Characterizing the Parasite Community in Local Raccoons, *Procyon lotor*

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Introduction

The study of parasite communities increases our understanding of host-parasite interactions and improves our ability to predict and prevent zoonotic infections. Raccoons, *Procyon lotor*, are abundant, in close contact with humans, and serve as hosts to potentially dangerous parasites. Specifically, raccoons are hosts to the raccoon roundworm, *Baylisascaris procyonis,* a zoonotic worm who's larval stage can be fatal to humans[1]. The parasite community will vary depending on the individual host's habitat , food preferences, and behavior[2]. This research aims to describe the parasite community of raccoons in the Santa Barbara area and explore the relationship between host location and parasite presence.

Methods

1. We obtained raccoons from pest control agencies in Santa Barbara, and used individual trap locations to generate longitude/latitude coordinates.

2. Gut contents were removed from each raccoon. Zoonotic parasites were killed by immersion in host saline and stored in ethanol.

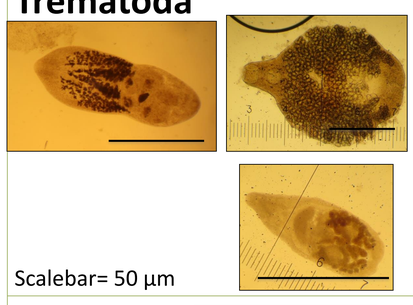
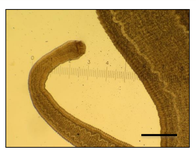
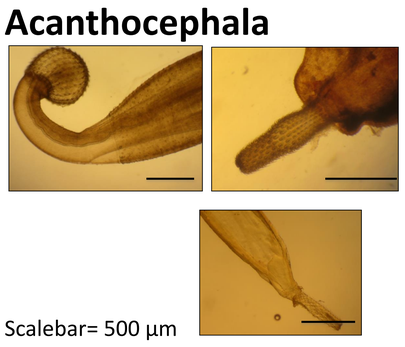
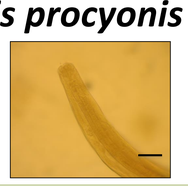
3. Gut contents were sorted under a stereomicroscope and parasites were separated by species.

4. We used a compound microscope to identify and confirm parasite species by distinguishing features, i.e. mouth structure, size.

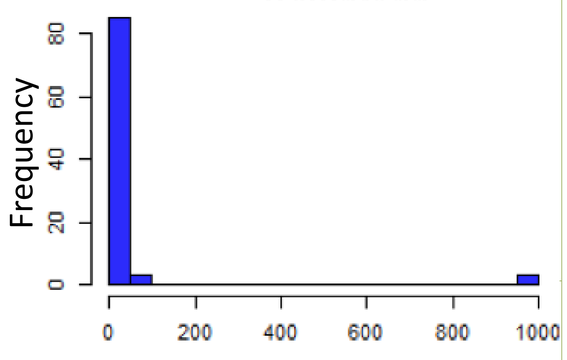
Results

n=92 raccoons

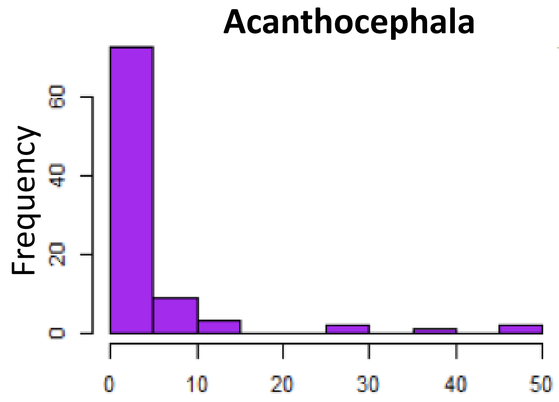
Prevalence - % of raccoons infected , **Intensity**- average number of worms per infected raccoon

