Arthropod Parasites

Spencer Greenwood
Dept. of Biomedical Sciences
Office: 2332N AVC-North Annex
Phone: 566-6002
Home: 892-4686
E-mail: sgreenwood@upei.ca
Arthropod Parasites

1. Arachnids
   - Ticks
   - Mites

2. Insects
   - Lice
   - Fleas
   - Flies
Arthropod features:
1. Segmentation
2. Exoskeleton
3. Jointed limbs
4. Tagmatisation
5. Haemocoel
6. Dorsal blood vessel
7. Ventral nerve cord
Hemimetabolous  Incomplete metamorphosis

Holometabolous  Complete metamorphosis
Arthropod Parasites

• **Ectoparasites**
  – Outer surface of the host

• **Direct effects**
  – Blood loss
  – Skin inflammation & pruritus
  – Toxicosis
  – Allergic responses
  – Myiasis

• **Indirect effects**
  – Disturbance/annoyance
  – Self-wounding
  – Social nuisance
  – Vectors
Arachnids – Ticks & Mites

DEER TICKS (Ixodes scapularis)

DOG TICKS (Dermacentor variabilis)

MART

larvae nymph male female adults

male female adults

Average grain of table salt (NaCl): 0.3 mm on a side.

Follicle Mite (Demodex)
Ticks

• Obligate blood-feeding ectoparasites of vertebrates
• Dorsoventrally flattened

• **Capitulum (Gnathosoma)**
  – Anterior cephalothorax
    • **Fused head & thorax**
  – Bears mouth parts
    • Chelicerae, palps & hypostome

• **Idiosoma (“abdomen”)**
  – Contains the internal organs
  – Bears the legs
    • 3 pairs in larval stage
    • 4 pairs in nymphs & adults
    • posterior portion may be subdivided into sclerites called festoons
Tick Mouth Parts

- **Palps**
  - Function as sensory organs
  - May aid in feeding by **stabilizing the tick**
- **Chelicera**
  - Appendages located within sheaths on each side of the mouth
  - Used to **cut & pierce the host’s skin**
- **Hypostome**
  - Extends anteriorly & ventrally from the basis capituli (~bottom lip)
  - Armed with backward directed teeth
  - Acts as an **anchoring device during feeding**

**Feeding**
- Palps grasp the skin, chelicerae cut the skin, then the hypostome is pushed into the wound to help anchor the tick
- Blood & lymph are sucked up from the lacerated tissues
- Saliva is secreted while the tick is feeding
  - Contains anticoagulants & disposes of excess water
Ticks

- Two families:
  - Ixodidae (hard ticks) & Argasidae (soft ticks)

**Ixodid ticks**
- Sclerotized (hardened) shield-like plate called a **scutum** that covers part of its abdomen
- **Capitulum visible from above**

**Argasid ticks**
- Leathery, unsclerotized abdomen (**no scutum**)  
- **Capitulum is not visible from above**
Hemimetabolous Life cycles

Egg → Larva → Nymph → Adult (no pupa stage)

**Ixodid Ticks**

- Eggs
- Six-Legged Larva
- Eight-Legged Nymph
- Eight-Legged Adult

**Argasid Ticks**

- Eggs in eggshells
- Larvae in eggshells
- Nymphs
- Adult

What Are The Differences Between Hard Ticks And Soft Ticks?

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<tr>
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<th>Ixodid Ticks</th>
<th>Argasid Ticks</th>
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<tr>
<td>Scutum (dorsal shield)</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Capitulum (head/mouth parts)</td>
<td>Anterior (visible from above)</td>
<td>Ventral (not visible from above)</td>
</tr>
<tr>
<td>Nymphal stages</td>
<td>1</td>
<td>Several</td>
</tr>
<tr>
<td>Adult feeding time</td>
<td>Several days</td>
<td>30-60 minutes</td>
</tr>
<tr>
<td>Female blood meals</td>
<td>1</td>
<td>Several</td>
</tr>
<tr>
<td>Egg laying events</td>
<td>1</td>
<td>Several</td>
</tr>
<tr>
<td>Total eggs laid</td>
<td>3000-8000</td>
<td>400-500</td>
</tr>
</tbody>
</table>

http://extension.entm.purdue.edu/publichealth/insects/tick.html
Note: The life cycle of a 3-host tick may take 1-2 years depending on whether or not the tick can find a suitable host between life stages.

