* (10).

The rise in fascioliasis in cattle through the years and the scant data regarding this disease in goats encouraged us to undertake this study to determine the extent of this parasitism in these animals.

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## MATERIALS AND METHODS

The Island was scanned for goat farms using a list obtained from the Society of Goat Farmers and word of mouth as a guide. Forty eight goat farms in 30 municipalities were visited. The random sample used for the selection of the towns and farms covered the entire Island. The majority of farms with goats were small and family operated rather than commercial enterprises. In some cases there were not more than two or three goats on what was considered a "finca." The selection of goats, however, proved to be a greater challenge as the fecal samples were obtained rectally by the researchers.

The stools collected were taken to our laboratory where each sample

TABLE 1.—*Helminths in goats in Puerto Rico*

Parasites	Number with parasite	Intensity Eggs per gram		Percent Infected
		Min.	Max.	
<i>Oesophagostomum columbianum</i>	499	100	850	65.67
<i>Haemonchus contortus</i>	433	250	980	56.31
<i>Bunostomum trigonocephalum</i>	355	20	60	46.94
<i>Chabertia ovina</i>	189	35	72	24.57
<i>Trichostrongylus capricola</i>	119	78	1,500	15.60
<i>Ostertagia circumcincta</i>	111	11	45	14.43
<i>Trichuris ovis</i>	77	50	1,400	10.14
<i>Moniezia expansa</i>	46	90	1,300	6.39
<i>Cooperia curticei</i>	17	120	350	2.21
<i>Fasciola hepatica</i>	11	5	31	1.43
Total no. of goats sampled	769			

was processed by the sedimentation method for trematode eggs, and by the centrifugal-floatation method with a saturated sugar solution for the nematode eggs (2, 13, 14). A 0.5 methyl green staining technique described by de León et al. (5) was used to stain the fecal debris but not the eggs prior to microscopic examination. The intensity of infection was determined by counting all the eggs present in each sample. Identification of the genera and species was based on observation of the adult and the egg.

## RESULTS AND DISCUSSION

Coprological examination of 769 goats taken from 48 farms in 30 municipalities located throughout the Island, showed the presence of 10 different helminths in these goats. In addition, almost 70% of the goats sampled had concurrent infections from two to eight different helminths in one host.

Table I shows the parasite eggs found and percentage rates of infection

with intensities. *Fasciola hepatica* shows the lowest rate of infection with 1.43%.

The low rate of fascioliasis in the goats sampled contrasted with the high rate of this parasite reported in a similar study conducted in dairy cattle in 1978 (10), where *F. hepatica* was found in 65% of the cows sampled. In cattle, however, *H. contortus* was found in only 17.7% of the samples.<sup>3</sup>

Many of the goats in this study grazed on the dry high lands along the mountain side rather than the lowlands generally grazed by cattle. This could be a possible explanation for the low fascioliasis in the goats

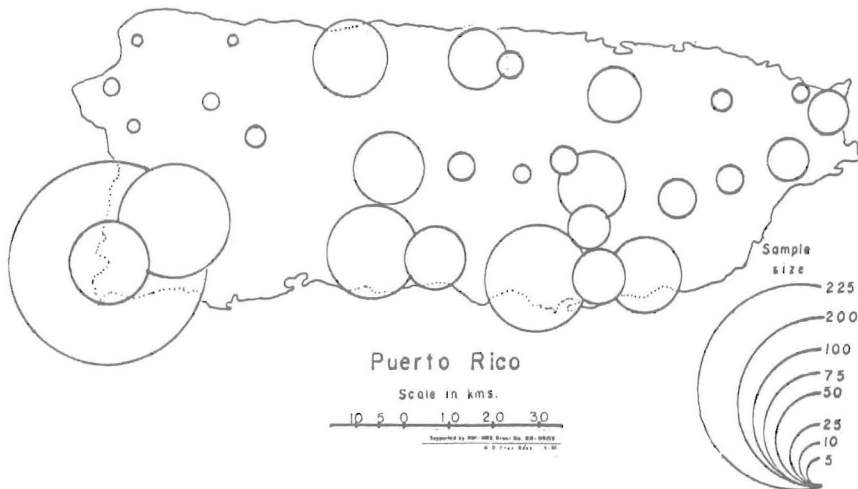


FIG. 1.—Location and size of goat samples.

sampled. All 11 goats positive with *F. hepatica* grazed in lowland wet pastures. On a small farm in Luquillo, located near a stream, two out of only three goats were positive with *F. hepatica*. Three goats with fascioliasis were found on a wet farm in the Boquerón area, and in Salinas three more positive goats were also found on a wet farm.

