ACE Preparation Course

GENERAL PEST KNOWLEDGE:
BITING AND STINGING PESTS

ENTOMOLOGICAL SOCIETY OF AMERICA • CERTIFICATION CORPORATION •

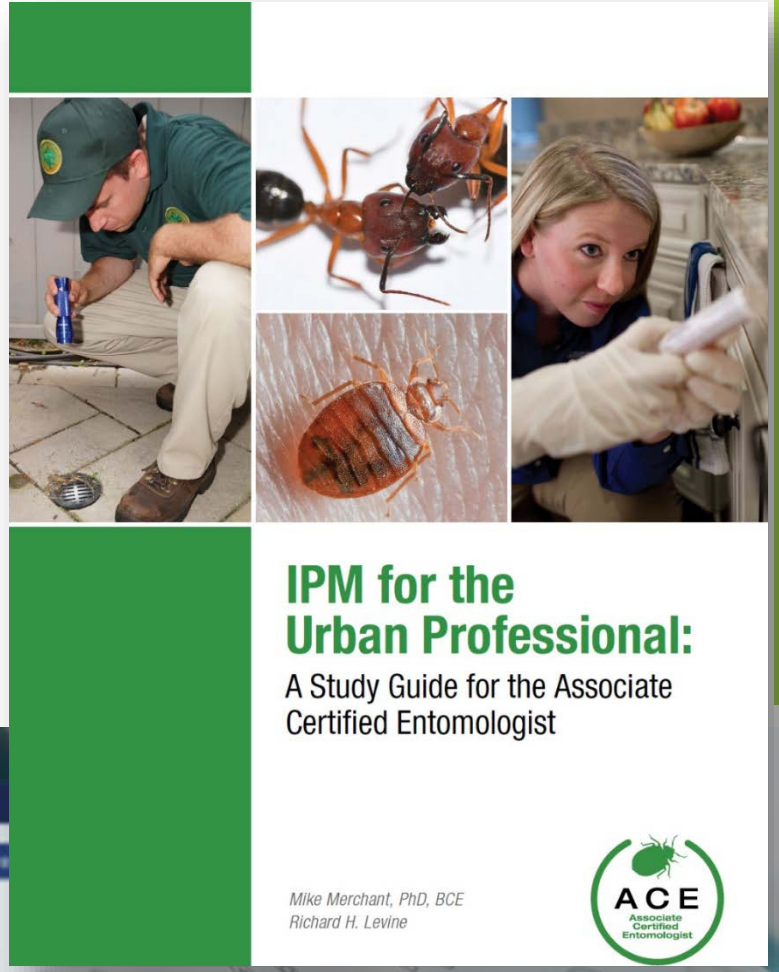
Biting and stinging pests

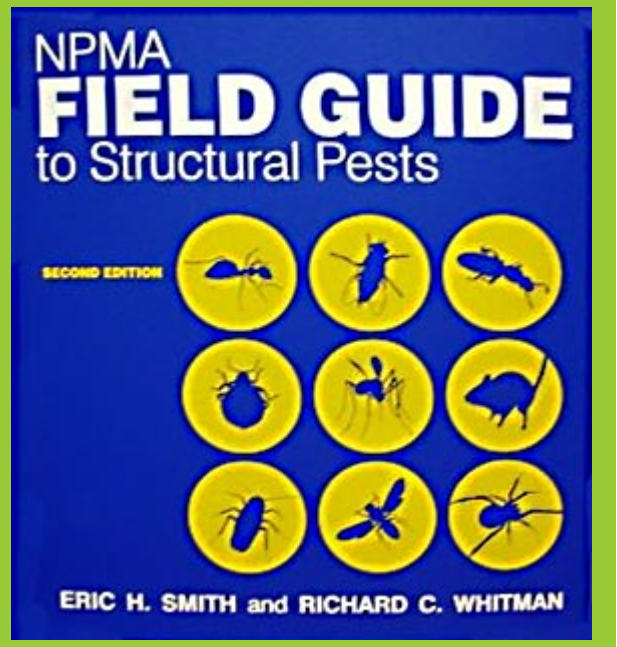
Much of the information in this section can be found in the NPMA Field Guide

- Bees, wasps hornets
- Blood feeders
- Spiders

Also see the Study Guide for the ACE

- Chapter 10, pp. 158-180





Images courtesy NPMA

Difference between a bite and a sting

Bites involve mouthparts

- May involve venom
  - Reduviid (assassin) bugs
  - Spiders
- Or no venom
  - Bed bugs
  - Fleas
  - Lice
- Stings are delivered via modified ovipositor
  - Bees, Wasps, Ants
  - Scorpions
- Venomous spines (less common)

Bites may also transmit disease pathogens

Mosquitoes
- West Nile virus
- Eastern equine encephalitis
- Dengue fever

Fleas
- Murine typhus

Ticks
- Lyme disease
- Rocky Mountain spotted fever

Body lice
- Typhus

Bedbugs

Adults approx. 3/16 inch-long (size of an apple seed)

Hide in cracks and crevices during day

painless bite

Previously fed adults typically survive 2-5 (6-12) months without human host

Must feed on blood from humans, pets, birds & bats

Other bed bugs

16 species from North America

- 8 genera

Swallow bug, *Oeciacus vicarious*

- *Short 2nd antennnal segment*
- *Long bristles around pronotum*

Bat bugs, *C. adjunctus* (E. U.S.)

