

BIO 475 - Parasitology Spring 2009

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<http://www4.nau.edu/isopod>

Lecture 25

Subphylum Cheliceriformes

Spiders, ticks,
mites, scorpions,
horseshoe crabs

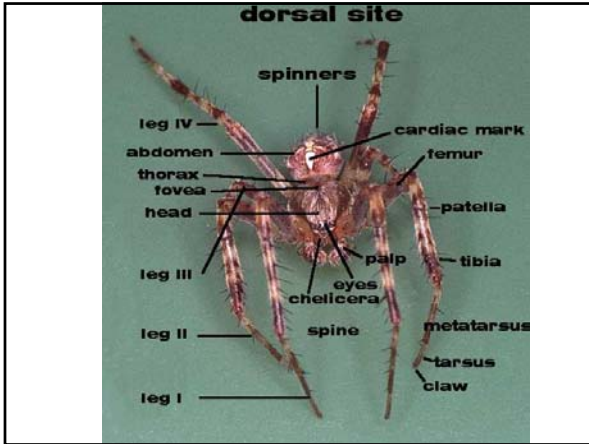


General Characteristics

Body composed of two tagmata; the
prosoma and *opisthoma*.

Appendages on prosoma are:

1. Chelicerae
2. Pedipalps
3. 4 pairs of walking legs (uniramous)
4. No antennae



Order Acari

Three major suborders

1. Opilioacariformes - primitive mites
2. Parasitiformes - parasitic ticks and mites
3. Acariformes - mites and chiggers



Order Acari



Characteristics

1. Hexapod larval stage
2. Three octopod nymphal stages (variously abbreviated in derived taxa)
3. Gnathosoma delimited by a circumcapitular suture
4. Palpcoxae fused medially forming a hypostome
5. Loss of external evidence of opisthosomal segmentation, i.e. without tergites or sternites



Acari - The Mites

- Among the oldest of all terrestrial animals, known from the early Devonian, nearly 400 million years ago.
- Mites are ubiquitous. They have successfully colonized nearly every known terrestrial, marine, and fresh water habitat
- 1 m² of coniferous litter may contain > 10⁵ mites representing 200 species in at least 50 families.





Acariformes The "mite-like" mites

- 30,000 described species
- They inhabit all imaginable biotic and abiotic habitats.
- They include such familiar scourges as dust mites, spider mites, scabies and chiggers



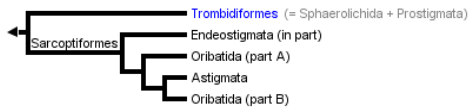
Oribatid Mites



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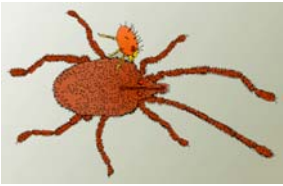
Trombidiformes

Trombidiform mites

Prostigmata - tracheal system opens near dorsal prosoma

Tetranychoidae – spider mites

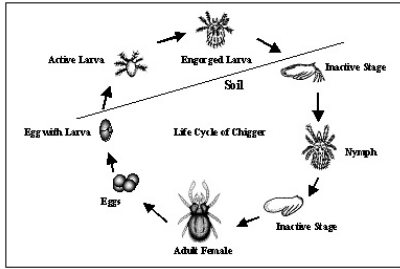
Eriophyoidea – gall mites



Parasitengona

Velvet mites, chiggers, water mites

- Are termed **protelean parasites** because larvae are parasitic while deutonymphs and adults are predatory.
- Amphibians, reptiles, birds and mammals are all subject to attack from these larvae.
- Trombids = chiggers!!



How Chiggers Work Feeding

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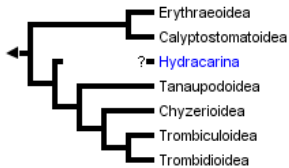




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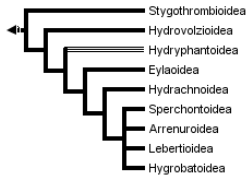


Hydracarina

Water mites

The only truly aquatic mites

Are parasitic on aquatic sponges, mussels, and insects





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Parasitiformes

Holothyran, ticks and mesostigmatic mites





FIGURE 40.13

Echinolaelaps echidinus, the common rat mite. Ventral view of female.
From S. Hirst, "Mites injurious to domestic animals (with an appendix on the acarine disease of hive bees)," in *Brit. Mus. (Nat. Hist.) Econ. Ser.* 13:1-107.
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Parasitiformes

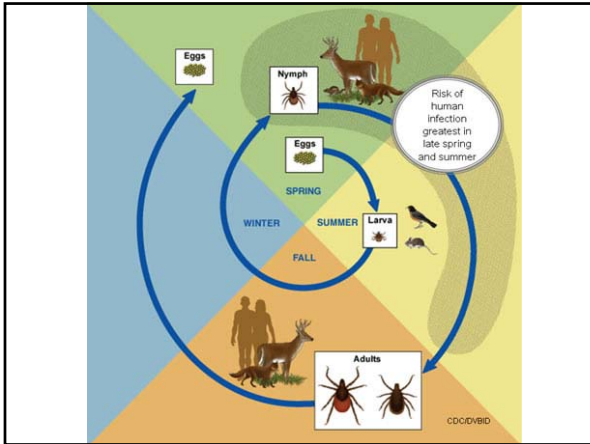
Holothyrans, ticks
and mesostigmatic
mites

