

BIO 475 - Parasitology

Spring 2009

Stephen M. Shuster
Northern Arizona University

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

Lecture 25

Subphylum Cheliceriformes

Spiders, ticks,
mites, scorpions,
horseshoe crabs

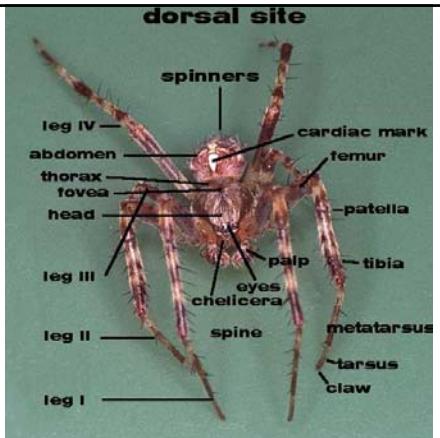


General Characteristics

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

Appendages on prosoma are:

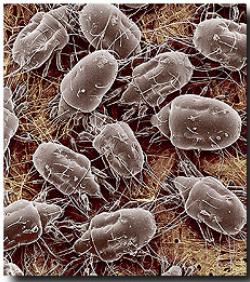
1. Chelicerae
2. Pedipalps
3. 4 pairs of walking legs (uniramous)
4. No antennae



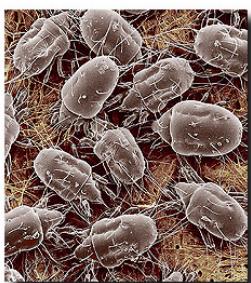
Order Acari

Three major suborders

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

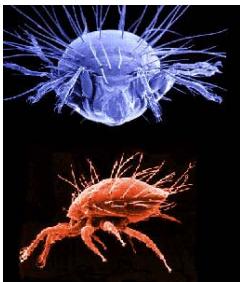


Order Acari



Characteristics

1. Hexapod larval stage
2. Three octopod nymphal stages (variously abbreviated in derived taxa)
3. Gnathosoma delimited by a circumcapitular suture
4. Palpcoxal endites 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)

Opilioacariformes

Parasitiformes (Holothyrans, ticks and mesostigmatic mites)



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

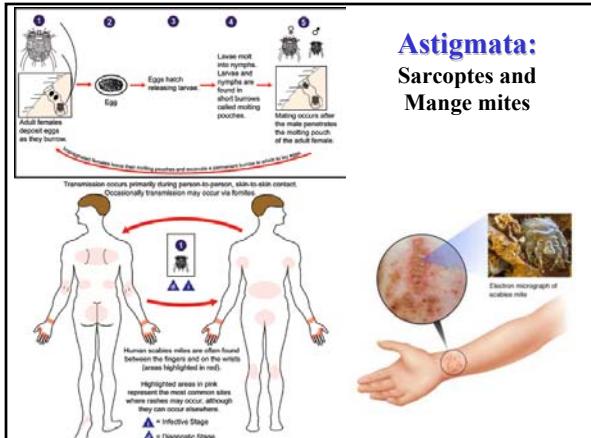
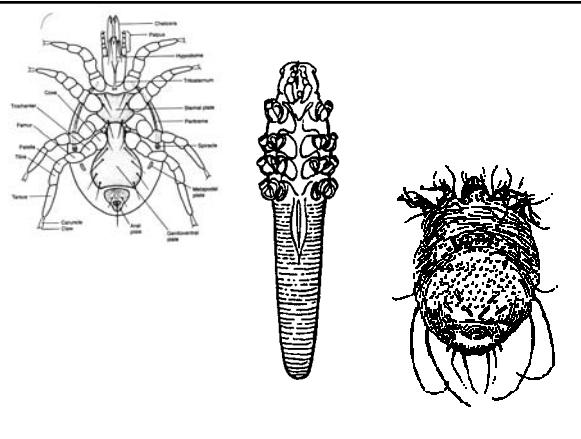




Acariformes

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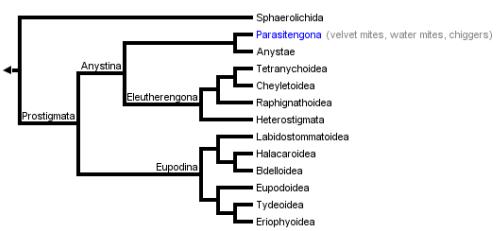




Trombidiformes

Trombidiform mites

Prostigmata - tracheal system opens near dorsal prosoma
Tetranychoidea - spider mites
Eriophyoidea - gall mites