Life Cycle of 3-Host Tick

1. Female tick lays eggs on ground.
2. Six-legged larva feeds on a small mammal, then drops off to the ground and molts.
3. Eight-legged nymph feeds on a small mammal, then drops off to the ground and molts.
4. Eight-legged adults feed and mate on a larger mammal, including livestock and pets, then drop off to the ground. Males die soon thereafter and females begin to develop eggs.
Ixodid Tick Life Cycles

1. **One-host ticks**
   - The ticks moult through all instars on a single host

2. **Two-host ticks**
   - The nymph drops off the host to moult, then quests & attaches to a new host

3. **Three-host ticks**
   - The larva & nymph both drop off to moult

- Note: In multi-host tick life cycles the “host” may be the same animal, a different animal of the same species or a different species
Ixodid Tick Host Detection

- Extremely hardy & can withstand long periods of starvation
- Spend as little as 10% of time on the host
  - 3-host tick
- Often must “sit & wait” for the host
- **Have an organ dedicated to detecting their hosts**

**Haller's organ**
- Complex sensory organ that ticks bear
- Tiny cavity at the terminal segment of the first pair of legs
- Composed of a pit & a capsule containing sensory setae
- Detects host via olfaction & the sensing of humidity, temperature & CO₂
Pathogenesis

1. Anemia
   - Blood loss in heavy infestations

2. Tick worry
   - Ill thrift caused by the loss of blood, pain & swelling from the bite wounds, secondary infections & absorption of toxins

3. Dermatosis
   - Inflammation, swelling, ulceration & itching
   - Induced by components of tick’s saliva & mouthparts that remain in the wound
Pathogenesis

4. Paralysis (Tick Toxicosis)
   - Some species of ticks’ saliva contain neurotoxins → disrupts motor nerve synapses in the spinal cord & blocks neuro-muscular junctions → ascending paralysis
     • A single tick can produce paralysis in dogs (& humans)
     • Heavy infections required to produce paralysis in cattle
   - Clinical signs do not appear unless tick has been feeding for ~ 4 days
   - Removing tick(s) often result in dramatic recovery

5. Vectors
   - Ticks can transmit bacterial, viral & protozoal pathogens
   - Pathogens may be passed
     1. Transstadially = from larva to nymph & nymph to adult
     2. Transovarially = from female to next generation
Protozoan parasites transmitted by arthropods

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<th>Vector</th>
<th>Host</th>
<th>Disease</th>
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<td>Tse tse fly (Glossina sp.)</td>
<td>African cattle</td>
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<td>Trypanosoma brucei brucei</td>
<td>Tse tse fly (Glossina sp.)</td>
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<td>Ixodid tick (Rhipicephalus appendiculatus)</td>
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<td>Babesia gibsonii</td>
<td>Ixodid tick (Rhipicephalus sanguinensis)</td>
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<td>Cytauxzoon felis</td>
<td>Ixodid tick (Dermacentor variabilis)</td>
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<td>Cytauxzoonosis</td>
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<td>Plasmodium relictum</td>
<td>Culicine mosquito (Culex spp.)</td>
<td>Birds</td>
<td>Avian malaria</td>
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<tr>
<td>Leucocytozooon simondi</td>
<td>Simulium black fly (Simulium spp.)</td>
<td>Ducks &amp; geese</td>
<td>Leucocytozooonosis</td>
</tr>
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Treatment & Control

Dogs & cats

• **Host-targeted**
  – Topical products
    • Selamectin = Revolution ®
    • Fipronil = Frontline®
  – Application of topical pesticides if animal is heavily infested
    • Sprays, dips, powders
  – Flea-tick collars
    • Do not work well – regional = just the neck

• **Environment**
  – Premises can be treated with pesticides with residual activity
  – Destruction of refugia on property
    • Around kennels, house, walking paths, etc.
Treatment & Control

Livestock

• Host-targeted
  – Application of pesticides to animals
    • Sprays, dips, powders, backscratchers, ear tags
  – Ivermectin, moxidectin, eprinex, doramectin

• Environment
  – Premises treated with pesticides with residual activity
  – Destruction of refugia on property
    • Around barns, house, etc.
Treatment & Control

• Removal
  – Grasp as close to animals skin as possible (forceps >> fingers)
    • Hold on to the capitulum
  – Exert steady, gentle traction
  – Wait for tick to release hold on skin
    • Don’t leave mouth parts in host