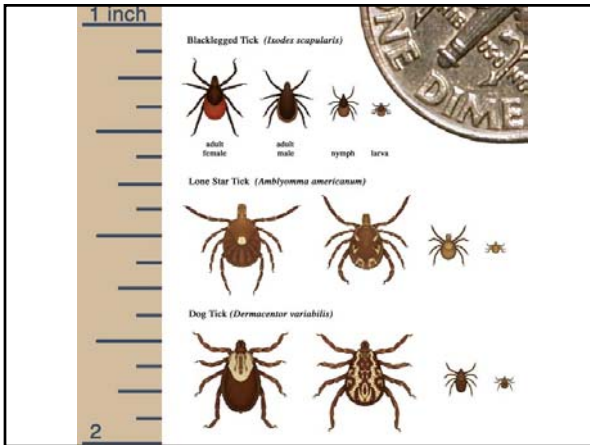


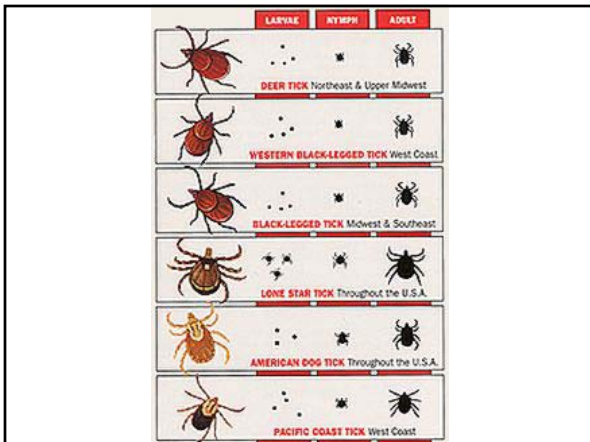


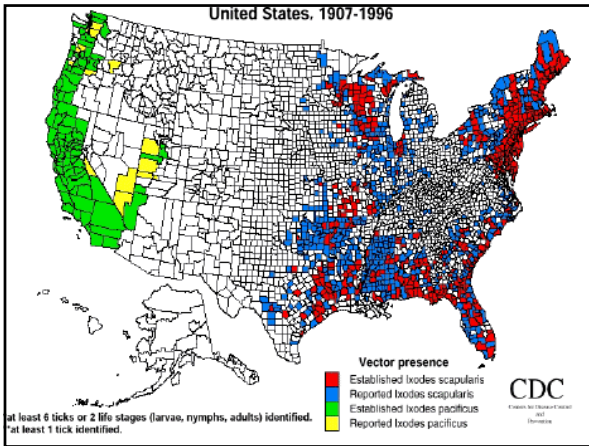
Ixodidae (Hard ticks)
Argasidae (Soft ticks)
Nuttalliellidae



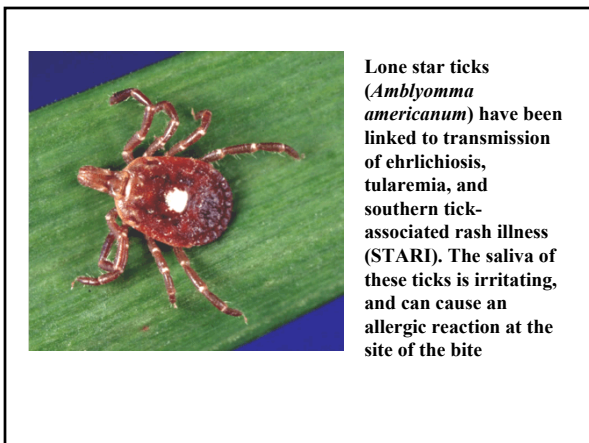


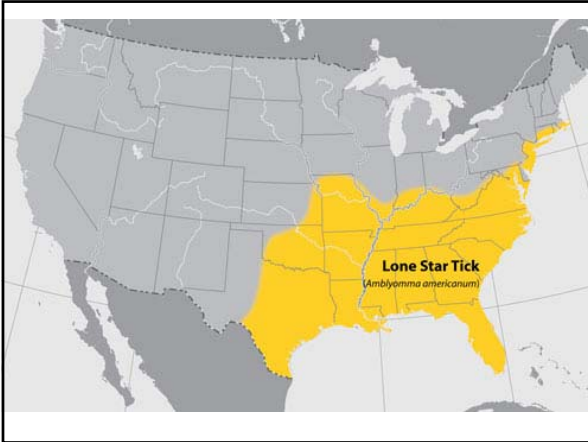














American dog tick (*Dermacentor variabilis*) as well as the Rocky Mountain wood tick (*Dermacentor andersoni*) can transmit many diseases including [Rocky Mountain spotted fever](#) and [tularemia](#).

Distinguishing between soft and hard TICKS (Family Argasidae vs. Family Ixodidae)

