





### Overview

- Modes of Action
- Venomous Hymenoptera
- Other Dangerous Insects
- Other Dangerous Arachnids



### Modes of Action

- Bites – spiders, centipedes, assassin bugs, ants
- Stings – scorpions, ants, wasps, bees, caterpillars
- Allergies – it's personal
- Dermatitis – caterpillars, blister beetles
- Myiasis – flies
- Delusional Parasitosis – psychological disorder

### Arachnids


- Black Widow (*Latrodectus* species)
  - One species in AZ
  - Severe pain, respiratory distress, cramping
- Brown spiders (*Loxocelos* species)
  - Five species in AZ
  - Local pain and swelling, potential necrotic ulcer
- Daddy long legs (*Opiliones* species)
  - Not venomous contrary to popular belief

### More Arachnids

- Scorpions
  - 56 species in AZ
  - All venomous but only one considered dangerous
    - Bark scorpion (*Centruroides exilicauda*)
    - Potentially life threatening to children under 4 years old
- Ticks
  - Brown dog tick (*Rhipicephalus sanguineus*)
  - Not venomous but able to spread disease by biting
  - Rocky Mountain Spotted Fever bacteria found in some

### Hymenoptera

- ♦ Larvae grub-like or maggot-like mostly, some resemble caterpillars
- ♦ Complete metamorphosis
- ♦ Membranous wings
  - ♦ Hind wings smaller
  - ♦ Tiny hooks (hamuli) join wings
- ♦ Hard bodied
- ♦ Females usually have ovipositor modified for defense
- ♦ Mostly beneficial
  - ♦ Pollinators, predators, parasites, provide honey and wax



**Sawfly Family: Tenthredinidae**

- Often brightly colored
- Body shape is somewhat roundish and robust, fly like in appearance
- Many adults are predaceous
- Larvae are caterpillar-like, but no crochets and more than five pairs of prolegs
- Larvae are herbivore pests

**Family: Ichneumonidae**

- Long antennae
- Females have a long ovipositor, sometimes longer than body
- Parasitoids, larvae feed on a single insect host

**Mutillidae**  
(moo-TILL-i-dee)  
**velvet ants**

- Females hairy, wingless, resembling ants, usu. red or reddish-brown
- Males winged, fewer hairs

**Sphecidae**  
(SFES-si-dee, SFEE-si-dee)  
**mud daubers, thread-waisted wasps**

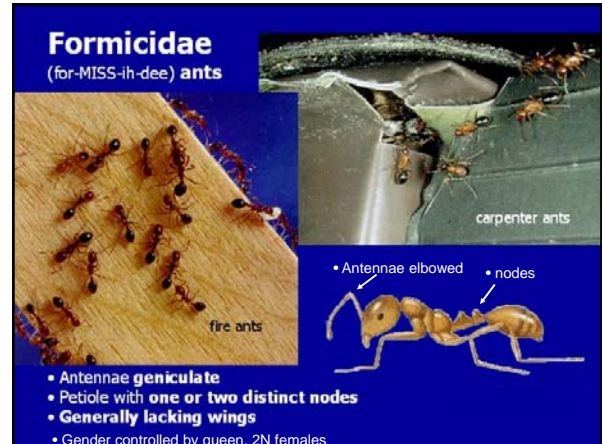
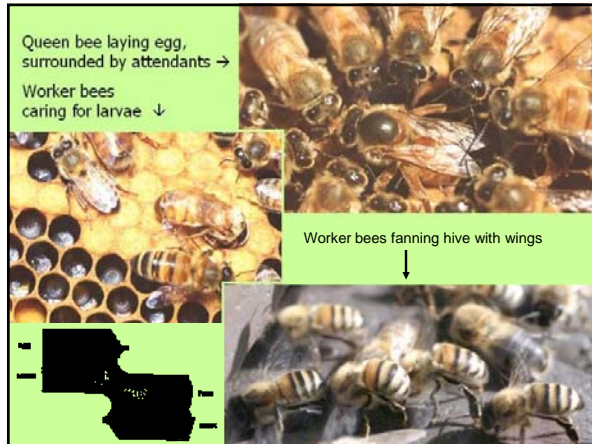
- Pronotum short and collarlike, w/small rounded lobe on each side
- Most are solitary ground-dwellers; each species provisions its nest with characteristic prey, e.g., bugs, grasshoppers, cicadas, planthoppers, flies, beetles, and spiders.

**Vespidae** (VESS-pi-dee)  
**wasps, hornets, yellow jackets**

- Wings **fold longitudinally at rest**
- Inner margin of eye **usu. notched**
- most spp. **eusocial**, papery nests

**Apidae** (AY-pi-dee) **honey bees, bumble bees, carpenter bees, digger bees**

- Jugal lobe in hind wing lacking (bumble bees) or **shorter than submedian cell**
- Labrium and maxillae form tongue like structure for lapping up liquid.



