Ticks

- Class Arachnida
- Order Parasitiformes
- Suborder Ixodida
  - Family Argasidae – argasids (soft ticks)
  - Family Ixodidae – ixodids (hard ticks)

External Anatomy
Ixodid or hard ticks

- Capitulum
- Idiosoma
- Scutum
- Integument
- Festoons

External Anatomy
Argasid or soft ticks

- Body is oval, covered with rounded discs
- Hard plate (scutum) is absent
- Mouthparts not visible from above
- Festoons lacking
- Take intermittent blood meals
Life History – hard ticks

Ixodid host-seeking behavior

- Climb up on vegetation
- Function of species and age
- Different heights for larval, nymphal and adult ticks
- Questing stimulated by odors, visual images, vibrations, heat.

Life Cycle

Ixodid or hard ticks

- One host life cycle – all stages feed and molt on the same host

- Two host life cycle – larvae and nymph on same host, adults feed on a second host

- Three host life cycle – 3 stages, 3 separate hosts (90% of the ixodid ticks)
One host life cycle

Three host life cycle

Life Cycle
Argasid or soft ticks
- Typically nest parasites, sheltered environments
- 2 to 7 nymphal instars – depends on nutrition
- Each stage consumes a blood meal on a different host
- Brief blood meals (<30 minutes); interval between feeding is several months
- Lay eggs in small batches (<500)
- Multi-host life cycle
- Highly resistant to starvation
- Live for many years
## Montana Ticks

- **Hard ticks**
  - Dermacentor variabilis
  - D. andersoni
  - D. albipictus
  - Rhipicephalus sanguineus
  - Haemaphysalis chiricahua

- **Soft ticks**
  - Ornithodoros hermanni
  - Otobius megnini
  - Cortes kelleyi

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### Winter tick, *D. albipictus*, one host tick

- Host-seeking in fall, not spring or summer
- Clusters of larvae attach to ungulate
- Thousands can infest a single animal
- Spends entire winter on host
- Drop off in spring, lay eggs
- Dormant during summer months
- Infest wildlife, cattle, horses, rarely humans
- Not considered a vector; anaplasmosis in OK

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*Photo: Daniel D. Whitehouse, 2004. Foundation of Alberta Wildlife, Edmonton*
Rocky Mountain wood tick, *D. andersoni*
Three-host tick, 3 year life cycle

- Common on livestock, wildlife, companion animals, humans
- Abundant in spring and summer
- Habits include: riparian areas, sagebrush, grassy meadows
- Home for small and large mammals
- Adults winter in soil, attach in spring
- Larvae and nymphs feed on small mammals
- Adults on large mammals
- Primary vector of RMSF, CTF, tularemia, anaplasmosis and tick paralysis

Brown dog tick, *R. sanguineus*, 3-host tick

- Most widely distributed tick in the world, so it's presumed to be in Montana
- Completes life cycle indoors
- Associated with dogs, kennels, bedding
- Often called kennel tick
- All life stages occur on dogs
- Frequently infests ears and toes
- Vector of canine ehrlichiosis and implicated as vector of RMSF but not Lyme Disease

Relapsing fever tick, *O. hermsi*, soft tick

- Common in mountains and foothills of western and southwestern US (3,000' – 9,000' elev.)
- Preferred hosts squirrels, chipmunks, wood rats
- Feed at night for 15 – 30 minutes, return to host nests
- Woodpiles, cracks in logs, ceilings, floors in mountain cabins and homes
- Vector of tick-borne relapsing fever
- Human cases in 2005 in Montana
Spinose ear tick, *O. megnini*

- Infests domestic livestock, horses and cattle, and wildlife
- Likely present in Montana but in low numbers
- Larvae and nymphs feed in inner ear
- Engorged nymph drops to ground, molts to adult
- Adult non-feeding, lays eggs
- Causes ear canker
- Not a known vector

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**Importance of Ticks**

- Dermatosis
- Envenomation
- Anemia
- Otoacariasis
- Tick paralysis
- Vectors

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**Vectors**

- Protozoans
- Bacteria
- Viruses
- Rickettsia
- Ehrlichiae