- Lateral pronotal bristles as long or longer than width of eye

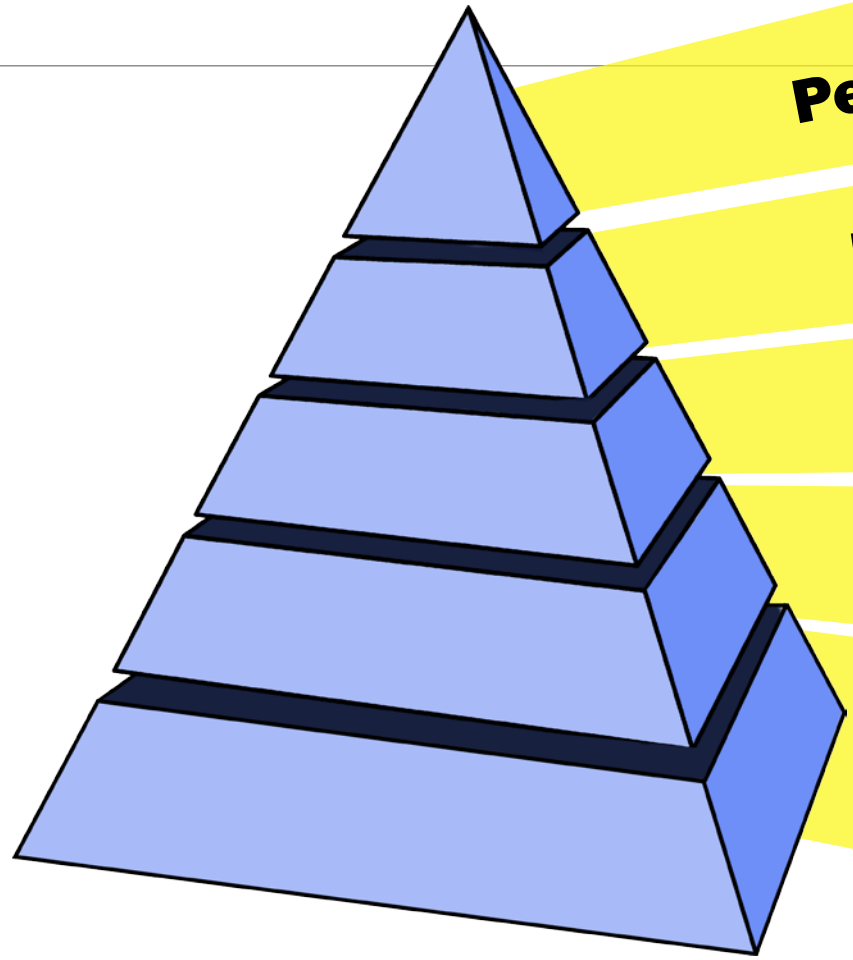
Most urban bed bugs likely to be *Cimex lectularius*

....verify the problem

Many consumers calling for bed bug service *do not have bed bugs*

- Pest misidentification
- Illusions of parasitosis
- Delusions of parasitosis

IPM tactics for bed bugs



Pesticides

Mechanical controls (barriers)

Physical controls (heat, cold)

Pest proofing / Sanitation

Education and Awareness

Fleas - Siphonaptera

Wingless, laterally flattened insects

2,000 species (95% occur on mammals, 5% on birds)

Infest cats, dogs, humans, rodents, birds and other domestic and wild mammals

Pathology

- Flea Allergy Dermatitis (FAD)
  - Saliva is allergenic
- Anemia
- Tapeworm (*Dipylidium caninum*)
- Bubonic plague (rat flea)