Parasite	Prevalence	Intensity (Range)	Standard Deviation	Distribution
Trematoda  Scalebar= 50 µm	29%	159 (1-1000)	314	
Cestoda  Scalebar= 50 µm	32%	85 (1-1000)	182	
Acanthocephala  Scalebar= 500 µm	36%	12 (1-49)	13	
***Physaloptera* sp.**  Scalebar=100 µm	27%	6 (1-45)	9	
Baylisascaris procyonis  Scalebar=100 µm	91%	36 (1-202)	36	

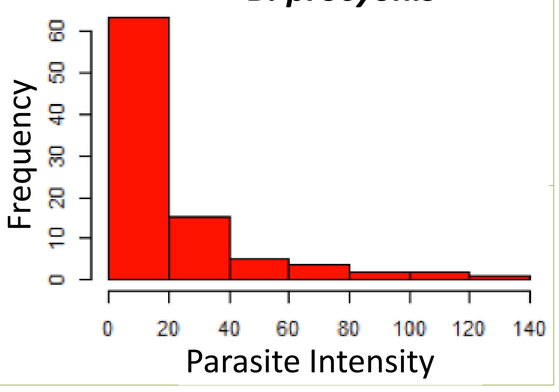
Trematoda



Acanthocephala



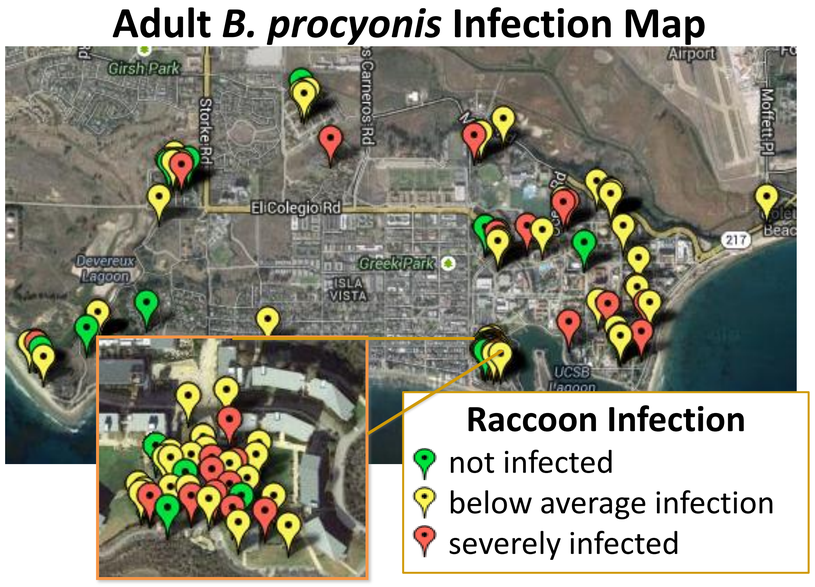
B. procyonis



Trematoda Infection Map

Acanthocephala Infection Map

Adult *B. procyonis* Infection Map



Discussion

The gut parasite community of local raccoons is composed of 12 parasite species belonging to four major taxonomic groups: Trematoda, Cestoda, Acanthocephala, and Nematoda. Of the 92 raccoons, 98% are infected with at least one parasite. The zoonotic nematode, *B. procyonis*, is present in 91% of the animals sampled. The infection intensity follows an aggregated distribution, where the majority of raccoons have low intensity infections, while a few raccoons are severely infected with a high number of parasites.

This distribution pattern is common among parasites and can be attributed to host immunity, host behavior, and parasite lifecycle. Although *B. procyonis* is present throughout Santa Barbara in both coastal and inland areas, other parasites such as acanthocephalans appear to be restricted to predominantly coastal areas. This may be because the lifecycle of acanthocephalans often uses crustaceans as intermediate hosts and these are a likely food source for coastal raccoons. These results improve our understanding of local raccoon parasite communities and provide a first step towards a predictive model of parasite occurrence.

Acknowledgements

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Literature Cited

1. Kazacos KR. *Baylisascaris procyonis* and related species. In: Samuel WM, Pybus MJ, Kocan AA, eds. *Parasitic diseases of wild mammals*. 2nd ed. Ames: Iowa State University Press, 2001;301-341.
2. Combes, Claude. *Parasitism. The Ecology and Evolution of Intimate Interactions*. University of Chicago Press, 2012.