

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

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Parasites are everywhere...

Parasite - organism that either harms or lives at the expense of another organism, the host

Zoonotic

Transfer of
animal to

- Major disease zoonotic
- all humans susceptible
- all regions world species



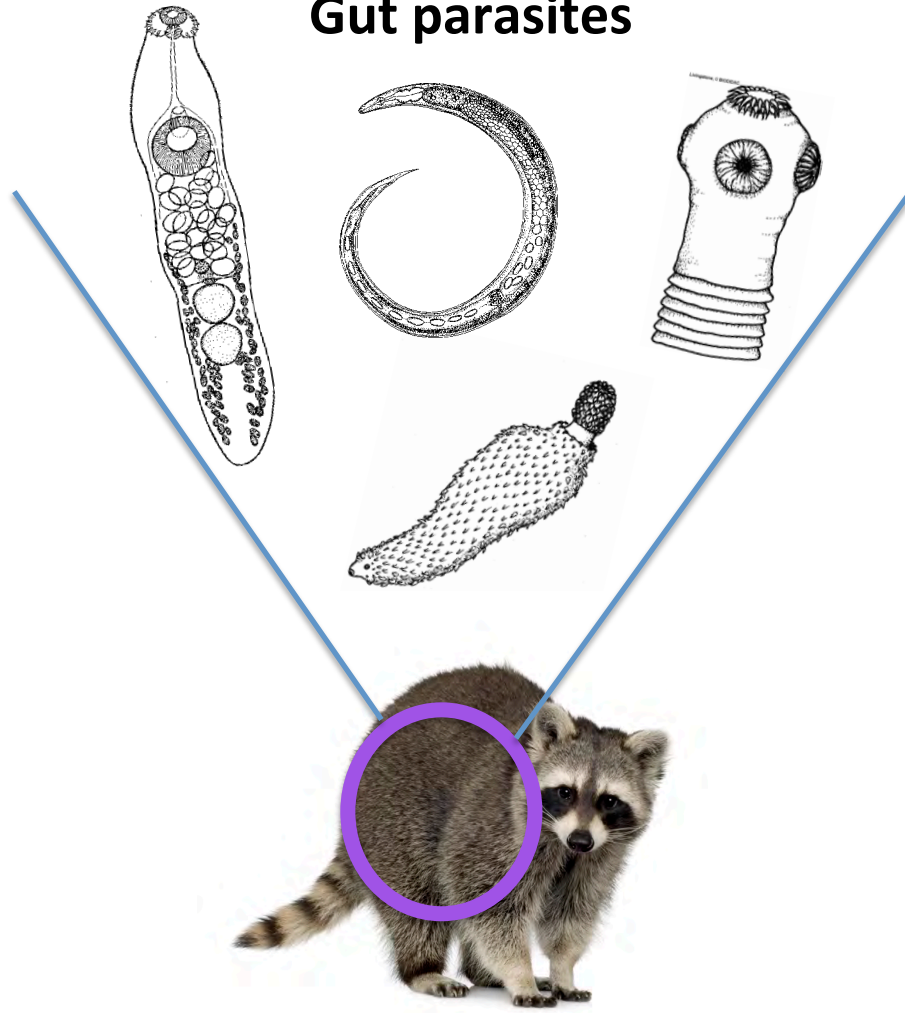
Raccoon Parasites:

- Abundant
- Within close contact
- Dangerous
i.e. Raccoon roundworm → neurological disease

Goal: Understand parasite lifecycle → Prevent disease transmission

Understanding Parasite Communities

Gut parasites



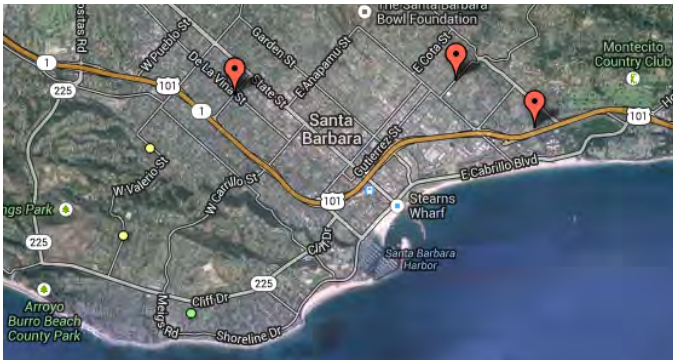
Questions:

- What is the parasite community?
- Is there a relationship between location and parasite presence?
i.e. beach, woods, urban