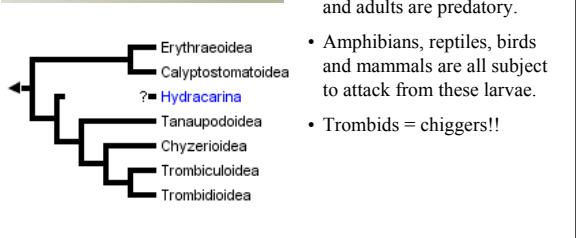


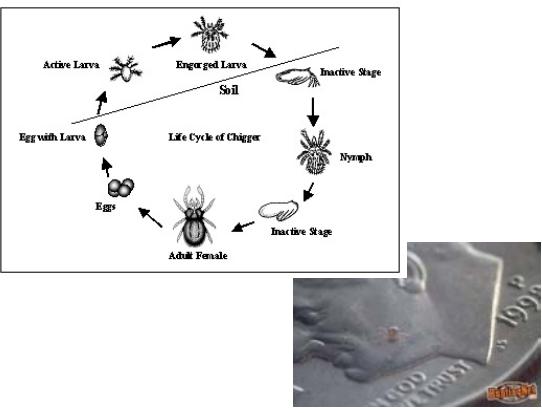


Parasitengona

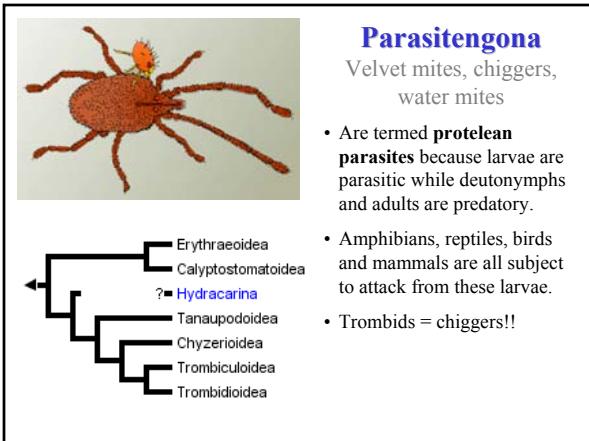
Velvet mites, chiggers, water mites

- 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!!









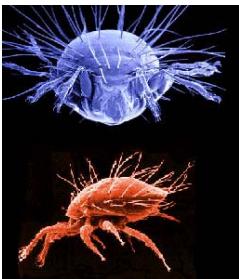
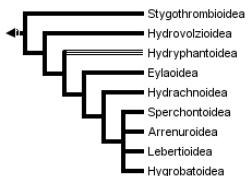


Hydracarina

Water mites

The only truly aquatic mites

Are parasitic on aquatic sponges, mussels, and insects



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Acariformes (The "mite-like" mites)
Opilioacariformes

Parasitiformes (Holothyrans, ticks and mesostigmatic mites)



