

Prevalence and dynamics of natural infection with *Fasciola hepatica* (Linnaeus, 1758) in Brazilian cattles

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SUMMARY

It has been determined the fluctuation of the prevalence of natural fasciolosis in dairy cattle herd formed by 44 cows (crossbred Holstein x zebu) and their calves, which were observed during 12 months in the municipality of Itajubá, Minas Gerais, Brazil. The cows eliminated *F. hepatica* eggs throughout the year, particularly during the dry season from March to October. Most of the calves began to eliminate eggs at four month old, suggesting that infection had occurred when they started grazing two months before. During the studied period, 1058 faecal samples from several different farms in the Itajubá area were examined and 10.59% were found to be positive for the eggs of the parasite. Based on these results, Itajubá was shown to be an enzootic area for *F. hepatica*, probably due to its propitious climate, the type of animal husbandry carried out, type of pasture, and presence of the snail vector *Lymnaea columella*.

Keywords : *Fasciola hepatica* - dairy cattle - prevalence - dynamics of infection - fluctuation.

RÉSUMÉ

Prévalence de l'infestation naturelle des bovins brésiliens par *Fasciola hepatica* (Linnaeus, 1758). Par R.N. FARIA, M.C. CURY et W.S. LIMA.

Les variations de prévalence de la fasciolose d'origine naturelle ont été déterminées par l'observation d'un cheptel de 44 vaches (crossbred Holstein x zebu) et de leurs veaux dans la municipalité de Itajubá, Minas Gerais, Brésil, sur une période de 12 mois. Les pontes parasitaires ont été observées durant toute l'année mais surtout pendant la période sèche (mars à octobre). Le début de l'élimination d'œufs par le parasite a été observé pour la plupart des veaux à l'âge de quatre mois, ce qui suggère que la contamination s'est produite deux mois plutôt, lorsqu'ils ont commencé à se nourrir sur les pâturages. Pendant la période de l'étude, 1058 échantillons de selles provenant de plusieurs fermes de Itajubá ont été analysés et 10,59% se sont révélés positifs. A partir des résultats obtenus, Itajubá peut être considérée comme une zone enzootique probablement à cause de son climat propice, du type d'élevage du bétail et aussi du type de pâturage associé à la présence de l'hôte intermédiaire *Lymnaea columella*.

Mots-clés : *Fasciola hepática* - vaches - prévalence - infestation naturelle.

Introduction

The trematode *Fasciola hepatica* (Linnaeus, 1758) is recognized as the most important helminthic parasite of cattle, causing economic losses to ranchers due to the reduction of the production of milk and meat, condemnation of parasitized livers, abortions, increased mortality, and the expense of control measures. In Brazil, the main enzootic area of *F. hepatica* lies in the south of the country [7,4] with smaller foci in the southeastern and Midwestern regions. The State of Minas Gerais in Brazil is not considered to lie within an enzootic area of fasciolosis. Sporadic reports of the disease have been accomplished in some parts of the state, particularly in the municipality of Itajubá [2,6], however no studies to date of the true prevalence of *F. hepatica* infection, its epidemiology or control in this area.

The objectives of the present study were to determine the fluctuations of prevalence of natural fasciolosis over time in a crossbred herd of dairy cattle in Itajubá.

Materials et methodes

The study was performed in rural properties of the municipality of Itajubá (22°25'33''S; 45°27'09''W) which is loca-

ted in the south/southeastern mesoregion of Minas Gerais.

The bovine population of the municipality consists of about 12,950 animals, distributed among 515 farms. A sample of 71 farms was chosen at random for the study. Faecal samples were collected from November 1998 to October 1999 by rectal stimulation of 20 animals of mean age 12 months (without noting race or sex) on each farm. Faeces of all animals were collected on properties where the number of cattle was less than 20. The technique of GIRÃO & UENO [5] was used to estimate the *F. hepatica* egg count. Prevalence was calculated by using the formula :

$$P = \frac{\text{Number of existing cases}}{\text{Sample population exposed to risk}} \times 100$$

A dairy cattle herd (crossbred Holstein x zebu) from a farm with a history of fasciolosis was chosen for this study. Forty-four cows and their calves aged approximately one month were chosen and monitored every month from November 1998 to October 1999.