Flea bites

Not all fleas are alike

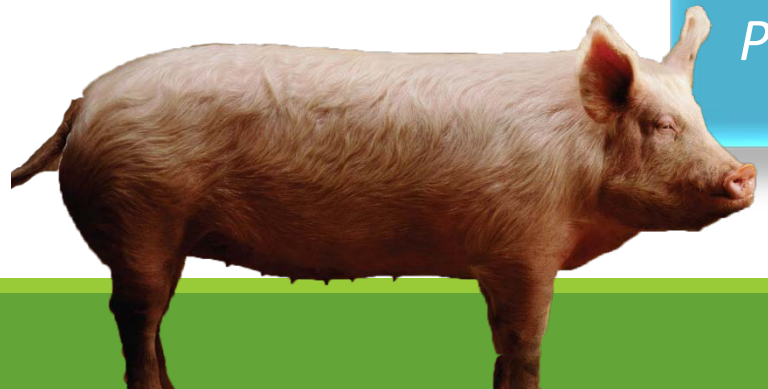
Cat flea, *Ctenocephalides felis*

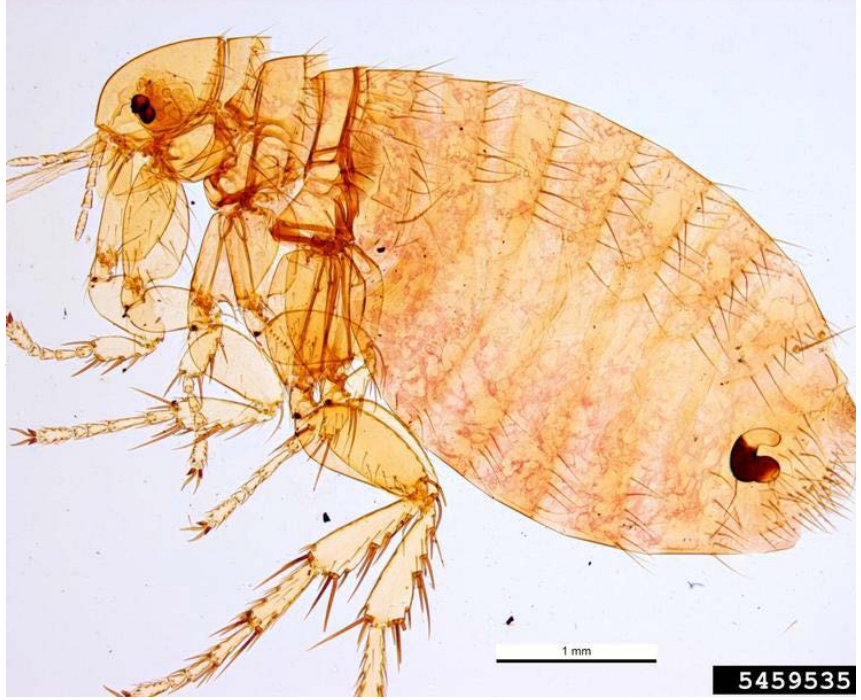
Dog flea, *Ctenocephalides canis*

Oriental rat flea, *Xenopsylla cheopsis*

Human flea, *Pulex irritans*

Sticktight flea, *Echinophaga gallinacea*

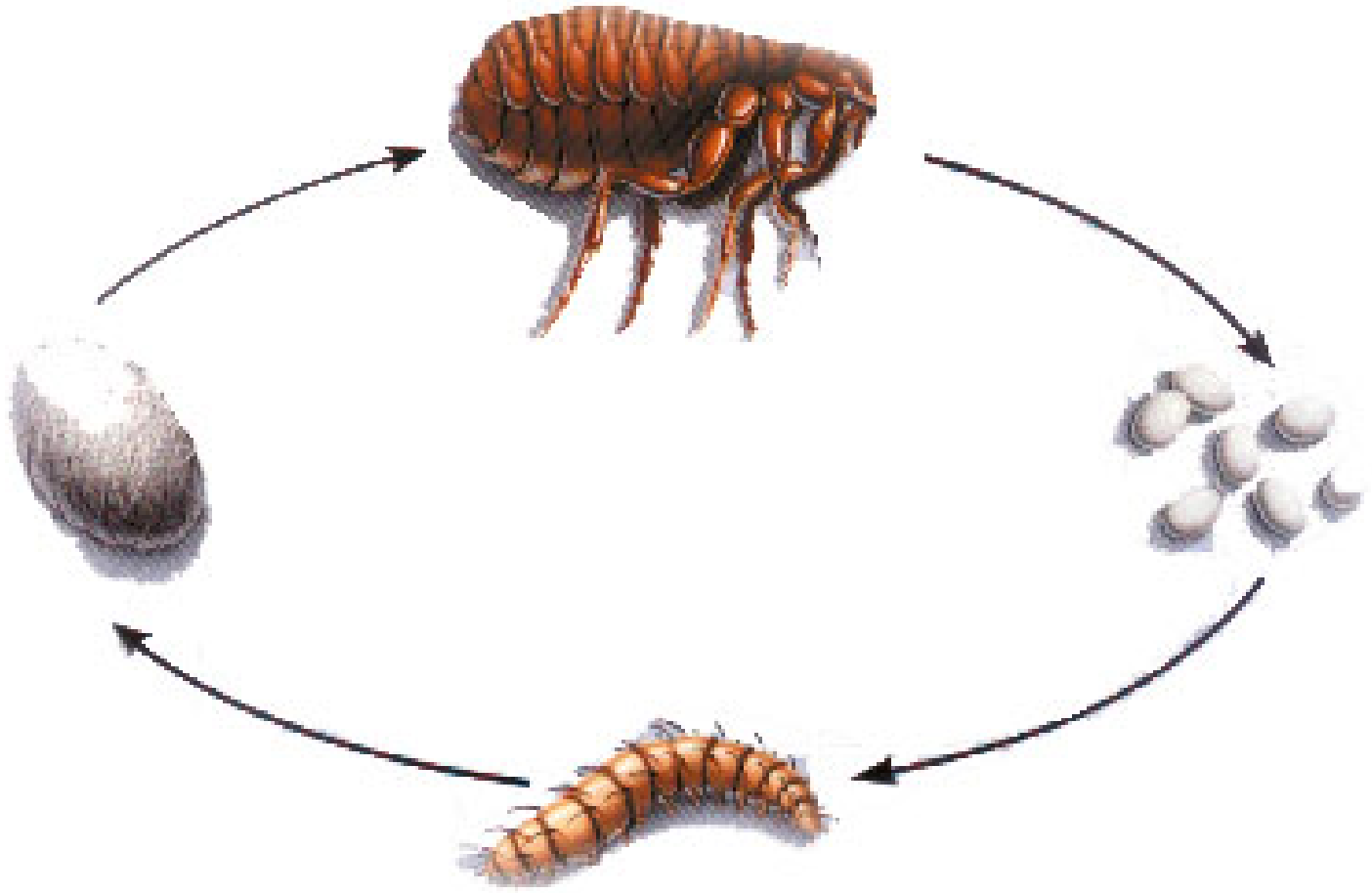




Flea features

Genal and pronotal comb

Both present on the cat flea



Flea Life Cycle

Life cycle stages

- Eggs (fall off host)
- Larva
- Pupa
- Adult

Adult is the only stage spent on host.

