

**A STUDY ON THE PREVALENCE AND  
PATHOPHYSIOLOGY OF HAEMONCHOSIS IN  
GOATS IN SRI LANKA**

by

**Wijitha Dharmappriya Paranagama  
B.V.Sc (Peradeniya)**

A thesis submitted in conformity with the requirements for the  
degree of

**MASTER OF PHILOSOPHY**

in the  
Department of Veterinary Pathobiology  
Faculty of Veterinary Medicine & Animal Science  
University of Peradeniya



**SRI LANKA**

**February 2002**

© W.D. PARANAGAMA

## Abstract

*Haemonchus contortus* is the most pathogenic abomasal blood sucking nematode in small ruminants. This study focused on the prevalence of this worm in the dry zone of Sri Lanka for a period of one year the relationship between natural infection levels and faecal egg count, weather parameters and selected haematological and biochemical parameters were investigated using animals in the field. Pasture larvae density of *H. contortus* was studied in the same area during the same period with use of tracer goats. Further, the responses of selected biochemical and haematological parameters and pathological responses of local crossbred goats were investigated using experimental goats.

The prevalence of *H. contortus* in naturally infected goats in the dry zone of Sri Lanka was studied ( $n = 218$ ) and the worm was found in the abomasa of affected animals throughout the year. The monthly mean worm population varied from 80 to 680, and the highest mean population was found in the month of February while the lowest count was encountered in April, 1997. The variation of worm population showed a significant relationship with the variation of faecal egg count ( $P=0.024$ ), but, showed poor relationships with weather parameters such as rainfall, temperature and relative humidity of the study area. The results further indicated that the naturally infected goats were affected by the chronic form of haemonchosis.

The relationship between worm populations and haematological and biochemical parameters of naturally infected animals were also investigated. The packed cell volume was the only parameter that showed an acceptable weak negative correlation ( $r = -0.4$ ) with highest worm counts (1000 - 1273), while, none of the other indices showed any significant relationship to indicate the presence of the infection. Serum pepsinogen concentrations however showed a modest positive correlation ( $r = 0.6$ ) when considered on a herd basis rather than on an individual animal basis. Serum pepsinogen levels also demonstrated increased values corresponding to the degree of infection in the animals with a natural infection.

The infective larval populations of *H. contortus* in communal grazing lands in the dry zone, were investigated over a 12month period using 24 tracer animals. It was found that the pasturelands were contaminated with the infective larvae during the rainy months and it showed an acceptable relationship ( $P < 0.05$ ;  $r = 0.56$ ) with the rainfall of the area. This more importantly demonstrated a seasonal variation of the parameter during the study period.

An experimental study was conducted ( $n = 22$ ) following an oral dosing of 50,000 *H. contortus* infective larvae, in order to study whether the biochemical and haematological changes have a usefulness as indicative of *H. contortus* infection. At the end of the experiment, packed cell volume and haemoglobin concentrations were reduced to 6 % and 2 g/dl, respectively. Serum total protein concentration and serum albumin concentration also showed lowered levels of 3.5 and 2 g/dl, respectively. Further, the abomasal pH increased from 2.7 to 5.8 in 6 days p.i. Similarly, body weights of the experimental animals were also reduced from 11 to 8 kg. Gross and histopathological changes were severe after 21 days p.i., but, the changes were less severe in animals of both early and latter parts of the experiment. Clinical signs such as anaemia and poor body condition were observed in 2 experimentally infected animals. However, serum pepsinogen concentrations appeared to be more sensitively altered showing the initiation of the infection and increased values were recorded from 3<sup>rd</sup> day of the experimental infection and this parameter also reflected the persistency of the infection during the experimental period.

Of the various haematological and biochemical parameters investigated, only serum pepsinogen levels indicated some relationship with the infection. Serum pepsinogen concentrations appeared to be reliable as a supportive diagnostic test both in field and experimental *H. contortus* infections of crossbred goats.