

SHORT COMMUNICATION

THE SEASONAL DISTRIBUTION OF *Cryptosporidium* oocysts IN SHEEP RAISED IN THE STATE OF SÃO PAULO

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ABSTRACT: GREEN, R.E.; AMARANTE, A.F.T.; MASCARINI, L.M. The seasonal distribution of *Cryptosporidium* oocysts in sheep raised in the State of São Paulo. [**Distribuição sazonal de oocistos de *Cryptosporidium* em ovinos criados no Estado de São Paulo.**] *Revista Brasileira de Parasitologia Veterinária*, v. 13, n. 3, p. 125-127, 2004. Departamento de Parasitologia, Instituto de Biociências, Universidade Estadual Paulista, Caixa Postal 510, Botucatu, SP, CEP 18618-000. E-mail: amarante@ibb.unesp.br.

Of the 184 fecal samples taken from lambs during the period of highest precipitation (more than 150 mm/month), 102 (55.4%) shed *Cryptosporidium* oocysts, while only 31 (17.3%) of the 179 samples taken during the period with low rainfall (less than 100 mm/month) were positive ($p < 0.001$). Infection rates were similar in Santa Inês, Suffolk and Ile de France breeds of sheep ($p > 0.05$). *Cryptosporidium* infection was asymptomatic in all animals.

KEY WORDS: *Cryptosporidium*, sheep, seasonal rainfall, breed.

RESUMO

De 184 amostras colhidas de cordeiros durante o período chuvoso (mais de 150 mm/mês), 102 (55,4%) apresentaram oocistos de *Cryptosporidium*, enquanto apenas 31 (17,3%) das 179 amostras colhidas durante o período de baixa precipitação (menos de 100 mm/mês) foram positivas ($p < 0,001$). As taxas de infecção foram similares em ovinos das raças Santa Inês, Suffolk e Ile de France ($p > 0,05$). A infecção por *Cryptosporidium* foi assintomática em todos os animais.

PALAVRAS-CHAVE: *Cryptosporidium*, ovinos, precipitação pluviométrica, raça.

Cryptosporidium parvum and *C. hominis* are obligate enteric protozoan parasites, which infect the gastrointestinal tract of animals and humans. The risk of waterborne transmission of *Cryptosporidium* is a serious global issue in drinking water safety (CAREY et al., 2004). Because of the resistance of oocysts to many disinfectants and to other

factors, oocysts from a variety of sources pose a threat to man (STERLING; ARROWOOD, 1993). Therefore, cryptosporidiosis is a zoonotic disease of great importance in waterborne human outbreaks of diarrhoea (SMITH; ROSE, 1998) and a life-threatening disease for immunodeficient people (KASPER; BUZONI-GATEL, 1998; UGA et al., 1998).

Cryptosporidiosis is most severe in newborn animals, while older lambs may demonstrate growth retardation, and adult animals are generally refractory to infection and disease (XIAO et al., 1993), but can act as asymptomatic carriers shedding small numbers of oocysts into the environment (OLSON et al., 1997; MAJEWSKA et al., 2000). There is also a seasonal variability in the frequency of *Cryptosporidium* infection. High rates of stool positivity have been frequently reported to occur in humans during or immediately following rainy months (MATA et al., 1984; NEWMAN et al., 1993). Within this context, a study was carried out to determine the seasonal occurrence of *Cryptosporidium* oocysts in three breeds of lambs raised on pasture in São Paulo State, Brazil.

Fecal samples were taken from the rectum of each 11 Suffolk, 10 Ile de France and 16 Santa Ines sheep, monthly, from October/2000 to July/2001. Samples were placed in disposable plastic bags. Throughout the study, it was possible to process 158 samples from Santa Ines sheep, 99 from Ile de France and 107 from Suffolk.

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Animals were 2-4 months old at the beginning of the study. They were kept together in a paddock of 0.6 ha with Coast-cross grass. Animals were fed daily with a commercial diet (Unique[®], Socil Guyomarc'H) and had free access to Coast-cross hay and drinking water.

