University of Prince Edward Island

Faculty of Veterinary Medicine
Summary of Dissertation

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DEGREE OF DOCTOR OF PHILOSOPHY

Haifaa Abdullah Mahjoub
Department of Pathology and Microbiology

Supervisory Committee

Dr. Gary Conboy, Co-supervisor
Dr. Spencer Greenwood, Co-supervisor
Dr. Fred Kibenge, Chair
Dr. Shannon Martinson
Dr. J McClure
Dr. Andy Tasker

Examination Committee

Dr. Megan Jones, Chair
Dr. Gary Conboy, Co-supervisor
Dr. Spencer Greenwood, Co-supervisor
Dr. Melanie Buote
Dr. Andy Tasker
Dr. Todd Smith, External Examiner

Investigations on the treatment and diagnosis of metastrongyloid infections in dogs and cats

Canine and feline metastrongyloids play an important role in respiratory diseases that affect domestic and wild canids and felids throughout the world. The first objective of this study was to determine anthelmintic efficacy against metastrongyloid L_3 using an *in vitro* larval motility assay. The study evaluated six anthelmintics (eprinomectin, ivermectin, milbemycin oxime, moxidectin, selamectin, and fenbendazole) on the motility of L_3 of *Crenosoma vulpis*, *Angiostrongylus vasorum*, and *Aelurostrongylus abstrusus*. The study identified that *C. vulpis* was the most sensitive species to the anthelmintics tested, while *A. vasorum* was insusceptible to all anthelmintics tested. *A. abstrusus* was most susceptible to moxidectin and selamectin. For objective two, the published molecular methods (PCR primer sets and assays and DNA sequencing) were evaluated for the detection of metastrongyloids L_1 to be used as a complementary test to confirm the morphological diagnosis. From January 2017 to August 2020, a total of 119 fecal samples from different sources were examined using centrifugal fecal flotation and Baermann techniques. Thirty-nine out of 119 fecal samples were Baermann positive and were subjected to PCR and DNA sequencing of SSU rRNA gene, LSU rRNA gene, or ITS2. As a result, *C. vulpis* (17), *A. abstrusus* (2), *A. vasorum* (2) and one case of *Oslerus rostratus* and *Parelaphostrongylus odocoilei* positive fecal samples were definitively confirmed. For third objective, the impact of freezing on the survival and retention of infectivity of various metastrongyloid L_1 was investigated during this study. As a result, L_1 of *Filaroides martis*, *O. rostratus*, *Skrjabingylus nasicola*, and *Troglostrongylus wilsoni* were detected alive, and these larvae were found to be able to infect *Limax maximus* successfully. The study aimed to test the spontaneous larval shedding of *F. martis* and *S. nasicola*, by experimental infection of *L. maximus* and examined the feces twice a week by modified Baermann to detect L_3. The results showed no L_3 were detected from the feces of slugs for both species.

Publications

1- **Mahjoub, H.A.**, Murphy, N., Mather, P., Greenwood, S.J., Conboy, G.A., 2020. Clinical crenosomosis in a black bear (*Ursus americanus*). Vet. Parasitol. Reg. Stud. Reports. 20, 100380.

2- Wakid, M.H., Toulah, F.H., **Mahjoub, H.A.**, Alsulami, M.N., Hikal, W.M., 2020. *Giardia duodenalis* pathogenicity on immunosuppressed animal model. Trop. Biomed. 37, 1008-1017.

3- **Mahjoub, H.A.**, Bedenice, D., Stryhn, H., Yu, J., Greenwood, S.J., Conboy, G.A. An *in-vitro* larval motility assay evaluating anthelmintic efficacy against canine and feline metastrongyloids. (submitted)

4- **Mahjoub, H.A.**, Greenwood, S.J., Murphy, N., Lichtenberger, J., Wood, J., McCarthy, T, Conboy, G.A. Clinical co-parasitic infections in a cat imported from Thailand. (in preparation)

5- **Mahjoub, H.A.**, Conboy, G.A., Greenwood, S.J., Murphy, N., Hofstede, T. Mistaken identity: finding of spurious larval nematodes in a dog. (in preparation)

6- **Mahjoub, H.A.**, Greenwood, S.J., Conboy, G.A. First report of *Angiostrongylus vasorum* in a scat fox sample in Prince Edward Island. (in preparation)

7- Egers, A., **Mahjoub, H.A.**, Robbins, W., Bourque, L., Jones, M. E. B., Martinson, S., Curley, R., Greenwood, S. J., Conboy, G.A. Morphologic and molecular characterization of *Skrjabingylus nasicola* found in American mink (*Neovison vison*) native to Prince Edward Island. (in preparation)

Presentations

Annual UPEI Graduate Studies and Research Conference
16-18 May 2018
Atlantic Veterinary College – UPEI
Oral presentation (*Crenosoma* sp. Case in a Black Bear cub (*Ursus americanus*).

27th Conference of the World Association for the Advancement of Veterinary Parasitology
(WAAVP 2019) Oral presentation Clinical Crenosomosis in a Black Bear (*Ursus americanus*)