Larva must feed on dried blood to develop.

Where will you find flea larvae?

Lice - Phthiraptera

- Pediculosis – the condition of being infested by lice
- Common species
  - crab louse (Pthirus pubis)
  - Head louse (*Pediculus humanus capitas*)
- Control with prescription or over-the-counter pediculicides
- Environmental sprays not usually needed

Scabies mite

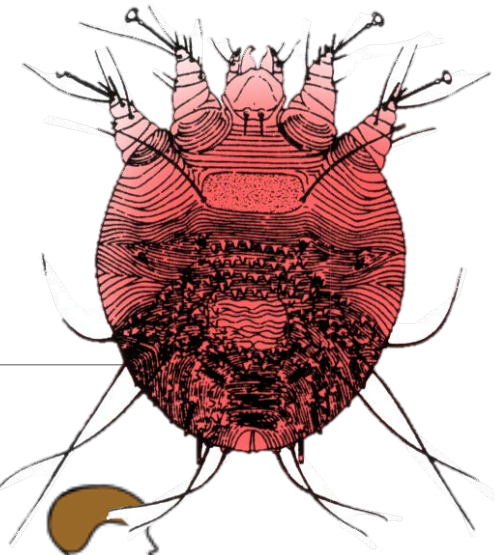
True human skin parasite

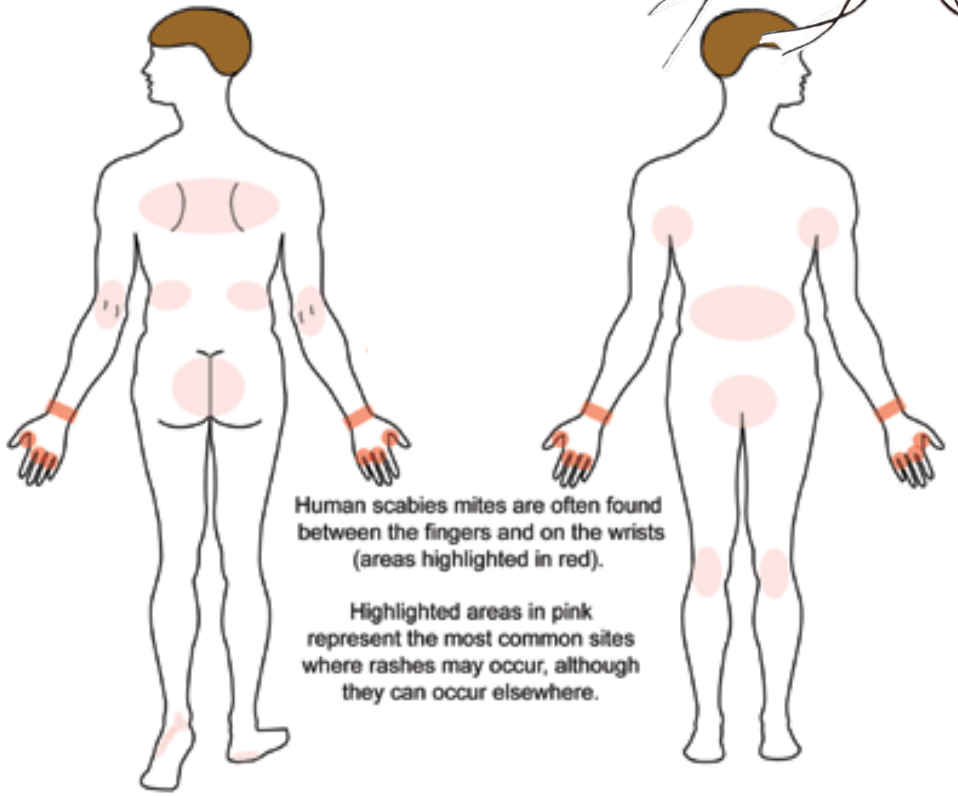
Sarcoptes scabiei, very tiny (0.2-0.4 mm) oval mites

