A National Study of Gastrointestinal Parasites Infecting Dogs and Cats in Australia

Carlysle Sian Holyoake
Bachelor of Science (Veterinary Biology) Murdoch University
Bachelor of Veterinary Medicine and Surgery Murdoch University

Division of Health Sciences
School of Veterinary and Biomedical Sciences
Murdoch University
Western Australia

This thesis is presented for the degree of Doctor of Philosophy of Murdoch University
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I declare that this thesis is my own account of my research and contains as its main content work which has not been previously been submitted for a degree at any other tertiary educational institution.

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Carlysle Sian Holyoake
Abstract

Despite the popularity of companion animal ownership in Australia, recent and comprehensive information with regard to the prevalence, epidemiology and public health significance associated with gastrointestinal parasites of pet dogs and cats in Australia is largely lacking. The primary aims of this study were to close this knowledge gap and to evaluate the veterinarian’s perception, awareness and knowledge of GI parasites in their locality, from a veterinary and public health standpoint. This included sourcing information with regard to commonly recommended deworming protocols. The awareness of pet owners regarding parasitic zoonoses and the degree of education provided to them by veterinarians was also determined.

A total of 1400 canine and 1063 feline faecal samples were collected from veterinary clinics and refuges from across Australia. The overall prevalence of gastrointestinal parasites in dogs and cats was 23.9% (CI 21.7-26.1) and 18.4% (CI 16.1-20.7), respectively. Overall *Giardia duodenalis* was the most prevalent parasite in dogs (9.3%, CI 7.8-10.8) followed by hookworm (6.7%, CI 5.4-8.0). *Isospora felis* was the most prevalent parasite in cats (5.6%, CI 4.2-7.0), followed by *Toxocara cati* (3.2%, CI 2.1-4.3).

A highly sensitive and species-specific PCR-RFLP technique was utilized to differentiate the various hookworm species which can infect dogs and cats directly from eggs in faeces. *Ancylostoma ceylanicum* was detected for the first time in Australia in 10.9% of the dogs found positive for hookworm. This was a significant finding in terms of the zoonotic risk associated with this parasite.
The zoonotic potential of *Giardia* and *Cryptosporidium* was investigated by genetically characterising isolates recovered from dogs and cats. All but one of the *Giardia* isolates successfully genotyped were host specific, indicating a low zoonotic risk. It was hypothesized that the lack of zoonotic *Giardia* Assemblages was a consequence of there being a low prevalence of *Giardia* in the human population. The *Cryptosporidium* recovered from dogs and cats was determined to be *Cryptosporidium canis* and *Cryptosporidium felis* respectively, a finding which supports growing evidence that *Cryptosporidium* in companion animals is of limited public health significance to healthy people.

Very few of the veterinarians surveyed in the study routinely discussed the zoonotic potential of pet parasites with clients. Most of the veterinarians recommended the regular prophylactic administration of anthelmintics throughout a pet’s life.

The low national prevalence of GI parasites reported is most likely a consequence of the widespread use of anthelmintics by pet owners. There is an over-reliance on anthelmintics by veterinarians to prevent and control parasites and their zoonotic risk. This has resulted in veterinarians becoming complacent about educating pet owners about parasites. A combination of routinely screening faecal samples for parasites, strategic anthelmintic regimes and improved pet owner education is recommended for the control of GI parasites in pet dogs and cats in Australia.
Publications

Scientific publications arising from this research
(note: recent change of surname from Palmer to Holyoake)


Explanation concerning the inclusion of published papers in the text of this thesis
and the contribution of co-authors to the published papers.

In all of the published papers included in the text of this dissertation I am the first author and I conducted all the work myself with the assistance of laboratory technicians and in collaboration with staff at Murdoch University, who have been included as co-authors on the papers.

Please note that as a consequence of this thesis being composed of published papers there is some repetition, particularly in the materials and methods section of each chapter.
Conferences:


September 2004: oral presentation: Risk Factors Associated with parasites of pets in Australia and Bangkok, Joint International Tropical Medicine Meeting Bangkok, Thailand.

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