• Tick ID
  • ID beyond the genus level is difficult
    • ID of nymphs & larva even harder
      – Expert often required
Ixodid (Hard) Ticks

- **Capitulum** is visible dorsally
- Sexually dimorphic
  - Females are larger than males
- Both sexes possess a sclerotized dorsal shield called a **scutum**
  - Males - scutum covers the entire dorsal surface
  - Females - scutum only partially covers the anterior portion of the dorsal surface

- Important Genera (North America)
  1. **Ixodes**
  2. **Rhipicephalus (Boophilus)**
  3. **Dermacentor**
  4. **Amblyomma**
Ixodid Tick Identification

1. Scutum (shield) pattern
   – Each species has a unique pattern or color

2. Festoons
   – Small areas separated by short grooves on the back margin of the tick
   – Helps distinguish all other ticks from *Ixodes* ticks, which lack festoons

3. Location & time of year
   – Based on location in North America & the time of year, only certain ticks will be active
Tick Identification

1. **Scutum (shield) pattern**
   - Each species has a unique pattern or colour
   - *Ixodes* ticks often have a black/brown solid colored scutum
   - *Dermacentor* & *Amblyomma* ticks each have a patterned scutum ("ornate" scutum)
Female *Ixodes scapularis* (Blacklegged tick or Deer tick)
Female *Amblyomma americanum* (Lone Star tick)
Female *Dermacentor variabilis* (American Dog tick)
Tick Identification

2. Festoons

*Ixodes* spp.

- Lack Festoons
- Anal groove in front of anus

*Dermacentor* spp., *Amblyomma* spp. & *Rhipicephalus* spp.

- Prominent festoons*
- Anal groove behind anus
Tick Identification

3. Location & time of year
   – Based on your location in North America & the time of year, only certain ticks will be active

http://www.tickencounter.org/current_tick_activity
Ixodid Ticks – Important Genera

1. *Ixodes*

2. *Rhipicephalus* (*Boophilus*)

3. *Dermacentor*

4. *Amblyomma*

http://people.upei.ca/sgreenwood/html/arthropods.html
*Ixodes scapularis*
Deer tick, Blacklegged tick

- Both nymph & adult stages transmit diseases
  - **Lyme disease**
    - *Borrelia burgdorferi*
  - Babesiosis
    - *Babesia microti*
  - Anaplasmosis
    - *Anaplasma phagocytophilum*
Morphology

- Female: orange-brown, larger & longer mouthparts than male
- Male: dark brown
- Nymphs: 1-2 mm x ~ 0.7 mm (~a pin head)
- Larvae: 0.5-0.6 mm x ~ 0.4-0.5 mm
Life cycle: 3-host tick (~2 year cycle)

- Eggs laid by adult in spring
- Eggs hatch into larvae (30d)
- Larvae attach to 1\textsuperscript{st} host in late summer, feeds for 2-4 days (mouse or vole)
- Larva detaches to overwinter & moult into nymphs the next spring
- Nymphs attach to 2\textsuperscript{nd} host & feeds for 3-4 days
- Nymphs detach & moult into adults
- Adults attach to 3\textsuperscript{rd} host in later summer/fall, where it mates & feeds
- Adult detaches to lay eggs
Pathology & Disease Transmission

- **Main vector for the spirochaete *Borrelia burgdorferi***
  - Causative agent of *Lyme Disease* (zoonosis)
  - Dogs: shifting-leg lameness (arthritis), glomerulonephritis
  - Cattle & horses: arthropathy, encephalitis (sporadic)
  - Humans: bull’s-eye rash, neurological problems, arthritis

- **White-footed deer mouse**
  - Principle reservoir for *B. burgdorferi*
  - Serves as the host for the larva & nymph stages

- **Spirochaete transmission**
  - Transstadially (eggs $\rightarrow$ larva, larva $\rightarrow$ nymph, nymph $\rightarrow$ adult)
  - Transovarially (adult $\rightarrow$ eggs)

- **Incidence of Lyme disease in humans (May-June)** coincides with the activity of the nymphs

- Nymph (very small) often goes unnoticed on host
Lyme Disease

Reported Cases of Lyme Disease -- United States, 2012

1 dot placed randomly within county of residence for each confirmed case.
Ixodes pacificus
Western black-legged tick

• Both adult & nymphal ticks are known to transmit disease to humans.