Parasitiformes

Holothyrans, ticks and mesostigmatic mites



Holothyrida
Ixodida
Mesostigmata

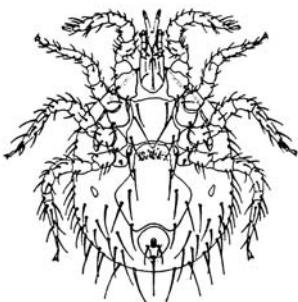


FIGURE 40.13

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

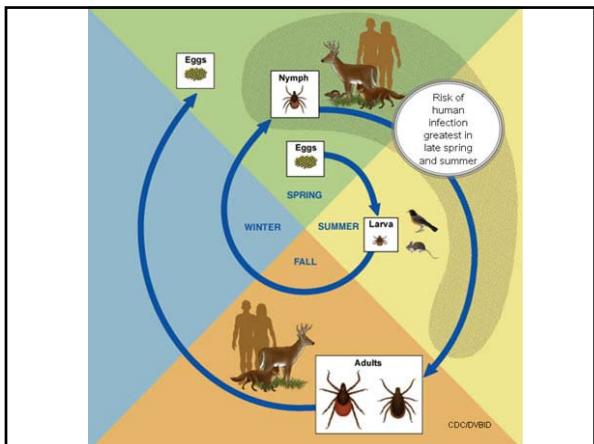


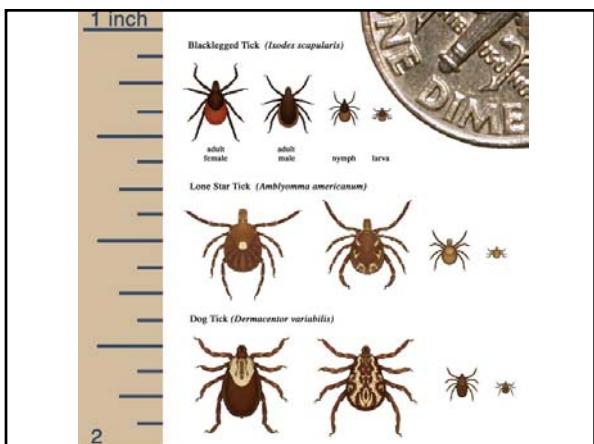
Ixodidae (Hard ticks)

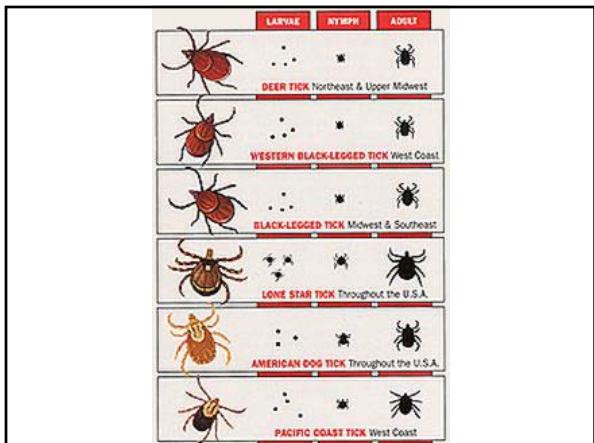
Argasidae (Soft ticks)

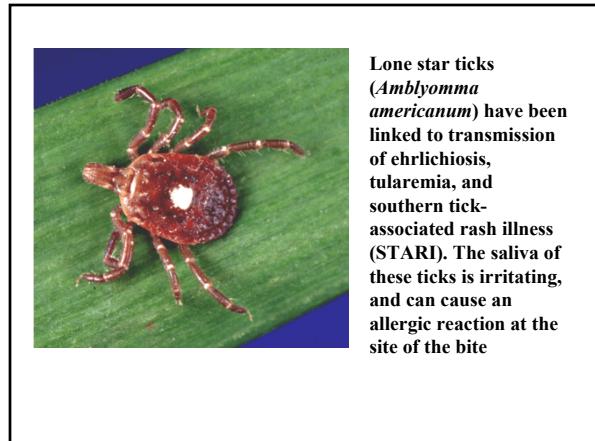
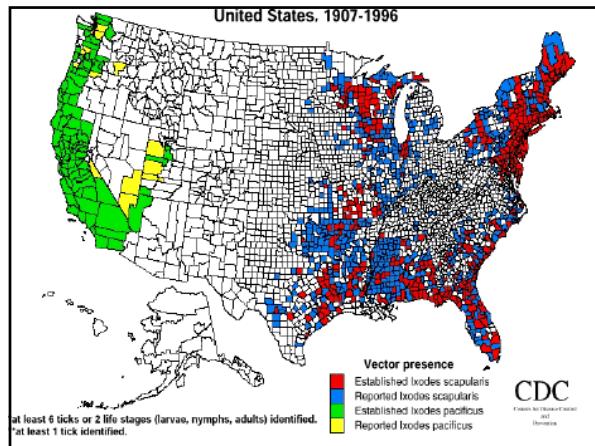
Nuttalliellidae

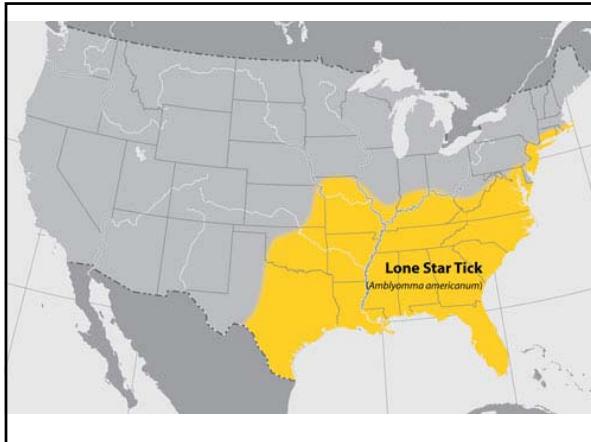












American dog tick (*Dermacentor variabilis*) as well as the Rocky Mountain wood tick (*Dermacentor andersoni*) can transmit many diseases including Rocky Mountain spotted fever and tularemia.

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

