University of Prince Edward Island

Faculty of Veterinary Medicine
Summary of Dissertation

Submitted in Partial Fulfilment
of the Requirements for the

DEGREE OF MASTER OF SCIENCE

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Investigation of Lung- and Heartworms in Red Foxes and Coyotes of Atlantic Canada

Cardiopulmonary nematodes infect domestic and wild canids across North America and can cause significant respiratory and cardiovascular disease. *Angiostrongylus vasorum* (French Heartworm), previously restricted to insular Newfoundland, has long been considered an emerging threat in Atlantic Canada. *Crenosoma vulpis* and *Capillaria aerophila* are established parasites in the region, primarily infecting foxes (*Vulpes vulpes*), but also coyotes (*Canis latrans*) from Prince Edward Island (PEI) and Nova Scotia (NS). This study aimed to estimate the prevalence and distribution of lung- and heartworms in wild canids, with an emphasis on *A. vasorum* presence.

Wild canids from PEI and NS were collected by voluntary submissions through hunting, trapping, and vehicle collisions. Hearts and lungs were removed from carcasses, and adult nematodes were recovered during dissection and identified morphologically via microscopy and molecularly via PCR and DNA sequencing when necessary.

A total of 517 wild canids were examined. Foxes exhibited higher prevalence, infection intensity, and co-infections of parasites than coyotes across both provinces. *Angiostrongylus vasorum* was detected in PEI and NS, with a prevalence of 20.8% in PEI foxes and 30.3% in coyotes; and 40.7% NS foxes and 7.4% in coyotes. *Crenosoma vulpis* and *C. aerophila* prevalence in foxes remained higher compared to coyotes, supporting the role of foxes as the primary reservoir host. Additionally, an adult *Dirofilaria immitis* was recovered from a coyote hunted on PEI, representing the first confirmed report of *D. immitis* in regional wildlife.

Overall, these findings highlight the importance of wildlife surveillance for cardiopulmonary nematodes in Atlantic Canada. The presence of these parasites in wildlife hosts has important veterinary implications, specifically in areas where domestic and wild canids overlap. This thesis provides a baseline dataset for the prevalence and distribution of lungworms in Atlantic Canada and aims to encourage awareness by informing veterinary professionals of parasites present in the region.

Publications

Leaman LJ, Graham KF, Jones MEB, Greenwood SJ, Germitsch N. First reported case of *Dirofilaria immitis* in a coyote (*Canis latrans*) from Prince Edward Island. Canadian Veterinary Journal. Accepted.

Presentations

Leaman L., Graham K., Jones M., Greenwood S., Germitsch N. "Investigating lung- and heartworm infections in Maritime wild canid" (Oral Presentation). Canadian Emerging Veterinary Scholars Summit Annual Conference, Calgary, Canada, 23 - 25 October 2025.

Leaman L., Graham K., Jones M., Greenwood S., Germitsch N. "Not all wildlife are wildy healthy: lung- and heartworm infections in Maritime wild canids" (Oral Presentation). Canadian Parasitology Network Symposium Annual Conference, Quebec City, Canada, 5 - 8 June 2025.

Leaman L., Graham K., Jones M., Germitsch N. "Worms on the Rise: the spread of lung- and heartworms in Maritime wild canids" (Oral Presentation). Atlantic Canada Association of Parasitologists Annual Meeting, Wolfville Canada, 26 October 2024.

Leaman L., Graham K., Jones., Germitsch N. "Are lungworms emerging in Prince Edward Island coyotes?" (Poster Presentation). Canadian Society of Zoologists Annual Conference, Moncton, Canada, 6 - 10 May 2024.

Biographical Data

Born in Riverview, New Brunswick

Awards

Mick Burt Award of the Canadian Society of Zoologists, awarded for best student poster presentation in the Parasitism, Immunity, and Environment (PIE) section