Occurs worldwide

Severe itching not restricted to mite feeding sites

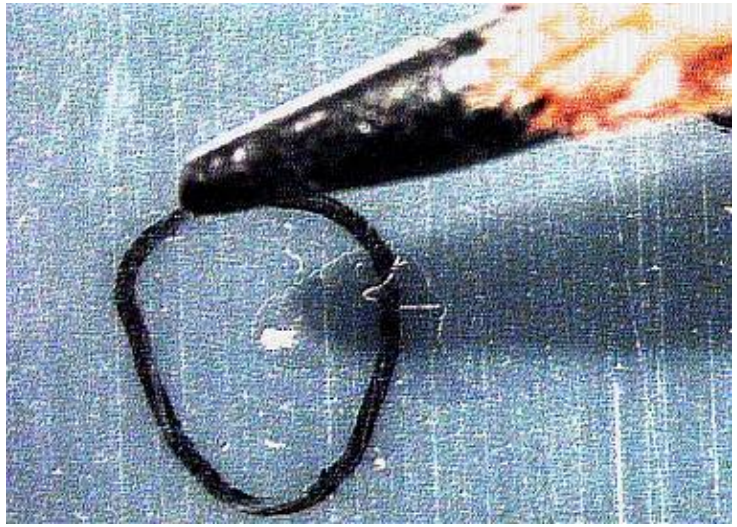
Environmental sprays inappropriate

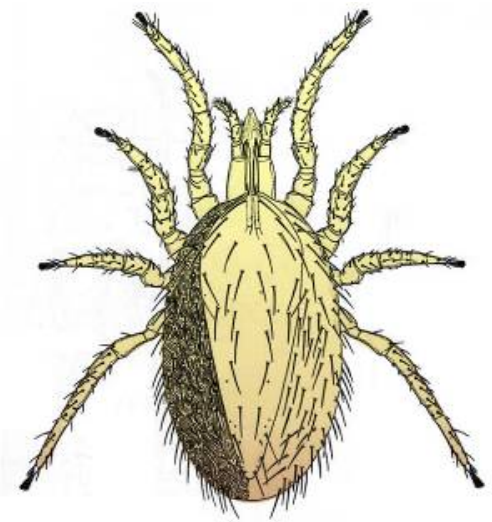




scabies

Photos courtesy Sven Teschke, Wikipedia





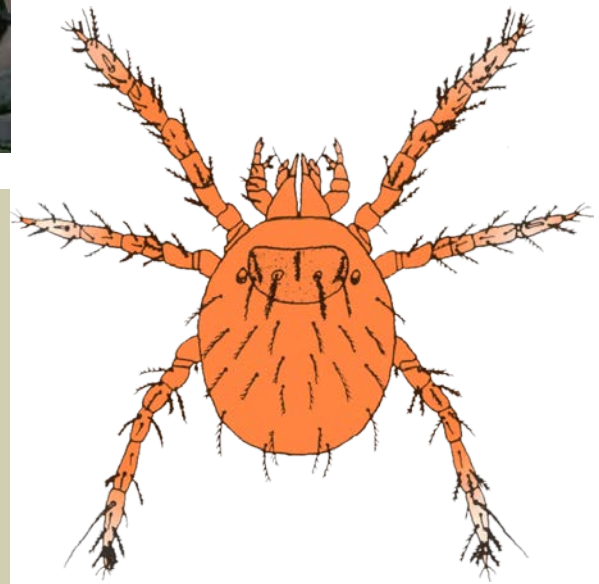
Biting mites

Rodent and bird mites

- Nest parasites of rats, mice, birds
- Will bite, but not infest humans

Stored Product mites

- May bite or cause allergic dermatitis



Chiggers

Immature (nymphal) stage of *Eutrombicula alfreddugesi* is parasitic life stage

Live outdoors, especially in ecological transition zones (edge habitats)

Bites mostly around socks and waist areas (areas of tight-fitting clothing)

Ticks

Human infestations generally picked up outdoors

May remain attached to skin for several days

Disease transmission possible

Hard Ticks (Family Ixodidae)

Three host ticks

- American dog tick, *Dermacentor variabilis*
- Lone star tick, *Amblyomma americanum*
- Black-legged deer tick, *Ixodes scapularis*
- Brown dog tick, *Rhipicephalus sanguineus*