Determine distribution pattern
→ Predict and prevent disease

Methods: Parasite Sorting & Identifying

Collect



- Raccoon location: longitude/latitude



Dissect



- Raccoon physical characteristics, health condition
- Kill & preserve parasites with ethanol and $> 63^{\circ}\text{C}$ heat



Sort, Count, Identify

- Record and count parasite species



Dissecting or Compound Microscope



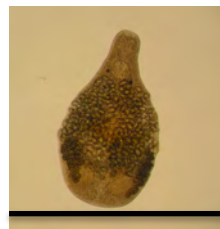
Tapeworm



Spiny-Headed Worm



Roundworm



Fluke

Scalebar= 500 um

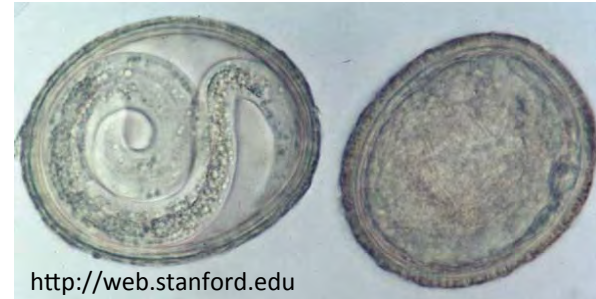
Constraints and Challenges



Scalebar= 500 um



Identification



Dangerous diseases: rabies,
raccoon roundworm

Good estimate
of raccoon
home range?



Parasite Data (n=92 raccoons)

% of raccoons infected with parasite

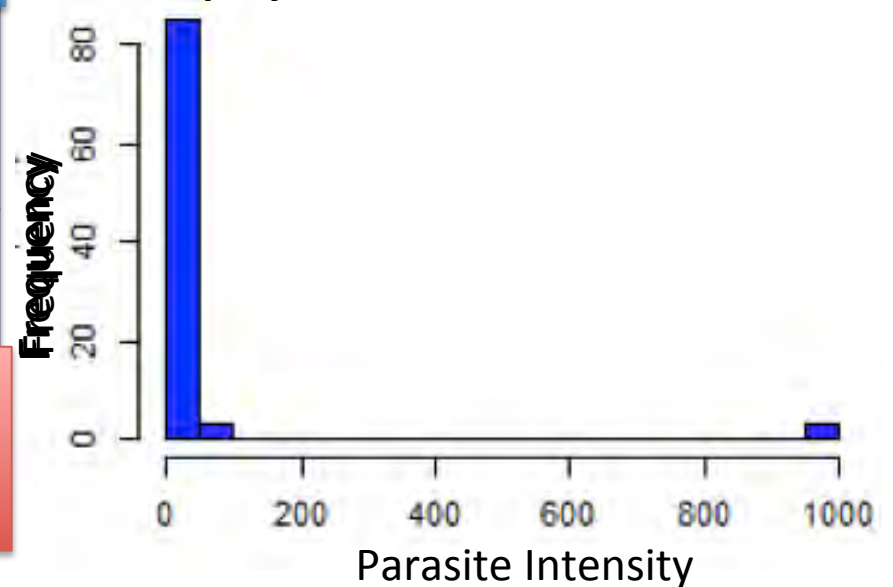
avg # of worms in infected raccoon

Parasite	Prevalence	Intensity	Standard Deviation
Fluke	29%	159	314
Tapeworm	32%	85	182
Spiny-Headed Worm	36%	12	13
Physaloptera	27%	6	9
Raccoon Roundworm	91%	36	36

