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THE OCCURENCE OF *GIARDIA* IN CATS AND DOGS
IN NEW ZEALAND AND SUBSEQUENT ISOLATION
AND DIFFERENTIATION OF STRAINS.

A thesis presented in partial fulfilment
of the requirements for the degree of
Master of Science
in Microbiology
Massey University, New Zealand.

Michael Craig Tonks

1988

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ABSTRACT.

Giardiasis, a debilitating diarrhoea that affects many people every year is caused by the ubiquitous protozoan parasite *Giardia intestinalis* (syn *lamblia*, *duodenalis*). This parasite infects and causes disease in birds and animals as well as man and has no known host specificity. Dogs and cats are some of the animals infected by *Giardia* and due to their close association with man, may be carrier sources of human giardiasis.

In an attempt to discover a relationship between man and these animals, a survey of the level of *Giardia* infection in cats and dogs in both Hamilton and Palmerston North, New Zealand, was undertaken. Percentages of 25% and 8% for dogs and 3% and 7% for cats respectively were obtained. Statistically the level of infection in Hamilton was higher than that of Palmerston North. In both cities the sex and breed of the animals showed no correlation to infection although animals less than 3 years old were more likely to be infected. Clinical manifestations of giardiasis were observed but did not significantly correlate with the presence of *Giardia* and were not necessarily caused by the *Giardia* when present.

To further enhance the relationship hypothesized it was attempted to culture the *Giardia* from the cats and dogs and relate them to cultured human isolates. Our attempts were unsuccessful and from 91 samples only 8 human strains from 5 geographical areas were isolated. These isolations were made by both *in vitro* and *in vivo* techniques that both yielded 7% sample to culture success.

The isolated *Giardia* strains plus a control culture, Bris/83/HEPU/106 supplied by Boreham, Australia, were compared by growth rate and sodium dodecylsulfate polyacrylamide gel electrophoresis (SDS-PAGE). Both these tests showed the similarity of these strains. The average growth rate was 0.09 ± 0.01 hours⁻¹ and no strain varied from the statistical mean. In relation to the total protein banding patterns measured by SDS-PAGE, the isolates varied, at most, by one or two bands.

An isolate of *G. muris* extracted from a naturally infected mouse and a human isolate that was extracted from an experimentally infected mouse were also compared by SDS-PAGE to a cultured isolate. The results showed many different bands between all three samples and suggests that an adaptation, or selection, of the *Giardia* must take place when it is cultured. If this is so, then perhaps the emphasis put on strain variation of cultured *Giardia* trophozoites is to be questioned.

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