Jordan Meeker, and Andrew McElwain
State University of New York at Oswego

Introduction

• Many helminth parasites (worms) can infect Canidae. Most commonly roundworms (Nematoda) such as hookworms, whipworms, and ascarids have been observed because they have a direct life cycle and fecal-oral transmission (Gompber, M. E., et al., 2003; Lucio-Forster, A., & Bowman, D. D., 2011).

• There is a lack of peer-reviewed articles examining these parasites and the possibility of spillover from wild to domestic canids in Oswego, New York. Rice Creek Field Station is inhabited by a variety of wildlife and has four trails where people are welcome to walk their dogs (Canis familiaris).

• The goal of this study was to compare the prevalence and intensity of helminth infections in wild canids (Canis latrans and Fulfpes vulpes) and domestic canids (C. familiaris).

Materials and Methods

• Stool samples from wild canids (C. latrans, F. vulpes) and domestic dogs (C. familiaris) collected on trails of Rice Creek Field Station. The origin of the sample was determined by referencing field guides (Murie, 1982) (Figure 5).

• Eggs were photographed at a total magnification of 400 X or 1000 X. Eggs were identified to the lowest taxonomic rank using a combination of human and veterinary parasitology reference manuals (Bowman, 2014; Colville, 2006; Despommier et al. 2019; Forrety, 2001; Garcia, 2007; Hendrix, 2006; Michel, 2015).

• A light microscope with a digital camera (Figure 1) and a grid microscope slide (Figure 2) were used to count each parasite and determine the approximate intensity of eggs from each fecal smear from each dog.

Results

• 15 samples from domestic canines, 12 from wild canines (Table 1).

• Two parasitic protozoa species. Oocysts of Isospora belli (Apicomplexa) (Figure 6) were observed in one wild canine sample (Table 1). Isospora spp. infect the small intestine of dogs and cats. Oocysts of the earthworm parasite, Monocystis lambrici (Figure 7) were observed in two wild samples (Table 1).

• Several unidentified pollen grains (Figure 8), and pollen (Pinnus sp.) (Figure 9).

• Hookworm eggs are oval with a thin shell, contain a conspicuous morula (Figure10). Larvae of the hookworm spp. were found in the samples (Figure 11).

• Toxocara canis eggs are spherical, containing a deep pigmented embryo surrounded by a rough, pitted shell (Figure 12).

• Whipworm eggs (Trichuris vulpes) are elongated, lemon-shaped, with polar plugs on opposite ends (Figure 13).

• Ae lia sp. eggs were observed in one wild sample (Figure 14). Eggs are large (>100 μm), ovoid, unembryonated, with a small operculum (Bowman, 2014).

Discussion

• Some parasites, such as hookworms, are not easily identifiable based on morphology alone. Several hookworm species infect canines including Ancyclostoma caninum, A. tubaeformis, A. braziliensis, and Uncinaria stenocephala (Hendrix, 2006). Hookworm species cannot be differentiated based on egg measurements (Colville, 2006).

• Ae lia spp. infect canids and felids. Aleia spp. have an indirect life cycle and must infect a small, frog, and a snake intermediate host (Roberts et al., 2013). Trematodes and tapeworms have been reported from wild and domestic canids (Lucio-Forster, A., & Bowman, D. D., 2011) but are uncommon because they are acquired by ingesting an intermediate host.

• Based on the limited amount of data collected, it is possible that some spillover of whipworm may have occurred between the wild and domestic canines.

• The collections herein were made during one month, yielded 27 samples.

• Other studies demonstrated wild and domestic canines can be infected by the same helminth species, but are based on collections made over months to years with hundreds of samples collected (Gompber, M. E., et al., 2003; Lucio-Forster et al., 2011; Whipples et al., 2019).

• The data herein may suggest a possible threat to domestic canines at Rice Creek Field Station if wild canine feces are ingested because 83.3% of wild canine samples contained at least one parasite.

Acknowledgements

Thank you to Rice Creek Associates for funding my research, the Possibility Scholarship for funding my housing, and Dr. McElwain for assistance throughout the research project.

References