Raccoon Roundworm

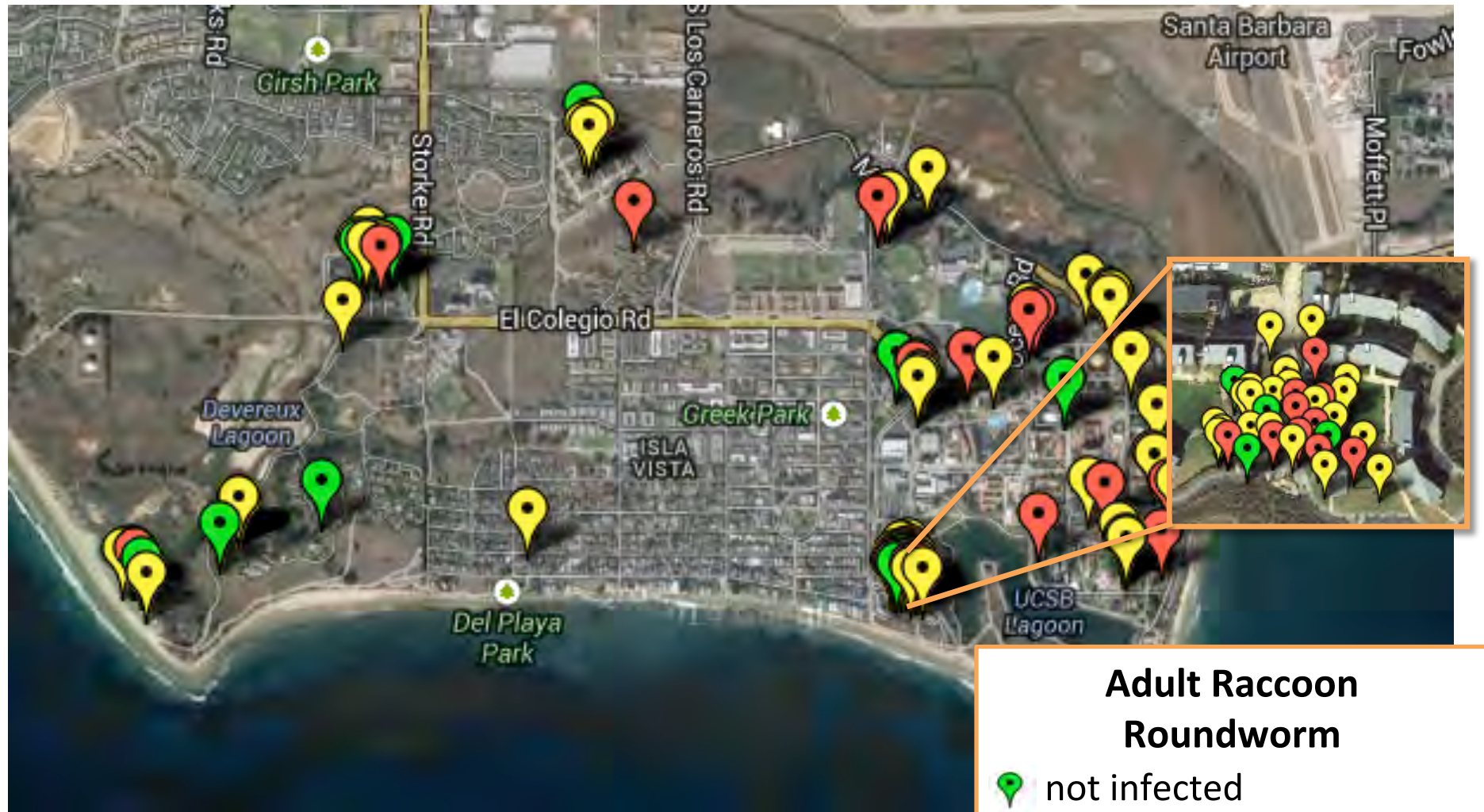


Spiny-Headed Worm Distribution



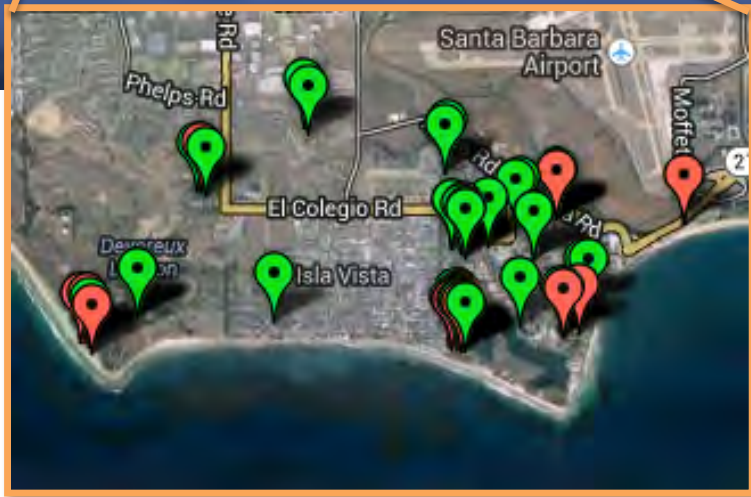
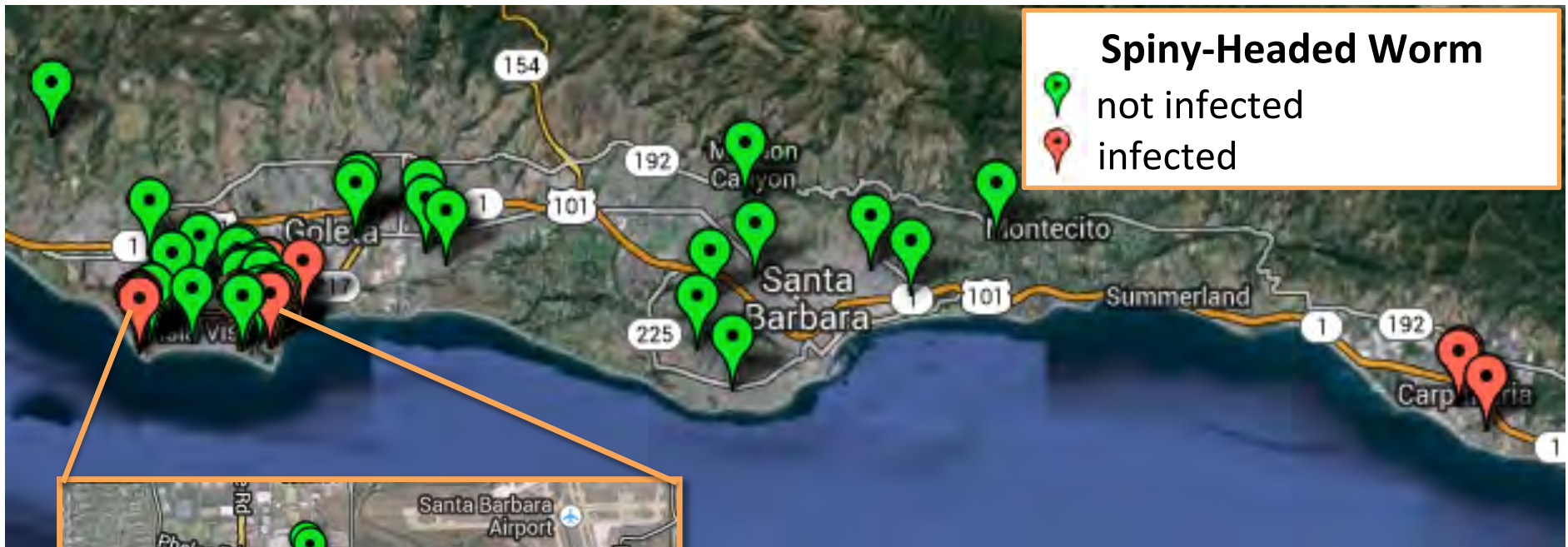
Adult Raccoon Roundworm Infection Map

- Each point represents an individual raccoon, n=140 raccoons

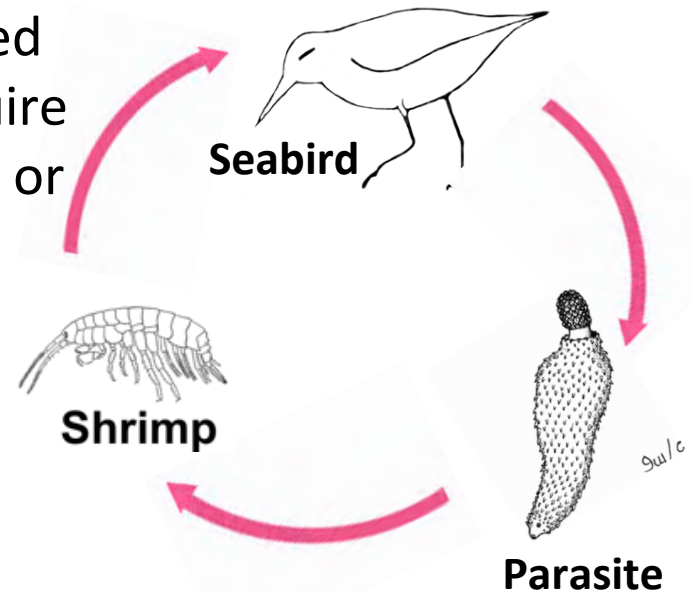


- Raccoons are abundant
- Local raccoons are very infected

Spiny-Headed Worm Infection Map



Spiny-headed worms require crustaceans or insects in lifecycle



Raccoon habitat may increase certain parasite infections

Summary & Future Work

What is the parasite community?

- 12 parasite species
- Of the sampled 92 raccoons, 98% are infected with parasite(s)
- The most prevalent is the raccoon roundworm, the most dangerous parasite

Is there a relationship between location and parasite presence?