After feeding on an infected host, tick may vector pathogen to subsequent host

Mosquitoes

Order Diptera (flies) Family Culicidae

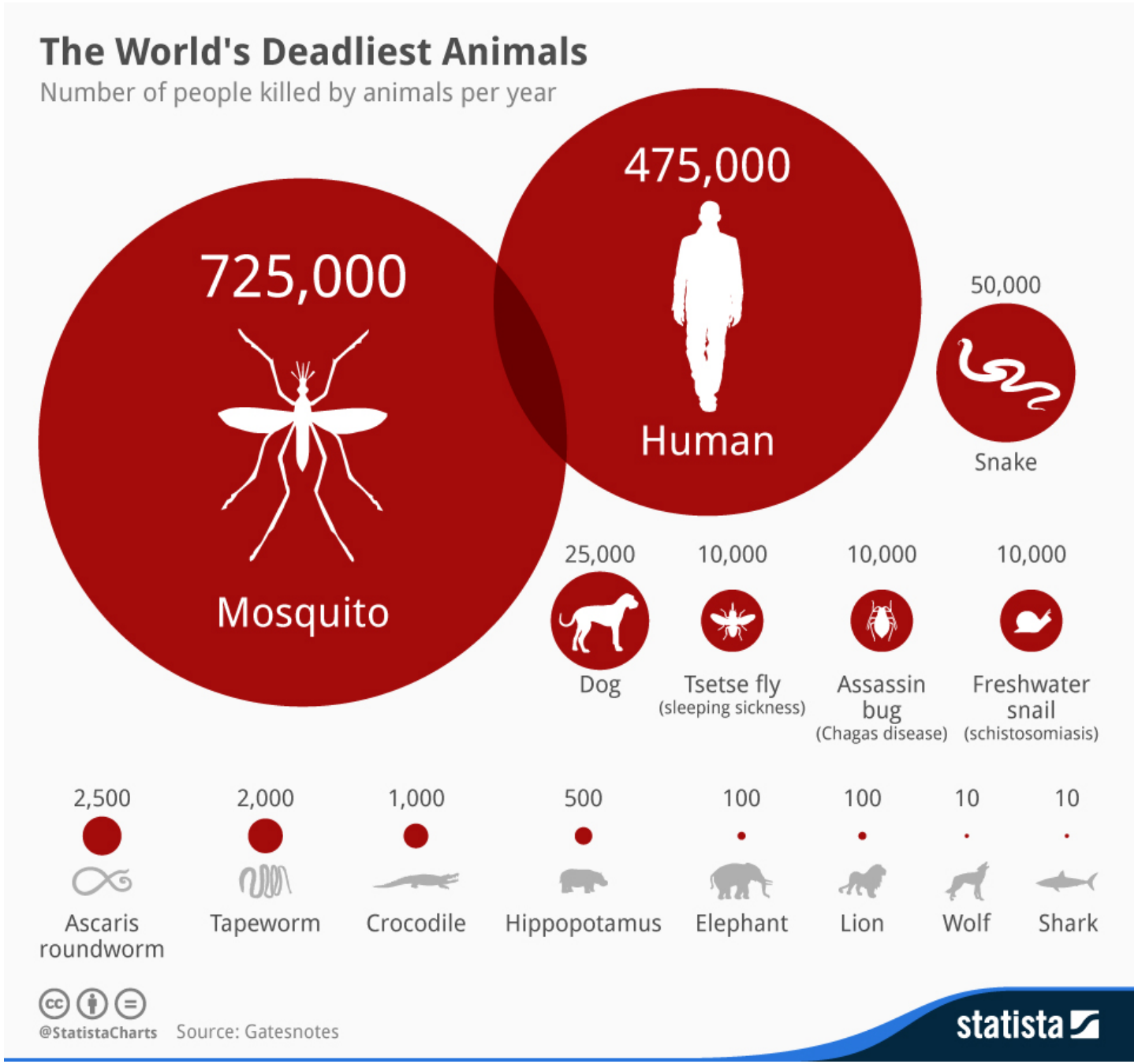
- approximately 170 species in North America

House mosquitoes (*Culex spp*) are delicate night-time biter and vector of WNV

Aedes mosquitoes day *and* evening biters

Itching, colorless welts

Photos from Oklahoma State University website



Mosquitoes are potentially the most dangerous pests in the world

Mosquito control starts with recognizing potential breeding sites

Brown recluse spider, *Loxosceles reclusa* Other names: fiddleback, violin and brown spiders

Identification: Fiddle-shaped mark on cephalothorax, 3 pairs eyes in semicircle

Nocturnal hunting spider

1 to 3-year lifespan

Most common in TN, AR, MO, KS, OK, NB, AL, MS, LA, IL, IO, OH, TX

Necrotic venom

Brown recluse lairs

Look for brown recluse spiders in protected locations indoors, outdoors

- Boxes and storage
- Wood shingle roofs
- Wood piles
- Under stones, ledges
- Under insulation
- Wall voids

Sac spiders (family Miturgidae) including Cheiracanthium**

Builds flattened silk tube or sac also called a retreat where they spend most of their daylight hours.

Necrotic toxin in some species

Common indoor and outdoor spider in some areas

Black widow spiders, *Latrodectus* sp.