## Bees and Wasps

- **Primary concern about the group is their defensive behavior - they sting**
- **As many as 10 - 15% of residents will be stung in any given year**

## Wasp or Bee?

- Most people cannot distinguish between the two
- Most stings are caused by wasps
- Proper control depends on identification

## Major Differences Between Bees and Wasps

1. Wasps are predatory; bees feed on plant products
2. Bees are hairy and have plumose or branched hairs

## What is a Bee?



- Many types of bees present in AZ
- Flying insects that collect nectar and pollen
- 20,000 species, many differences between them
- Some make honey and some don't
- Some sting, while others can't

### Arizona Bees

 <p>Honeybee Sting</p>	 <p>Carpenter bee Sting under extreme circumstance</p>
 <p>Sweat bee Small Sting</p>	 <p>Bumble bee Sting</p>



### Leafcutter Bee



- Beneficial Insect
- Pollinators
- Not aggressive


Photography: Neil Bromhall


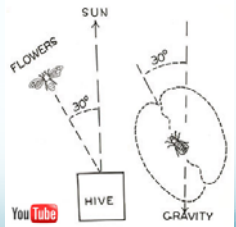
### Venom Sack

### Honey Bee Biology

- Bees are social insects and live in colonies
- Caste system
  - Queen
  - Worker
  - Drone





YouTube

### Swarm vs Hive

Hives	Swarms
<ul style="list-style-type: none"> <li>• <b>Permanent:</b> weeks +</li> <li>• Usually in holes, walls, trees</li> <li>• Most bees not visible</li> <li>• Usually much flight activity</li> <li>• If exposed, comb seen</li> <li>• Often defensive</li> <li>• Bees with yellow/orange pollen on legs arriving</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Temporary:</b> present 1-4 days</li> <li>• Always <b>exposed &amp; open</b></li> <li>• <b>Visible cluster</b> of bees</li> <li>• Usually quiet, little flight</li> <li>• Comb not present</li> <li>• Very rarely defensive</li> <li>• Pollen-laden bees not seen</li> <li>• Usually occurs in spring</li> </ul>

### Swarm vs Hive

### Hives

- Usually made in openings



### Hives



### Bee Problems and Control

- Bees are beneficial and should not be killed unless they are causing a problem
- Bumble bee nests are small and can be killed with an insecticidal spray or a dust placed in the entrance
- Carpenter bees only cause problems in early spring
- Honey bee nests are difficult to destroy and should be done by a professional



### Hive and Swarm Removal

- Bee hives and swarms should be handled by professionals
  - Local bee keepers are available for removal of bees



### Bee Pollination


- Honeybees provide 80% of the pollination needed by agricultural crops.
- US harvest more than \$20 billions annually in pollinated crops.
- Bees are important!



### Bumble Bee Biology

- Bumble bees have a biology and life cycle similar to Vespid wasps
- Nests are started by queens in the spring and die out at the end of the season
- Bumble bees nest in the ground, old mouse nests, old hay or similar locations
- Bumble bee colonies are generally small

Bumble bee nest



## Carpenter Bees

- Carpenter bees resemble bumble bees
- Carpenter bees are solitary and nest in wood
- They are not aggressive, but male bees will defend territories (but males cannot sting!)
- They can be common around structures where wood is exposed to nesting



## What's Not a Bee



All can sting multiple times

## Problems with Paper Wasps

- Most problems occur in late summer and fall when nest are large
- Wasps are more defensive when nests are large
- Yellowjackets readily scavenge food, bringing them into contact with people
- Good sanitation will help reduce problems



## Wasp and Hornet Nests



## Removing Nests

- This is a dangerous job!
- Large nests should be removed by pest control operator
- Small nests (can be handled by others)
  - Cover face/neck, wear long sleeves, long pants, hat and eye protection
  - Spray at night when wasps are quiet




## Stay Safe

- Remain calm
- Never wave your arms when approached by a stinging insect!
- Cover face with hands and look through fingers
- Run directly to a building or car
- If in the open run 2 football field lengths




### Ants

- More than 12,000 species of ants all over the world
- Use pheromones to communicate (ant trails)
- Social insects
  - Workers
  - Males
  - Queen




### Ant vs Termite

- Ants
  - Elbowed antenna
  - Skinny waste
- Termites
  - Straight antenna
  - Thick waste



### Find the Source

- The best way to treat ants is at the source
- Spraying individual ants is not effective
- You must kill the queen



### Food Sharing

- Trophallaxis



### Ant Food

- Ants eat different things
- Seeds
- Protein
  - Dog food, peanut butter
- Sweet
  - Honey, jelly



### Boric Acid Baits

- Sweet bait-
  - 3 ounces (6 tablespoons) honey
  - ¼ teaspoon boric acid
- Protein bait-
  - 2 ounces (4 tablespoons) peanut butter
  - 3/4 teaspoon boric acid



## Stinging Ants

- Can be very painful
- In response to danger



## Red Imported Fire Ant

- Originated in South America
- First found in Mobile Alabama between 1918-1930
- No known colonies in AZ
- A few nests are found each year in nursery stock but they are destroyed



## Little Black Ant

- 1/16 inch long
- Nests in soil under debris, in open areas and in turf
- Sweet ant
  - Aphid/mealybug honeydew
  - Sweet human food
- Imidacloprid gel bait



## Harvester Ant

- 1/4 to 1/2-inch long
- Nest in open areas, under concrete slabs and turf
- Seed feeders
- Amdro



## Arizona Fire Ant

- Native to Arizona
- 1/8 inch to 1/4 inch
- Nest in turf
- Protein feeders
- Amdro and Fipronel



## Carpenter Ant

- 1/4 to 1/2 inch
- Nest in damp wood (decomposers of decaying wood)
- Wide variety of foods
- For best management fix leaks
- Granular baits and gel baits specifically designed for carpenter ants





