A STUDY ON CAPRINE *CRYPTOSPORIDUM* INFECTION WITH SPECIAL REFERENCE TO PREVALENCE AND PATHOLOGY

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A thesis submitted for the degree of Master of Philosophy

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January 2001

ABSTRACT

Cryptosporidium is a minute intracellular protozoan parasite that has worldwide distribution and is known to cause morbidity and mortality in young animals and immunocompromised hosts. The objective of the present work was to determine the prevalence and species of caprine *Cryptosporidum* isolates, patterns of oocyst shedding and changes in intestinal morphology of the goat following experimental infections.

The prevalence of *Cryptosporidium* oocysts in the faeces of 1020 goats in three age categories was examined in selected locations of three agroclimatic zones. The oocysts were identified using the Sheather's sucrose flotation followed by staining with the modified Ziehl Neelsen technique (MZN). Acid fast character and size (4-6 μm) were used to identify the oocysts. *Cryptosporidium* oocysts were detected in animals from all agroclimatic zones with the highest prevalence of infection in the dry zone (33.6%) compared with 24.7% and 21.7% in the intermediate and wetzones, respectively ($P<0.001$). The overall prevalence of infection in three zones was 28.5%. The *Cryptosporidium* oocyst counts were significantly higher in goats of < 6 months and those between 7 and 12 months, compared to goats of >12 months of age ($P<0.001$).

A total of thirty *Cryptosporidium* positive faecal samples from the three zones (n=10/zone) were used in the speciation studies. MZN stained smears were subjected to micrometry where the size of 10 oocysts in each slide was ascertained. The average size of the oocysts was 5.0 x 4.5 μm. Fifteen samples (dry zone-8; intermediate zone-7) were identified as *Cryptosporidium parvum* by Polymerase Chain Reaction (PCR). None of the samples from the wet zone were positive on PCR and this may be due to the occurrence of other species of *Cryptosporidium*, which are morphologically similar to *C. parvum*. The presence of an overwhelming number of isolates (75%) of *C. parvum* in the dry and intermediate zones indicates the wide occurrence of the zoonotic species of the organism among goats in these zones.

The pattern of *Cryptosporidium* oocyst shedding by goats in relation to age and season was investigated in three groups of one-month-old kids (n=24/group). The oocyst shedding was monitored at monthly intervals for periods of 12, 6 and 3 months in three groups. Prevalence of infection and faecal *Cryptosporidium* oocyst count were found to be higher in animals which were <6 months. A statistically significant association between age and faecal *Cryptosporidium* oocyst count was noted ($p<0.01$) and prevalence of the infection was also associated with age. Further, oocyst excretion and the prevalence of the infection were high during the dry season.

The infectivity of *C. parvum* oocysts isolated from asymptomatic adult goats was examined in mice and goat kids following an oral inoculation of purified oocysts. All infected mice excreted oocysts by day 3-post inoculation (pi.) whereas the kids did so between days 3 and 6. The maximum faecal oocyst counts were observed between day 12 and 14 pi. Intestinal pathology, which included infiltration of inflammatory cells into the lamina propria, fusion and villous atrophy, was evident in the light and scanning electron microscopic studies.

It is concluded that *Cryptosporidium* is a common protozoan parasite of goats in all three agroclimatic zones of Sri Lanka. The infection was detected in a wide range of age groups extending from 2-week-old kids to goats of above one year. *Cryptosporidium parvum* was identified in goats from dry zone and intermediate zones. Oocysts shedding declined with age and had no bearing to the rainfall pattern. The oocysts isolated from asymptomatic adult goats were infective to mice and goat kids and in the latter species the experimental infection caused intestinal pathology and diarrhea. Further, these studies indicate that goats are potential animal reservoirs for the human infection.