• **Vector**
  – Lyme disease in Pacific North-West
  – Anaplasmosis

• May cause tick paralysis

• Larvae & nymphs feed on birds & small rodents

• Adult ticks feed on deer & other mammals
**Ixodes spp.**

**Tick ID**

- **Genus level**
  - *Inornate scutum*, relatively long mouth parts
  - Examine the ventral surface of the tick
  - **Anal groove** runs **anterior** to the **anus**
  - No festoons

- **Species level ID** requires an expert
**Rhipicephalus sanguineus**
Brown Dog Tick

- Common ectoparasite of dogs
- Worldwide distribution
  - Almost all of USA (esp. Southern states)
  - Parts of Canada
- Disease vectors
  - All life stages can transmit **Rocky Mountain Spotted Fever rickettsia** (*Rickettsia rickettsii*) to dogs & rarely to humans.
  - Both nymphal & adult stages can transmit the agents of **canine ehrlichiosis** (*Ehrlichia canis, E. ewingii, E. chaffeensis*) & **canine babesiosis** (*Babesia canis vogeli & Babesia gibsoni-like*) to dogs
Morphology

- Inornate (no white colour)
- Basis capitulum hexagonally shaped in dorsal view
- Festoons present
- Unfed adults may be 3-4.5 mm (size is variable)
- Engorged female may be 12 mm
Life cycle: 3-host tick, ~2 month+cycle

- Eggs laid by adult
- Eggs hatch into larvae
- Larvae attach to 1st host
- Larva detaches & moult into nymphs
- Nymphs attach to 2nd host
- Nymphs detach & moult
- Adults attach to 3rd host where it mates & feeds
- Adult detaches to lay eggs
Life cycle: 3-host tick, ~2 month + cycle

- All **3 hosts** can be **dogs**
  - Even on the same dog!

- **Home & kennel infestations**

  egg to adult in 63 days
  (vs. 2 years for *Ixodes* spp.)
Brown dog tick infestations

(*Rhipicephalus sanguineus*)
Pathology & Disease Transmission

• Vector
  – Rocky Mountain Spotted Fever (*Rickettsia rickettsii*)
    • Dogs & Humans
  – Babesiosis (*Babesia canis, B. gibsoni*)
  – Ehrlichiosis (*Ehrlichia canis, E. ewingii, E. chaffeensis*)
  – Hepatozoon canis, possibly *Anaplasma platys*

• Problem in dog kennels
  – High numbers can occur on dogs
  – Professional exterminator may be required
Rocky Mountain Spotted Fever
**Rhipicephalus** spp.

**Tick ID**

- **Genus level**
  - Hexagonal basis capitulum
  - Festoons present*
    - *Not in *R. (Boophilus) annulatus*
  - Anal groove encircles posterior half of the anus only
  - Males have adanal shields
Rhipicephalus (Boophilus) annulatus
Blue cattle tick, Texas cattle fever tick

- **Eradicated** from USA
  - Ambitious program of intensive dipping of cattle
- **Also in Central & South regions of** the Mediterranean
- **One-host tick**
- **Vector**
  - *Babesia bigemina* (Texas Cattle Fever = Red Water)
  - *Babesia bovis* (Bovine babesiosis)
  - *Anaplasma marginale* (Bovine anaplasmosis)
In 1905, the U.S. Department of Agriculture began a cooperative effort with state governments to eradicate cattle ticks. Secretary of Agriculture James Wilson established the Cattle Fever Tick Eradication Program in 1906, which shared costs and resources among the federal government and 14 southern states and California. The USDA’s Bureau of Animal Industry (BAI) developed treatment methods, including dipping solutions and tank systems, which were effective in ridding animals of ticks. In 1910, the first arsenical solution (made from white arsenic, soda, and pine tar) was officially permitted for cattle-dipping after the BAI’s field tests had shown it to be effective. Tick eradication was so successful that a division of the BAI was dedicated to it in 1917.