One gram of feces preserved in 6 ml of 10% formalin was processed using a centrifuge-sedimentation technique in ether (RITCHIE, 1948). Fecal smears were stained with 1% auramine O (IDRIS; AL-JABRI, 2001). Positive slides for the presence of oocysts in this first exam were then stained by the technique of Ziehl-Neelsen, modified (HENRIKSEN; POHLENZ, 1981), and again examined to confirm the diagnosis.

Rainfall was measured at a weather station located within 7 km of the experimental paddock.

The chi-square test was used to analyse the data (MINITAB, 1996).

All animals shed oocysts of *Cryptosporidium* in feces at least on one occasion. At the beginning of the study (October), only three lambs shed oocysts (2.8%). In the following months, there was a steep increase in positive fecal samples reaching a high of 64.9% in February (Figure 1).

Positivity for *Cryptosporidium* oocysts was observed in 34.8% of 158 samples from Santa Ines sheep, in 38.4% of 99 samples obtained from Ile de France sheep, and in 37.4% of the 107 samples obtained from Suffolk sheep, with no significant difference between groups ($p > 0.05$).

The occurrence of *Cryptosporidium* was associated with rainfall ($p < 0.001$). The highest occurrence of *Cryptosporidium* oocysts coincided with the rainy months of the year (Figure 1). Of the 184 samples taken during the period of highest precipitation (more than 150 mm/month), 102 (55.4%) showed *Cryptosporidium* oocysts, while only 31 (17.3%) of the 179 samples taken during the period with low rainfall (less than 100 mm/month) were positive.

This result is in agreement with previous reports of higher occurrence of cryptosporidiosis in warmer and rainy months. In domestic animal raised in Brazil, predominantly dogs, Newman et al. (1993) found *C. parvum* in four of the 64 stools (6.3%) collected during the dry season and in nine (14.3%) of

the 63 samples examined in the rainy season. The percentage of laboratory specimens of children positive for *Cryptosporidium* oocysts ranged from (16.4%) during the rainiest month of the year to 0% during 4 of the 5 driest months of the year in a human slum located in Ceará State (NEWMAN et al., 1999). Cryptosporidiosis in children from Costa Rica is also clustered in the warmer, rainy and humid months of the year (MATA et al., 1984).

In contrast, sampling season was not significantly associated with the risk of *C. parvum* infection in lambs in Spain, although both farms and lambs were more likely to be positive in summer/winter than in spring/autumn (CAUSAPÉ et al., 2002). The prevalence of *Cryptosporidium* infection in calves was also stable over a 1-year-follow-up in France, except for a low prevalence related to a decrease of calving during summer (LEFAY et al., 2000).

The animals studied here did not display any clinical sign of cryptosporidiosis such as diarrhoea. They were simply asymptomatic carriers of the infection. Olson et al. (1997) and Majewska et al. (2000) also found lambs and adult sheep asymptotically infected with *Cryptosporidium* in Canada and Poland, respectively.

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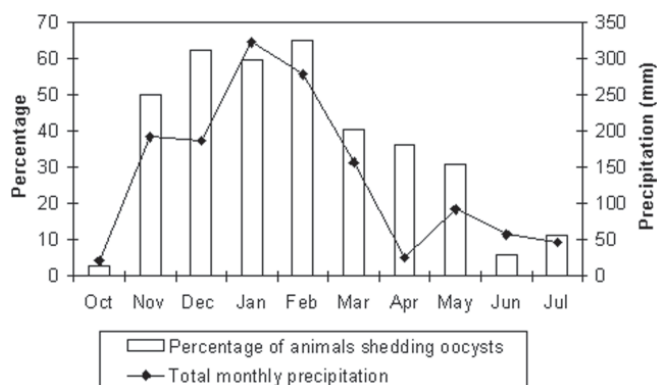


Figure 1. Monthly occurrence of *Cryptosporidium* infection in young male sheep and total monthly precipitation from October/2000 to July/2001.

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Recebido em 08 de junho de 2004.

Aceito para publicação em 20 de agosto de 2004.