- Yes

Possible Future Work:

- Predictive modeling of parasite locations
- Identifying parasite species
- Human interaction with raccoons and these parasites

Acknowledgements

Mentor: Sara Weinstein

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Megan and all others involved

And my fellow INSET interns 😊



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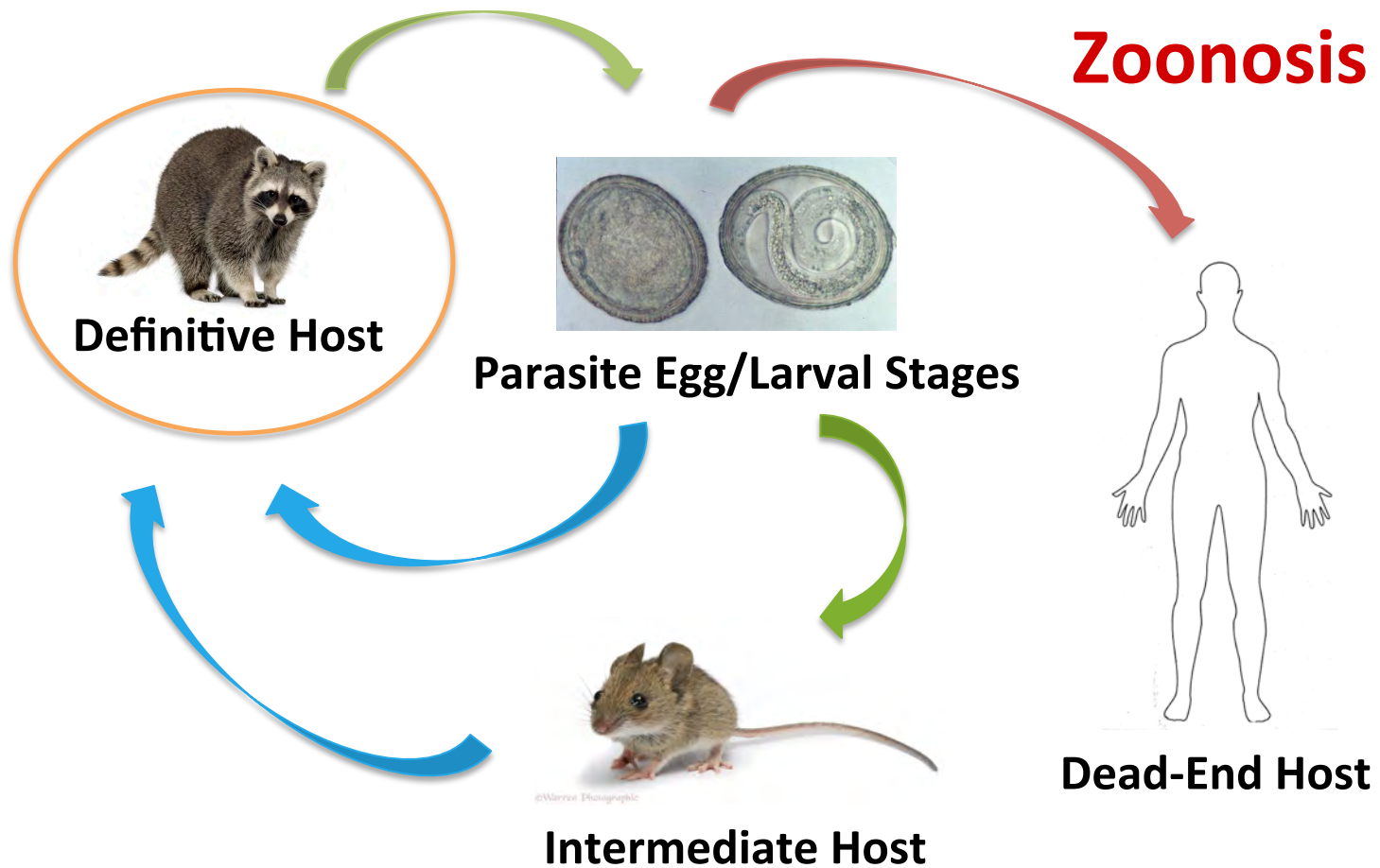
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Raccoon Roundworm Lifecycle



Parasite Classification

Microparasites

virus, bacteria, fungi,
protists

- Small
- Induce durable immunity
- Unstable population
- Cause epidemic diseases

Macroparasites

helminths, arthropods,
metazoans

- Larger (may be seen with the eye)
- Stable population
- Cause endemic diseases

Specific Parasite Data Comparisons

Parasite	Prevalence	Intensity	Standard Deviation
Fluke	29%	159	314
Fluke 1	17%	211	393
Fluke 2	12%	41	47
Fluke 3	2%	52	69
Fluke 4	2%	100	0
Spiny-Headed Worm	36%	12	13
Worm 1	29%	12	14
Worm 2	8%	10	7
Worm 3	2%	1	0

Fluke Infection Map