By 1954, the application of a standard arsenical dip treatment at 14-day intervals had resulted in eradicating both species of cattle ticks, *Boophilus annulatus* and *B. microplus*, in the 15 states participating in the government program, except for a narrow zone along the Texas-Mexico border, where re-infection occurred from time to time because the adjacent area in Mexico was heavily infested.
Rhipicephalus (Boophilus) annulatus

Morphology
• Porose areas are broad & oval
• Palps are ridged dorsally & laterally
• Basis capituli is hexagonal dorsally
• Unfed females & males 2.0mm-3.0mm in length
• Engorged females can measure up to 12mm in length
• Males have adanal shields
**Dermacentor variabilis**

American Dog Tick

- Ectoparasite of dogs, horses, cattle, wildlife & humans
- **Eastern & Central US** + some areas of Pacific coast
- Found predominantly in areas with little or no tree cover
  - Grassy fields & scrubland
  - Along walkways, trails, & roadways in forests
- Vectors (nymphs & adults)
  - Rocky Mountain Spotted Fever
  - Tularemia
  - Cytauxzoonosis
Morphology

• Rectangular basis capitulum
• Ornamented scutum
  – Cream to silvery-gray coloured vertical markings or lines
• Festoons present
• Adult females ~5-6 mm, adult males ~4 mm
Life cycle: 3-host tick, ~2 month + cycle

- Eggs laid by adult
- Eggs hatch into larvae
- Larvae attach to 1\textsuperscript{st} host
- Larva detaches & moult into nymphs
- Nymphs attach to 2\textsuperscript{nd} host
- Nymphs detach & moult
- Adults attach to 3\textsuperscript{rd} host where it mates & feeds
- Adult detaches to lay eggs

- Larvae & nymphs prefer small rodents as hosts
- Adults prefer dogs and medium-sized mammals

Egg to adult in ~ 54 days, but can take up to 2 years
Pathology & Disease Transmission

• Can cause **Tick Paralysis**
• Vector
  – Rocky Mountain Spotted Fever (*Rickettsia rickettsii*)
  – Cytauxzoonosis (*Cytauxzoon felis*)
  – Tularemia (*Franciscella tularensis*)
Dermacentor andersoni
Rocky mountain wood tick

• Ectoparasite of dogs, horses, cattle, wildlife & humans
• Distributed over the Rocky mountains
  – North-western US
• Found predominantly in areas with little or no tree cover
  – Grassy fields & scrubland
  – Along walkways, trails, & roadways in forests
• Vectors (nymphs & adults)
  – Rocky Mountain Spotted Fever
  – Tularemia
Life cycle: 3-host tick, ~2-3 year cycle

- Eggs laid by adult
- Eggs hatch into larvae
- Larvae attach to 1st host
- Larva detaches & moult into nymphs
- Nymphs attach to 2nd host
- Nymphs detach & moult
- Adults attach to 3rd host where it mates and feeds
- Adult detaches to lay eggs
- Larvae & nymphs prefer small rodents (voles) as hosts
- Adults prefer medium-sized to large-sized mammals

Typically takes 2-3 years
Pathology & Disease Transmission

- Can cause Tick Paralysis
- Vector
  - Rocky Mountain Spotted Fever \( (Rickettsia rickettsii) \)
  - Tularemia \( (Franciscella tularensis) \)
Dermacentor albipictus
Winter tick, Moose tick

- Ectoparasite of moose, deer, elk, mules, cattle and horses
- Rarely seen on dogs, feral swine & humans
- Distributed widely in North America
- 1-host tick
- Vector
  - *Anaplasma marginale*
    - causes anaplasmosis in cattle
Life cycle: 1-host tick, 1 year cycle

- **FEB. - MARCH**: The adults feed and mate on the host.
- **OCT. - FEB.**: The nymphs feed on the host and transform into adults.
- **SEPT. - NOV.**: The larvae feed on the host and transform into nymphs.
- **SEPT. - OCT.**: The larvae climb onto plants and wait for a host to come by.
- **MARCH - APRIL**: The swollen females disengage from the animal and fall to the ground.
- **JUNE**: The swollen females lay their eggs on the ground.
Pathology & Disease Transmission

• **Vector**
  – Anaplasmosis (*Anaplasma marginale*)

• **Ghost Moose**
  – Thousands of ticks can be on a severely affected animal
  – Clinical signs visible at **end of winter** (February/March)
  – Abnormal behaviour
    • Excessive grooming (pruritus)
    • Less fearful of humans
    • Lost/confused, wander outside of natural habitat
      – More vulnerable to predators, poaching and road accidents → ↑ winter deaths
  – **Weight loss, poor physical condition**
  – **Hair loss & appearance of wounds**
  – Loss of blood (**anemia**)
Ghost moose

Dermacentor spp.