Every four weeks a faecal sample was collected from the rectum of each animal and analysed by the Girão-Ueno technique [5].

The relief and vegetation characteristics of each farm were noted as well as details of the management of the animals.

Mean monthly temperature, relative humidity and rainfall were measured. The results of coprological exams were submitted to the Kruskal-Wallis non-parametric test and compared using Student's t-test.

Results

Faecal samples were collected from 1058 animals, of which 112 were positive for *F. hepatica* eggs, giving a prevalence of 10.59%.

The monthly mean egg counts per gram of faeces (EPGF) of the 44 cows increased gradually from March to October 1999, reaching a peak in September and falling again thereafter. This increase occurred during the months when rainfall was lowest (Figure 1). In March 1999, mean EPGF values increased coincidentally with a reduction in mean monthly rainfall.

The calves began to eliminate eggs in their faeces when they were 4 months old. A gradual increase was observed in the mean egg counts, reaching maximum values in June and July followed by a decrease in August 1999 and increasing again from September onwards. Mean monthly rainfall was reduced in the months showing increasing EPGF values.

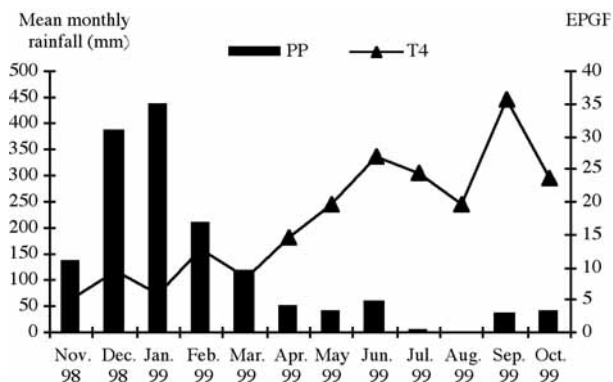


FIGURE 1.—Monthly mean egg count per gram of faeces (EPGF) of *Fasciola hepatica* from 44 cows using Girão- Ueno technique (1982) (T4) and the mean monthly rainfall (PP).

Discussion

The *F. hepatica* prevalence of 10.59% obtained from 1058 faecal samples was higher than the 4% noted by Serra-Freire *et al.* [6] and similar to values recorded for areas of Brazil considered to be enzootic for the parasite. Although there are some records of *F. hepatica* in Minas Gerais, the state is not considered to lie within an enzootic area. Nevertheless the Itajubá area has several eco-epidemiological conditions that would permit *Fasciola* to occur, including the presence of the snail *Lymnaea columella* and a high degree of animal tra-

ding among cattle ranchers [3]. It is noteworthy that the herd used in the follow-up study of the dynamics of infection was from an area with extensive seasonally flooded pastureland surrounded by undulating hillsides, these being propitious conditions for the snails which act as intermediate hosts for the parasite.

It appears from the results of the present study that cattle in the Itajubá area eliminate *F. hepatica* eggs throughout the year, although highest egg counts were recorded during the dry season, from May to October. In these months were observed a decrease in the pluvial precipitation. The results have demonstrated high seasonal tendency with higher elimination in dry season. It hasn't been studied the lymnaeid population's dynamic however there is a hypothesis that during the months, the *Lymnaea collumela* population could be enhanced and consequently increased the infectant meta-cercaries levels, which ones would be swallowed by the cattle, intensifying not only the contamination but also the posterior eggs elimination. In agreement with AMATO *et al.* [1] and COELHO & LIMA [3] the population density of *Lymnaea columella* is cyclical, decreasing from september to february and increasing from march to September (dry season).

The age of the calves and the type of management employed may have influenced infection of these animals, which began to eliminate eggs at 4 months, indicating that they were first infected when they started grazing at 2 months old.

It is therefore clear that the municipality of Itajubá is a focus of hepatic fasciolosis and that the authorities of the Official Animal Health Defense Service should take appropriate measures in the area.

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