Five US species
- Black, brown, northern, red and western widows

Hourglass marking

Neurotoxic venom

Irregular cobweb

Principally found outdoors or in older buildings, storage sheds, outhouses, workshops


Brown widow
Image courtesy Martyn Hafley

Hobo spider and other funnel-weaver spiders (family Agelenidae)**

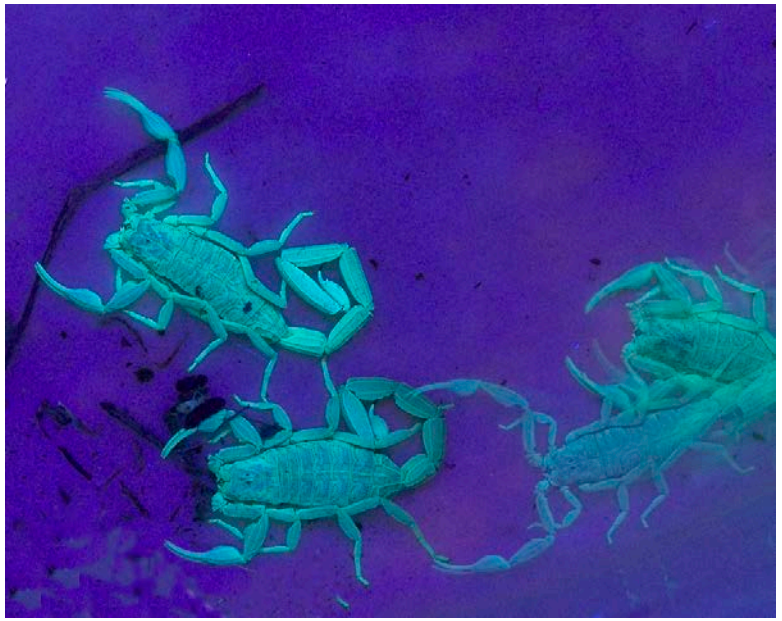
Hobo spider, formerly known as aggressive house spider.

Common in WA, OR, ID, UT

Builds funnel webs

No good evidence for it as a medically important spider

- Not believed to be a significant threat for necrotic bites



Scorpions
Class Arachnida: Order Scorpiones

Nocturnal hunters feed on insects

Neurotoxic venom

Fluoresce under black light

Arizona bark scorpion (*Centruroides elixicauda*) most medically important species

Hornets (bald-faced and European) *Dolichovespula maculata* and *Vespa crabro***

Construct inverted, pear shaped enclosed paper carton nests which can be up to three feet long.

Mature colonies have queen and 200-400 workers, brood and sometimes males.

Elevated nests not usually a threat to people

Paper wasps, *Polistes* species

Umbrella-like nest

Exposed brood chambers

Social insects

Colonies less than 200 workers

Yellowjacket wasps: *Vespula* and Dolichovespula

Social insect with annual colonies generally less than 2,000 workers (20,000)

Aggressively defend nest

Most commonly encountered in fall

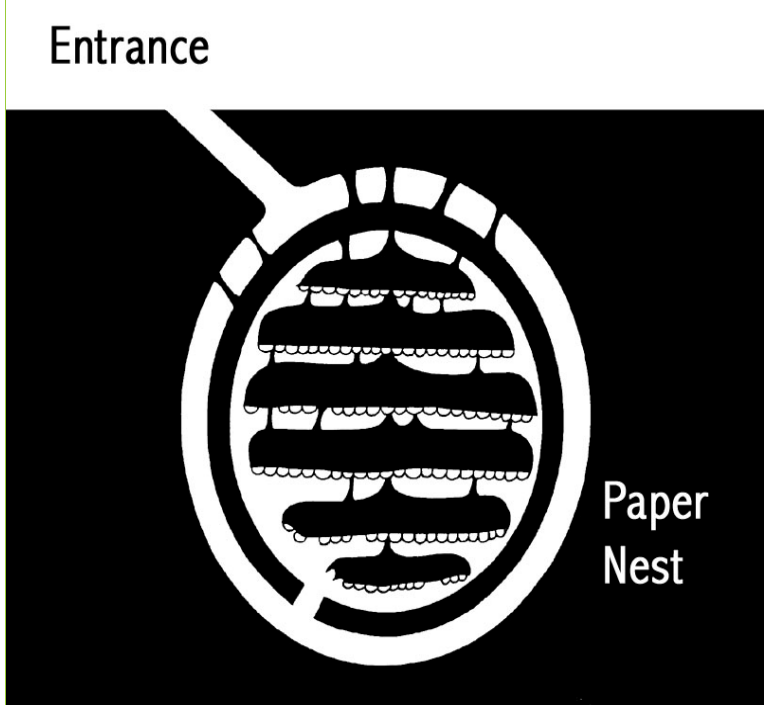
Primarily ground nesters

Yellowjacket nest variations

Usually underground with multiple brood layers surrounded by paper envelope

Old animal burrows, hollow logs or railroad ties

Above-ground nests irregular in shape



Bumble bees *Bombus* spp.