Tick ID

- Genus level
  - Rectangular basis capitulum
  - Ornamented scutum
  - Anal groove not prominent
  - Eleven festoons present
Amblyomma americanum
Lone star tick

- Characteristic “lone star” marking located centrally on its dorsal surface, at the distal tip of its scutum
- Found in woodlands with dense undergrowth & around animal resting areas
- Aggressive human biters
- Vectors (nymphs & adults)
  - Rocky Mountain Spotted Fever
  - Monocytic Ehrlichiosis
Morphology

- Mouthparts are longer than basis capitulum
- Ornamented scutum
  - Reddish-brown with deep parallel grooves
  - Large pale iridescent spot at the posterior margin
- Festoons present
Life cycle: 3-host tick

- Eggs laid by adult
- Eggs hatch into larvae
- Larvae attach to 1st host
- Larva detaches & moults into nymphs
- Nymphs attach to 2nd host
- Nymphs detach & moult
- Adults attach to 3rd host where it mates & feeds
- Adult detaches to lay eggs

- Larvae & nymphs prefer small rodents, rabbits, birds
- Adults prefer deer, cattle, horses & humans (ears & flanks)
Pathology & Disease Transmission

• Vector
  – Rocky Mountain Spotted Fever
  – Tularemia
  – Maybe Lyme Disease

• May cause Tick Paralysis
**Amblyomma** spp.

**Tick ID**

- Genus level
  - Mouthparts are longer than basis capitulum
  - Ornamented scutum
    - Reddish-brown with deep parallel grooves on the scutum
    - A large pale iridescent spot at the posterior margin
  - Festoons present
Amblyomma spp.

Tick ID

• Engorged female ticks
Argasid (Soft) Ticks

• Body is leathery & unsclerotized (no scutum)
• Capitulum is not visible in the dorsal view
• Little sexual dimorphism
  – But female is usually larger than male
• 4 Genera
  1. *Argas*
  2. *Carios*
  3. *Ornithodoros*
  4. *Otobius*
Argas persicus
Fowl Tick or Chicken Tick

- Ectoparasite of poultry
- Southern USA
- Female is ~8 mm, Male is ~ 5 mm
- Feeds at night
- Hides in cracks & crevices during the day
- Can cause severe anemia & a fatal flaccid paralysis in young chickens
Otobius megnini
Spinose Ear Tick

- Gray to light brown in color
- Common parasites of livestock
  - Larval & nymphal stages
  - Found in the ear canal
- Nymphs
  - Have well developed chelicerae
  - Pronounced spines present on the anterior regions of the cuticle
  - Body of second nymph is fiddle-shaped
- Adults
  - Non-parasitic (live off nymphal blood meal)
  - Typically measure 4 to 8 mm long
Otobius megnini
Spinose ear tick

• **Hosts:**
  – *Cattle*, horses, mules, sheep, goats, cats, and dogs; wild canids, lagomorphs, elk, white-tailed deer, mountain sheep & goats
  – Humans are also known to be parasitized

• **Distribution:**
  – From Western Canada (BC) throughout the US into Mexico, Central & South America, Africa & India

• **Year-round problem**
  – Typically worse during **late winter & spring**
**Otobius megnini**
**Spinose Ear Tick**

**Life cycle:** 1-host tick (rare for argasids)

- Larvae board host & feed in ear canal for 7 days
- Moult to 1st nymphal stage which feeds & moults to 2nd nymphal stage in the ear canal (feeds for 2-6 months)
- 2nd nymph drops to ground to moult to adult stage
  - Adult stage does not feed
- Adults mate & female deposits eggs intermittently for 6 months
- Eggs hatch in 2-3 weeks
- Larvae can survive 3 months without feeding
Otobius megnini
Spinose Ear Tick

Pathology

• Large infestations of cattle → blockage of the ear canal → severe irritation & discomfort → restlessness, head turning/tossing, ear rubbing

• **Secondary bacterial infections** can occur
  – Rupture of the eardrum
  – Heavily infested animals can die

• Severely infested animals prone to maggot infections

• Not a known vector of disease pathogens
Argasid (Soft) Ticks

1. *Argas persicus*  
   - Ectoparasite of poultry  
   - Feeds at night,  
   - Hides in cracks & crevices during the day

