

XII. Subphylum Chelicerata, Class Arachnida (Chapter 41) 2009

A. Characteristics

1. CHELICERAE
 - a. Mouth appendages
 - b. Move up and down = stab
2. No antennae

B. Class Arachnida

1. Usually 8 legs
2. Body with 2 divisions

Slide #1: Generalized Mite, Ventral View, Figure 41.12; p. 649; 8th ed.

C. Order Acari

1. Body divisions fused (Give appearance of one)
2. Development
 - a. Egg
 - b. Larvae (= 6 legs)
 - c. Nymphs (= 8 legs)
 - d. Adult (reproductive)
3. Ticks
 - a. Macroscopic
 - b. Blood feeders

Slide: Engorged lone star tick; Bowman, A. & V. Beregovoy 1996 *Parasitology Today*, 12:(10): cover

4. Mites
 - a. Usually microscopic
 - b. Skin & lymph feeders (Cannot penetrate to blood vessels)

Video: Ear mite from dog; L. Erickson, 2006

D. Family Ixodidae

1. Hard ticks
2. Capitulum (contains mouthparts) visible dorsally
3. Free living after feeding
 - a. Life cycle involves feeding on many hosts
 - b. Good vectors
 - (1) Rocky Mountain spotted fever (Fig. 41-5, p. 643)
 - (2) Encephalitis
3. *Ixodes dammini*
 - a. Deer tick
 - b. Larvae or “seed ticks” have only 6 legs (Fig. 41-2, p. 641)
 - c. Vector of spirochaete bacterium, *Borrelia burgdorferi*, that causes Lyme disease

Slide: Six-legged larva of *Ixodes*; Figure 41.2, p. 641, 8th ed

E. Family Argasidae

1. Soft ticks
2. Capitulum not visible from above
3. Painful bites

4. Live in nests (= near food)

Slide: Soft Tick, Capitulum not visible from above; Figure 41.9, p. 647

F. Family Demodicidae

1. *Demodex folliculorum* (Fig. 41-19)
 - a. Found in human hair follicles and sebaceous glands
 - b. Universal (Prevalence increases with host age.)
 - c. Benign

Slide: *Demodex folliculorum*, The Human Follicle Mite; Figure 41.19, p. 653

Slide: *D. folliculorum* in hair follicle; <http://www.polesine.com/pagine/salute/altre/a002.htm>

2. *Canine demodectic mange* or “red mange”

- a. Caused by *Demodex canis*

Slide: Life-cycle: <http://www.dr-dan.com/red.htm>

Slide: http://www.marvistavet.com/html/demodectic_mange.html

- b. Can be fatal to some dog breeds as bacterial infections can develop
- c. Not transferable to humans

Slide: <http://www.mange-in-dogs.com/demodectic-mange-in-dogs.php>

G. Family Trombiculidae

1. Chiggers or “red bugs”
2. Only the larval stages (w/ 6 legs) infect humans
3. Feeding
 - a. Do NOT burrow into skin
 - b. Penetrate epidermis, secrete saliva that dissolves host cells and suck up juices
 - c. Itching reaction often occurs after mites have dropped off.

Slide: <http://mdc.mo.gov/nathis/arthopo/chiggers/>

Slide: <http://www.nlm.nih.gov/medlineplus/ency/imagepages/2046.htm>

H. Family Sarcoptidae

1. Scabies or sarcoptic mange mite, *Sarcoptes*
2. Female burrows through keratinized layer of mammalian skin
3. Itching is INTENSE
4. Sarcoptic mange is readily transferable to humans

I. Family Pyroglyphidae

1. *Dermatophagoides* is not a parasite
2. Feeds on organic material (= dead skin) on floors and in furniture (*i.e.* beds & linens)
3. Inhalation causes “house dust allergy” in those whose immune systems are overly sensitive to mite antigens

Slide: *Dermatophagoides* sp. House Dust Mite; Figure 41.27, p. 657

H. Bee Mites

1. Varroa mite
 - a. Recently introduced (1987) into USA from Asia
 - b. Females visible on abdomens of adult bees
 - c. Juveniles feed on bee larvae in hive

Slide: Adult bee with varroa mite on back, Photo by Scott Bauer, USDA;

http://creatures.ifas.ufl.edu/misc/bees/varroa_feeding2.htm

Slide: Life Cycle of Varroa Mite,

<http://www.ento.vt.edu/~fell/apiculture/mitepages/biology-v.html>

2. Tracheal mites
 - a. Insects breathe through a system of tubes (= tracheals) that open onto the insects' surface
 - b. Bees with tracheal mites do not fly as far nor harvest as much pollen as uninfected bees.
3. During 1990's, both types of mites ...
 - a. wiped out most of feral (= wild) honeybee colonies
 - b. caused extensive damage to apiculture colonies
4. Presently strains of bees resistant to the mites are becoming more common in the wild