Large native bees

Nest in underground holes

Will sting if nest disturbed

Considered beneficial pollinators

Photo courtesy Bugwood, David Cappaert

Ground nest of bumble bees

Honey bee

Apis mellifera

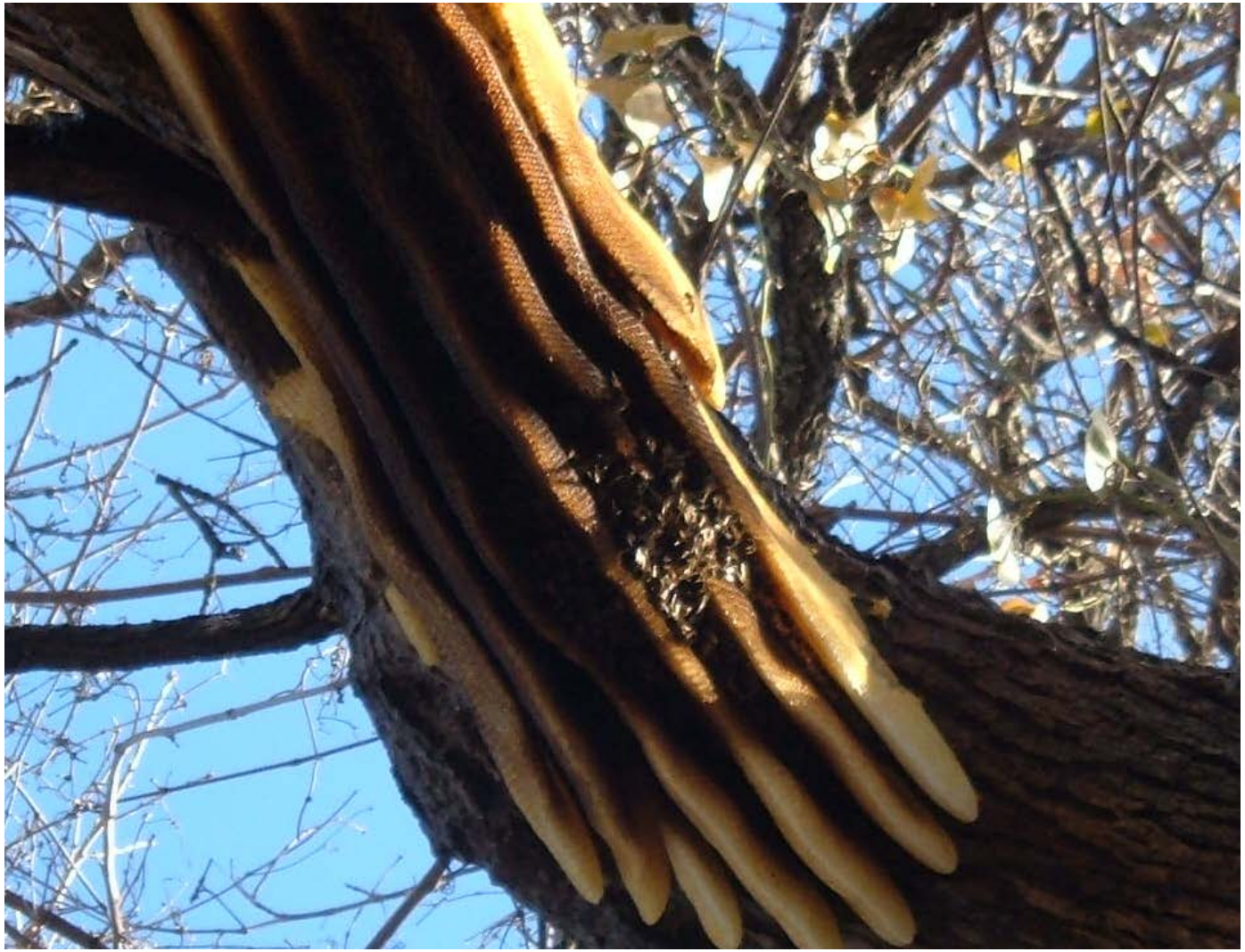
Social insect, lives in colonies of 10,000+ bees

Colonies reproduce by swarming

Beneficial pollinator

One of most difficult-to-control stinging insects

Honey bee swarms



Exposed honey bee hive

When bees get into buildings

Enter through small holes

May go up to 20 feet into structure

Failure to remove may be a sticky disaster

Consequences of not removing bee nests

Comb melts releasing wax and honey into wall, ceiling

Dead insects and honey decay and result in odors

Secondary infestations of cockroaches, carpet beetles, wax moths, clothes moths, ants, rodents

Re-infestation by new bee colony possible

Stinging caterpillars

Which of the following statements about bedbugs is false?

heavy infestations may have an odor

rarely hide away from beds

the bite is painless

nymphs and adults can move quickly

The family to which all species of mosquitoes belong is:

Muscidae

Simuliidae

Culicidae

Calliphoridae

To be effective, integrated mosquito management (IMM) programs should include:

Accurate and complete assessments of the mosquito problems to be dealt with

Continual surveillance

Multiple control measures

Continual program evaluation and modification when and where necessary

B and C

All of the above