



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



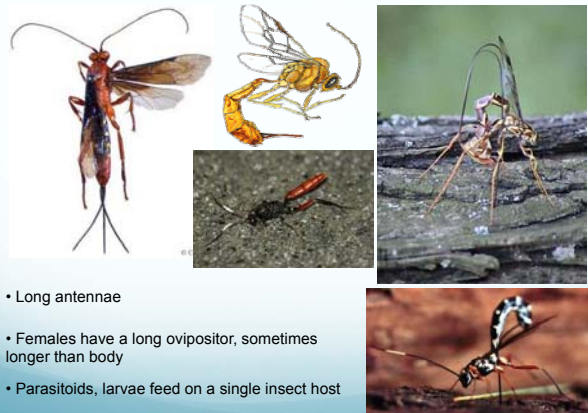
Sawfly Family: Tenthredinidae



- 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-li-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

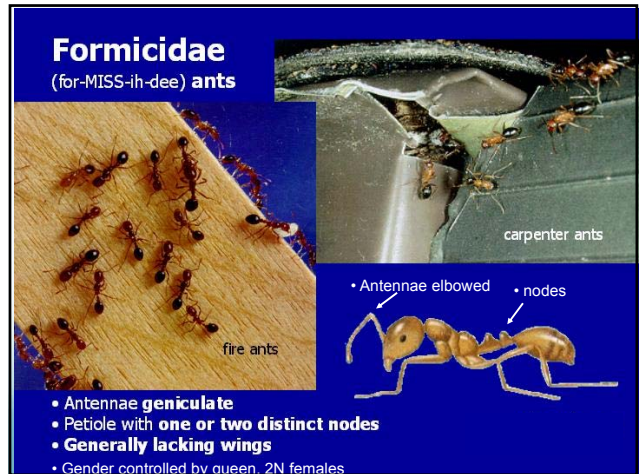
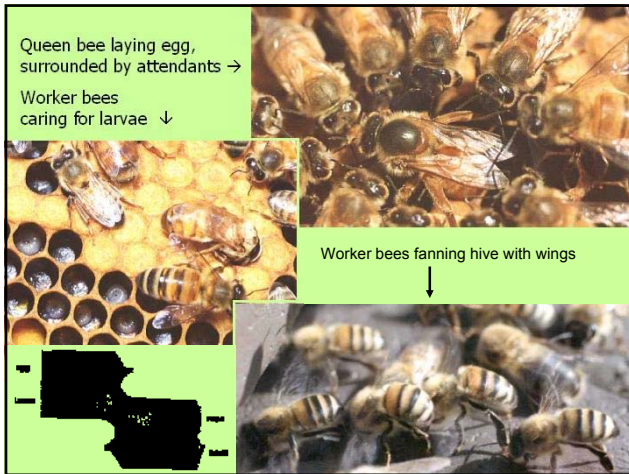
(VESS-pi-dee)
wasps, hornets, yellow jackets

- 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

Honeybee



Sting

Carpenter bee



Sting under extreme circumstance

Sweat bee



Small Sting

Bumble bee



Sting

Leafcutter Bee

- Beneficial Insect
- Pollinators
- Not aggressive



Photography: Neil Bromhall

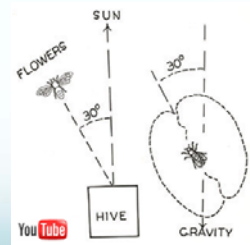


Venom Sack



Honey Bee Biology

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



Swarm vs Hive

Hives

- **Permanent:** weeks +
- Usually in holes, walls, trees
- Most bees not visible
- Usually much flight activity
- If exposed, comb seen
- Often defensive
- Bees with yellow/orange pollen on legs arriving

Swarms

- **Temporary:** present 1-4 days
- Always **exposed & open**
- **Visible cluster** of bees
- Usually quiet, little flight
- Comb not present
- Very rarely defensive
- Pollen-laden bees not seen
- Usually occurs in spring

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 very 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 ne



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

- | | |
|---|---|
| <ul style="list-style-type: none"> • Ants <ul style="list-style-type: none"> • Elbowed antenna • Skinny waste | <ul style="list-style-type: none"> • Termites <ul style="list-style-type: none"> • Straight antenna • Thick waste |
|---|---|



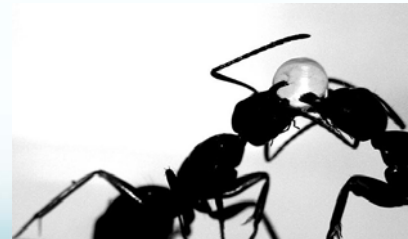
Find the Source

- 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
 - Sweet food, 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

- Ants sting not bite
- 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 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