2. *Carios* spp.  
   - Bat and rodent soft ticks

3. *Ornithodoros moubata*  
   - Infects domestic pigs  
   - Vector of African Swine Fever Virus (asfivirus)

4. *Otobius megnini*  
   - Common parasites of livestock  
   - Larval & nymphal stages  
   - Found in the ear canal
<table>
<thead>
<tr>
<th>Species</th>
<th>Common Names</th>
<th>1-Host Tick</th>
<th>3-Host Tick</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ixodes scapularis</em></td>
<td>Blacklegged Tick</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Deer Tick</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ixodes pacificus</em></td>
<td>Western blacklegged tick</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><em>Rhipicephalus sanguineus</em></td>
<td>Brown dog tick</td>
<td></td>
<td>✓*</td>
</tr>
<tr>
<td><em>Rhipicephalus (Boophilus) annulatus</em></td>
<td>Blue cattle tick</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Texas cattle fever tick</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Rhipicephalus (Boophilus) microplus</em></td>
<td>Cattle Tick</td>
<td>✓</td>
<td></td>
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<tr>
<td></td>
<td>Southern cattle tick</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dermacentor variabilis</em></td>
<td>American Dog Tick</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><em>Dermacentor andersoni</em></td>
<td>Rocky Mountain Wood Tick</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><em>Dermacentor albipictus</em></td>
<td>Moose tick</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><em>Amblyomma americanum</em></td>
<td>Lone star Tick</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><em>Argas persicus</em></td>
<td>Fowl Tick</td>
<td></td>
<td>Multihost</td>
</tr>
<tr>
<td></td>
<td>Chicken Tick</td>
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<td></td>
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<tr>
<td><em>Ornithodoros moubata</em></td>
<td>Eyeless tampan</td>
<td></td>
<td>Multihost</td>
</tr>
<tr>
<td><em>Otobius megnini</em></td>
<td>Spinose ear tick</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Common Ticks & the Diseases they Transmit

Blacklegged Tick (*Ixodes scapularis*): Also known as the *Deer* tick, identified by long mouth parts and a black scutum on the adult female. As suggested by its nickname, also is associated with white-tailed deer. Capable of transmitting *Borrelia burgdorferi* (Lyme disease), *Anaplasma phagocytophilum*, and *Babesia microti*.

Western Blacklegged Tick (*Ixodes pacificus*): Like the Blacklegged tick, transmission of organisms responsible for anaplasmosis and Lyme disease is possible. Commonly found near the West Coast.

Brown Dog Tick (*Rhipicephalus sanguineus*): Identified by short mouth parts and a brown scutum. Thrives in dry environments. This tick is a 3-host tick but is unique in that all 3 hosts can be dogs, or the same dog, accounting for home and kennel infestations. Agents vectored include *Ehrlichia canis*, *E ewingii*, *E chaffeensis*, *Rickettsia rickettsii*, *Babesia canis*, *B gibsoni*, *Hepatozoon canis*, and possibly *Anaplasma platys*.

American Dog Tick (*Dermacentor variabilis*): Found in Eastern and Central U.S., as well as areas of the Pacific Coast. Identified by a distinctive ornate scutum and short mouth parts. Commonly encountered along roadways and trails and in forests. Potential vectored pathogens include *Rickettsia rickettsii*, *Francisella tularensis*, and *Cytauxzoon felis*.

Rocky Mountain Wood Tick (*Dermacentor andersoni*): Like the American Dog tick, commonly found along roadways, trails, and in forests of the Rocky Mountain region. Can potentially transmit *Rickettsia rickettsii* and *Francisella tularensis*.

Lone Star Tick (*Amblyomma americanum*): Noted for its long mouth parts and a single white spot on the back of adult females. Found in wooded areas and grassy meadows. Associated with white-tailed deer. Potential pathogens transmitted include *Ehrlichia chaffeensis*, *E ewingii*, *Francisella tularensis*, and *Cytauxzoon felis*.

Gulf Coast Tick (*Amblyomma maculatum*): Mouth parts are similar in length to the Lone Star tick, but the scutum (back plate) is more ornate and lacks a white dot. Range is also limited compared with the Lone Star tick. Capable of transmitting *Hepatozoon americanum* and *Rickettsia parkeri*.

http://www.veterinaryteambrief.com/article/ticks-glance