Figure I shows the location and size of the goat samples surveyed. The largest sample was obtained from the southwestern end of the Island, where a large number of goat farms were located.

More than half (68.7%) of the goats sampled harbored more than one parasite concurrently (fig. 2). One hundred and forty-two goat stool samples showed no parasite eggs, and 98 had eggs of only one parasite species.

Concurrent infections with two or more helminths were found in 529

<sup>3</sup> Frame, A. D. and Bendezú, P. unpublished data.

goats sampled. In each of 126 samples, eggs of two parasites were found. The highest number of goats, 205, showed concurrent infections with three parasites. In 114 goats, four different helminths were found per goat, and 63 goats had five different helminths. Six goats had seven helminths each, and one goat was found with eight different parasites.

In spite of the worm burden found in the goats sampled most of the animals appeared in average condition. Few, however, were viewed as

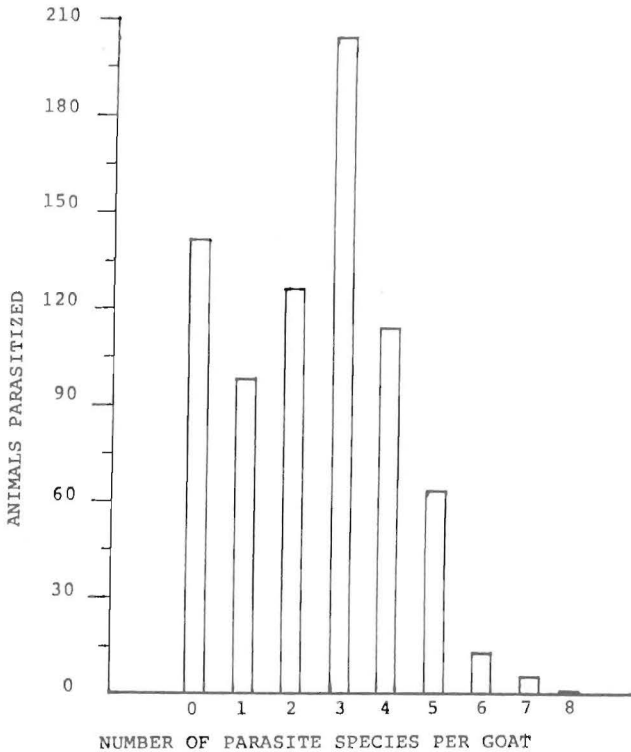


FIG. 2.—Parasite burden.

being “grade A” quality. Heavy worm burdens are known to stunt growth, decrease weight gain, and decrease milk production because of lowered feed efficiency and blood loss (13). Economic losses suffered by farmers because of parasitism are bound to affect the farmer as well as the community in general if not curbed.

#### RESUMEN

Exámenes fecales de 769 cabras de 48 fincas en 30 municipios de Puerto Rico realizados en el año 1981 demostraron que 10 helmintos de

diferentes especies eran comunes a estos mamíferos domésticos, siendo 1.43% de estas muestras positivas a *Fasciola hepatica*. Para los otros parásitos el porcentaje fue el siguiente: *Oesophagostomum columbianum* 65.67%, *Haemonchus contortus* 56.31%, *Bunostomum trigonocephalum* 46.94%, *Chabertia ovina* 24.57%, *Trichostrongylus capricola* 15.60%, *Ostertagia circumcincta* 14.43%, *Trichuris ovis* 10.14%, *Moniezia expansa* 6.39% y *Cooperia curticei* 2.21%.

El bajo porcentaje de 1.43% de infección de *F. hepatica* en cabras contrasta con la alta infección de 65% en el ganado lechero (10). Con *H. contortus* sucede lo contrario, encontrándose 56.31% de infección de este parásito en cabras y 17.7% en vacas lecheras.

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