Parasites of Urban Coyotes
Jackson Chambers
Introduction

• *Canis latrans*
  – *Cosmopolitan*
  – Opportunistic omnivores

• Zoonotic parasites
Introduction

- 17 coyotes (14 suitable for necropsy)
- Collected from Edmonton and area

http://www.edmontonurbancoyotes.ca/
Research Objectives

• How healthy are urban coyotes in Edmonton?
  – Parasites present
  – Amount of parasites
  – Overall body condition
Methods

• Necropsy
Methods

- Identification

*Taenia serialis*
Methods

- Fecal floatation

- Uncinaria sp.
- Echinococcus multilocularis
- Alaria sp.
## Results

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Intensity</th>
<th>Range</th>
<th># infected /14</th>
<th>Prevalence (%)</th>
<th>Zoonotic?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaria arisaemoides</td>
<td>67</td>
<td>10 to 123</td>
<td>4</td>
<td>28%</td>
<td>No</td>
</tr>
<tr>
<td>Alaria marcianae</td>
<td>5</td>
<td>1 to 18</td>
<td>5</td>
<td>36%</td>
<td>Yes</td>
</tr>
<tr>
<td>Toxascaris leonina</td>
<td>47</td>
<td>1 to 100</td>
<td>8</td>
<td>57%</td>
<td>Yes</td>
</tr>
<tr>
<td>Taenia pisiformis</td>
<td>246</td>
<td>3-962</td>
<td>4</td>
<td>29%</td>
<td>No</td>
</tr>
<tr>
<td>Taenia serialis</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>7%</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncinaria stenocephala</td>
<td>15</td>
<td>3 to 38</td>
<td>4</td>
<td>29%</td>
<td>Yes</td>
</tr>
<tr>
<td>Echinococcus multilocularis</td>
<td>51879</td>
<td>13 to &gt;100000</td>
<td>10</td>
<td>71%</td>
<td>Yes!!!!</td>
</tr>
<tr>
<td>Physaloptera sp.</td>
<td>3</td>
<td>1 to 6</td>
<td>3</td>
<td>21%</td>
<td>No</td>
</tr>
<tr>
<td>Capillaria sp.</td>
<td>16</td>
<td>3 to 61</td>
<td>5</td>
<td>36%</td>
<td>No</td>
</tr>
<tr>
<td>Oslerus osleri</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7%</td>
<td>No</td>
</tr>
<tr>
<td>Isospora canis</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7%</td>
<td>No</td>
</tr>
</tbody>
</table>
Results

Echinococcus multilocularis
Results

*Alaria arisaemoides*

*Alaria marcianae*

*Toxascaris leonina*

*Taenia serialis*
Results

Parasite Site Specificity

Toxascaris leonina
- Stomach: 10%
- Duodenum: 20%
- Jejunum: 70%
- Ileum: 10%
- L. Intestine: 0%

Taenia sp.
- Stomach: 0%
- Duodenum: 90%
- Jejunum: 0%
- Ileum: 0%
- L. Intestine: 10%

Physaloptera sp.
- Stomach: 20%
- Duodenum: 30%
- Jejunum: 40%
- Ileum: 10%
- L. Intestine: 0%

E. multilocularis
- Stomach: 5%
- Duodenum: 25%
- Jejunum: 60%
- Ileum: 10%
- L. Intestine: 0%

Capillaria sp.
- Stomach: 0%
- Duodenum: 0%
- Jejunum: 85%
- Ileum: 15%
- L. Intestine: 0%

Alaria marcianae
- Stomach: 0%
- Duodenum: 0%
- Jejunum: 75%
- Ileum: 25%
- L. Intestine: 0%

Alaria arisaemoides
- Stomach: 0%
- Duodenum: 25%
- Jejunum: 50%
- Ileum: 25%
- L. Intestine: 0%
Discussion

- Berries used to self-medicate? - Herbal Prophylaxis
- Coyotes that ate berries had fewest parasites
Significance

• Coyote Ecology
  – *Alaria sp.*

• Public health/education
  – Clean up after pets
  – Eliminate attractions

• Future Research
  – Calgary/ North America
  – *Echinococcus multilocularis*
Fun Finds
Fun Finds
Acknowledgements

- Mike Stock
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- Sarah Bucknor
- Cara Hooper
- Jennifer Bubenko
- Gord Youzwyshyn
- Karen Christensen-Dalsgaard
THANK YOU!
References


• http://www.edmontonurbancoyotes.ca
• http://veterinaryteam.dvm360.com/why-do-dogs-and-cats-eat-grass?id=&sk=&date=&%0A%09%09%09&pageID=2
Questions?
Results

# of Parasites vs. Spleen Weight
Echinococcus Lifecycle

1. Scolex attaches to intestine
2. Adult in small intestine
3. Embryonated egg in feces
4. Ingestion of cysts (in organs)
5. Protoscolex from cyst
6. Ingestion of eggs (in feces)

Definitive Host (dogs & other canidae)
 Intermediate Host (sheep, goats, swine, etc.)

Hydatid cyst in liver, lungs, etc.
Oncosphere hatches; penetrates intestinal wall

CDC Logo: SAFER. HEALTHIER. PEOPLE.
Alaria Lifecycle

Fig. 2.4 - Alaria spp. nematode cycle in 9.5 days.
Toxascaris Lifecycle

Roundworm Lifecycle

Toxocara canis
Toxocara cati
Toxascaris leonina

1. Parasite enters host through direct or indirect (mouse) route
2. Parasite migrates through various organs to the lungs and into the trachea
3. Larvae are swallowed and mature to adults in the small intestine.
4. Eggs are shed in the feces

Parasite can be passed to young
Egg embryoanates
Tapeworm (Taenia)

Small mammals eat eggs on grass.

Proglottids shed in feces; lay eggs on the ground.

Dogs & Cats eat mammals and become infected.

Scolex or head attaches.

Adult tapeworm attaches to small intestine wall.

Segments called proglottids.
Discussion

• Edmonton vs. Calgary

*Pterygodermatites affinis*  
*Alaria sp.*
Safety

• Biosafety Level 2
• Extra precautions taken
• Careful clean-up
• Still safe